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# Competitive Market Socialism: A Practical Alternative for Sectors of the Cuban Economy

Melvin Burke  
*University of Maine*

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**PROCEEDINGS  
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Editors:  
Raul Moncarz  
Edgar Ortiz  
Joseph King

## PREFACE

The intention of this proceeding is to bring in a set of academic papers presented at the Sixth International Society for the Intercommunication of New Ideas meeting held at the Biscayne Bay Campus of Florida International University in August of 2001. The papers presented at the above date, the Sixth of our bi-annual conference, which is the subject of this publication, were intended by their content and approach to serve the goals of ISINI. We hope that they will fulfill their mission in an intellectually profitable and pleasant manner.

The general theme of the conference is “The New Millennium and Its Technological, Economic, and Financial Issues: Paradigms, Models, and Analysis” The goal of the conference is to bring together the work of a number of researchers to evaluate what progress has been made to date and to consider where the most promising directions for further research may lead. One conference, obviously, could not complete this agenda. Many open questions remain for future consideration in this very complicated field.

The authors represent a rainbow of specializations and approaches. Academic viewpoints have been interspersed with those of practitioners, covering several orientations, while spanning a spectrum of perspectives arising from private agencies, public bodies and higher learning institutions from all over the World. Consequently this work can claim a solid balance in its treatment of the timely topics discussed.

We are grateful to the authors of the timely articles contained in this volume who have made possible, with their contributions an up-to-date treatment of World economics, fiancé, and related interdisciplinary topics from an ample variety of perspectives. This publication represents some of the approximately 130 papers presented at the Sixth ISINI conference. The papers appear on the CD-ROM disk in order of authorship and represent presentation in the five following areas::

1. Finance and Monetary Theory and Issues
2. Social Science Issues
3. General Theoretical and Research Issues
4. Labor Issues and Administration
5. Technology and Development

Please view the following pages containing the CD-ROM Index to locate papers of your interest.

## ACKNOWLEDGEMENTS

We were honored at our inaugural session by the remarks of Dr. Mark Rosenberg, Provost at Florida International University, and Nathan Katz, Professor and Chairman, Department of Religion at FIU. For one of our lunch meetings Dr. Terry Buss, director of the School of Policy Management at FIU, gave us an excellent lecture. Also present at the Conference were faculty, staff and students of Universities in the region as well as governmental, business and political personalities.

ISINI would also like to acknowledge the efforts of all the members that were instrumental in making possible this publication, especially those of its Directors and Officers. In addition, grateful recognition is provided to the enterprises that generously supported our activities during the Conference, and which are listed in the sponsor's page. We also wish gratefully to acknowledge the invaluable cooperation of Professor Joe King without whose indispensable participation the task at hand would have been impossible to accomplish. Dr. Judy Blucker, Senior Vice-Provost of Academic Affairs has supported our organization in its short and long-term goals as well as the present conference. She has been a pillar of strength and support for ISINI as well as our dearest friend and business manager of the Conference, Joe Aguilera from the Home School of America.

The support of the Officers of ISINI was also very helpful. I am forever indebted to ISINI's past president and mentor Dr. Edgar Ortiz. Dr. Ortiz, of Universidad Nacional Autonoma de Mexico (UNAM), is the most committed colleague I have met at ISINI as well as in any academic organization that I have been involved with. His contribution has made the Conference another success for the Society and given him, I hope the stimulus needed to continue as Executive Director of the Society.

The assistance given to the Conference by our artist in residence Mercedes Kuper is greatly appreciated as well to the staff at Florida International University, Biscayne Bay Campus which was instrumental in managing the details of this event. Special thanks go to Linda Chinnery, Danielle Reynolds, Rachel Morrow, and Principessa Jayne Klein.

Raul Moncarz  
Biscayne Bay  
Miami, Florida

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**TECHNICAL AND SCALE EFFICIENCIES OF DOMESTIC AND FOREIGN OWNED  
COMMERCIAL BANKS IN MALAYSIA:  
A NONPARAMETRIC APPROACH**

Hazlina Abd.Kadir and Balachander K. Guru  
Multimedia University, Jalan, Malaysia

**Abstract**

The focus of this paper is to test for evidence of technical and scale efficiency in the commercial banking sector in Malaysia. In this context, the study attempts to evaluate if there are any differences between the efficiency of domestic and foreign owned Malaysian banks by applying the Data Envelopment Analysis (DEA). The result indicates that Malaysian commercial banks did not efficiently combine their inputs and that technical inefficiency was attributed to scale inefficiency.

Keywords: Efficiency, Data Envelopment Analysis, Malaysia

**Introduction**

The recent financial crisis of 1997, which had a significant adverse effect on the financial institutions in Asia, had certainly raised everyone's awareness of the weaknesses of the Asian financial systems. In this regards Malaysia is no exception. Since the crisis, the monetary authority namely the Central Bank of Malaysia (BNM) had initiated many reforms including the consolidation of the domestic financial sector. The rationale for these reforms particularly the consolidation process rests heavily on the assumption of the existence of scale and technical efficiency in these financial institutions.

**With greater use of information technology and with the initiation of the idea of the Multimedia Super Corridor (MSC), Malaysia is now moving towards a digital economy, thus, there is an urgent need for reviewing and enhancing the banking institution's efficiency and productivity. If there are potentials for efficiency enhancement, then we can expect improved profitability, greater amounts of funds intermediated, better prices, service quality and greater safety and soundness if some of the savings achieved via the efficiency enhancements can be transformed into capital buffers that absorb risk.**

**In the light of the above argument, the focus of this paper is to test for evidence of technical and scale efficiency in the commercial banking sector in Malaysia. In this context, the study attempts to evaluate if there are any differences between the efficiency of domestic and foreign owned Malaysian banks. This is done by applying the non-parametric Data Envelopment Analysis (DEA) for commercial banks in Malaysia from 1994 to 1999.**

## **Literature Review and Methodology**

The evaluation of commercial banks' efficiency has been studied from a variety of approaches. Estimates of efficiency vary substantially across studies according to the data sources, as well as the efficiency concepts and measurement methods used in these studies. Two widely used approaches in the literature are the parametric and non-parametric methods. The parametric programming is generally concerned with the production or cost function base. It focuses on estimating the characteristics of the function and measuring economies of scale by assuming that all banks are operating efficiently.

Meanwhile, the non-parametric approach, which is widely used by researchers, is an extension of the pioneering idea of Farrel (1957). This approach is suitable for dealing with a multiple input-output technology. It utilizes the observed outputs and inputs to construct the best practice reference units as a convex hull in the input/output space without estimation parameters. It is also input based in that it computes the efficiency of input usage to produce a given level of output (Fukuyama, 1993). Thus, the non-parametric approach considers by how much total productivity can be improved, and ranks the efficiency scores of individual banks.

There are five common methods of evaluating productivity and efficiency in the literature. They are Data Envelopment Analysis (DEA), Free Disposal Hull (FDH), Stochastic Frontier Approach<sup>2</sup> (SFA), Thick Frontier Approach (TFA) and Distribution Free Approach (DFA) (Berger and

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<sup>2</sup> Sometimes also referred to as the econometric frontier approach.

Humphrey, 1997). DEA and FDH are also known as non-parametric methods. Meanwhile, SFA, TFA and DFA, are parametric techniques (Berger and Humphrey, 1997).

Data Envelopment Analysis (DEA), the method used in this study, is a special application of linear programming based on the frontier methodology of Farrell (1957). It was later advanced by Charnes, Cooper and Rhodes (1978) and Banker, Charnes, and Cooper (1984). DEA compares the inputs and outputs of decision-making units (DMUs) and assesses their relative efficiency. DMUs found to be inefficient are strictly inefficient in a Pareto sense in that at least one other decision-making unit can produce the same level of output for less input. The performance of each DMU is measured relative to the performance of all other DMUs. The unit being evaluated can be judged relatively inefficient if the composite unit requires less input to obtain the output achieved by the unit being evaluated. On the other hand, the DMU will be judged as relatively efficient if the composite unit requires as much input as the unit being evaluated does (Al-Shammari and Salimi, 1998)

Assuming there are  $N$  banks (DMUs), each producing  $m$  different outputs using  $n$  different inputs. The efficiency of the DMU is measured as follows:

$$h_s = \frac{\sum_{i=1}^m u_i y_{is}}{\sum_{j=1}^n v_j x_{js}}, \quad (2.1)$$

Where  $y_{is}$  is the amount of the  $i$ th output produced by the  $s$ th bank,  $x_{js}$  is the amount of the  $j$ th input used by the  $s$ th bank,  $u_i$  is the output weight,  $v_j$  is the input weight,  $i$  runs from 1 to  $m$ , and  $j$  runs from 1 to  $n$ . This efficiency ratio ( $h_s$ ) is then maximized subject to the following:

$$\frac{\sum_{i=1}^m u_i y_{ir}}{\sum_{j=1}^n v_j x_{jr}} \leq 1, \quad \text{for } r = 1, \dots, N \text{ and } u_i \text{ and } v_j \geq 0 \quad (2.2)$$

where the first inequality ensures that the efficiency ratios for the other banks cannot exceed one, while the second inequality requires that the weights are positive. The weights for each output and input are determined so that each bank maximizes its own efficiency ratio. Any other set of weight produces a lower efficiency score.

This fractional linear program can be transformed into an ordinary linear program as follows:

$$\text{Maximize } h_s = \frac{\sum_{i=1}^m u_i y_{is}}{\sum_{j=1}^n v_j x_{js}} \quad (2.3)$$

$$\text{Subject to : } \sum_{i=1}^m u_i y_{ir} - \sum_{j=1}^n v_j x_{jr} \leq 0, \quad \text{for } r = 1, \dots, N$$

$$\sum_{j=1}^n v_j x_{is} = 1 \quad \text{and } u_i \text{ and } v_j \geq 0 \quad (2.4)$$

Or the dual problem as follows:

Minimize  $\beta_s$

Subject to:

$$\sum_{r=1}^N \phi_r y_{ir} \geq y_{is}, \quad i = 1, \dots, m; \quad (2.5)$$

$$\beta_s x_{js} - \sum_{r=1}^N \phi_r x_{ir} \geq 0, \quad j = 1, \dots, n; \quad (2.6)$$

$\phi_r \geq 0$ ; and  $\beta_s$  free.

The variable  $\beta_s$  is the overall technical efficiency and must lie between zero and one. The linear programming problem outlined in (2.5) and (2.6) assumes constant returns to scale (CRS). The overall technical efficiency can be divided into pure technical and scale efficiency. To accomplish this, we must resolve the linear programming problem (2.5) and (2.6) after imposing that the sum of the  $\phi_{rs}$ , from 1 to N equals one, which allows for variable returns to scale (VRS).

If scale inefficiency exists, then the source of inefficiency can be due to increasing (IRS) or decreasing (DRS) returns to scale. To distinguish between these two efficiencies, the linear programming problem in (2.5) and (2.6) must be solved with the restriction that the sum of the  $\phi_{rs}$ , for 1 to N is less than or equal to one.

## Variables and Samples used

This study is based on a sample of 29 commercial banks in Malaysia, which includes sixteen domestic, and thirteen foreign-owned banks. To facilitate the analysis DEAP Version 2.1 program by Tim Coelli from the Center for Efficiency and Productivity Analysis, University of New England is used for this study. In terms of variable selections, the intermediation approaches that views banks as financial intermediaries, which transform and transfer financial

resources from surplus units to deficit units (Favero and Papi,1995) is used. As such bank inputs are deposits, interest expense and non-interest expense, while, outputs are total loans, interest income and non-interest income.

### Findings

**The result of this study shows that the average technical efficiency scores over the period of 1990 to 1999 for local or domestic commercial banks (LCB) is less than 1, which implies that the LCB in the sample are not fully efficient. They tend to waste resources and under utilize the inputs in generating outputs. The average efficiency ranged from a minimum of 0.928 to highest of 0.984, which was recorded in 1991 and 1992, respectively (see Table 1).**

The decrease in technical efficiency of LCB at an increasing rate from 1992 to 1994 was mainly because during these period there were continued expansion of branch networks and heavy investment in electronic banking and communications equipment (BNM, 1994). For instance, by the end of June 1993, the number of Automated Teller Machine (ATMs) had increased to 1,492 units from 861 units at the end of 1988.

There seems to be some recovery in the technical efficiency of LCB in 1995 due to sustained economic growth of the country of above 8%, which has boosted corporate and individual earnings as well as improved collateral values. This led to a reduction in the level of NPL in the commercial banks from a high of 8.8% of total loans in 1990 to 1.9% in 1996. In addition, bad debt provisions and interest-in-suspense for commercial banks also declined in 1995 and 1996. This means that more income has been generated from the resources invested. At the end of 1995, the domestic banks as a group registered an increase of pre-tax profits of 26.6%. In 1996, the pre-tax profits grew by over four times from RM1.4 billion in 1990 to RM6.2 billion in 1996.

The technical efficiency of LCB decreased in 1997 due to the regional financial crisis that hit the Asian countries since July 1997. Due to the financial crisis, some commercial banks recorded lower profits and even losses, which resulted in overall pre-tax loss of RM658 million for the industry. Following the financial crisis, the Malaysian Government and BNM has adopted

several approaches<sup>3</sup> to strengthen the resilience of the banking sector. Since these moves have been implemented, the effect towards enhancing, and improving the performance of commercial banks can be seen from the increased technical efficiency recorded in 1999.

In the case of the foreign owned banks (FOB), the data from the thirteen FOB operating in Malaysia from 1994 to 1999 were used in order to calculate the technical efficiency of the foreign banks. This was because only in 1 October 1994, the local incorporation exercise of the foreign banks was successfully completed. All foreign banks' branches that were operating in Malaysia were required to incorporate locally as subsidiaries, in order to continue their operations in Malaysia. Since 1994, the financial performance of these foreign bank subsidiaries was also reported on their Malaysian operations.

The results indicate technical efficiency of FOB in Malaysia ranged from 0.815 to 0.981 and the score decreased every year. The decrease, generally, may be due to limitations imposed on the FOB in terms of expansion of their operation. Foreign banks are restricted from expanding their branches. Thus, it has created stiff competition among the commercial banks. Foreign banks, having less opportunity to spread their operating cost more 'evenly' due to the fact that they have fewer branches, and hence need to provide services or expand their banking products in order to attract more customers.

When efficiency is analyzed to compare the performance of both LCB and FCB, on average, the FOB performed better than the LCB. This is more likely due to their strong and stable parent banks in their country of origin.

From the result of technical efficiency, this study is also aimed at identifying the sources of technical inefficiency. Source of technical inefficiency was mainly due to scale rather than due to pure technical inefficiency for both LCB and FCB. This means that commercial banks in Malaysia have yet to reach the optimal production level.

Table 1 - Efficiency of local commercial banks

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
TE	0.930	0.928	0.984	0.982	0.966	0.954	0.970	0.968	0.949	0.958
PTE	0.968	0.962	0.995	0.985	0.977	0.966	0.986	0.983	0.963	0.972
SE	0.960	0.965	0.989	0.997	0.989	0.987	0.984	0.985	0.985	0.985

<sup>3</sup> which include a merger programmed, the setting up of an asset management company (Pengurusan Danaharta Nasional Berhad), a special purpose vehicle to recapitalise the banking institutions (Danamodal Nasional Berhad), and the Corporate Restructuring Committee (CDRC).

Note: TE = Technical Efficiency, PTE = Pure Technical Efficiency, SE = Scale Efficiency

Table 2 - Efficiency for Foreign Commercial Banks

Year	1994	1995	1996	1997	1998	1999
TE	0.981	0.967	0.955	0.953	0.885	0.815
PTE	1.000	0.986	0.973	0.985	0.992	0.951
SE	0.981	0.980	0.982	0.967	0.892	0.863

### Conclusion

**This study is carried out to investigate the efficiency of commercial banks in Malaysia by applying a non-parametric Data Envelopment analysis approach. The result indicates that Malaysian commercial banks did not efficiently combine their inputs and that technical inefficiency was attributed to scale inefficiency. The move by the Central Bank of Malaysia to consolidate the banking industry in Malaysia through the merger programmed is supported from the study, as the commercial banks are inefficient mainly because of scale inefficiency. Those inefficient, especially smaller commercial banks, need to consider merging with the efficient ones to reap the economies of scale and enhance their performance. Meanwhile, small banks need to merger with bigger banks**

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## **Social and Economic Aspects of Tax Reform in Poland**

ANNA KRAJEWSKA

University of Lodz, Poland

Already at the beginning of transformation period all Central and East European countries faced a need of introduction the significant changes in their tax systems. In most countries there was not any common taxation of personal incomes, while turnover tax was as a rule very complicated and was subject to manipulations, used for often, current corrections in order to keep market equilibrium.

The process of tax changes was initiated in Hungary. On the 1<sup>st</sup> of January 1988, fundamental tax reform was introduced there, already before the beginning of transformation process. Hungarian reform to a large degree was based on the West European countries' experiences. The main aim of the reform was to make tax policy clear for foreign partners and to create suitable conditions for inflow of foreign capital. Other important goal of the reform was to create a system of participation of society in financing public expenditures, which would be correlated with the incomes of population. Change of redistribution system was of more and more importance, as together with widening of market mechanism and development of private entrepreneurship there appeared bigger and bigger differentiation of income amongst different social and professional groups. The new tax system was to adopt the main functions of redistribution of income, up till now realized by the price and wage policy. For such a reason progressive taxation of personal income as well as different rates of VAT were implemented.

Similar assumptions were accepted in Poland while introducing in 1992 common taxation of personal income (with three-degree tax rate: 20%, 30%, and 40%) and differentiated rates of VAT (with standard rate of 22%). In some Baltic countries very simple tax systems were introduced (for example linear tax in Estonia). This resulted to a more degree from lack of experiences and weakness of fiscal administration than from doctrinal reasons.

Taxation of personal income is one from the most significant tools of redistribution of income, enabling both realization of equity (social justice) idea and stimulation of demanded behaviors in the production and consumption spheres as well.

In theory of economics two kinds of equity are distinguished: horizontal equity, meaning identical treatment of identical persons and vertical equity, consisting in differential treatment of particular persons in order to reduce effects of natural differences<sup>4</sup>. While horizontal equity is commonly accepted, vertical equity, which essence resolves itself into taking away from the rich and giving the poor, is controversial and difficult for univocal defining. Controversial question is both the range and forms of redistribution. Equity rule is a subjective category, changing in time and needing social consensus.

Construction of personal income tax results from the fact that its task is to realize important social functions. The main elements of this construction are tax progression, amount free of tax dictated by social reasons, tax reliefs and exemptions influencing demanded directions of income expenditures. In principle, personal income tax introduced in 1992 includes all mentioned above elements. However, the Ministry of Finance critically evaluated their practical functioning. The widest range of weaknesses concerning hitherto existing personal income tax system was presented in "White Book of Taxes", prepared and published by the Ministry of Finance in August 1998. The following main disadvantages of personal income taxation system are pointed there<sup>5</sup>:

- The system is too complicated, mainly due to lots of different tax reliefs. In the framework of personal income tax there exist: 125 tax exemptions defined in the act and executory regulations, 13 kinds of income deductions and 16 kinds of tax deductions.
- Tax rules are unclear and complicated, which causes disputes and needs many interpretations. Tax offices issue tens of thousands of interpretations a year, sometimes contradictory to one another.
- Wide system of reliefs not only softens progression, but also causes that rich persons use reliefs more often than people with relatively low incomes. For example, in 1997 only 38.8% of taxpayers from the lowest tax bracket used tax deductions, 80.9% of taxpayers from the second bracket, and as much as 89.5% of those from the highest tax bracket. In previous years scale of deductions was similar in particular brackets. Two main factors have impact on such distribution of persons using tax reliefs and deductions. Firstly, the poorest do not have enough money for expenditures covered by the reliefs (the so-called "big" building

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<sup>4</sup> D. Begg, S. Fischer, R. Dornbusch, Economics, vol. 1, PWE Warsaw 1993, p. 429 (in Polish).

<sup>5</sup> White Book of Taxes, Ministry of Finance, Warsaw 1998, pp. 51-53 (in Polish).

relief, modernization relief, education relief, health care expenditures' relief, etc.) Secondly, complicated system of accounts causes a lot of problems for many people who do not have enough information concerning different kinds of reliefs and have difficulties with fulfilling tax sheets.

➤ Tax system is unstable and is subject to many different changes. In “White Book of Taxes” one can read that in the years 1992-1998 the act on personal income tax was changed over 30 times. In principle, none regulation in the act - except from the first articles – does not resemble its preliminary version (for example the rules of flat reliefs were changed every year).

Construction of the Polish personal income tax system (tax brackets, widely developed range of reliefs and exemptions, possibility of joint account of married couples as well as persons who take care of children alone) caused that in 1997 (which in “White Book of Taxes” is treated as starting point for proposed tax reform) up to 94.57% of taxpayers found themselves in the first tax bracket, 4.42% in the second, and only 1.01% in the third. Moreover, there existed big differentiation between nominal and effective burdens for taxpayers.

These relations are as follows<sup>6</sup>:

**Tax burdens (in %)**

	<b>Nominal</b>	<b>effective</b>		
Total			19.24	17.13
First income bracket	(20%)		16.40	14.97
Second income bracket	(32%)		21.59	18.26
Third income bracket	(44%)		36.47	30.89

Critical analysis of personal incomes' taxation, as well as critical evaluation of the remaining taxes became the base for presentation by the Ministry of Finance in the end of 1998 the assumptions of tax reform aiming at introduction of uniform taxation of physical and legal persons with linear rate of 22%. Taking into account the fact that standard VAT rate in Poland amounts to 22%, tax system would be very simple, as rates of three basic taxes: PIT, CIT, and VAT would be the same.

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<sup>6</sup> See as above, p. 23.

The ideas of Professor Milton Friedman might become inspiration for replacement of progressive tax with proportional one. For the first time such a postulate Friedman formulated already at the beginning of sixties, proposing uniform tax rate of 23.5%<sup>7</sup>. With time he proposed even lower rate. Friedman's tax credo was presented in the book "Free to Choose". According to the author, low, uniform tax rate – let's say 20% - referring to the incomes higher than level of exemptions (which results from tax regulations), without any deductions from the basic tax amount, except from strictly professional expenditures, would give more revenues than present, languid tax structure. Taxpayers would be better off, as they would not have to bear costs connected with hiding incomes in gray zone. The economy would be better off, too, as tax issues would play less important role in allocation of resources. Only lawyers, accountants, public administration officers and members of legislatures would be worse off, but instead they would have possibility to deal with something more productive than fulfilling tax sheets and revealing and liquidating gaps in existing legal regulations<sup>8</sup>.

It is worth mentioning that also Leszek Balcerowicz gave very similar argumentation, additionally pointing at one more important factor in the Polish conditions: lowering of taxes will accelerate creation of new jobs. However, it should be underlined that M. Friedman, arguing for lowering of taxes, does not forget about adjustment of tax regulations to payment liabilities of the poorest part of society. From these premises (as well as from lack of belief in effectiveness of social policy) a concept of negative income tax is derived. This concept means that when income exceeds level of threshold value, one should pay a tax according to tax rates put on different amounts of incomes. However, when income is lower than threshold value, one receives donation dependent on donation rates attributed to different levels of not used threshold amounts<sup>9</sup>.

Radical lowering of taxes as well as their maximum simplification was important "supply" element of economic strategy of Ronald Reagan administration. The main role in propagation of the idea is assigned to representatives of "supply side of economics" as A. Laffer, G. Gidler, J. Wanniski, J. Kemp and I. Kristal.

Well-known Hungarian economist J. Kornai has similar view on tax reform. He is of opinion that tax system should not include any anti-incentives for increasing economic efficiency

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<sup>7</sup> M. Friedman, *Capitalism and Freedom*, University of Chicago Press, Chicago, 1962, pp. 174-176.

<sup>8</sup> M. R. Friedman, *Free to Choose*, Panta, Sosnowiec, 1994, p. 296 (in Polish).

<sup>9</sup> See as above, p. 116.

and investment growth. The system should not put progressive taxes on those, who are ready to devote a part of their free time for additional job. It should not force anybody to hide these activities and the same to cheat the state<sup>10</sup>. He clearly suggests one uniform tax rate. One of his postulates is as follows: "There should be one, linear (non-progressive) wage tax. All employers that lead their activities legally, should pay linear tax on all kinds of remuneration paid to their employees"<sup>11</sup>.

The United States failed to introduce linear tax despite the fact that tax reform started in 1981 resulted in significant reduction of tax rates. Top rates were reduced from 70% to 50%. Successive lowering of tax rates took place in subsequent years. However, growing budget deficit caused increase of tax progression during presidencies of George Bush and Bill Clinton. At present in the USA personal incomes are taxed according to five rates: 15%, 28%, 31%, 36%, and 39.6%. J. Kornai's arguments did not have impact on shaping the construction of Hungarian taxes, either.

Leszek Balcerowicz's trial to eliminate progressive tax raised categorical resistance amongst significant part of the society. This is clearly visible while analyzing the results of two surveys of public opinion conducted by the Center For Public Opinion Investigation (CPOI) in May and September 1998 on sample of 1000 people. My investigation completed in May 1999 on the base of 730 questionnaires gave similar results. It occurred that progression rule is accepted by 77% of investigated by CPOI (the same answers in both investigations<sup>12</sup>) and 76.3% of those investigated in May 1999. 17% of persons investigated by CPOI<sup>13</sup> and 23.7% respondents investigated a year later declared for linear tax.

In CPOI investigations persons with higher education and high social and economic status were most of all advocates of linear tax. In favor for this concept was 41% of respondents with higher education, 42% representatives of management, administration officers and private entrepreneurs, 38% with highest incomes, and 33% of respondents evaluating their financial standing as good. For keeping existing status quo (i.e. for progression with three tax rates) most of all declared respondents paying taxes according to the first tax rate (44.3% versus 18.5% of persons paying according to the third rate), employees with lower

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<sup>10</sup> J. Kornai, *Way to Market Economy*, Fundacja Polska Praca, Warsaw 1991, p. 81 (in Polish).

<sup>11</sup> See as above, p. 82.

<sup>12</sup> M. Falkowska, *Opinions on tax system*, CPOI Information Service, 1998, no 10 (in Polish).

<sup>13</sup> 6% of respondents investigated by CBOS had difficulties with precise formulation of their opinions.

level of education (40.7% of respondents with basic and vocational education and 43.9% with secondary and post-secondary education versus 32.3% of investigated with higher education) as well as employed in public sector (45.4%). Such attitude is fully justifiable, as for these groups of respondents tax progression is the most beneficial solution (as a rule they are taxed according to the lowest tax rate).

It is worth underlying that this common attitude towards tax progression points at sense of justice deeply rooted in the Polish society, according to which richer people should pay higher taxes while the poor should be subject to lower taxation. Opinions of respondents suggesting need of lowering the lowest tax rate are also an expression of egalitarian tendencies. The rate of 3%, 5%, and 7% was proposed. However, the most common opinion was to introduce the lowest rate amounting to 10%. These demands are not excessive taking into account fact that the lowest rate of 19% which is at present obligatory in Poland is high enough compared to European standards. On the other hand, there were not any suggestions of increasing the highest rate above 40%, although in some EU countries there exist higher tax rates (see tax rates in the European Union countries presented in table 1).

Table 1. Personal income tax rates in the European Union countries in 1996

<b>Country</b>	<b>Number of rates</b>	<b>Level of tax rates (in %)</b>
Austria	5	10; 22; 32; 42; 50
Belgium	7	25; 30; 40; 45; 50; 52.5; 55
Denmark	3	10; 38; 58
Finland	6	6; 16; 20; 26; 32; 38
France	6	10.5; 24; 33; 43; 48; 54
Germany	15	19; 19.6; 20.2, 20.8; 21.9; 22.6; 23.4; 25.7; 28.7; 31.7; 34.8; 37.8; 40.8; 46.9; 53.0
Great Britain	3	20; 23; 40
Greece	5	5; 15; 30; 40; 45
Ireland	2	26; 48
Italy	7	10; 22; 27; 34; 41; 46; 51

Luxembourg	17	10; 20; 22; 24; 26; 28; 30; 32; 34; 36; 38; 40; 42; 44; 46; 48; 50
The Netherlands	3	37.3; 50; 60
Portugal	4	15; 25; 35; 40
Spain	10	17; 19.55; 23.8; 27.2; 30.6; 34; 38.25; 41.65; 45.05; 47.6
Sweden	2	20 to 50 (including local tax)

Source: Own calculations based on: European Tax Handbook 1996, P.S. Andersen (ed.), International Bureau of Fiscal Documentation, Amsterdam 1997.

The Ministry of Finance, proposing lowering of tax rates assumed simultaneously liquidation of nearly all of existing reliefs. However, empirical research points at very high attachment of taxpayers to the reliefs. The most of respondents (over 78%) vote for maintaining the reliefs connected with bad health situation (disability, chronic diseases). Almost 70% regard education reliefs for children as necessary. Over a half of investigated persons (61.5%) support house repair reliefs, reliefs connected with expenditures for cure (61.1%), and professional reliefs (53.4%). Least of all are accepted reliefs connected with saving, for example purchase of bonds (17% of respondents) as well as private pensions and scholarships (18.4%). 37.9% of investigated persons supported reliefs for grants for social goals.

Significant majority of respondents (76.2%) declares for keeping tax-free amount, although the opinions on level of this amount are differentiated. Only 11.5% think that there should not be any tax-free amount, e.g. the whole income should be taxed, while 12.3% does not have any opinion on the issue.

Relatively small number of respondents are of opinion that tax-free amount should be connected with the level of minimum wage (19.8%) and the level of unemployment benefit (6.3%). This manifests relatively moderate claim attitudes and at the same time points to the fact that financial situation of groups of society with the lowest incomes is not taken into account. It is worth mentioning that in tax systems in many countries tax-free amount is established on the base of taxpayers' payment liability. Level of tax-free amount is a result of political compromise that takes into consideration civilization, cultural, and social factors, as well as level of social benefits covered by the state budget. In some countries, for

example in Portugal, tax-free amount is established in relation to minimum wage (in 1996 it amounted to 71% of minimum wage). However, more often it is established as lump-sum tax (for example, in 1996 it amounted to 4049 USD in Greece, 8428 USD in France, and 9259 USD in Finland). In Hungary incomes lower than 100.000 forints (606 USD) were not taxed<sup>14</sup>. At the same time in Poland due tax was decreased by 218.4 PLN, which means that tax-free amount reached a level of 1040 PLN (361 USD).

There exist some premises that Polish society has clearly visible redistribution-egalitarian expectations towards domestic tax system. The following views predominate: need of taking into consideration a difficult financial situation of taxpayers with the lowest incomes (underlined by over 40.7% of respondents), need of redistribution of income (21.5%), collection of revenues for budget expenditures (20.0%), care for social peace (19.2%). Pro-effectiveness reasons (28.1%) and simplification of tax account procedures (38.4%) are of less importance.

It is obvious that redistribution reasons are most clearly pointed by respondents with the lowest income, while taxpayers from the second and the third tax brackets prefer pro-efficiency aspects.

Such social expectations towards tax system are not individual phenomenon. Even in Sweden, country with high level of fiscal stringency, it occurred that lowering of taxes causing reduction of the level of social benefits is not accepted by the society. When in 1991 conservative coalition threw away the power and started to lower taxes and to reduce range of "social state", it did not meet with common applause. Investigations proved that two thirds of Swedes are inclined to pay higher taxes rather than resign hitherto existing benefits. Victory of social democrats in the next election confirmed that society does not accept rapid changes of social policy<sup>15</sup>.

Also American experiences are worth closer analysis. It occurred that lowering of taxes in 1981 did not cause demanded supply effects, but it resulted in drop in income in the poorest

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<sup>14</sup> Own calculations based on European Tax Handbook 1996, P.S. Andersen (ed.), International Bureau of Fiscal Documentation, Amsterdam, 1997.

<sup>15</sup> D. Mibank, Swedes are resistant, „The Wall Street Journal Europe” (Gazeta Wyborcza, 6.02.1995) (in Polish).



families. It was a kind of warning for politicians and was reflected in corrections of tax system, aiming at reduction of tax burdens for the poorest groups of population.

The government project of lowering the second and third tax rates, keeping level of the first one unchanged<sup>16</sup>, awoke serious social resistance, supported by veto of the President of Republic of Poland. Resistance of different political parties towards this proposition arose from similar premises. Advantages for the economy due to diminishing tax burdens were not questioned. Politicians were seriously alarmed by the fact, that lowering of taxes can shake budgetary balance and cause shortage of financial sources for realization of important social goals. On the other hand, one cannot be sure that lowering of taxes for social groups with the highest incomes will lead to growth in savings. Maybe – as opponents maintain – it would cause increase of luxury consumption and consumption import? Moreover, suggested changes would result in deepening of - already high - social differentiation. Elimination of mentioned anxieties and gaining of acceptance for tax reform in shape proposed by L. Balcerowicz needs fundamental analysis of presented objections.

During discussions on changes in tax system, need of regarding demands of the European Union is often pointed at. This mainly refers to VAT and excise tax. Some changes in corporate income tax are also necessary. However, need of harmonization of taxes in the framework of the UE does not refer to personal income tax. It was assumed that its unification is not necessary condition for free flow of products, services, capital, and labor within common internal market. Particular countries have full self-dependence in shaping the rules of taxation of population and in taking into consideration domestic specificity, traditions, feeling of social justice, economic situation, and the range of social benefits. The only limitation of particular countries' independence is the so-called European Social Card included into Maastricht Treaty, guarantying defined packet of social benefits for different social groups as well as consideration of the "social justice" rules in budget policy. This can raise pressure for use of taxation of personal incomes as a tool for softening excessive social differentiation (for example through tax progression, tax-free amount, reliefs and exemptions taking into account personal situation of a taxpayer and his/her family).

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<sup>16</sup> In the Budgetary Act for the year 2000 it was assumed that 19% will not change, 30% rate will be lowered to 29%, and 40% tax rate will be reduced to 36%.

In context of mentioned about facts it is clearly visible that proposition of changes in tax rates in 2000 (placed by the Ministry of Finance in "White Book of Taxes" in August 1998, and discussed in the Parliament at the end of 1999), as well as project of two-degree personal income tax with final rates of 17% and 34% in 2005 presented by present Minister of Finance or project of linear tax with rates of 15% or 18% suggested by liberal political parties, do not arise from need of harmonization of the Polish tax system towards demands of the European Union and are not convergent with actual solutions adapted in West European countries.

Propositions of radical lowering of personal income taxes are most often articulated by advocates of significant reduction of role of the state in the economy. In official forecasts it is predicted that share of public expenditures in GDP, which in Poland in 2000 amounted to about 43% (less than an average in the EU), will decrease to 39% in 2003 and to 35% in 2009. This will be possible mainly due to lowering of corporate taxes and taxation of groups of taxpayers with the highest incomes (in order to stimulate entrepreneurship) on one hand, and thanks to reduction of widely understood social benefits on the other. This is a clear appearance of direction of the state role evolution, which will cause important consequences for the whole society, although this issue is not exposed in official statements and discussions. In my opinion such changes must not be introduced in secret, under a cover of improvement of the existing tax regulations' efficiency, and taking advantage from lack of knowledge amongst the population concerning tax systems in the world.

A question of reduction of public expenditures is controversial and difficult for implementation. But where to look for possibilities of lowering these expenditures? Already nowadays a level of expenditures for health care, education, research and development, and wide range of social benefits is alarmingly low.

Rather unrealistic, and besides economically and socially groundless, is also significant reduction of personal income tax. The following arguments speak for this opinion:

- From the beginning of transformation period state budget revenues have been lower than budget expenditures. State budget deficit has reached permanently a level of 2-4% of GDP. Lowering of taxes for the group with highest incomes can significantly reduce budget revenues from personal income tax. Although in 1999 only 1.2% of taxpayers paid taxes

according to the highest 40% tax rate, however this gave the state budget as much as 30% of revenues from personal income tax. Taxpayers from the second tax bracket (burdened with rate of 30%) constituted less than 4% of all taxpayers, but they supported the budget with over 15% of revenues from PIT. On the other hand, the most numerous group of taxpayers (95%), who pay taxes according to 19% rate, provided the budget with the rest (55%) of revenues from PIT<sup>17</sup>. In the previous years situation was similar. Reduction of tax burdens without exact analysis of impact of such a decision on budget revenues can cause a threat of shaking budget equilibrium.

- The main argument of advocates of lowering of taxes for the richest, a few percent group of the society, is not convincing, either. Lower taxes are to increase savings that will be assigned for growth in investments and creation of new jobs. However, only small part of taxpayers from the highest tax bracket they are entrepreneurs who run their own businesses. In this group representatives of free professions, members of parliament, high public administration officers, managers and board members of large firms, especially with foreign capital, as well as specialists from consulting firms predominate. Results of analysis of the budgets of households, conducted on base of the Main Statistical Office data, point at the fact that increase of income in Poland is clearly connected with growth, and most of all with change in the structure of consumption<sup>18</sup>. Lowering of taxes for physical persons does not cause direct increase of savings with all its consequences for creation (through investments) of the new jobs. Increase of luxury consumption can result in subsequent growth of imports and worsening of trade account balance (for many years negative in Poland).
- Tax reforms, consisting in lowering of tax rates on personal incomes, assuming stimulation of pro-effective activities (increase of incentives for growth in incomes and growth in investment sources) as a rule at the same time assume increase of burdens connected with indirect taxes (in order to keep budget equilibrium). It is clearly visible that Polish reformers have also such an idea. Share of indirect taxes in state budget revenues has been increasing very quickly: from 38.7% in 1993<sup>19</sup> to 58.8% in 2000<sup>20</sup>. At the same time it is commonly known that indirect taxes are of digressive character, e.g. they burden poor

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<sup>17</sup> Information referring to rules of account of personal income tax in 1999, Ministry of Finance, Warsaw, September 2000, p. 4 and 11.

<sup>18</sup> I. Bolkowiak, Effects of proposed reform of tax system for the Polish economy. Expertise for the Ministry of Economy, Warsaw 1999, p. 12 (in Polish).

<sup>19</sup> Polish Statistical Yearbook 1995, GUS, Warsaw 1995, p. 497.

<sup>20</sup> Statistical Bulletin, GUS, Warsaw 2001, p. 61.

households in greater degree than rich ones. This leads to further pauperization of the Polish society.

- Reliefs and exemptions connected with the ways of earning income and its spending are important pro-effective instrument of tax policy. Thanks to these reliefs it is possible to influence taxpayers' behaviors in many important areas, for example via stimulating propensity to save, purchase of bonds, increase of expenditures for flat building, health care, education, etc. Advocates of lowering of tax rates at the same time postulate liquidation of almost all reliefs. There are not any reasonable reasons for resigning these rather effective, reliable, and commonly used instruments of exerting influence on taxpayers' behaviors only in order to decrease taxes for narrow group of the richest taxpayers (not knowing their further behaviors).
- One of the basic assumptions of lowering of taxes for the richest population was a conviction that in present conditions low propensity to invest is the main barrier of economic growth and that the rich have the highest propensity to save. Empirical research proves that for many entrepreneurs insufficient demand is a factor that more and more limits their development possibilities<sup>21</sup>. Lowering of taxes is in fact the best stimulator of the global demand growth, but in groups of population with the lowest income (e.g. where the propensity to save is the lowest). In conditions of recession and lack of demand savings coming from lowering of taxes do not have to be transformed into investments and new jobs. Who will develop production capacities having difficulties with selling already manufactured products? On the other hand, lowering of taxes for people with the lowest income could undoubtedly cause significant growth of demand.
- Belief that one should choose between effectiveness and equity is a popular argument for postulating or accepting growth in differentiation of incomes. A view predominates that higher national income is better ("national cake"), even if it is unequally divided. Is such an attitude reasonable? Experiences of Asian countries are convincing examples that one can act more effectively and divide more equally. Fast speed of growth in "Asian tigers" is not connected with significant increase of social differences<sup>22</sup>.
- Experiences from countries with relatively low level of development, that were admitted to the European Union in subsequent phases of widening (Ireland, Greece, Spain, and Portugal) should serve as source for reflections on possibilities of significant lowering of tax

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<sup>21</sup> Restructuring of enterprises in the process of transformation of the Polish economy, vol. 1, E. Mączyńska (ed.), DiG, Warsaw 2001, p. 332 (in Polish).

<sup>22</sup> The East Asian Miracle. Economic Growth and Public Policy, A World Bank Policy Research Report, Oxford University Press, 1993, p. 81-87.

revenues in Poland in following years. In mentioned countries after entering the European Union budget expenditures have been increasing, due to need of adjustment to union standards, support of restructuring processes, and improvement of competitiveness of the economy<sup>23</sup>. There are not any reasons for thinking that in Poland adjustment processes after entering the European Union will need lower financial sources (taking into consideration situation in agriculture, environment protection, education, and technical infrastructure).

Summing up my reflections concerning tax reform in Poland, I think that both economic and social arguments do not justify necessity of introduction of tax reform in a shape proposed by the Ministry of Finance and other liberal circles.

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<sup>23</sup> *European Economy. Annual Economic Report 1991-1992*, no 50, ECSC-EEC-EAEC, Brussels, December 1991, p. 265.

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## The Class Conflict Model: Theory and History

**Barrington K. Brown**  
**Barrington Associates**

### I. Introductory Background

Modern theory of class conflict was first analyzed by Karl Marx,<sup>24</sup> who defined classes in relationship to a given system of production. Focusing on two pure classes, Marx noted the historical fight between freeman and slave, dating from antiquity; patrician and plebeian, in ancient Rome; lord and serf, in feudal society; guild master and journeymen, under the handicraft system; where, generally speaking, the oppressor and the oppressed stood in constant opposition to each other. Marx concentrated upon the property relationship of the capitalist system of production, where one class, the bourgeoisie, owns the means of production, and the other class, the proletariat, works for them. The exploitation of the proletariat by the bourgeoisie leads, according to Marx, to conflict that ultimately results in the overthrow of the capitalist system.

Max Weber<sup>25</sup> expanded the concept beyond economic factors and developed a multidimensional concept of class. Weber's analyses included an economic dimension, wealth (property, income), a political dimension, power (authority), and a social dimension, prestige (honor). Weber referred to those people with common economic conditions as classes, those with common political interests as parties, and those with various degrees of prestige as status groups. While members of one of these groups may not be members of the others, where they are coincident, the systems of stratification, and class structure, is fully developed; since these various interests are joined. Class, then, according to Weber, is a group of people whose shared situation is a frequent basis for action by the group.

According to Ralf Dahrendorf<sup>26</sup>, the unequal distribution of power and authority leads to the formation of social classes, independent of economic conditions. The key element in the analyses of class conflict, then, is the authority relationships that exists between dominant and subordinate groups; where the distribution of authority may, or may not, be related to the ownership of property. When authority is distributed unequally, tension arises between such groups as management and workers, males and females, or teachers and students, such that the existence of dominance implies the possession of authority and the existence of subordination implies the exclusion from authority. These two groups have interests that are contradictory since the dominant group attempts to maintain the status quo while the subordinate group desires to change existing arrangements. Therefore, according to Dahrendorf, ownership of the means of production is but a special case of general authority relations. Dahrendorf acknowledges that authority, within limits, is empirically accompanied by relatively high income and prestige.

Gerhard Lenski<sup>27</sup> states that conflict arises over the control of the economic surplus; the surplus being the goods and services produced over and above the minimum required for society to survive. According to Lenski, the production of the surplus gives rise to stratification with regard to control over, and access, to society's resources. Lenski concludes that the distribution of the surplus is determined on the basis of the distribution of power in a society; where the inequalities in the distribution of power give rise to inequalities in the distribution of privilege and

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<sup>24</sup> Karl Marx and Frederick Engels, The Communist Manifesto (New York: International Publishers 1948).

<sup>25</sup> H.H. Gerth and C. Wright Miller, ed. Max Weber: Essays in Sociology (New York: Oxford University Press 1946) "Class, Status and Party".

<sup>26</sup> Ralf Dahrendorf, Class and Class Conflict in Industrial Society (Stanford, California: Stanford University Press 1959).

<sup>27</sup> Gerhard Lenski, Power and Privilege: A Theory of Social Stratification (New York: McGraw-Hill 1966).

prestige. This ultimately results in the unequal distributions of the economic surplus. Class, then, can be defined as an aggregate of people in a society who stand in a similar position with respect to the distribution of power, privilege, and prestige.

The present study focuses on the conflict view of social stratification from both a theoretical and historical perspective and analyzes ongoing circumstances. Social stratification, or structured inequality, refers to the unequal access, by entire categories of people, to social rewards; where social rewards include the general categories of wealth, power, and prestige. This paper will analyze, employing an interdisciplinary approach, the nature of the competition, by various groupings of people with insatiable appetites for social advantages, for scarce resources in given societies.

Some degree of status, or class, hierarchy is inevitable in any society because there are differences in the functional roles of individuals, in the power or authority they possess, or in the position they occupy. Status implies superior-inferiority relationships, and class assignments are based on a number of economic, social, political and anthropological factors. These factors include wealth and income, occupation, education, political affiliation, gender, race and ethnicity, achievement, age, ability, and family background. Since some form of social hierarchy, based on these differences, exists in all societies, social stratification is, therefore, a law of human nature.

In the presence of inequality, group or class distinctions develop which inevitably result in some degree of class feeling which, itself, leads to some degree of class tension and class friction. Class friction, or class conflict, involves activities that are directed by members of one class against the interests of another class in favor of its own interests; with all groups seeking to enhance, or at least maintain, its position relative to competing groups. While class friction, or class conflict, may be overt or covert, it always results in a certain degree of social tension, social instability, and social disorder.

Any class conflict consists of two distinct groups, standing in relationship to each other, competing for the same, scarce, resources and, thus, having opposing interests. The two class model introduced by Marx, seems appropriate since there can only be two sides to a given fight or argument. In any conflict between two opposing sides, any number of distinct classes might enter a given contest through the forming of coalitions. In any case, one party attacks, the other defends; one side seeks change, the other wants to maintain the status quo; one group seeks to improve its situation, the other desires to retain or secure its position.

Competition between opposing groups usually involve dominant versus subordinate groups, where the dominant group, of course, has the greater access to social resources, and hence, a greater amount of power.<sup>28</sup> Thus, dominant groups are able to obtain a large part of the economic surplus relative to subordinate groups.<sup>29</sup> Conversely, subordinate groups tend to be subjected to restraints, or oppression, and, through unequal exchange, exploitation. Randall Collins<sup>30</sup> notes that this exploitation, and its accompanying oppression, "need not involve conscious calculation on the part of those who gain from the situation; rather, they are merely pursuing what they perceive to be their best interests."<sup>31</sup> Thus, given two distinct classes — standing in relationship to each other —, what is comfort to one party is oppression to the other;

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<sup>28</sup> Power, as defined by Weber, is the ability of persons or groups to obtain their will even though opposed by others.

<sup>29</sup> Social Psychologist have found that people who control resources, emotions, or finances valued by others clearly have the advantage in a relationship, whether it is commercial or personal. Erik J. Coates and Robert S. Feldman, eds. *Classic and Contemporary Readings in Social Psychology* (Upper Saddle River, N.J.: Prentice Hall, 1998 2<sup>nd</sup> ed.) p. 208.

<sup>30</sup> George Ritzer, *Sociological Theory*, (New York; McGraw-Hill 1992 3<sup>rd</sup> ed.) p. 609.

<sup>31</sup> As a form of Parkinson's law: the use of power expands to fill the extent of its existence.



what is a fair exchange to one party is exploitation to the other; and, generally, what is justice to one party represents a threat to the other.

Social distinctions ultimately lead to inequalities, which leads to repression, which, in turn, leads to resistance. Since some degree of patterned inequality exists in all societies, it follows, then, that class conflict, whether overt or covert, is an inevitable occurrence in all human societies. Thus, it can be postulated that, from the point of view of sociology, the history of all societies is a history of class conflict; class being defined as people of like kind and circumstance. Further, each side of a conflict believes that their goal is theirs by “divine right”; which, of course, is why there is conflict.

The government, as Weber was the first to note, the apparatus of the state, is the only agency in society with a monopoly on the legal use of force and coercion; and it is the state that determines who gets what portion of the economic surplus. Thus, the object of any group is to gain control of, or otherwise influence, the government in order to enhance its position relative to competing groups. Since dominant groups have greater access to scarce resources and, hence, have more power, it can be postulated that, from the point of view of sociology, the function of the state is to maintain the position of dominant groups, i.e., to maintain the status quo. As a corollary, it can be postulated that the function of the state, operating through the government, is to provide a means whereby subordinate groups can enhance their position relative to dominant groups. The state, then, is the primary arena of conflict between classes. Competing groups seek to use the coercive powers of the state to enhance or maintain their relative position.

Over the course of human history, inequalities have been a continual source of tension and conflict, resulting in oppression and exploitation; with periodic episodes of violence. Throughout history, less powerful classes have fought more powerful classes, over perceived injustices, with some successes to their credit. Conversely, more powerful classes have fought to prevent various rights from being obtained by less powerful classes, and have attempted to undermine them even if these rights were established. These efforts have also had their share of successes. The struggles have continued; employer versus worker, rich versus poor, and, generally, haves versus have nots. The next chapter presents some examples of these struggles in order to provide a deeper insight into the class nature of society and the nature of class struggles.

## II. Class Conflict in the United States

### Business Versus Agriculture

One of the first major conflicts between agricultural and industrial interests occurred in England in the first half of the nineteenth century. After the Napoleonic Wars, an agriculturist controlled parliament enacted heavy protective tariffs on agricultural products. Those tariffs, called the Corn Laws, enabled British landowners to obtain higher prices from the sale of their outputs, and, thus, earn higher profits. British industrialists viewed the Corn Law as a threat to the growth of manufactured exports because, unless foreigners sold their output in England, they could not pay for British manufactured products. Further, industrialists feared that tariffs on British imports might induce foreigners to retaliate with tariffs of their own.

Pressure from industrialists and merchant classes resulted in the passage, by Parliament, of the Reform Act of 1832, which set up new districts for electing members of Parliament. Prior to 1832, districts for electing members of Parliament were primarily in rural areas, and new industrial centers, such as Manchester and Sheffield, had no representation; since they grew up after older districts had been formed. The Reform Act of 1832 gave these thriving new cities representation, in Parliament, for the first time.

The Reform Act of 1832 enabled the industrialist and merchant classes to gain political power relative to landowners. As a result, Parliament repealed the Corn Laws, in 1846, and England entered upon eighty-five years of virtually tariff-free trade, a unique experiment.<sup>32</sup>

Quite the opposite situation occurred in the United States during the same period. The first significant protective tariff was enacted in 1816 in order to protect manufacturers, primarily located in the north, from British competition. Southern planters opposed the tariff because it raised the cost of goods they imported from Europe and, because, they feared, the tariff would cause other countries to retaliate with tariffs against southern products, primarily cotton.

Southern planters protested but were outvoted in Congress by manufacturing interests. In 1828, another protective tariff, called the Tariff of Abominations, imposed especially high duties on imported textiles and iron. Again, southern planters lacked the votes in Congress to counter manufacturing interests.

The question of the tariff resulted in what was termed the Nullification Crisis, in United States history. The doctrine of nullification upheld the right of a state to declare a federal law null and void and to refuse to enforce it within the state.<sup>33</sup>

### Farmers in the United States

The unique debt position of farmers results from the way in which farm production is carried out. Farmers usually receive their income, in a lump sum, when the crop is sold. In the meantime, however, farmers must borrow in order to pay for machinery, land, seed, and so forth; hoping to earn enough money from the sale of the output to repay the loans. Thus, farmers must borrow even in the best of times.

In the latter half of the nineteenth century, farmers joined together in order to bring an end to the growing power of corporations over their existence and to provide a means by which they could better appropriate the fruits of their labor. Farmers were burdened by the monopoly rates that railroads charged to transport their output to market and by the excessively high interest rates that banks charged on loans. Further, high protective tariffs on farm machinery enabled United States manufacturers to charge high prices for equipment. These, and other factors, combined to worsen the debt position of farmers.

The extension of the suffrage after the civil war to include all adult males enabled farmers to participate directly in the political process and influence government to operate in its behalf. The first national organization that promoted farm interests was the Patrons of Husbandry (the Grange). The Grange, by supporting the Greenback Party, hoped to increase the money supply in order to raise prices. As a debtor class, farmers perceived that they would benefit from an inflationary money supply at the expense of the creditor class. While farmers were not successful in expanding the money supply, they were successful in influencing federal and state legislation that benefited agricultural interests.

As the Grange faded, the Farmers' Alliances, more politically oriented than the Grange, took on a more national scope. In the election of 1890, the Farmers' Alliances took control of twelve state legislatures, elected six governors, and sent over fifty representatives to Congress. The Farmer's Alliances, and the populist movement that grew out of it, pushed for an increase in the money supply; the resulting inflation helping debtors relative to creditors. The populists advocated the creation of a bimetallic monetary system, i.e., gold and silver, rather than just a gold standard. In the election of 1896, the Populist Party supported the Democratic Party's

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<sup>32</sup> Paul Hohenberg, A Primer on the Economic History of Europe, (New York: Random House 1968) p. 97.

<sup>33</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People, Volume I (Upper Saddle River, N.J. Prentice Hall 2000), p. 280.

nomination of William Jennings Bryan, who gave his famous “Cross of Gold” speech at the Democratic convention. The Democrats lost the election primarily because urban workers in the northeast feared that the populist agenda would cause prices to rise significantly, eroding their standard of living.

## **Business Interests**

Industrial interests have had a long history of attempting to influence government to intervene in its behalf. Industrial interests have, historically, tried to combat agricultural interests, sought protection from foreign competition, attempted to impede the growth of organized labor, and have attempted, whenever possible, to maintain an environment conducive to monopoly in its own sphere of operation.

After the revolution of 1830, Louis Philippe, who was sympathetic to liberal reforms, was installed as King of France. In England, the Reform Act of 1832 gave Parliamentary representation to industrialists and enabled industrial interests to defeat agricultural interests in having the Corn Laws repealed. In other European countries, industrial interests began to gain power relative to agricultural interests. In Belgium, for example, the issue of relative political power was decided in the election of 1847 and the subsequent reforms of 1848.

In the United States, the railroads received assistance from state and local governments in the form of land grants and low interest loans. After the Civil War, the federal government made land grants and construction loans. Under the National Mineral Act of 1866, mining firms were given millions of acres of free public lands.

Although the first tariff enacted in the United States, in 1789, was intended to raise revenue, its primary function was soon to become the protection of infant industries, especially manufacturing. In 1816, in response to urging from New England manufacturers, Congress enacted its first really protective tariff, aimed against British textile manufacturers. Seaport merchants, however, opposed this tariff because it limited international free trade and, thus, eroded their profit potential. After 1865, businesses generally, were particularly favorably disposed to tariffs, which were placed upon products which were cheaper to produce in Europe; thus enabling United States firms to earn higher profits by charging higher than competitive prices. In 1909, the Payne-Aldrich Tariff, which was initially designed to lower tariffs, actually increased import duties.

The Interstate Commerce Commission was created to get the railroads to charge reasonable rates, particularly to farmers. However, when the railroads attempted to block the Commission’s rulings, particularly between 1887 and 1905, the Courts decided in favor of the railroads in 15 out of 16 cases. Under the Mann-Elkins Act of 1910, the government gained regulatory power over additional industries, including the telephone and telegraph.

As a result of corporate efforts to control and monopolize markets and, thus, obtain higher profits, Congress passed the Sherman Antitrust Act of 1890. However, due to ambiguities in the law, firms were generally successful in avoiding prosecution under this Act. In 1914, Congress passed the Clayton Antitrust Act and the Federal Trade Commission Act in order to strengthen the government’s antimonopoly efforts.

Since the Sherman Act prohibited any combination in restraint of trade, the courts interpreted the law in such a way that inhibited the growth of labor unions. Thus, labor was at a disadvantage relative to corporations. The Clayton Act exempted labor organizations from constraints under the Sherman Act and forbade federal courts to issue injunctions against strikers. Thus, corporations lost power relative to labor unions due to the Clayton Act.

After World War I, big business enjoyed considerable favor in the United States. This gain in political strength was due to the perceived contribution of big business to the war effort.

## Labor

The modern labor movement had its beginnings during the enclosure movement in Europe, primarily in England, when peasants who previously worked the land were freed to move to urban areas and form the workforce for the oncoming industrial revolution. Further, the larger, enclosed farms, with no common lands and common pastures, provided incentive for increased productivity in agriculture. The increased agricultural output resulted in the further increase in the population, which was necessary to form the labor supply for the industrial revolution.

As the industrial revolution proceeded, wealth flowed into the hands of factory owners, merchants, and shippers; people who made up the middle class. Along with the decline in their relative income share, workers worked long hours under unsafe working conditions. This exploitation of labor led workers to organize unions to press for their interests.

In England, the Combination Acts of 1799-1800 prohibited the forming of unions since the authorities were threatened, and intended to suppress them. Between 1815 and 1819, mass demonstrations and riots were common, particularly in the industrial cities, in England.

The Combination Acts were repealed in 1824 and, thereafter, unions were tolerated though not yet legal. After 1875, in England, union tactics were regarded as legal and trade union activity expanded significantly. In France, laws passed during the revolution, in 1791, and under Napoleon outlawed unions. However, these laws were repealed in 1864, whereby union activity was legalized.

The basis of workers' growing influence was the right to vote. In England, the Reform Act of 1832 gave most middle class men the right to vote. Subsequent reform acts, in 1867 and 1884, extended the franchise to all adult men. In 1871, France established universal male suffrage; the first European country to do so. By 1850, in the United States, nearly all adult white males could vote. By the end of the nineteenth century, most industrial countries had universal male suffrage. By the last decade of the nineteenth century, workers had made considerable progress and their standard of living had increased significantly.

While the early unions were made up, primarily, of skilled workers, unions later began to combine skilled and unskilled workers. The first union in the United States to do so was the National Labor Union, established in 1866. The second union of this type, the Knights of Labor was established in 1869, and reached its peak membership in 1886. The violence accompanying the Haymarket Square protest, in 1886, turned public opinion against the knights. Further, employer associations were successful in pooling their resources and impeding the growth of unionism.

After the Haymarket Square incident, the American Federation of Labor (AFL), consisting of 25 unions of skilled workers, was founded in 1886. By 1901, the AFL represented about one-third of all skilled workers.<sup>34</sup>

Meanwhile, the United States experienced a number of violent labor disputes; three of which are of particular significance. The Great Railroad Strike of 1877 was the first nationwide strike in the history of the United States. The President, fearing a national insurrection, set a precedent by sending federal troops to suppress the strike. The Homestead strike of 1892 resulted in the governor of Pennsylvania sending in troops to retake the steel plant which was under the control of strikers. In the Pullman strike of 1894, the attorney general of the United States obtained a court order, under the Sherman Act of 1890, claiming that the strike interfered with interstate commerce and impeded the movement of the mail.

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<sup>34</sup> Margaret L. King, Western Civilization: A Social and Cultural History, Volume 2 (Upper Saddle River, N.J. Prentice Hall 2000) p. 819.

The National Association of Manufacturers, a group of industrialists founded in 1903, launched a campaign to get rid of unions altogether. The NAM supplied strikebreakers, private guards, and labor spies to assist employers.

The Clayton Act of 1914, reflecting the growing power of the AFL, exempted unions from being viewed as illegal conspiracies in restraint of trade, as under the Sherman Act, and forbade courts to issue injunctions against strikes. Section 7a of the National Industrial Recovery Act (NIRA), of 1933, gave workers the legal right to organize and bargain collectively. When the NIRA was declared unconstitutional, in 1935, Congress passed the National Labor Relations Act, later that same year. The Wagner Act, as it was called, protected the rights of workers to bargain collectively and defined and prohibited unfair labor practices by employers. As a result of this law, union membership increased significantly. By 1947, unions represented about 40 percent of all wage earners.

In 1947, however, the balance of power shifted from labor to employers when congress passed the Labor Management Relations Act. The Taft-Hartley Act, as it was called, outlawed many labor policies approved by the Wagner Act, including the closed shop, and allowed states to pass right-to-work laws. This law made it more difficult for workers to establish unions.

The position of the labor movement was enhanced, in 1955, with the merger of the American Federation of Labor and the Congress of Industrial Organizations. The merger ended a long rivalry and the AFL-CIO made significant gains in the post World War II years.

Between 1970 and 1982, the AFL-CIO lost almost 30 percent of its membership and its political base decreased accordingly. Further, the decline in the manufacturing infrastructure has contributed to the decline in union power. By 1990, less than 15 percent of United States workers were union members, the lowest since before World War II. Currently, labor-backed measures now routinely fail in Congress.<sup>35</sup>

## Women

During the Middle Ages, in Western Europe, women held relatively little power, and their opportunities were, largely, limited to the home or the convent. In general, women were excluded from inheritance and divorce was practically unknown. When men went off to fight, as in the crusades, for example, women did, in their absence, hold some unofficial power with regard to property. Further, in some instances queens did rule, in effect, for their husbands and sons.

In colonial America, few opportunities existed for women outside the household. Men, by law, held managerial rights over property and inheritance rights for women were limited.

When the National Convention abolished the monarchy, in 1792, and declared France a republic, all adult males were given the right to vote. Women were denied this right although they had played a significant role in the revolution. However, divorce was legalized under the revolution, enabling women to leave marriages; and stronger inheritance rights were given to them.

The Napoleonic Codes, 1804, took away some of the right that women had won during the revolution. Property rights and personal freedom for women were once again restricted.

In the United States, by 1868, 27 states had granted women the right to own and administer property. In England, Parliament followed in 1882.

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<sup>35</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 919.

The women's movement in the United States officially began in 1848 in Seneca Falls, New York, at a meeting attended by about 100 women, led by Lucretia Mott, and some men who supported their cause. The meeting was concerned primarily with putting an end to women's subordination to men, in general, and was concerned with such specific items as women's right to hold property; and dealt particularly with the right to vote. Since the women's movement had roots in the abolitionist movement, women were particularly disappointed that the women's right to vote was not mentioned when the fourteenth and fifteenth amendments were passed.<sup>36</sup>

In 1869, Elizabeth Cady Stanton and Susan B. Anthony established the National Woman Suffrage Association (NWSA) to push for women's rights at the federal level. In that same year, Lucy Stone headed the American Woman Suffrage Association (AWSA) to lobby the states rather than Washington, DC. In 1890, these two organizations merged.

Farmers organizations such as the Grange (Patrons of Husbandry) and the Farmer's Alliances and labor organizations such as the Knights of Labor, included women who put forward their own set of demands. However, women were unable to gain equality within these movements. Further, they were unable to get the political parties they supported to endorse woman suffrage.

After decades of relatively peaceful efforts to obtain the vote for women, more militant organizations began to be founded, around 1900. In the United States, Carrie Chapman Catt established the North American Woman Suffrage Association (NAWSA) in 1902. In England, Emmeline Pankhurst established the Women's Social and Political Union (WSPU) in 1903.

As a result of their wartime contributions and in response to continued pressure from the suffrage movement, the Nineteenth Amendment to the Constitution was ratified in 1920, giving women the right to vote in the United States. The suffrage was also extended to women in other countries, around this time, as well. New Zealand was the first, in 1893; Australia, in 1902; Norway in 1913; Canada, in 1917; Great Britain, in 1918, to cite some instances. France did not extend the franchise to women until 1945.

After the Nineteenth Amendment was ratified, some women, such as Alice Paul, began to push for the Equal Rights Amendment, first proposed in Congress in 1923. In 1972, Congress approved the Equal Rights Amendment to the Constitution. The time limit ended in 1982; only 3 states short of the required number needed for ratification.

In the meanwhile, another hotly contested issue in the late nineteenth century and early twentieth century concerned the matter of birth control. Advocates faced opposition from the religious establishment, politicians – mostly men -, and national laws which condemned or forbade the distribution of birth control information and devices. Sexual radicals such as Margaret Sanger, in the United States, and Marie Stokes, in Great Britain, were trained in Amsterdam, the center of the birth control movement. The availability of birth control was significant in the female quest for equality and autonomy; since the ability to control their bodies is as crucial as the attainment of civil and political rights.

The politics of reproduction continue in the fight over abortion rights; which has aroused at least as much concern as the issue of contraception. The current struggle is between advocates of pro-choice (abortion rights) and pro-life (abortion rights opponents). A Supreme Court victory for the feminist movement was the 1973 case, *Roe v. Wade*, which upheld abortion during the first trimester of pregnancy. The issue rages on!

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<sup>36</sup> At the time, the idea of women suffrage was considered by Congress as being too radical. Senator Charles Sumner said that womanhood suffrage was "the great question of the future."

## Blacks

After the emancipation proclamation was issued and the Civil War had ended, southern states still attempted to keep the freedmen as near to slavery as possible by passing the Black Codes. The Black Codes seriously restricted the movement and activities of black people and attempted to return them to plantation labor.

In 1866, Congress passes the Civil Rights Act, over the President's veto, which granted full citizenship rights to black people and overturned the Black Codes. Fearing that the Act might be declared unconstitutional, Congress sent the Fourteenth Amendment to the states for ratification. Thus, black people obtained full citizenship rights under the law. In 1870, the Fifteenth Amendment, granting the vote to former slaves, was ratified.

With the end of reconstruction, the south became increasingly segregated, and this system of racial segregation was backed by state and local laws; which became known as "Jim Crow" laws. Although these laws were passed in the late 1880's, they remained in place some fifty years later. "Jim Crow" legislation in the south encouraged states outside the south to pass similar laws. Where segregation laws were not on the books, they existed in practice.

The Civil Rights Act of 1875 outlawed racial discrimination in theaters, railroads, and other public places. However, the Supreme Court overturned this law in 1883. Further, the case of Plessy v. Ferguson, in 1896, upheld a Louisiana segregation law and created the "separate but equal" doctrine. This doctrine was particularly harmful to black people when applied to education; although segregation was the norm in public school systems even in the reconstruction south.

Black voting rights were severely restricted by such tactics as literacy tests, poll taxes, and property qualification; where loopholes permitted poor whites to vote even under these conditions. In 1898, the Supreme Court ruled that these measures were proper methods of restricting the franchise to qualified voters. As a result of these efforts, only 5 percent of southern Blacks voted. In addition, blacks were barred from holding public office and serving on juries.<sup>37</sup>

White violence against blacks was common; as race riots occurred and thousands of lynchings took place. Between 1882 and the turn of the century, the number of lynching usually exceeded 100 each year.<sup>38</sup>

In 1905, W.E.B. DuBois and other black leaders met at Niagara Falls, New York, and formed an organization called the Niagara Movement. The group published a statement demanding equal opportunities for all black people. This movement led to the establishing of the National Association for the Advancement of Colored People (NAACP), in New York, in 1909.

In 1913, President Wilson ordered black and White workers in the federal government to be segregated from each other. This represented a major step backward for black people, in general.

In July of 1948, President Truman made a giant move on behalf of civil rights when he issued an executive order barring segregation in the Armed Services. Six years later, in 1954, another major step was taken when the NAACP won the landmark Supreme Court Case, Brown v. Board of Education of Topeka, Kansas. A combination of five cases, the Brown decision

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<sup>37</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 596.

<sup>38</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 596.

overturned the “separate but equal” doctrine with regard to education, established by *Plessy v. Ferguson*, in 1896.

The modern civil rights movement, led by Dr. Martin Luther King, began when the arrest of Rosa Parks, in December, 1955, sparked the Montgomery, Alabama, bus boycott. In late 1956, the court ruled that segregation on buses was illegal. In September, 1961, the Interstate Commerce Commission outlawed segregation in interstate buses and terminals.

The Civil Rights Act of 1964, signed by President Johnson, prohibited discrimination in employment based upon race, color, religion, sex, and national origin. The Act also created the Equal Employment Opportunity Commission.

In the late 1940’s about 10 percent of the eligible southern black people voted, most of them in urban areas in the upper south.<sup>39</sup> In 1964, the situation had not changed significantly.

The Voting Rights Act of 1965 authorized the Attorney General to investigate charges of discrimination at the polls and monitor elections and register qualified black voters in those areas. The Act also authorized federal supervision of registration in states and counties where fewer than half of the voting age residents were registered and outlawed literacy tests. Between 1964 and 1968, black registration increased from 7 percent to 59 percent, in Mississippi, and from 24 percent to 57 percent, in Alabama. In those years, the number of southern black voters increased from one million to 3.1 million.<sup>40</sup>

## Latinos

Hispanics, people of Spanish and Latin American background, have been the fastest growing group of people in the United States in recent years. The largest proportion of Hispanic Americans are people of Mexican descent; the second are Puerto Ricans.

After World War II, Latinos began serious efforts to improve their political, legal, and economic status. During the war, Mexican Americans won more medals than any other ethnic minority, and they were no longer willing to accept second-class citizenship. Latinos began to organize and stressed the importance of the vote. Dr. Hector Garcia established the G.I. Forum, in 1948, which aimed at fighting discrimination against Mexican Americans. The League of United Latin American Citizens (LULAC), founded in 1928; successfully pursued two legal cases important to Latino advancement. In *Mendez v. Westminster*, a 1947 California case, and in the 1948 *Delgado* case in Texas, the Supreme Court upheld lower court rulings that declared the segregation of Mexican Americans unconstitutional. LULAC won another important legal case in the 1954 *Hernandez* decision, in which the Supreme Court ended the exclusion of Mexican American from Texas jury lists.

Chicano nationalism of the 1960’s inspired a variety of organizations whose purpose was, not only to gain equality with whites, but also, to attain cultural and political self-determination. Corkey Gonzales’s Crusade for Justice, formed in 1965, campaigned for greater job opportunities throughout the southwest. In late 1967, David Sanchez formed the Brown Berets to address such issues as housing and unemployment. A new political party, La Paza Unida – “the united people” – (LRUP), increased Mexican-American representation in local government and established social and cultural programs. The student-led Mexican American Youth Organization (MAYO) worked closely with LRUP to help Mexican Americans take political power in Crystal City, Texas. The two organizations registered voters, ran candidates for office, and staged an extensive boycott of Anglo-owned businesses.

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<sup>39</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, *Out of Many: A History of the American People* Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 853.

<sup>40</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, *Out of Many: A History of the American People* Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 871.



In 1968, President Johnson signed the Bilingual Education Act, which reversed state laws that prohibited the teaching of classes in any language other than English. Meanwhile, students organized Mexican-American studies programs on various campuses.

Latino activists soon realized that economic power remained outside the community. Given the high incidence of poverty, ordinary Mexican Americans lost some confidence in the political process, and a degree of apathy set in after early hope for significant, and rapid, change.

## Asian Americans

The Chinese were the first group of Asians to arrive in the United States in significant numbers, coming initially as a result of the discovery of gold in California and in response to the need for workers to build the Central Pacific Railroad. Business leaders in California and other western states favored Chinese immigration because it provided a large supply of workers. Labor unions, however, opposed Chinese immigration, claiming that it lowered the wages of existing workers.

Anti-Chinese feeling resulted in the passage, in 1882, of the Chinese Exclusion Act, which suspended Chinese immigration, limited the rights of resident Chinese, and forbade their naturalization. Further, in 1902, pressure from the American Federation of Labor resulted in the total restriction of Chinese immigration.

In the late 1800's and early 1900's, Japanese immigrants began to arrive in significant numbers. Native-born Americans began to protest the inflow of Japanese workers and western states passed discriminatory laws against them.<sup>41</sup>

The egalitarian climate growing out of the civil rights movement resulted in the passage of the Immigration and Nationality Act of 1965, which eliminated quotas based upon national origin. In the twenty years following the 1965 Act, four times as many Asians settled in the United States than in the entire previous history of this country. As a result, the Asian Community underwent a profound change. In 1960, Japanese represented 52 percent of the Asian population, Chinese represented 27 percent, and Filipinos represented 20 percent. In 1985, however, Japanese represented 15 percent; Chinese, 21 percent; Filipinos, 21 percent; Vietnamese, 12 percent; Koreans, 11 percent; Asian Indians, 10 percent; Laotians, 4 percent; and Cambodians, 3 percent.

Inspired by the black power movement, college students of Asian ancestry began to unite in order to combat racial oppression. In 1968, students on the West Coast founded the Asian American Political Alliance (AAPA), one of the first Pan-Asian political organizations. Similar organizations spread rapidly to the East Coast and Midwest. These students began to seek alternatives to the goal of assimilation into mainstream American society; promoting instead a unique sense of Pan-Asian ethnic identity.

Older civil rights organizations, such as the Japanese American Citizens League (JACL), were prompted to bring forward the issue of internment during World War II. As a result, in 1988, Congress voted reparations of \$20,000 for each of the surviving

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<sup>41</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 874-75.

victims.

Since the late 1960's, major universities have introduced courses in Asian American studies. Currently, Asian Americans represent 4 percent of the U.S. population; and the politics of identity continue.

### Upper Income Groups

Upper income people, in the United States, benefited in the 1980's when Congress passed a huge tax decrease that lowered the tax rates for individuals and corporations. Up to that time, the richest people paid about 70 percent of their income in taxes. Their tax rate fell to 50 percent and then to 33 percent. This tax cut was financed largely by a decrease in social welfare programs. The number of people receiving food stamps declined from about 17 million to about 8 million during the first half of the 1980's.<sup>42</sup> About 1 million people were dropped from welfare and Medicaid.<sup>43</sup> Some job training programs were cancelled.

### III. Fundamentals of Class Conflict

The Concept of class implies inequalities and further implies the existence of class conflict. Classes do not exist in the absence of class conflict and, therefore, tension between classes is a constant feature of any society. As Marx states, these groups stand "in constant opposition to one another [carrying] on an uninterrupted, now hidden, now open fight...".<sup>44</sup> Whether class conflict is overt or covert, it always results in some degree of social tension, social instability, and social disorder.

Fundamental to the class nature of society are the concepts of class consciousness and false consciousness, originally introduced by Marx.<sup>45</sup> When a group develops class consciousness, it moves from being a class-in-itself, created by the structures of society, to being a class-for-itself; where the members are aware of each other and have a shared sense of their circumstances and what they can do collectively to enhance their shared position.<sup>46</sup>

As was mentioned in section one, the state determines who gets what portion of the economic surplus; and gaining political access, or otherwise gaining control of the state apparatus, is the method by which classes influence the state to intervene in their own behalf. Thus, the government, the apparatus of the state, is used by various groups to enhance their position relative to competing groups. Dahrendorf discusses the institutionalization and regulation of class conflict and notes three methods by which political change can occur. The first type involves a total (or near total) exchange of personnel in positions of domination. While this method represents the rarest type of change, an example occurred during the French revolution. In 1791, the National Assembly drew up a constitution calling for a constitutional

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<sup>42</sup> Ghomas DiBacco, Lorna Mason, and Christian Appy, History of the United States (Boston Houghton Mifflin 1991) p. 817.

<sup>43</sup> Ghomas DiBacco, Lorna Mason, and Christian Appy, History of the United States (Boston Houghton Mifflin 1991) p. 817.

<sup>44</sup> Karl Marx and Frederick Engels, The Communist Manifesto (New York: International Publishers 1948) p. 9.

<sup>45</sup> Class consciousness refers to the objective awareness by a group of their situation and shared interest and begins to challenge existing social arrangements which maintain their current position. False consciousness refers to group acceptance of ideologies that justify their relatively low status and the acceptance of current social arrangements, which maintain their current position as natural and proper.

<sup>46</sup> A unique example of the development of class consciousness was the successful middle class tax movement in California, in 1978. Proposition 13, which lowered property taxes, was approved. See section IV.

monarchy. In 1792, however, the National Convention abolished the monarchy and proclaimed France a republic.

The second mode of change involves a partial exchange of personnel in dominant positions. In this type of change, some representatives of subordinate groups penetrate the ruling class and influence the policies adopted and decisions made. In the United States, this type of change occurs when subordinate groups increase their representation in elected and appointed offices. Between 1970 and 1993, the total number of Black elected officials at the federal, state, and local levels, combined, increased by 440 percent, from 1,479 to 7,984.<sup>47</sup> From 1984 to 2000, the total number of Latino elected officials increased by nearly 65 percent, from 3,009 to 4,921, at the local level; by 80 percent, from 110 to 198, at the state level; and more than doubled, from 9 to 19, at the federal level.<sup>48</sup> From 1977 to 1999, the number of women serving as mayors increased by more than 300 percent, from 47 to 192; in state legislatures by 140 percent, from 688 to 1,652; in the U.S. House of Representatives by more than 200 percent, from 18 to 56. In the 106<sup>th</sup> Congress, in 1999, 9 women served in the U.S. Senate.<sup>49</sup>

The third type of change resulting from class conflict does not involve any exchange of personnel, and change occurs in the direction intended without any members of the subordinate group penetrating into dominant positions. This is accomplished when holders of dominant positions initiate legislation and adopt policies favorable to the subordinate group. In a representative democracy, this is accomplished by an extension of the suffrage. Legislators, in order to pursue their self-interest and remain in positions of power, will pass legislation which benefit the interests of certain groups at the expense of opposing groups. In the process of political sociology, it seems that reality lies between the extremes of type II and type III.

Institutionalization and regulation of class conflict is indicative of certain types of social machinery which provides a framework through which class struggles might be routinized and carried out in a relatively orderly manner. Examples of social machinery include the National Labor Relations Board, strengthened under the Wagner Act of 1935, and the Equal Employment Opportunity Commission, created by the Civil Rights Act of 1964.

The institutionalization and regulation of class conflict clearly decreases the violence associated with class struggles though not necessarily its intensity.<sup>50</sup> The intensity of class conflict is related to the social psychology of intergroup relations, where people develop friendly or hostile attitudes depending upon whether the functional relations between them is cooperative or competitive.<sup>51</sup> Competition for the same, scarce, resources results in prejudices and negative stereotyping and the development of an ingroup-outgroup mentality that intensifies the friction. The more people view others as competitors, the more they will compete, thereby intensifying and amplifying the competition.

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<sup>47</sup> United States Department of Commerce, Statistical Abstract of the United State. Various years.

<sup>48</sup> National Association of Latino Elected and Appointed Officials Education Fund. Los Angeles, California.

<sup>49</sup> National Women's Political Caucus. Washington, DC.

<sup>50</sup> Under authoritarian, non-democratic regimes, or even in democratic societies where class conflict is not regulated, class conflict and the attempt to gain upward mobility may be perceived as a threat by the dominant class. In pursuing their self-interest, the dominant class meets the accompanying social disorder with repression and, possibly, violence, extending, at times, to wholesale murder. For example, racial violence reached a wartime peak during the summer of 1943, when 274 conflicts occurred in about 50 cities. In Detroit, 25 blacks and nine whites were killed with more than 700 injuries. Also in 1943, the zoot suit riots occurred in Los Angeles where American Navy personnel initiated violence against Mexican-American youths. Further, during the civil rights movement of the 1960's, civil rights workers were killed, churches were bombed, and so forth.

<sup>51</sup> Muzafer Sherif, O.J. Harvey, B. Jack White, William E. Hood, and Carolyn W. Sherif, The Robber's Cave Experiment: Intergroup Conflict and Cooperation (Norman: University of Oklahoma Book Exchange 1961).

Superordinate goals, particularly with regard to the pluralist model, decreases intergroup friction. However, when the challenge is met, intergroup friction resumes. An example of a superordinate goal occurred during World War I when Samuel Gompers and most other labor leaders agreed to cooperate with business and the federal government to keep up production. For the good of the war effort, workers agreed not to strike during the War. Another example occurred during World War II when civil rights leader A. Phillip Randolph and President Roosevelt made a deal. President Roosevelt issued Executive Order 8802 -prohibiting discrimination in War industries – and Randolph cancelled a march on Washington, planned for July, 1941.

The concept of social dominance orientation, applicable to the elitist model, describes the extent to which a person wants his or her group to dominate and be superior, both socially and materially, to other groups, rather than thinking that all people should be treated equally. People having strong social dominance orientation are particularly likely to hold negative stereotypes and prejudices with regard to lower status groups because such stereotypes and prejudices help justify the existing social hierarchy. In the elitist model, from the point of view of psychology, the dominant group would rather suffer a loss than relinquish its relative position.

#### IV. New Theories of Class Conflict

Social stratification, based on certain factors, exists in all societies, and class feeling, class tensions, and thus, class friction exist, irrespective of the absolute level of the class structure. For example, if two, given, societies have identical social, political, and cultural features, and identical relative income distributions; but differ only with respect to the absolute income level of the total class structure, the intensity and the degree of class friction would be the same in both societies.<sup>52</sup> Support for their theory can be found in the history of the United States, which for the better part of its existence, has enjoyed a high national and per capita income relative to any country in the world. Yet, as has been shown, its history has revealed numerous sequences of farmers' movements, workers' movements, teachers' movements, civil rights movements, women's movements, middle class tax movements, and so forth. These types of activities were all undertaken to enhance the status and position of particular groups relative to others. In modern democracies, these groups are sometimes referred to as special interests<sup>53</sup>, and the pendulum continues to swing, in a relative sense.<sup>54</sup>

When a given society is in the process of moving to a higher level of prosperity, each contending party perceives that it is gaining and, thus, class feeling, class tension, and class friction decreases. At the new, higher, level of prosperity, each party assesses its new relative position, and class conflict continues accordingly. The party that loses relative position attacks and the party that gains relative position defends.<sup>55</sup> In the process of moving to a lower level of prosperity, each contending party perceives that it is losing and, thus, class feeling, class tension and, class friction increases.<sup>56</sup> At the new, lower, level of prosperity, the party that loses relative position attacks, the party that gains relative position defends, and class conflict continues accordingly. If all other conditions are identical at the new, higher or lower, levels of prosperity, the degree of class tension and class friction is the same at both levels.

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<sup>52</sup> This theory was initially stated as a hypothesis in a previous paper created by this author. See: Barrington K. Brown, "The Philosophical Nature of the Social Sciences and the Development of Human Technology". Prepared for presentation at the Fourth Annual Convention of the Congress of Political Economists, International, Paris, France, January 8-13, 1993. P. 14-15.

<sup>53</sup> It's always amusing to hear politicians in modern democracies accusing each other of catering to special interests. The state is always class biased and state policy is never class neutral.

<sup>54</sup> The pendulum swings because the winning party (or coalition of classes) becomes complacent and the losing party is spurred into action. Such is the nature of political sociology – political psychology.

<sup>55</sup> This point is more applicable to the pluralist model. In the elitist model, the subordinate class attacks and the dominant class defends.

<sup>56</sup> If both parties perceive that they are losing, both will be on the attack.

The following analysis holds, in concurring with Dahrendorf's inference, that there is no significant leveling of the class structure and that there is a minimum of inequality that will not be lowered by egalitarian trends. Further, the analysis holds that class conflict is prosperity neutral; maintaining consistency with the previous two analyses of this section. It can be assumed that social rewards among the members of a given society is a normal distribution with, mean,  $\mu$ , and standard deviation,  $\sigma$ . It is further assumed that the distribution is symmetrical such that the mean, median, and mode are identical. The quantification, social rewards, is some combination of wealth, power, and prestige; where the three dimensions are coincident, such that the system of stratification is fully developed, in the Weberian sense.

Fig. 1

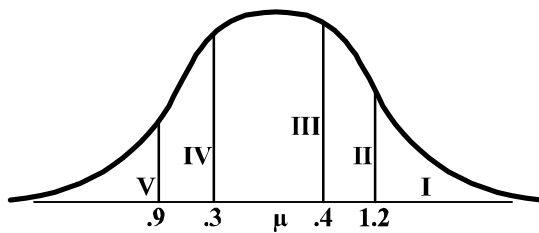


Table I<sup>57</sup>

Class	Standard Deviations from mean	Percent of Population
I	> +1.2	11.5
II	+ .4 and +1.2	23.0
III	-.3 and +.4	27.3
IV	-.9 and -.3	19.3
V	-.9 <	18.4

The graph and the table illustrates a society with five distinct classes, noted I, II, III, IV, and V. Members of Class I, the most privileged class, hold social rewards that range upward from 1.2 standard deviations above the mean and represent 11.5 percent of the population.

Members of Class V, the least privileged class, holds social rewards which range downward from .9 standard deviations below the mean and represent 18.4 percent of the population. Members of the middle most class, Class III, hold social rewards that range between .3 standard deviations below the mean to .4 standard deviations above the mean, and represent 27.3 percent of the population.

From the illustrations, Classes II or III (or both) could form a coalition with Class IV in order to enhance its position. As a result, Class IV could enhance its position; possibly by achieving an extended suffrage or through an increase in transfer payments. An example of this type of coalition occurred when British workers joined middle class reformers in agitating for the Reform Act of 1832, which extended the suffrage to nearly all middle class men. This eventually led to the repeal of the Corn Laws, in 1846, which made it easier to import grain and lowered the cost of living for the working poor. Further, this led to the Reform Acts of 1867 and 1884, which extended suffrage to all adult males and attended the legalization of labor union activity.

Another example is the successful middle class tax revolt in California in 1978, which approved Proposition 13, cutting property taxes and government revenue for social programs and education. In the above illustration, this can be represented by a coalition of Classes III and IV strengthening their position relative to Class V.

In the context of the above model, position shifting and displacement can also occur. As a result of the civil rights movement, black family income rose from 53 percent of white family income in 1954 to 60 percent in 1969, peaked at 62 percent in 1975, then fell back to 57 percent in 1977. These changes represent position shifting of blacks relative to whites. When the income of one group increases relative to that of another, position shifting occurs and the resulting displacement represents a decline in life chances for the displaced group. In the latter 1970's,

<sup>57</sup> Data for such an analysis can be obtained from a normal distribution table.

particularly in economically hard-pressed urban areas, white voters began to resent the gains made by Blacks and Latinos and formed a powerful backlash movement.<sup>58</sup> The backlash coalition of such groups as Poles in Chicago, Irish in Boston, Italians and Jews in Brooklyn, New York, and so forth, was undertaken to consolidate political influence.

Nearly all of the movements discussed in this paper have ultimately resulted in an extension of the suffrage. The increase in voting rights allow groups to compete successfully within the hierarchical structure; i.e., along the bell shaped curve.

The final part of this section deals with people's need for consistency in action (behavior) and attitude (belief). In the process of conflict, group members may act in ways that aid members of their group and harm members of another group. This behavior, if not accompanied by changes in attitudes and belief, with regard to members of others groups, result in cognitive dissonance; where people feel uncomfortable due to contradictions. Consistency requires dissonance reduction, where attitudes and beliefs conform to behavior. Thus, when groups compete for the same, scarce, resources, prejudices, negative stereotyping, and mistrust develop.

#### V. Smith Versus Marx

The present section will show that Adam Smith's key insight, while leading to an optimum when viewed from an economic perspective, leads away from the social optimum when viewed from an interdisciplinary perspective. This section will further show that Karl Marx's dictum, while leading away from the optimum when viewed from an economic perspective, leads toward the social optimum when viewed from an interdisciplinary perspective.

Fundamental to the present analysis is the primary law of human nature; self interest. It should be noted that laws of human nature are no less fixed than laws of physical nature.

Adam Smith's key insight states that when two parties engage in voluntary, free, exchange, both parties gain otherwise, because of the law of self-interest, the exchange would not have taken place. As a result of the exchange, the whole is greater than the sum of its parts, and society benefits accordingly. This insight forms the basis of a capitalist, free market, society.

Karl Marx's dictum, "from each according to his ability to each according his need", forms the basis of a socialist society. However, the law of self interest requires that the more abled decrease their productive efforts since they are not reaping the benefits of such efforts. The less abled are required by the law of self interest to increase their needs since these needs are being met by someone other than themselves. Thus, under pure socialism, productive efforts decrease while, at the same time, need is increasing, resulting in the bankruptcy of the economy.

Thus, when viewed from an economic perspective, Adam Smith's key insight leads towards the social optimum and Karl Marx's dictum leads away from the social optimum. However, the situation reverses when viewed from an interdisciplinary perspective.

Under Adam Smith's key insight, a dominant group will have power relative to a subordinate group, and unequal exchange takes place.<sup>59</sup> The result of unequal exchange between classes is exploitation and, thus, inequality. While society benefits from voluntary, free, exchange, exploitation and inequalities lead to social instability and social disorder.

The classic example of unequal exchange between classes is, of course, the relationship between business and labor. Another example is the relationship between farmers and the

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<sup>58</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 931.

<sup>59</sup> Randall Collins notes that in situations of inequality, groups that control resources are likely to exploit groups that lack resources. See: George Ritzer, Sociology Theory (New York: McGraw-Hill 1993 3<sup>rd</sup> ed.) p. 609.

railroads during the latter part of the nineteenth century. Other examples of unequal exchange between classes include the relationship between men and women, blacks and whites and, generally, rich and poor. Women and members of minority groups tend to receive less pay for the same work even after controlling for job type, educational background, and the like.<sup>60</sup> The fact that, in the United States, the income of women is 60 percent that of men, that family income of blacks is 54 percent that of whites, and that family income of Hispanics is 61 percent that of whites is indicative of unequal exchange, exploitation, and obviously, inequality.

As has been discussed in this paper, subordinate classes have attempted to use the coercive powers of the state to alter exchange relationships. Dominant classes have attempted to use the coercive powers of the state to strengthen their position relative to subordinate classes. This paper has discussed various pieces of labor, civil rights, and other types of legislation. Further, specific laws such as minimum wages and rent controls directly affect exchange relationships.

Application of Marx's dictum has been employed to decrease tension and friction between upper and lower income groups and enhance social stability and social order. In the United States, labor unions, as well as farm organizations, began advocating the redistribution of income through progressive income taxation as early as the 1870's. In 1892, the platform of the Populist Party called for a progressive federal income tax. Congress initially passed a federal income tax in 1894 but, the following year, the Supreme Court declared it unconstitutional. The Sixteenth Amendment, ratified in 1913, provided the legal basis for a progressive income tax by the federal government.

In the United States, the ratio of the top 20 percent of income earners to the bottom 20 percent of income earners decreased from 31.2 to one before taxes and transfers to 7.48 to one after taxes and transfers.<sup>61</sup> This figure does not include income from stocks, bonds, and property.<sup>62</sup> To accomplish this, the share of income of the top 20 percent decreased from 53.1 percent of all earned income to 47.1 percent, representing a decline of only 11.3 percent in relative well being. This redistribution was accomplished without too great a loss to the top 20 percent. The percent of total income earned by the bottom 20 percent increased from 1.7 percent to 6.3 percent, an increase of 271 percent in relative wellbeing. This increase occurred primarily because the bottom 20 percent of income earners received about 40 percent of transfer payments.

Some of the programs mentioned in this section tend to be inefficient when viewed solely from an economic perspective. Minimum wages, under a net of competitive conditions, result in a decrease in employment. Rent controls, under a net of competitive conditions, result in a decrease in rental units. Progressive income taxes result in disincentives with regard to productive efforts and, generally, distort the work-leisure trade-off. These, and other policies, including other egalitarian measures, import restrictions favoring certain industries, investment incentives favoring certain industries, and so forth, result in inefficiencies in the aggregate production function. The class nature of society, manifest through universal suffrage, however, requires that these policies be implemented so as to allow some groups to gain relative to others. Their implementation results in less class tension and less class friction and, ultimately, a stable and orderly social environment. A stable and orderly social environment is essential in providing a climate favorable to savings and investment, and, hence, economic growth.

## VI. An Application of the Model: Educational Vouchers

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<sup>60</sup> Douglas T. Kendrick, Steven L. Neuberg, and Robert B. Cialdini, Social Psychology: Unraveling the Mystery (Boston: Allyn and Bacon 1999) p. 398.

<sup>61</sup> Melvin M. Tumin, Social Stratification: The Forms and Functions of Inequality (Englewood Cliffs, N.J. Prentice-Hall 1985) p. 55.

<sup>62</sup> Melvin M. Tumin, Social Stratification: The Forms and Functions of Inequality (Englewood Cliffs, N.J. Prentice-Hall 1985) p. 55.

**Educational vouchers is an arrangement whereby parents receive vouchers corresponding to all or part of the amount that the state or local community committed to spend in providing public education for their children. Under this arrangement, parents, rather than the government, choose the schools their children attend. If they are not satisfied, parents can move their child from one school to another, thus, introducing competition into the schooling process. This arrangement, if applied universally, would result in the development of a private, for profit, schooling industry. Theoretically, schools would compete with each other for students; offering the highest quality education at the least possible cost. Public schools, if any were left, would be competitive. While the foregoing analysis views the situation from an economic perspective, the following analysis examines the situation from an interdisciplinary perspective.**

**For most of the history of mankind, education was a private affair and, for the most part, only upper income classes received an education. Prior to the nineteenth century, most children of working class families did not attend school at all and would, more likely, be apprenticed to a craftsman, do agricultural work, or work as a servant. Many people did not learn to read, write, or do arithmetic, and the idea that all children should receive even an elementary education is a fairly recent one.**

**With the extension of the franchise to lower income groups, people began to view public education as a step in the advancement of the working class. The realization was that, without schooling, children of working class families would be denied social and economic opportunities.**

**In the latter part of the nineteenth century, mass public education began to expand, with the United States and countries in Western Europe instituting mandatory, free, public schools for all children. With access to public schooling in at least the leading nations, all children, rich and poor, had an opportunity to learn skills with which to strive for upward mobility.**

**Thus, given the class nature of society, lower income classes, having fought so hard, over the years, to obtain public schooling for their children, fear that the opportunities for upward mobility would be severely limited by the privatization of education.<sup>63</sup> An analogous argument can be made with regard to the historically black colleges and universities.**

**In the nearly fifty years since the idea of educational vouchers was first proposed, no significant progress has been made in the implementation of this system. Only trial and token programs have been instituted.**

**Milton Friedman<sup>64</sup> has attributed the failure to adopt educational vouchers to the vested interests of the politically powerful public education establishment reinforced by the growing power of the teachers' unions. Even if this were even partially true, the school bureaucracy and the unions could not have been successful in opposing the program without the votes of lower income classes; the 60 percent of American families that earn 31 percent of total national income and tend to send their children to public schools. It follows, then, that the primary beneficiaries of a system of educational vouchers are upper income classes; the 40 percent of American families that earn 69 percent of the nation's total income, who tend to send their children to private schools, and pay twice for their children's education.**

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<sup>63</sup> In the competition for scarce resource (or life chances), what's to prevent upper income groups from taking advantage of the fact that all (or most) schools were private, or that the number of public schools had decreased significantly.

<sup>64</sup> Milton Friedman, "Public Schools: Make them Private", The Washington Post (February 19, 1995), op. ed.



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# **SUCCESS FACTORS OF E-CHANNELS OF COMMERCIAL BANKS**

**Hway-Boon Ong**

Ming-Yu Cheng

Multimedia University, Cyberjaya, Malaysia.

## **Abstract**

The impact of technology in banking is mainly felt in the delivery of banking services through electronic channels. Electronic channels like ATMs, PC banking, phones banking and banking kiosks have provided other alternatives to acquire banking products and services. By developing e-channels through appropriate innovative technology, banks could perhaps compete better and reduce operating and distribution cost. Nonetheless, it is not easy changing from traditional methods of banking to one that is paperless and cashless. In view of the high investment cost of operating electronic channels, the return is in fact, uncertain. Therefore, the question now is what would it take to bring about success in implementing electronic distribution channels.

The purpose of this study, data is collected by self-administered questionnaires distributed to all the domestic commercial banks in Malaysia. The factor analysis conducted indicated that banks' operation management is the main factor affecting the success of ATMs and PC, while product innovation and knowledge development factor are found to have the most effect on the success of banking kiosks and phone banking, respectively.

Key word: e-channels, critical success factors, and commercial banks

## **INTRODUCTION**

The intense competition in the banking industry is recently felt in the delivery of banking services following the advent of electronic distribution channel. Unlike the traditional brick and mortar era, bank branches alone are now insufficient to cater for today's sophisticated and demanding customer (Freeman, 1996; Zineldin, 1996).

However, though the latest technique in distribution channels is said to provide convenience and reduce operating cost, it is also a double-edged sword, providing both opportunities and threat. Due to difficulty in sustaining competitive advantage and growth through other marketing mix, developing marketing channel strategy through appropriate use of innovative technology, could reduce distribution cost could be met (Rosenbloom, 1999). Quite the reverse, implementing e-channels require high investment on staff training, development of information communication technology (ICT) infrastructure, as well as promotions and advertisements to persuade customers, while the return is uncertain.

As such, the question now is what would it take to bring about success in implementing e-channels in banks? This study attempts to ascertain how e-channels can be implemented successfully by domestic commercial banks in Malaysia. By focusing on four e-channels currently used by commercial banks in Malaysia, namely, ATMs, banking kiosks, phone and PC banking, the identification of success factors is to warrant improvement on bank services in order to remain competitive in the banking industry.

## **ELECTRONIC CHANNELS**

Generally, e-channels emerged with the evolution of IT and the Internet. E-channels use PC, the Internet or other enabling technology to make products and services available to the target market. In banking, e-channels are also known as innovative distribution channel (Wong, 1998; Kimball et. al., 1997), online banking (Daniel, 1999) and technology-intensive delivery system (Filotto et al., 1997).

Perhaps, ATMs are the most commonly used electronic distribution channel that give consumers the convenience of financial transactions like balance enquiry, credit card applications, cheque books applications, cash and cheque deposits, fund transfer and applications for the purchase of initial public offers (IPOs), 24-hours a day. The most recent development is to enhance the conventional ATMs to store consumers' information electronically so that ATM cards can perform the function of electronic wallets.

Apart from ATMs, phone banking is another option of E-banking. In order to use phone banking, consumers will have to call the bank's phone centre. With a centralised consumer service department, a phone centre takes in-coming calls from consumer enquiring for services like account balance enquiry, instruction to issue bankers cheques and give standing instructions. Each call will first reach an automated response system, but a consumer may also re-route a call to a service representative. Most banks keep the phone centres open 24 hours a day. Some examples are Direct Access of Southern Bank, Tele-banking of RHB Bank and Maybank.

PC banking, also known as remote e-banking, self-service banking, home banking and office Banking, is another choice of e-banking. PC banking could be done via web-based or Internet. Using a personal computer that is equipped with a modem enables banking at home or office. Home banking allows consumer to check account balances, credit card activity, transfer funds and bills payment. At present only three domestic banks that offered Internet banking in Malaysia, namely Maybank, Southern bank and Hong Leong Bank. Since Internet banking is rather new in the industry, more PC-based banking is practised in Malaysia.

Another e-channel, the banking kiosk, also known as the banking booth or virtual kiosk, is the integration of phone banking, ATM and PC-based banking services, where consumers are able to access their account either by the telephone, ATM, or the computer terminal. Banking kiosks are usually open to consumers 24 hours a day. At present, banking kiosk services, are provided by Phileo Allied Bank (now operating under Maybank).

## **SUCCESS FACTORS**

Several studies had identified critical success factors of banks. For example, Chen (1999) had identified four critical success factors of banks in Taiwan when adopting various business strategies as the ability of bank operation management; bank marketing, developing bank trademark and financial market management. In US, Sciulli, (1998) noted that banks with lower levels of centralisation, higher levels of formalisation, higher levels of complexity, larger in size and higher level of integration were highly related to the success of implementation of product and service innovations. On the

other hand, Gupta and Collins, (1997) described investing in advanced and well established technologies, integrating existing distribution channels with new technology, providing staff training and proper planning as the banks' ability to succeed in creating, processing, generating and disclosing real-time information to their consumers.

Ghoshal and Ackenhusen (1998) discovered that organisational competence for innovation affected the provision of e-banking in UK. They reasoned that a bank that was reputed for innovation would be easier to introduce electronic related services as consumers have accepted their previously proven innovation. Devlin (1995) added that in order to save cost and to take advantage of economies of scale, a centralised processing unit in the head office should render routine administrative procedures that were processed by bank branches. By doing so, more office space will be available in the branch for staff to play a more marketing-oriented role.

A study conducted by Daniel, (1999) on retail banks in UK and the Republic of Ireland discovered that three critical success factors of e-services are organisation's vision of the future, prediction of customer acceptance, and organisation culture of innovation. In Germany, Dannenberg and Kellner (1998) emphasised that success in e-banking requires adequate and appropriate software and hardware technical equipment to run the e-channels efficiently. Since e-channels will co-exist with the traditional branch network, the technology required involve the application of IT that allows new channels to run hand in hand with the existing ones.

## **RESEARCH METHODOLOGY**

In order to identify the factors that will bring about success in operating electronic distribution channels by commercial banks, self-administered mail questionnaires are distributed among targeted population of bankers currently employed by locally owned commercial banks in Malaysia. Questionnaires are mailed out to all 20 domestic commercial banks under the supervision of the central bank of Malaysia as at 31 December 1999. Out of 112 responses received, 72 completed responses were usable, 16 return unanswered and 24 uncompleted. Data collected are analysed using reliability test and factor analysis to determine the factors of success in operating e-channels by commercial banks.

## RESULTS

The respondents are asked to rank their views on 26 items of 5 Likert-scale questionnaires with regards to ATMs, banking kiosks, phone and PC banking. Firstly, a reliability test is conducted to determine the reliability of respondents' reply in relation to all four e-channels and the  $\alpha$  score is highest for banking kiosks, followed by PC banking, phone banking and lastly ATMs, respectively. As presented in Table 1, the minimum  $\alpha$  obtained is 0.79. Thus, all responses can be deemed reliable.

Table 1: Reliability test,  $\alpha$

	ATMs	Banking Kiosks	Phone Banking	PC Banking
$\alpha$	0.7931	0.9854	0.8026	0.9388

Prior to factor analysis, the Bartlett's and Kaiser-Meyer-Olkin (KMO) tests are conducted to test the feasibility to conduct factor analysis. The Bartlett's test indicates nonzero correlation existed at the level of significance of less than 1%. As for KMO, the reduced set of variables collectively meets the necessary threshold of sampling adequacy of more than the acceptable MSA value of 0.50. The summary of both Bartlett's test and KMO test is illustrated in Table 2.

Table 2: Bartlett's test of sphericity and KMO test.

	ATM	Banking kiosks	Phone banking	PC Banking
Bartlett's test				
Chi-square value	*731.198	*2462.046	*719.652	*1208.989
KMO				
MSA value	0.66265	0.91992	0.67475	0.83611
* Significant level at 1%				

Next, factor analysis is conducted and five factor solutions are retained for all distribution channels where variables with more than 50% loadings from the rotated component matrix table are accepted. The output of the component analysis and varimax rotation suggests that the success factor for implementing ATMs would depend on firstly, the

bank's operation management factor, and is followed by product innovation factor, knowledge development factor, planning and control factor as well as organisation factor. On the other hand, the success factor for banking kiosks would primarily depend on product innovation, followed by planning and control factor, bank's operation management factor, knowledge development factor and finally, the pricing factors. As for phone banking, it is discovered that knowledge development is the principal success factor, followed by product innovation factor, the planning and control factor, the organisation factor, and finally, the bank's operation management factors.

Nevertheless, as for PC banking, the success factor would mainly depend on the bank's operation management factor, followed by the organisation factor, product innovations factor, knowledge development factor and finally, the planning and control factors. Summary of the success factors for all distribution channels is illustrated in Table 3.

## CONCLUSIONS

Banks' operation management is discovered to be the main factor affecting the success of ATMs and PC banking. That is to say, for ATMs, banks' operation management factor is closely associated with the availability of various bank services, the established good customer-banker relationship as well as staff familiarity and professionalism in servicing and advising customers. As for the success of PC banking, it would largely depend on staff training, provision of fast and efficient services, good service quality to establish long term relationship with clients and acceptable pricing of service fees.

Table 3: Success factors for e-channels.

Success factors	% of Variance Rotated Sum of Squared			
	Loadings			
	ATMs	Banking Kiosks	Phone Banking	PC Banking
Bank's Operation Management	12.18 (1)	16.80 (3)	7.85 (5)	21.41 (1)



Product Innovation	11.27	22.913	10.71	12.92
	(2)	(1)	(2)	(3)
Knowledge Development	11.13	16.09	14.33	9.92
	(3)	(4)	(1)	(5)
Planning and control	9.98	21.27	10.66	8.25
	(4)	(2)	(3)	(4)
Organisational Structure	7.95	-	10.04	14.59
	(5)		(4)	(2)
Pricing	-	8.93	-	-
		(5)		
Cumulative % Rotated	52.51	86.00	53.59	67.09
Sum of Squared Loadings				

Note:

The parenthesis ( ) represents ranking of factors affecting the success of distribution channels

Nonetheless, product innovation is found to be the most important factor determining the success of banking kiosks. As such, product innovation which is associated with the availability of appropriate technology and technical support, user friendly electronic services, proper introduction and development of electronic services to ensure higher utilisation at lower cost are the main factors affecting successful product innovation in banking kiosks.

The success of phone banking, however, is mainly dependant on knowledge development of staff involved in delivering services via telephone. Since phone banking involves delivery of services without face-to-face interaction, first hand information and ability to handle queries promptly are important in determining the success of phone banking.

Nevertheless, it should be noted that this survey is conducted before June 2000, prior to the introduction of Internet banking, and the respondents are not asked to specifically rank their opinions on PC based or Internet based banking, though both uses PC as a means of operation. Also, this study has focused on identifying success factors of implementing e-channels of domestic commercial banks and thus no comparison could be done between domestic and foreign banks. It would be vital to take note of the weaknesses and advantages of domestic banks in terms of provision of electronic services so as to be better equipped to face a globalise and fully liberalised banking industry in Malaysia by year 2007.

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## **Competitive Market Socialism:**

**A PRACTICAL ALTERNATIVE FOR SECTORS OF THE CUBAN ECONOMY**

**Melvin Burke  
University of Maine**

[A competitive producer] by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and is in this, as in many other cases led, by an invisible hand, to promote an end which was no part of his intention....By pursuing his own interest he frequently promotes that of society more effectively than when he really intends to promote it.<sup>i</sup>

Adam Smith

This paper has two parts, one more theoretical and the other more practical. The first part takes the orthodox economic theory of perfect competition and briefly traces its history of thought from Adam Smith's "invisible hand" under capitalism to Oskar Lange and F. M. Taylor's competitive market socialism.<sup>ii</sup> It argues that competition is the most efficient industrial structure in either capitalism or socialism.

The second part of this paper outlines a model of competitive market socialism which seems appropriate for certain sectors of the Cuban economy. This paper argues that there is a need for competitive market socialism in Cuba, and it highlights some of the structural arrangements required for its successful operation as well as the potential benefits which can be expected from its implementation.

While few neoclassical economists dispute the merits of competition, such as least cost production, full employment, greater equality, greater freedom and greater self regulation, it is no longer seriously considered a realistic alternative for capitalist societies. Instead, neoclassical economists simply assume competition in their models and use competitive rhetoric to rationalize and justify neoliberal monopoly practices and policies.

Economists and planners in socialist societies also dismiss competition. They see it as a tool of capitalist ideology and disguised economic and cultural imperialism. They attempt to achieve their economic goals with public ownership, state planning, collective action, rationing and non-material incentives. In short, both socialists and capitalists today rely upon non-market and non-competitive allocations of resources and products; both systems actively promote and justify monopoly (either private or public) and both reject competition (either officially or

unofficially). Consequently, the least cost efficiency, self-regulating markets and welfare maximization afforded by competition elude socialists and capitalists alike in contemporary times. This paper takes exception to this explicit and implicit anti-competition position and argues that competitive market socialism is indeed practical and constitutes a viable alternative to command socialism, if not to monopoly capitalism.

Competition has been the model of efficiency for economists since Adam Smith. Every economist and student recognizes Smith's contention that competitive producers unintentionally promote the interests of society while pursuing their own materialistic goals. Unfortunately, few note Smith's warnings about monopoly and joint stock companies (corporations) such as "seldom do businessmen get together but that they conspire against the public."

Today, the neoclassical school of economics dominates the profession and virtually all their models are founded upon the competitive markets first promoted by Adam Smith. However, competition and free market rhetoric, rather than substance, is used to justify and apologize for monopoly capitalism. Oligopolistic non-price rivalry on a global scale is sufficient competition for them. Inter-firm transactions are called markets, transfer prices are called market prices and privatization of public enterprises is assumed to enhance efficiency.

## **Competitive Market Efficiency**

All this notwithstanding, the theory, but not the practice, of competition and free markets continues to be economists' ideal means of achieving efficiency. Let us go back to the history of economic thought and devise a new way of thinking about competition, this time in a socialist setting.

We begin with the economic definition of a competitive market. A competitive market is one in which: (1) the number of buyers and sellers are so numerous that no one of them can influence market prices by varying his/her demand or supply and is therefore forced to regard prices as constants which are independent of his/her behavior; (2) there is abundant freedom to buy and sell, to enter and exit the market; (3) the product is more or less homogeneous; and (4) there is no collusion among the buyers or sellers. The competitive model will be first outlined for a capitalist setting, then modified for a socialist economy and finally adjusted to the Cuban economy.

Competition in practice requires a significant but not total degree of consumer sovereignty; a high but not exclusively materialistic motivation; and a free but not anarchistic environment in which to operate. In addition, a competitive market does not require private property or any particular distribution of wealth or income for its benefits to be realized. Finally, a competitive market can function within a larger economy that is itself not wholly competitive and still enhance overall efficiency.

Let us now see how a competitive market functions. We begin with a given distribution of income, consumer preferences, and numerous independent consumers and small producers free to enter or exit the market. With the price taken as a given, ultimately determined by market supply and demand, the producing firms either earn an economic surplus (profit), or they break even or they incur losses – depending solely upon their costs of production. One may then ask where does price competition exist in this market? The answer is that no individual producer can determine price, and should they be foolish enough to offer their product at below market price, their economic surplus would be reduced. Or conversely, should they attempt to offer their products at greater than the market price, consumers would be foolish to buy it thus foregoing other purchases. Economic rationality is assumed and those who violate it will suffer the consequences, i.e., lower economic surplus or lower consumption.

Costs of production depend upon many factors including the costs of inputs, management skills and the ability to anticipate as well as to satisfy consumer tastes and needs. Those firms which incur losses or less than normal profits eventually cease to produce and exit the market. Should a resulting temporary decrease in the quantity supplied exceed the quantity demanded this would give rise to a deficit in the market (a supply shortage) and a higher price. The higher price would make the remaining firms more profitable which would attract new firms to the market. If too many new firms should enter the market, the quantity supplied would exceed the quantity demanded and the price will decrease. A number of firms would again realize economic losses and leave the market. Conversely, should an increase in the quantity demanded result in a market deficit and an increase in the market price, this would in turn attract new firms which would increase the quantity supplied. In this case, the market price will again decrease and the process is repeated over and over again as in the previous case until an equilibrium price is approximated in the long run, stabilizing the market. The long run tendency is toward zero economic surpluses and least average costs of production.

From this exercise, we see that, in a manner of speaking, the competitive market fools the producing firms as it entices them with potential economic surpluses which can only be realized in the short run and only by the most efficient producers. The ultimate beneficiaries of the competitive market are the consumers and the public who realize maximum satisfaction from maximum production, at least-cost low prices in a self-regulating market. Although material incentives to obtain economic surpluses are the motivating force in a competitive market, they can only be achieved in the short run by reducing costs. In the long run they are automatically eliminated. In this way the material incentives of competitive producers are harnessed to achieve the social good which, as Adam Smith pointed out, was not their intention.

There are many misconceptions about the practical operation of the competitive market, far too many to be expanded upon in this short paper. However, a number of them warrant mentioning here. Competitive firms, in practice, have a high degree of individual freedom, but their freedom is not absolute and it can be controlled. For example, competitive firms may be licensed, inspected, regulated, etc.. Some of their products may be subsidized, such as basic foods and medicines, or taxed, such as cigarettes and alcohol. Moreover, some commodities may be distributed free of charge, such as health care and education, while others may be prohibited like addictive drugs and weapons. Anti-social behavior such as price gouging, discrimination, monopolistic collusion and the like are typically illegal. In other words, competition does not imply unconditional laissez faire and is much easier to control and regulate than its non-competitive alternatives. All of the above controls and market corrections, for both producers and consumers in competitive markets, are simply operating parameters, “rules of the game” which do not cause the markets to function any less effectively or efficiently.

We now come to the biggest misconception about competitive markets; namely, that they are a capitalistic industry structure which cannot work in socialist societies or in the absence of private property. Nothing could be further from the truth. Indeed, as will become evident from what follows in this paper, socialism is more conducive to competitive markets than is capitalism and more likely to function properly in such an environment.

Karl Marx, and nearly all other economic philosophers of socialism, had very little to say on the subject of resource and product allocation since their primary focus was to analyze and expose capitalism in order to bring about its overthrow. From their writings, however, we can

ascertain that the general distribution guidance under socialism should be from each according to his/her ability and to each according to his/her ability and basic needs. The mechanism or market structure by which this allocation was to be achieved was left to future generations to solve -- theoretical solutions devised before the overthrow of capitalism, and practical solutions after socialism replaced capitalism.

The first writers to deal with the issue of the feasibility of competitive market socialism at the theoretical level were neoclassical economists--a number of whom were sympathetic to the socialist cause--during the time period 1900-1930s. A brief sketch of their conclusions reached during the great debate on the feasibility of competitive market socialism provides us with an introduction to the Taylor-Lange model of competitive market socialism used in this paper.

Vilfredo Pareto, applying his welfare theory to a socialist economy in 1902-1903, found no reason why maximum welfare could not be achieved under competitive market socialism.<sup>iii</sup> Enrico Barone, in 1908, systematically and mathematically demonstrated that the conditions necessary to achieve an optimum allocation of resources could be achieved in a competitive socialist economy with the aid of a Ministry of Production setting prices which minimized costs of production and cleared the markets.<sup>iv</sup> In 1920, Ludwig von Mises, however, contended that because there were no private owners of the factors of production under socialism, there would be no factor markets and no market prices and thus no optimum allocation of resources.<sup>v</sup> In 1928, Fred M. Taylor, building upon the earlier works of Pareto and Barone, demonstrated that von Mises' argument was erroneous and that, in fact, the prices of factors of production under socialism could be determined by imputation and trial and error.<sup>vi</sup> The debate was continued by F. A. Hayek who, in 1935, contended that while competitive market socialism was theoretically possible, it was practically impossible for socialist planners to collect the mass of data necessary, let alone solve the necessary and innumerable equations simultaneously.<sup>vii</sup> It was left to Oskar Lange to effectively close the debate and win the argument. He showed that competitive market socialism was not only theoretically, but also practically possible. In 1936-1937, Lange demonstrated conclusively that a socialist Central Planning Board, starting with random prices followed by trial and error adjustments, could obtain the "right prices"; i.e., prices which minimize costs, clear the markets and rationally allocate resources.<sup>viii</sup>



It is the seminal works of Taylor and Lange which we now expand upon to construct a practical model of competitive market socialism, which will then be applied to the Cuban economy.

## **Taylor-Lange Competitive Market Socialism**

Only a socialist economy can fully satisfy the claim made by many economists with regard to the achievements of free competition.<sup>ix</sup>

Oskar Lange

In this practical model of competitive socialism, as in capitalism prior to monopolization and globalization, the government determines the economic and social values, and the goals and objectives for the society. Unlike capitalistic societies, however, the economy is run by a Central Planning Board (CPB) which may be either centralized or decentralized. The CPB acts as the central bank. It sets a rate of interest to reflect the social decision of the value of present consumption as compared to future consumption. The CPB is also the lender of investment funds and the sole exporter and importer of capital and consumer goods. Finally, because not all production of goods and services is efficiently or rationally allocated by competitive markets, the CPB operates all strategic or hi-tech enterprises and those which produce with increasing returns to scale as well as public monopolies such as utilities, education, health, the military and the police. The remainder of the economy is operated according to the principles and organization of competitive markets.

Income is distributed by the state and is composed of wages plus a social dividend extracted from the economic surpluses of the producing firms. Consumers are free to spend their incomes, after savings, to maximize their satisfactions, given their incomes, personal tastes and preferences--at CPB-determined prices. The consumers determine the market demands. The firms that produce goods and services are free to enter and leave the markets. They may be state-owned or state-leased. They provide the supplies for the competitive markets to meet the consumers' demands. Like their counterparts under competitive capitalism, these firms attempt to maximize their economic surpluses by minimizing costs of production. As we saw above, however, in the long run, these economic surpluses are eliminated by competition.

In the short run, part of the economic surpluses could be taxed and redistributed as social dividends. The normal economic surplus--the part included in the cost of production and

the part remaining after taxes—are viewed as rewards to the successful producers for their managerial services and efficiency. These normal economic surpluses could be set by the state and function much like bonuses or higher wages for socially desirable performances. These economic surpluses could also be a source of investment funds for expansion, modernization or innovation. To maximize their economic surpluses, the competitive firms, like their capitalist counterparts, would have to produce at the lowest average cost. That is to say, they must operate efficiently or they will cease production.

Also like their capitalist counterparts, competitive market consumers and producers take all prices as “givens” while they attempt to maximize their satisfactions or economic surpluses. These prices in competitive market socialism are set by the CPB at first arbitrarily and then periodically adjusted to clear the market by the trial and error method. If prices are set too high, market surpluses will occur and the prices will be lowered to increase the quantities demanded and decrease the quantities supplied—which would then clear the markets. Conversely, if the prices are set too low, market deficits will result and the prices would be raised to decrease the quantities demanded and increase the quantities supplied -- again, to balance the markets. Consumers’ basic needs could be subsidized by low prices while producers of necessary products, such as staple foods, could be subsidized by high prices. Thus the CPB is ultimately responsible for the market price determination and adjustment and operates much like Adam Smith’s invisible hand. The reader may, at this point, be tempted to ask the question: What then are the merits of competitive market socialism and how is it superior to capitalism?

First of all, it retains all the merits of capitalism’s competition where it exists in practice, such as functional consumer sovereignty, least-cost efficiency and a high degree of self-regulation—to name just a few.<sup>x</sup> Secondly, it is superior to competitive in capitalism because the CPB can include in its prices all externalities, i.e. social costs such as environmental damages as well as social benefits like nutrition, health, safety, etc.. In the resource markets, for example, wages could be set by the CPB to cover minimum basic needs, to reward hazardous/dangerous work, or to reflect social priorities like education.

Thirdly, competitive market socialism is superior to contemporary capitalism because it averts private monopolies, overproduction (business cycles) and globalization. Consumer demands are not created by advertising, prices are not set by monopolistic firms, and profits are not maximized and perpetrated in the long run for the benefit of a capitalist ruling class. Neither

are lower costs obtained by exploiting the workers in the home country or abroad. It is obviously not a neoliberal economic model of laissez-faire, deregulation, “global competition” and “free trade”—with all its inherent defects and false promises.

Finally, competitive market socialism retains many of the advantages of socialism such as greater equality, social justice and freedom from unemployment, poverty, hunger and exploitation. As such, it can be viewed as an improvement upon command socialism and rationing without implying that individual consumer sovereignty and material incentives are superior to moral incentives or collective social production and consumption. This can perhaps be better understood by adapting the Taylor-Lange model of competitive socialism to a real economy, that of Cuba – the next and last task of this paper.

## **Cuban Competitive Market Socialism**

In effect, the absence of an economic theory of socialism.....lends an air of “crisis” to the present situation in socialist countries.<sup>xi</sup>

This practical model of competitive market socialism applied to the economy of Cuba highlights the need for such an industry structure, the institutional arrangements required for its successful operation, and the potential benefits which can be expected. The Cuban economy was selected for this exercise because: (1) it is one of the few economies in the world not dominated by neoliberal, globalization “rules of the game,” (2) it has often demonstrated a willingness to experiment with alternative, practical ways of allocating resources as well as commodities and, (3) it has many social and political problems which can be alleviated, if not solved, with the implementation of competitive market socialism in a planned and controlled manner.

We begin by pointing out that the proposed model of competitive market socialism for Cuba is not an attempt to take any side in the “Great Debate” that occurred in the country during the period 1962-1965, although Alberto Moro did cite Lange in his arguments during that debate. Indeed, perhaps that debate on the merits of different allocative mechanisms and values warrants a reconsideration during these difficult times. This model makes no value judgements on the issues in that debate which include:

- moral versus material incentives,
- labor theory of value versus market price,
- market versus non-market allocative mechanisms,
- money wages and prices versus voluntary labor and rationing,
- social versus individual economic activity.

Rather, the model is intended to be viewed as a compromise of these debated issues, a combination of their various positions and a practical alternative to Cuba's present reality. Since the model is not proposed for the entire Cuban economy, it is a complement to, rather than a substitute for, existing allocative mechanisms. It is compatible with Cuba's national economic planning, state monopolies, social cooperatives, joint ventures with foreign transnational corporations and much else present in the country. Most importantly, it is not a disguised attempt to reintroduce capitalism to Cuba or to encourage or prepare the way for such a transition in the future. These disclaimers are, unfortunately, necessary in light of the works of some Cubanologists whose thinly disguised objective is the return of Cuba to capitalism. It should be noted, however, that there are other Cubanologists who are sympathetic to the Cuban revolution, its socialist system and its people.<sup>xii</sup>

We now turn our attention to Cuba's model of competitive socialism, its required institutional arrangements and its expected potential benefits. Like all countries, it is assumed that Cuba too has a need for an efficient, productive, and high growth economy. As a socialist country, Cuba has the additional obligation of achieving these objectives with socialist institutions. Even under the best of circumstances, this would be a daunting task. For Cuba, the job is made more difficult by the country's unique situation today—its "special period" crisis existing since the turn of the last decade—which makes an efficient allocative mechanism critically important at this time.

Cuba is a small island nation with limited natural resources and population. It is the only socialist country in the Western Hemisphere and lies 90 miles off the coast of the United States, the hegemonic capitalist country in the world. The United States has imposed a forty-year old trade embargo on the island nation, recently made more restrictive and punitive by the 1992 "Cuban Democracy Act." Globalization and the multinational corporate integration of the capitalistic economies of the world via the GATT/WTO, the IMF and the World Bank have

combined to further isolate the nation from world capitalism. Most significant of all, the collapse of the Soviet Union, the disbanding of the Council for Mutual Economic Assistance in Eastern Europe, and the transition of many of these countries to capitalism deprived Cuba of her major socialist trading partners and deepened her global isolation.

The impact of all this was to force the country to rely increasingly upon its own limited resources for production and consumption to meet the demands of its people and preserve the gains of the revolution.<sup>xiii</sup> That socialism in Cuba survived these crisis shocks is just short of miraculous and attests to the flexibility and success of the government's and the people's response to the challenge. Without resorting to unemployment, poverty and hunger to bring consumption down to the lower level of resource availability, the Cubans have found innovative ways to make ends meet--to keep the labor force employed and to meet the population's basic needs. Cuba has also succeeded in acquiring new trading/investing partners and in obtaining much needed foreign exchange from non-traditional sources. Most important of all, from the perspective of this paper, Cubans have made many pragmatic alterations in the institutional mechanisms for resource and product allocation to preserve the country's socialist achievements--if not to enhance them. Among the many "special period" adjustments and institutional changes to the Cuban economy since the crisis that are noted and addressed by this model include the following:

- Provision for joint ownership and investment ventures with non-U.S. foreign multinational corporations (mostly tourism).
- Establishment of a dual monetary and price system of Cuban pesos and U.S. dollars.
- Conversion of state farms to cooperatives and reduced subsidies to state enterprises.
- Legalization of significant types of self-employment, except for those in education, medicine or with university degrees.
- Expansion of parallel markets, hard currency markets, and *ferias de agro* (farmers' markets).
- Permission of family member remittances from abroad (mostly from the U.S.) and dollar denominated savings accounts.

While these "reforms" have temporarily succeeded in enabling the country to cope with its "special period" crisis, they have obvious inherent and undesirable qualities from an economic, social and political perspective--many of which could be corrected by competitive

market socialism. Not the least of these is the inadvertent increase in “black” market activity and the expansion of Cuba’s “second,” non-socialist economy.<sup>xiv</sup>

Among the other indictments which can be laid against these ad hoc and pragmatic measures is that many of them are inherently inefficient (misallocate resources), discriminatory (against peso earners), and ineffective (do not work).

For example, when state enterprises resort to increasing prices, rather than reducing costs of production, or when the same products cost one peso or one dollar, you have a case of inefficiency and a misallocation of resources. When a parking or bathroom attendant at a tourist facility makes more than a medical doctor, engineer or other professional who works for the state, or when the relative of an exile becomes enriched for no other reason, you have classic examples of inefficiency, discrimination and unjustifiable inequality. When consumers have too little disposable money income and too few goods to purchase, it is difficult if not impossible for them to maximize their satisfaction—despite having their basic needs met by rationing and social consumption. These are just a few of the many problems and inefficiencies present in the Cuban economy today, which worsen inequality, increase foreign dependency, and make the long term socialist goals of Cuba most difficult to achieve in the future.

Many, if not all, of Cuba’s contemporary social and economic problems can be attributed to inefficient resource and product allocations and could be solved by the implementation of competitive market socialism which is readily adaptable to Cuba’s existing economic institutions and socialist objectives. Outlined below is a sketch of a model of competitive market socialism adapted to and incorporated into Cuba’s current economic system. It is an adaptation of the Taylor-Lange model explained previously in this paper to the economy of Cuba. Therefore, its fundamental features should by now be readily comprehensible to the reader and require a minimum of elaboration.

First, the competitive market model for socialist Cuba takes the existing distribution of income, composed of wages plus a social dividend, as given and based upon existing wage scales for workers and the self-employed.<sup>xv</sup> Material incentives are assumed to be acceptable, so long as they have a social benefit and do not replace moral incentives or distort social income distribution and consumption goals, which appear to be the case in Cuba today.

Small competitive firms would be permitted, encouraged and designed by the state for many sectors of the Cuban economy. Included among these are retail trade, services, small agriculture, and small manufacturing (artisans/handicrafts) and perhaps modest-income tourism. These competitive firms could be state-owned and leased.<sup>xvi</sup> They could also be individually or cooperatively operated and their directive would be to maximize economic surpluses by reducing their costs of production while taking prices as fixed and given. The excess economic surpluses could be progressively taxed while normal surplus would be the rewards for efficient operation.<sup>xvii</sup> Zero or negative surpluses would result in an exit of these firms from the market. In essence, the socialist competitive firms would operate much like the existing “parallel” markets in the country.

A State Price and Planning Committee (SPPC) structured along the lines of the existing *Comite Estatal de Precios* would set all prices for these competitive firms. The model envisions state-owned wholesale operations and import/export enterprises. Prices would be based upon costs of production (including regional transportation costs) and be set and adjusted to reflect social priorities/goals. Basic foods, for example, which are currently rationed, could be allocated through heavily subsidized low prices for consumers on the one end of the market and high prices for small farmers at the other end of the market. These price subsidies could be balanced by imposing price penalties on such goods as alcohol and luxuries. Except for these type products, market surpluses or deficiencies would signal the SPPC to raise or lower prices to balance quantities supplied and demanded; i.e., to clear the markets. The SPPC thus sets prices and ultimately controls the market much like capitalist monopolistic firms but without labor exploitation, profit maximization, private capital accumulation and the creation/perpetuation of a class system.

For the competitive socialist markets to operate efficiently and effectively, there cannot exist a dual peso/dollar monetary system—nor would there be any need for it. Competitive market socialism would also significantly reduce Cuba’s secondary economy, black markets, discriminatory pricing, sundry illegal activities, as well as rationing and bartering. This would facilitate state planning and control, enabling the government and the people to achieve their social objectives with significantly less bureaucracy and less policing.

The paramount benefit of competitive market socialism for Cuba, however, would be the least-cost efficiency of competitive production and the freedom of consumption according to consumer tastes, preferences and income. Competitive market socialism has the potential to

enhance Cuba's economic efficiency, growth, equity and freedom—all within the context of socialism and without the danger of lapsing into a transition to capitalism. Cuba, in short, has the opportunity to reap the benefits of competition, a goal which has eluded capitalist economies since Adam Smith. Competitive market socialism is not a panacea, but it does have merits worthy of consideration for Cuba at this stage of the revolution and in this time of crisis. It is a far better alternative than either the Russian or Chinese embrace of corporate globalization.

<sup>1</sup> Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (New York: Random House, 1985), p.225.

<sup>1</sup> Oskar Lange and Fred F. Taylor (Benjamin E. Lippincott (ed.) *On the Economic Theory of Socialism* (Minneapolis: University of Minnesota Press, 1938)

<sup>1</sup> Vilfredo Pareto, *Manual of Political Economy* (1906) Translated by Ann S. Schwier (New York: Augustus Kelley, 1971)

<sup>1</sup> Enrico Barone, "The Ministry of Production in a Collectivist State" in *Collectivist Economic Planning*, F.A. Hayek (ed.) (London: George Routledge, 1935)

<sup>1</sup> Ludwig von Mises, "Economic Calculation in the Socialist Commonwealth" in *Collectivist Economic Planning*

<sup>1</sup> Fred M. Taylor, "The Guidance of Production in a Socialist State" in *On the Economic Theory of Socialism*

<sup>1</sup> F. A. Hayek, "The Nature and History of the Problem" and "The Present State of the Debate" in *Collective Economic Planning*

<sup>1</sup> Oskar Lange, "*On the Economic Theory of Socialism*."

<sup>1</sup> Oskar Lange, *On the Economic Theory of Socialism*, p. 107.

<sup>1</sup> See above, pp. 2-3 for more detail on the merits of the competitive market structure as an allocative mechanism.

<sup>1</sup> Alberto Mora, "On Certain Problems of Building Socialism", in Bertram Silverman (ed), Man and Socialism in Cuba: The Great Debate. (New York: Atheneum, 1971)

<sup>1</sup> Among the best, most objective Cubanologists and their highly recommended works re: Claes Brundenius, Revolutionary Cuba: The Challenge of Economic Growth with Equity (Boulder, Colorado: Westview Press, 1984), and Andrew Zimbalist and Claes Brundenius, The Cuban Economy: Measurement and Analysis of Socialist Performance (Baltimore, MD: The Johns Hopkins Press. See also Andrew Zimbalist (ed.), Cuban Political Economy (Boulder, Colorado: Westview Press, 1988)

<sup>1</sup> Frank T. Fitzgerald, The Cuban Revolution in Crisis: From Managing Socialism to Managing Survival, (New York: Monthly Review Press, 1994)

<sup>1</sup> For elaboration of Cuba's second economy and its attendant problems see, Jorge F. Perez-Lopez, Cuba's Second Economy (New Brunswick, NJ: Transactions Publications, 1995).



<sup>1</sup> Family remittances from abroad and the dual peso/dollar monetary system are ignored in the model and remain issues to be resolved by the government if the country's current income inequalities and distribution distortions are to be eliminated.

<sup>1</sup> Initial capitalization and investment financing could come from savings and be borrowed from the banks or credit cooperatives. The state would set the interest rate to achieve planned social objectives as in the Taylor-Lange model..

<sup>1</sup> See above, p. 6.

# REMITTANCES AND MONEY SUPPLY IN EL SALVADOR

Luis René Cáceres  
Interamerican Development Bank

## 1. Introduction.

As a result of large migration flows out of El Salvador, remittances have grown considerably in recent years, representing large percentages of its GDP and exports. These inflows have contributed to close the trade deficit and have imparted dynamism to the local economy's commercial sectors.

There have been in recent years several studies devoted to the topic of remittances in El Salvador. The seminal paper is Segundo Montes' (1986) study of Salvadorean migrants in the U.S., their age and demographic characteristics and the determinants of the amounts of funds they send to their relatives. This study introduced for the first time the use of sample surveys to study migrants and their economic behavior. A paper by López Cáliz and Seligson (1990) also used surveys to estimate the amounts sent to El Salvador and their use, encountering that 86 per cent of such funds were destined to consumption and the rest to investment. Of particular importance is Pedro Abelardo Delgado and Gabriel Siri (1995) paper on the productive use of remittances. These authors recommended several mechanisms that could be employed to facilitate the mobilization of capital investment by the recipients of remittances, such as investment funds, underwriting of small enterprises, special lines of credit targeted to microenterprises, etc. A recent paper by Serrano Calvo (2000) presented an overview of remittances in each of the Central American countries as well as an extensive survey of literature and pending issues.

Notwithstanding the growing literature on remittances, the analysis of their macroeconomic impact has received relatively little attention. Reference can be made to Rivera Campos (1996) study of the estimation of the external gap that would occur as a result of a gradual reduction of remittances inflows. In a subsequent work, Rivera Campos (1998) invokes the Dutch Disease theory to build a model whereby remittances give rise to an active sterilization policy from the Central Bank which, under a fixed exchange rate, leads to rises in the real interest rate. In this model, in order to decrease the appreciation of the fixed exchange rate, the Central Bank would have to increase the interest rate, thus causing investment and exports to decline. There is thus a trade off between exports' competitiveness and the firms' financial expenses and investment.

This paper will investigate the macroeconomic effects of remittances from the perspective of their impact on liquidity. First, a brief review of the literature on the Dutch Disease model will be presented. This will be followed by the presentation and estimation of the proposed model. After a discussion of the main results, the paper will end with a series of recommendations for further study.

## 2. Dutch Disease Models.

In one of the most well known Dutch Disease models, Corden and Neary (1982) argue that when an export boom takes place because of a natural resource discovery, there will be a resource movement from the non-booming sector to the booming one. This resource effect would help sustain the growth of the booming sector and lead to the stagnation of the non-booming one. Another effect arises from the income generated by the boom, which would increase the demand for both non tradables and non-booming tradables. These two effects would cause the exchange rate to appreciate as the price of non tradables increases relative to the price of tradables.

In a further elaboration of the model, Neary and van Wijnbergen (1986) argue that the export boom has implications on liquidity as it increases the demand for money via the increase in real income. In other

words, the extra boom income increases the demand for money, which under fixed supply, would give rise to a situation of excess demand. However, Edwards and Aoki (1983), Harberger (1983) and Edwards (1984) argue that under a regime of fixed exchange rate, the export boom would give rise to an increase in the money supply through the effect on the build up of reserves. This indicates that although the money market would be in disequilibrium, it could not be known whether a situation of excess demand or excess supply of money exists.

### 3. The model.

This paper will analyze the liquidity effect of remittances. To this effect the following money demand function will be estimated:

$$M_d = a_0 + a_1 Y + a_2 R + a_3 P + e$$

Where:

$M_d$  = money supply

$Y$  = real GDP

$R$  = foreign interest rate

$P$  = national inflation rate

$e$  = error term

When the error term from the equation above is positive, it will be interpreted that there is an excess supply of money, which would imply that monetary authorities could not totally sterilize the inflow of remittances. If the error term is negative, it would denote the existence of an excess demand for money, implying an effective sterilization policy. But it would have to be noted that the above argument can only provide an approximation to the actual disequilibrium, since, as was indicated before, remittances may end up financing a large volume of imports and, as such, the build up of reserves may not be significant. In this case, there may be more interest in a negative error term that would denote the existence of excess demand for money, resulting from the income effect of remittances. In this context, a more accurate description of the monetary disequilibrium process would require observing the real interest rate. If the error term is positive and the interest rate decreases or remains constant, this could be interpreted as evidence of excess supply of money, given that such excess prevented the interest rate from increasing, despite the sterilization process.

In any case, it can be expected that there will be an association between the error term, remittances inflow, and the real interest rate. As well, there would be a relationship between money supply, remittances and capital flight.

### 4. Results for the Demand for M2.

An important caveat resides in the fact that annual data on remittances was not available for El Salvador. Therefore the empirical analysis is based on data on aggregated public and private transfers, obtained, as all other variables, from the IMF's International Financial Statistics. In a first estimation the variable used to represent the money supply was the broadly definition of money, deflated by the consumer price index. Real annual GDP was used to represent the income variable in the money demand equation, while the annual percentage change in consumer prices represents the national inflation rate. The U.S. prime rate was used to represent the foreign interest rate variable. Data on national interest rates was not available. The analysis was performed using data for the 1960-1998 period.

All time series were tested for the presence of unit roots and in all cases it was found that they were integrated of order one.

The money demand function was estimated by the Johansen method. The cointegration test results are presented in Table 1. It can be seen that the null hypothesis of no cointegration can be rejected and the existence of one cointegration vector can be inferred. There thus exists a long term relationship between money, income, inflation and the foreign interest rate. The normalized cointegration vector is also shown in Table 1. It can be seen that the income elasticity of the demand for money has the expected positive sign, but it is very small. The inflation rate has the expected negative sign and is also very small; the international interest rate shows a positive sign, which is contrary to expectations.

Table 1

Eigenvalue	Likelihood Ratio	5% critical value	Hypothesis no. of cointegration vectors.
0.6999	62.70	39.89	None
0.4105	24.18	24.31	At most 1
0.1710	7.27	12.53	At most 2
0.0387	1.26	3.84	At most 3

Cointegration Vector:

Variable:	Coefficients:
Log(M2)	-1.0000
Log(GDP)	0.4150
Interest rate	0.6547
Inflation rate	-0.0679

An equation was estimated to express the error term (ERX) from the cointegration vector, as a function of its lagged value and of the annual rate of growth of the ratio of remittances to GDP, TYG, a variable used to express the importance of remittances in a given year. The estimated equation is the following:

$$ERX = -0.5091 + 1.2353ERX(-1) - 0.3638ERX(-2) + 0.0100TYG +$$

(2.40)      (7.89)      ( 2.43)      (2.02)

$$0.0124TYG(-1) \quad R^2 = 0.81 \quad D.W. = 1.73$$

(2.69)

It can be seen that the variables TYG, current and with one year lag, are significant. This would indicate that in El Salvador the growth of remittances give rise to an excess money supply; it would also indicate that the sterilization policies have not been totally successful.

Next, two equations were estimated for the inflation rate and the results are presented in Table 2. It can be seen that neither variable TYG or TYG(-1) are significant. This would indicate that whatever inflationary impact may be caused by the remittances, it may be dissipated through the import of consumer goods. Note also that the growth of the real money supply M2G and M2G(-1), are significant, whereas the lagged interest rate and error term are not. As well, equations were estimated for the annual growth rate of the real money supply, M2G, as function of the inflation and interest rates and the rate of growth of remittances. The results are presented on Table 3. It can be seen that in the two equations the current inflation rate is significant. The inflation rate coefficient has a negative sign that is congruent with the cointegration vector results. The interest rate has a significant negative sign. It should be noted that remittances show coefficients with a negative sign, as if they would dampen money growth, but the coefficients are not significant. This would indicate that sterilization policy is effective in annulling the money supply growth effect of remittances.

Table 2

Inflation Rate Equations		
Variable	Coefficients	
Constant	-25.8014 (1.09)	5.0311 (0.25)
INF(-)	0.9886 (3.56)	0.6833 (3.09)
TYG	0.0119 (0.50)	
TYG(-1)	-0.0114 (0.53)	-0.0192 (1.08)
ERX(-1)	5.2782 (1.10)	-1.2922 (0.31)
M2G		-26.6631 (2.92)

M2G(-1)		33.6961 (2.85)	
INT(-1)	3.6821 (1.23)	-0.2984 (0.11)	
-----R2			
0.69	0.79		
DW	1.83	2.00	
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Table 3

MONEY GROWTH EQUATIONS (M2G)

Variable	Coefficients		
Constant		0.2339 (3.18)	0.2341 (3.60)
INF		-0.0079 (2.87)	-0.0062 (3.40)
INF(-1)		-0.0021 (0.70)	
M2G(-1)		0.2119 (1.45)	0.1854 (1.09)
TYG		-0.0003 (1.07)	
TYG(-1)		-0.0005 (1.52)	-0.0004 (1.41)
ERX(-1) (1.92)	(1.82)	-0.0238	-0.020
INT		-0.0174	-0.0169

	(2.23)	(2.32)
R2	0.52	0.49
DW	2.04	2.01

### 5. Results for the the demand for M1.

Cointegration tests were also performed for the case of the narrowly defined money, and the results are presented in Table 4. The cointegration tests indicate that there exist two cointegration vectors. The first vector is presented on Table 4. It can be seen that, as expected, the income elasticity of the demand for M1 is larger than the elasticity for M2. It should be also noted that the interest rate elasticity is smaller and the inflation elasticity is positive which is contrary to expectations.

Table 4

Likelihood Ratio	5% Critical value	Hypothesis no. of cointegration vectors	-Eigenvalue
0.7443	73.78	39.89	None
0.5409	30.14	24.31	At most 1
0.1280	5.22	12.53	At most 2
0.0259	0.83	3.84	At most 3

#### Cointegration Vector:

Variable	Coefficients:
Log(M1)	-1.0000
Log(GDP)	-0.7651
Interest rate	0.0429
Inflation rate	0.0138

The error term variable, ERZ, was regressed as a function of the growth rate of remittances, with the following results

$$ERZ = -0.0098 + 0.7766ERZ(-1) + 0.0003TYG + 0.0006TYG(-1)$$

(0.35)      (7.18)                      (0.56)                      (1.25)

$$R2 = 0.63 \quad DW=1.75$$

It can be seen that, contrary to the results for M2, remittances growth do not have significant effect on the excess M1 supply or demand. Table 5 presents estimated equations for the inflation rate. It can be seen that the lagged money supply M1(-1) is significant in the three equations, but remittances are not significant in any of the equations. Thus, as in the previous case of M2, remittances have no effect on the inflation rate. It should be noted that the lagged interest rate has no effect on the inflation rate. Table 6 presents the estimated equations for the rate of growth of M1. It can be seen that, as in the case of M2, the inflation rate is significant and negative. Neither the interest rate nor the lagged error term is significant. It is interesting to note that remittances growth have no effect on the growth of the narrowly defined money supply.

Table 5

Inflation Rate Equations			
Variable	Coefficients		
Constant	-3.83334 (1.38)	-2.0196 (0.69)	-3.8829 (1.43)
INF(-1)	0.8946 (6.82)	0.8205 (6.23)	0.8871 (6.90)
MIG		-0.1323 (1.62)	
MIG(-1)	0.2538 (2.59)	0.2412 (2.57)	0.2489 (2.59)
TYG	0.0092 (0.48)		
TYG(-1)	-0.0171 (0.98)	-0.0205 (1.22)	-0.0174 (1.01)
ERZ(-1)	4.1422 (0.69)	3.2319 (0.56)	4.0489 (0.69)
INT(-1)	0.5438 (1.89)	0.4825 (1.76)	0.5797 (2.11)
R2	0.77	0.78	0.79
DW	1.68	1.63	1.65



Table 6

MONEY GROWTH EQUATIONS		
Variable	Coefficients	
Constant	13.3156 (2.23)	14.9849 (2.85)
M1G(-1)	0.0083 (0.04)	0.0117 (0.05)
INF	-0.6194 (1.63)	-0.5097 (2.17)
INF(-1)	0.1389 (0.32)	
TYG(-1)	-0.0631 (1.51)	-0.0471 (1.31)
INT	-1.4872 (1.42)	-0.8107 (1.36)
ERZ(-1)	3.1349 (0.24)	-1.9156 (0.18)
R2	0.35	0.34
DW	2.02	1.94

## 5. Conclusions.

The previous empirical analysis found no evidence of effects of remittances on inflation nor on the growth of the money supply. However, these results would not indicate that sterilization policies have been successful, but that given the high openness of El Salvador's economy, the income and liquidity effects resulting from remittances may be dissipated by increasing imports, which would increase aggregate supply and thus dampen inflationary pressures. In effect, the trade balance has increased its synchronism with remittances during the 1990's, the correlation coefficient between these variables being 0.96.. Moreover, given the large trade deficit, which remittances finance, the increase in reserves may not be large and thus the money supply or liquidity effects advocated by the Dutch model may be small.

Notwithstanding the explanations presented above, it should be indicated that real interest rate has remained at high levels in the 1990's. Given this situation, the point that has to be made is that a vigorous

sterilization policy may be unnecessary given the significant leakages that occur through capital flight and imports.

An important caveat that has to be mentioned is that the consumer price index may not be an appropriate variable for this analysis. A more precise approach may rest in using price index of non-tradeables goods as an indicator of the inflation pressures in the empirical analysis.

Finally, it should be indicated that it is very important that the recipient of remittances invest part of their income so that additional productive capacity be created, which constitute a new capital stock that would sustain the economy once remittances end. Delgado and Siri(1995) present interesting recommendations on this matter. Another response would consist in the public sector taking an aggressive role in establishing facilities of venture capital and in the incubation of new firms.

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# Real Exchange Rate Dynamics: Evidence from the Australian Economy

Mamta B Chowdhury  
University of Western Sydney, Australia

## Abstract

This paper analyses the role of real and nominal factors in determining the behaviour of real exchange rate for Australia employing annual data for the period 1970-1998. A two goods (tradable and non-tradable) dependent economy (Australian) model modified in the light of recent theoretical advances of macroeconomics is considered for the theoretical framework of the analysis. The findings are generally consistent with the predictions of the model using Hendry type Error Correction Model. They suggest that nominal devaluation and openness in trade regime play a major role in determining the real exchange rate behaviour in Australia. An improvement in external terms of trade and technological advancement seem to have positive long run effect on the trade-weighted real exchange rate whereas net capital inflow, government expenditure and expansionary macroeconomic policies tend to appreciate the real exchange rate of Australia.

## Introduction

The role of the real exchange rate (RER) in Australian economic performance is crucial to determine the international competitiveness, payments condition and resource allocation across traded and non-traded sectors in the recent environment of increasing globalisation in Asia Pacific region. The analysis of competitiveness in the foreign trade sector becomes essential as Australia turns out to be more integrated into the world economy. In spite of the crucial role of real exchange rate in policy discussion, a consistent and systematic measure of real exchange rate index<sup>65</sup> and empirical analyses of the factors behind the real exchange rate behaviour of Australian economy is sparse.

The objective of this paper is to develop a dynamic model of RER and empirically test the implications of changes in possible determinants of RER for the Australian economy. In this analysis, particular emphasis will be given on the major real and nominal variables in determining RER movements both in short and long run.

The organization of the paper is as follows: Section II develops a dynamic model of real exchange rate determination to analyze how the long-run equilibrium real exchange rate reacts to a series of real disturbances as well as by nominal variables. Section III presents an empirical model of the real exchange rate using the theoretical model developed in Section II. Section IV presents the data sources and the

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<sup>65</sup> Due to limit on the size of the paper, the discussion of the construction on the real exchange rate for the Australian economy has been omitted.

different measures of variables employed. Section V shows the econometric procedures used and Section VI presents the empirical results. Section VII summarizes the findings of this study.

## II THE CONCEPTUAL FRAMEWORK

The basic theoretical framework used in this paper has been adopted from Edwards' (1989) model of real exchange rate determination. The model assumes a small, open economy, which produces and consumes two goods – tradable and non-tradables. Importable and exportable are aggregated into one tradable category. The government sector consumes both tradable and non-tradables and finances its expenditures by non-distortionary taxes and domestic credit creation. The country holds both domestic money and foreign money. The nominal exchange rate of the economy is pegged to a basket of currencies of its major trading partners. It is also assumed that there is a tariff on imports. The price of tradable in terms of foreign currency is fixed and equal to unity. Finally, perfect foresight is assumed in this model.

$$ERER = e^* = x(a, g_{NT}, P_T \text{ and } \tau) \quad (1)$$

where,  $\delta x/\delta a < 0$ ;  $\delta x/\delta g_{NT} < 0$ ;  $\delta x/\delta P_T > 0$ ;  $\delta x/\delta \tau < 0$

The model stipulates that the long-run equilibrium real exchange rate (ERER) is a function of real variables only. The value of real assets ( $a$ ), government expenditure on non-tradables ( $g_{NT}$ ), price of tradable ( $P_T$ ) and trade restrictions ( $\tau$ ) in this model are normally influenced by changes in other real variables such as terms of trade (TOT) shocks, changes in government consumption, technological progress, and changes in trade and capital restrictions<sup>66</sup>. Changes in these real variables can cause the actual RER to deviate from its equilibrium level. However, changes in nominal variables, such as domestic credit expansion, and changes in the values of the nominal exchange rate, also affect the path of the actual RER in the short run.

TOT may have two different effects on the RER, namely, income and substitution effects. The income effect results when an increase in export prices, or a fall in import prices, raises the income via improvement in the current account balance. Increased income increases demand for non-tradables and reduces the relative price of tradable to non-tradables and appreciates the RER. On the other hand, the substitution effect can be observed due to relative cheapness of non-tradables, which increases demand for non-tradables and triggers real exchange appreciation. However, an improvement in TOT due to an export price increase brings about RER depreciation for given levels of nominal exchange rate and non-tradable prices. Because of the ambiguity about the final effects of a TOT shock on the RER, the price of

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<sup>66</sup>The model is mentioned here in its barest outline. For a thorough exposition of the model refer to Chowdhury (1999).

importable and exportable should be regarded as two separate variables in determining real exchange rate behavior.

Increases in government expenditure increase the demand for non-tradables if the major portion is spent on non-tradable goods and services. In the short run, given the supply constraint, this excess demand for non-tradables bids up their price and results in RER appreciation. However, there will be depreciation of the RER if a larger share of government expenditure is spent on the tradable sector rather than on consumption of non-tradables. Thus, the sign of this variable can be either positive or negative in determining behavior of the ERER.

Trade restriction, in the form of quantitative restriction and stiffer tariff rate, generally causes a RER appreciation. If tariff improves the current account position and increases the demand for and price of non-tradables, the RER appreciates. An increase in binding quantitative trade restriction (import quota) also increases the demand for import substitutes, which behave as non-tradables due to imposition of quantitative trade restrictions (Warr, 1986). This results in higher prices and profitability for non-tradables and leads to a long-run equilibrium real appreciation. However, if trade restrictions lead to a worsening of the current account position and reduce the demand for non-tradables, there will be RER depreciation. In this case negative income effect will outweigh the positive substitution effect.

Increases net capital inflow leads to expansion in the monetary base, which raises current expenditure over income and increases the demand for non-tradables, resulting in an appreciation of the equilibrium RER. A fall in world real interest rates or a rise in international transfers, such as foreign aid flows, also affects the ERER in a similar way to net capital inflow. RER may depreciate when net capital inflow augments the domestic savings and increases efficiency and productivity of the domestic factors of production.

Increased productivity induced by technological progress increases factor availability. By reducing the cost and price of tradable, increased productivity makes the tradable sector more competitive and tends to depreciate the RER of the sector. In this situation, supply effects of technological progress offset the demand effects according to the *Rybczynski* principle (Edwards, 1989:48). On the other hand, advancement in technology may cause an appreciation of RER via increased income and demand for non-tradables. In this case, the demand effects of technological progress are greater than the supply effects and this is known as the *Ricardo-Balassa* effect (Edwards, 1989:136).

Expansionary monetary or fiscal policy raises the real stock of money, increasing demand for both tradable and non-tradable goods and financial assets. The excess demand for tradable goods (imports) results in a higher trade deficit and loss of international reserves. Whereas the increased demand for nontradables raises their price and tends to deviate the actual RER further from its equilibrium value.

The over-valuation of the RER, which is a fall in the actual real exchange rate from its long run equilibrium, will be short-lived and the economy adjusts through reduction of the money stock.

Adjustment of the nominal exchange rate (devaluation/revaluation) could be one possible strategy to speed up this readjustment. In the case of an over-valued real exchange rate, a nominal devaluation reduces the stock of money and thus reduces the real value of financial assets. This induces expenditure reducing effects, dwindling expenditures on both tradable and non-tradable goods. A nominal devaluation also induces expenditure-switching effects by switching expenditure from tradable. It tends to increase the production of tradable, since the exportable sector becomes more competitive following devaluation.

### III Empirical Model

Based on the theoretical model developed in Section III, the equilibrium real exchange rate is exclusively determined by the following real variables: (1) international terms of trade; (2) government expenditure; (3) trade restrictions; (4) exchange and capital controls; and (5) technological progress and productivity gain.

Incorporating the above-mentioned 'fundamentals' a model of equilibrium real exchange rate is formulated in the following equation:

$$\begin{aligned} \log e_t^* = & \beta_0 + \beta_1 \log (\text{TOT})_t + \beta_2 \log (\text{GEX})_t + \beta_3 (\text{NKI})_{t-1} \\ & + \beta_4 \log (\text{TOPEN})_t + \beta_5 \log (\text{TECP})_t + u_t \end{aligned} \quad (2)$$

where,  $e^*$  = equilibrium real exchange rate, TOT = barter terms of trade, GEX= share of government expenditure to GDP, NKI = net capital inflow, TOPEN =  $(X+M)/Y$  (trade restrictions proxied by the openness of an economy), TECP= measure of technological progress, and,  $u_t$  = error term.

The actual RER is a function of both real and nominal variables. Three major factors determine the dynamics of actual RER and are specified by the following equation:

$$\log e_t = \alpha \{ \log e_t^* \} - \lambda \{ \text{MP}_t \} + \gamma \{ \log E_t - \log E_{t-1} \} \quad (3)$$

where,  $e$  is the actual real exchange rate, and  $e^*$  is the equilibrium RER, which is a function of real variables as specified in equation (2). The second determinant of the actual RER is macroeconomic policies ( $\text{MP}_t$ ), indicating that unsustainable macro policies under a fixed rate tend to appreciate RER. A large  $\lambda$  represents a large over-valuation of the actual RER from its long-run equilibrium value. Finally, actual RER movements are affected by the changes in the nominal exchange rate ( $\log E_t - \log E_{t-1}$ ). A nominal devaluation has a short run positive impact

on an over-valued RER in restoring a misaligned real exchange rate towards its equilibrium value. The parameters  $\alpha$ ,  $\lambda$ ,  $\gamma$  are positive and capture the most important dynamic aspects of the adjustment process. By successive substitution for  $\log e_t^*$ , the macroeconomic policy variables by excess supply of domestic credit (EXCR) and the change in nominal devaluation by  $NDEV$  in equation (3), the following estimable equation for the actual RER is given by:

$$\log e_t = \theta_1 \log (TOT)_t + \theta_2 \log (GEX)_t + \theta_3 (NKI)_{t-1} + \theta_4 \log (TOPEN)_t + \theta_5 \log (TECP)_t - \lambda_1 EXCR_t + \gamma NDEV_t + u_t \quad (4)$$

where  $\theta$ s are the combination of  $\alpha$ s and  $\beta$ s.

#### IV Variable Definition and Measurement

The real exchange rate model in equation (4) is estimated over the period 1970-1998 using annual data. All variables, except net capital inflow and GDP growth are measured in natural logarithms. The variables are extracted from the DX World Bank *World Tables* and IMF *International Financial Statistics*.

One of the major obstacles faced was the non-availability of annual data for most of the real exchange rate fundamentals. Therefore, some surrogates had to be used to estimate the real exchange rate equation (4). Government expenditure is included in the model as a ratio of government consumption to GDP (GEX). Exchange and capital control is represented by the long-term net capital inflow (NKI). The degree of openness of the economy is used as an indicator of trade policy restrictions. This is given by the expression  $((X+ M)/Y)$  and used as an indicator of openness in international trade regime. It must be emphasized that a less restrictive trade regime is only one of the major factors of openness, as international trade is also determined by other factors affecting imports and exports, including the RER itself (Cottani *et al.*, 1990). Technological progress (TECP) has been used as an explanatory variable to capture the *Rybczynski* or *Ricardo-Balassa* effect on the equilibrium RER and is proxied by the rate of growth of real GDP<sup>67</sup>. Regarding the dependent variable, trade-weighted real exchange rate (RERT) has been constructed from the available secondary data.

#### V Econometric Procedure

Significant developments in the recent time series econometric analysis suggest that many macroeconomic time-series may possess unit roots and the systematic movements of integrated variables in the estimation process may yield spurious results. Mindful of these considerations, the estimation process begins by testing the time-series properties of the data series by the use of Augmented Dickey-Fuller test. The results

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<sup>67</sup> This is admittedly a weak proxy because factor accumulation itself can increase GDP with little technical progress.

from these tests suggest that all the variables used in this model do not have the same order of integration; in particular, the dependent variable trade-weighted real exchange rate (RER) and some other independent variables including the trade-weighted nominal exchange rate are found to be non-stationary in levels.

To guard against the possibility of estimating spurious relationships in the presence of some non-stationary variables, estimation is performed using a general-to-specific Hendry-type error correction modeling (ECM) procedure. Under this ECM procedure, the long-run relationship is embedded within the dynamic specification, including lagged dependent and independent variables, in order to minimize the possibility of estimating spurious relationships.

The error correction specification for the real exchange rate model can be represented by the following equation of autoregressive distributed lag model with one period lag as annual data has been used for the model estimation:

$$\Delta RER = f(\Delta TOT, \Delta GEX, \Delta NKI, \Delta TOPEN, \Delta EXCR, \Delta NDEV, TOT_{t-1}, GEX_{t-1}, NKI_{t-1}, TOPEN_{t-1}, EXCR_{t-1}, NDEV_{t-1}, RER_{t-1}) \quad (4.1)$$

The above dynamic equation of real exchange rate is “tested down” using OLS by dropping statistically insignificant differenced and lagged terms. The testing procedure continues until a parsimonious error correction representation is obtained which retains the *a priori* theoretical model as its long run solution. The selection of final equations is made after careful diagnostic tests on the OLS error process.

## VI Results

The estimates of parsimonious dynamic Error Correction Models are reported in Table 1 together with the most common diagnostic tests. The long-run elasticities relating to the key explanatory variables and their t-ratios are reported in Table 2. Long-run elasticities are derived from the long run (steady state) solutions of the estimated equation and their respective standard errors are derived by using Kmenta’s (1986) formula<sup>68</sup>.

The results are satisfactory and indicate that the equation performs well by all diagnostic tests providing support to the view that actual real exchange rate responds both to real and nominal variables.

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<sup>68</sup> As Kmenta (1986:486) writes “The formula refers to the general case where an estimator, say  $\alpha$ , is a function of  $k$  other estimators such  $\beta_1, \beta_2, \dots, \beta_k$ ; that is,

$$\alpha = f(\beta_1, \beta_2, \dots, \beta_k)$$

Then the large sample variance of  $\alpha$  can be approximated as

$$\text{Var}(\alpha) = \sum [\delta f / \delta \beta_k]^2 \text{Var}(\beta_k) + 2 \sum [\delta f / \delta \beta_j] [\delta f / \delta \beta_k] \text{Cov}[\beta_j, \beta_k] \quad (j, k = 1, 2, \dots, k) \quad (j < k)$$

(The approximation is obtained by using Taylor’s expansion for  $f(\beta_1, \beta_2, \dots, \beta_k)$  around  $\beta_1, \beta_2, \dots, \beta_k$  dropping terms of the order two or higher and then obtaining the variance by the usual formula”).



The adjusted  $\bar{R}^2$  is quite high and suggests that the model has fairly good fit. The equation is also statistically significant in terms of the standard F-test. The lagged error correction term for the real exchange rate equation (4.1) is statistically significant at the 5 per cent level and has the expected negative sign.

**Table 1: Determinants of Real Exchange Rates in Australia 1970-98**

**Trade-weighted real exchange rate (Equation 4.1)**

$$\begin{aligned} \Delta RER = & 1.65 - 0.04 \Delta NKI + 1.04 \Delta NDEV + 0.18 \text{TOT}_{t-1} - 0.05 \text{NKI}_{t-1} - 0.24 \text{GEX}_{t-1} \\ & (3.12) \quad (19.62) \quad (2.85) \quad (4.44) \quad (2.00) \\ & + 0.07 \text{TOPEN} + 0.03 \text{TECHP}_{t-1} - 0.093 \text{GDC}_{t-1} + 0.99 \text{NDEV}_{t-1} - 0.14 \text{RER}_{t-1} \\ & (2.01) \quad (2.12) \quad (1.99) \quad (11.70) \quad (4.21) \end{aligned}$$

$$\begin{aligned} \text{Adjusted } R^2 = 0.96 \quad F(10,16) = 69.45 \quad \text{JBN-}\chi^2(2) = 4.63 \quad \text{LM-}\chi^2(8) = 14.5 \\ \text{ARCH-}\chi^2(1) = 0.02 \quad \text{RESET}(2)\text{-}F(1,15) = 0.51 \quad \text{CHOW-}F(12,4) = 1.98 \end{aligned}$$

Notes:

1. Figures in parentheses are t-statistics.

2. The F statistic is against the null that all coefficients = 0. The Durbin Watson for first order serial correlation is not reported for these models since it is strictly not valid in the model with lagged dependent variable.

3. LM is the Lagrange multiplier general test for residual serial correlation. ARCH is the test for Autoregressive Heteroscedasticity, RESET is the Ramsey's RESET test for functional mis-specification, and residual normality test for skewness and excess kurtosis is given by Jarque Bera Normality (JBN) test.

The computed value for the Jarque-Bera test indicates normality of the residual errors. Lagrange multiplier test of residual serial correlation and the residual correlograms of up to six years are estimated for the equation and pass comfortably at 5 per cent level. Computed value of ARCH- $\chi^2$  tests for error variance is smaller than the tabulated value at a 5 per cent significance level and suggests the error variances are not correlated in the equation (4.1).

Ramsey's RESET test for specification error indicates that the calculated F value is much smaller than the critical value at a 5 per cent significance level, indicating the equation is not misspecified. The equation passes the Chow test for parameter stability, as the computed F-value of Chow-test for the equation is smaller than the critical value at a 5 per cent significant level.

Equation 4.1 indicates that the net long-term capital inflow significantly affects the trade-weighted real exchange rate. The sign of the coefficient is negative as expected in the theoretical model. A one per cent increase in capital inflow appreciates the RER by 0.05 per cent in the short run and 0.36 per cent in the long run.

**TABLE 2: Estimates of Long-Run Elasticities of RER in Australia 1970-98**

Dependent/ Independent variable	TOT	GEX	NKI	TOPEN	TEPC	GDC	NDEV
<b>RER (Equation 4.1)</b>	<b>1.28**</b> (2.71)	<b>-1.71**</b> (2.62)	<b>-0.36**</b> (3.46)	<b>0.50*</b> (1.88)	<b>0.21*</b> (1.97)	<b>-0.66</b> (1.45)	<b>7.22**</b> (7.01)

Figures in parentheses are t-statistics. \*\* denotes significant at 5 %, \* denotes significant at 10 %.

**Source:** Long-run multiplier values are computed from the long-run steady state solutions to the estimated model reported in Table 1.

The coefficient of the government expenditure variable (GEX) has the expected negative sign with respect to the trade-weighted real exchange rate in equation (4.1). An increase in government expenditure significantly appreciates the RER by 0.24 per cent in the short run and 1.71 per cent in the long run at the conventional 5 per cent level.

Improvement in external TOT has significant short and long run impact on the trade-weighted real exchange rate. The coefficient indicates a positive sign in relation to RER of Australia and is statistically significant at the conventional 5 per cent level. A one per cent improvement in TOT depreciates RER by 0.18 per cent in the short run and by 1.28 per cent in the long run.

Technological progress (TECP) has significant supply side '*Rybczynski*' effect on real exchange rate dynamics. A one per cent technological advancement has 0.03 per cent improvement on Australian trade competitiveness in the short run and 0.21 per cent in the long run.

Increase in openness in trade regime (TOPEN) has significant positive impact on the real exchange rates of Australia both in short and long run. Openness in the trade regime proxied by  $((X+M)/Y)$  depreciates the RER by 0.07 per cent in the short run and by 0.50 per cent in the long run. Thus, a more open trade regime has an important bearing on the movement of the real exchange rate in Australia.

The role of macroeconomic policy, as proxied by the growth in domestic credit (GDC), is found to be significant in affecting the trade-weighted real exchange rate of Australia. A one per cent growth in domestic credit appreciates the RER by 0.09 in the short run but seems to have no long run effect on RER at a 5 per cent confidence level, supporting the view that inconsistent policies will result in overvaluation of RER.

The estimated coefficient of nominal devaluation (NDEV) is statistically significant with positive sign as expected by the theoretical model. The econometric results indicate that there is a close link between the two variables in Australia. A one per cent nominal devaluation depreciates the RER by 0.99 per cent in the short run and 7.22 per cent in the long run representing less than one to one devaluation in the short run but has a significantly large impact in the long run.

The coefficient of the lagged dependent variable is significantly different from zero. The low value of the coefficient suggests that in the absence of other intervention, actual RER converges quite gradually towards its long run equilibrium, which indicates that nominal devaluation could be a powerful device to re-establish the exchange rate misalignment from its equilibrium value (Edwards, 1988b).

## **VII Summary and Conclusion**

This paper has examined the extent to which real and nominal determinants can explain the behaviour of the real exchange rate in Australia using a single equation of Error Correction Model of real exchange rate dynamics. The results suggest that an improvement in the external TOT seems to have positive long run effect on the trade-weighted RER in Australia, whereas increased net capital inflow and government expenditure appreciate the RER. Increased openness in external trade and technological progress appear to have positively affected the traded-goods sector through RER depreciation. It was found that the nominal variables also significantly affect the real exchange rate of the economy over the study period. Nominal devaluation has a significant positive impact on the trade-weighted real exchange rate in the long run, indicating that a nominal devaluation can be a powerful device to correct real exchange rate misalignment.

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# **Savings Behavior under Income Uncertainty: Cohort Analysis of Taiwan Household Pseudo-Panel Data**

Yih-Luan Chyi  
National Tsing Hua University

## **Abstract**

This paper performs cohort analysis of Taiwan pseudo-panel household data of saving rates over the past twenty years. It also investigates the importance of precautionary saving in explaining household saving behavior in Taiwan. Some of the first empirical evidence shown in this paper indicates that the variance of permanent and transitory components in unpredictable income has a role in explaining Taiwan household saving behaviors.

## **1. Introduction**

Exploring the effect of uncertainty on saving and wealth accumulation has been a focus of theoretical and empirical literatures for the recent decade. Earning uncertainty may lead to the excess sensitivity of consumption to expected income fluctuations<sup>69</sup> (see Zeldes, 1989; Caballero, 1990; Carroll, 1992, 1997; Gourinchas and Parker, 1999). Emphasizing the role of income uncertainty, models of precautionary or buffer-stock saving imply that a higher variance of labor income should lead to higher savings. There has been a growing body of empirical research on effects of income variance on wealth during the past decade. Kazarosian (1997) and Carroll and Samwick (1997, 1998) estimate income variances from the U.S. panel data and then regress the level of wealth on these variances. Applying the measuring method proposed by Carroll and Samwick (1997) for Taiwan household pseudo-panel data, this paper attempts to provide some useful evidence for us to access the effect of income uncertainty on Taiwan household saving behaviors.

An Average cohort technique has been used in Section 2 in order to generate cohort average saving rates from Taiwan pseudo-panel data. There are significant discrepancies between actual data and the prediction of life-cycle theory. Chyi (2000) suggests a theoretical relation between income uncertainty and saving. In section 3, estimates of permanent and transitory variances and some relevant demographic characteristics are included in the precautionary saving model to examine empirically the importance of precautionary saving. Section 4 offers concluding remarks.

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<sup>69</sup> See Browning and Lusardi (1996) for surveys.

## 2. The Data and Empirical Evidence

Browning, Deaton, and Irish (1985) proposes a method of so called “average cohort techniques” to allow us to study the life-cycle dynamics of variables such as consumption or income even when there are lack of observations on the same individuals at different times.

### **The Taiwan Cohort data**

We use the data from the Surveys of Personal Income Distribution in Taiwan (SPIDT) during 1976 to 1995 to follow cohorts of individuals over time, where cohorts are defined by date of birth. We compute average consumption, income, and saving rate of 40-year-olds in the 1980 survey, of 41-year-olds in the 1981 survey, and so on so that these averages have similar properties as panel data. Households headed by persons born before 1910 and after 1959 are excluded due to certain sources of potential sample bias (see Deaton, 1992).

We define cohorts by five-year bands, and analyze a total of eight cohorts. Averages for each cohort data are computed in every year and thus we have a total of 160 cells. Table 1 reports the cohort definition, the median age in 1980 and in 1990, and the average cell size in our sample. Saving is defined in a conventional way as disposal income minus consumption expenditure. Saving rates for the household over the life cycle are shown in Figure 1. The figure plots cohort cell medians<sup>70</sup> against the average age of the head of household.

### **Empirical evidence**

There are two major inconsistencies between either actual Taiwan household saving rates or empirical findings and the prediction of a life-cycle model. First, saving rates do not show a clear “hump” in Figure 1. Secondly, the rising age profile and declining cohort profile of the sample slope found in Paxson (1996) can be interpreted as an increasing time trend in Taiwan household saving rates. But if the LCH can explain completely our saving rates, we should not find the canceling of age and cohort effects. Deaton and Paxson (1997) have shown that life cycle saving rates are not large enough to fully explain Taiwan’s household saving rates.

## 3. Empirical methodology and findings

**Chyi (2000) constructs a permanent income model of saving with income uncertainty. There are two components in the saving rate equation, one is a traditional part suggested by Campbell’s (1987) “saving for a rainy day”; the other part illustrates the precautionary saving motive. The theoretical predictions from Chyi can be summarized with reference to the following reduced-form regression equation:**

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<sup>70</sup> Median saving rates by age and cohort are used in this figure in order to reduce the impact of outlying observations.

$$s_h = \varphi_0 + \varphi_1 \text{Age} + \varphi_2 \text{Age}^2 + \varphi_3 \text{Cohort} + \varphi_4 \ln(z_h) + \varphi_5 \sigma_{h,p}^2 + \varphi_6 \sigma_{h,T}^2 + u_h \quad (1)$$

Where  $s_h$  and  $\ln(z_h)$  indicates the saving rate and the income growth rate of cohort  $h$  respectively. Age profile of saving rates suggests that the first candidate for explaining saving rates is the age distribution. For Taiwan SPIDT data set, it is evident that cohort dummies should be considered as important independent variables. We use the current actual income growth rate to proxy for the expected income growth rate recognizing that there will be errors-in-variable to some extent. Since there may be either positive or negative relation between saving rates and income growth over the entire life cycle, the sign of  $\varphi_4$  will not necessarily be expected to be positive. The last two variables shown in the left hand side of the saving rate equation indicate the precautionary saving motive. The Appendix in Carroll and Samwick (1997) shows how to derive an efficient estimate of  $\sigma_{h,p}^2$  and  $\sigma_{h,T}^2$ . In practice, we first remove predicted component of income growth by dividing actual income of individual household by the fitted value obtained from a permanent income regression. The predictions from the regression of household income on a set of demographic characteristics are used as a proxy for the permanent component of income.<sup>71</sup> Then, the predicted values are adjusted for economy-wide growth in income so that the average normalized income variable contains no trend over the sample period. All income values are real in that they are deflated by the GDP deflator. The second step is to compute cohort averages based on the unpredicted component of individual household's income for each year during 1976-1995. Finally, the cohort averages of unpredictable incomes are used to construct measures of income uncertainty. I restrict the sample to those younger than 55 because the theoretical results in Carroll (1997) suggest that the behavior of households before their retirement may be qualitatively different from the behavior of retirees.

**It is likely that OLS estimates can be misleading since our measures of income risk and expected income growth may subject to non-negligible measurement errors. Therefore, the precautionary saving model should be estimated using generalized method of moments (GMM) method. Potential instrumental variables used for the two income variances may be occupation, education, and industry dummies, age, and other demographic control variables included in equation (1). The results of GMM estimation of saving rate equation are shown in Table 2.**

**The empirical results of GMM estimation of saving rates shown in Table 2 suggest that both permanent and transitory variance have positive influence on cohort average saving rates. Taiwan household saving rates respond positively to both transitory and permanent income uncertainties at 5% significant level. This result implies that to some extent Taiwanese households suffer from liquidity constraints during the past two**

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<sup>71</sup> The estimation results are not presented in this paper due to the space limit. They are available from author on request.

decades. Cohort average saving rates and economic growth are negatively correlated. The age effects are not significant. However, it shows significantly negative cohort effects. Younger cohorts on average have higher saving rates. The number of kids and years of schooling have significant positive effect in explaining the cohort average saving rates. Households live in Taipei have higher saving rates compared with residents at other places in Taiwan. We also present other specifications for the saving rate regression as a robustness check. We consistently find that saving rates are higher as there is higher income uncertainty.<sup>72</sup>

We test the validity of this assumption by considering the IV regressions in a GMM framework and using the heteroskedasticity-robust test of the over identifying restrictions given in Hansen (1982). The  $p$ -values are reported at the bottom of the Table 2. The  $p$ -values are not small enough to reject the specification.

#### 4. Concluding Remarks

Applying cohort analysis technique on Taiwan pseudo-panel data, this paper presents some of the first empirical evidence those households who face greater income risk save a higher fraction of their income. The method developed in Carroll and Samwick (1997) for measuring income risk and decomposing innovations into transitory and permanent components has been extended to the pseudo-panel SPIDT data. Empirical estimates indicate that the variance of permanent and transitory components in unpredictable income has a role in explaining saving in Taiwan.

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<sup>72</sup> The results of robustness checks are available from the author.



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Table1: Cohort Definition and Cell Size

Cohort	Year of Birth	Age in		Average Cell Size
		1976	1995	
1	1952-1956	22	41	265
2	1947-1951	27	46	459
3	1942-1946	32	51	645
4	1937-1941	37	56	637
5	1932-1936	42	61	729
6	1927-1931	47	66	742
7	1922-1926	52	71	958
8	1917-1921	57	76	773

Table 2 – Regressions of Saving Rates on Uncertainty

Variable	OLS		GMM	
Constant	-0.0514	(-0.2784)	-0.3294	(-1.502)
Uncertainty:				
Permanent	0.0452	(1.5153)	0.1014**	(4.5241)
Transitory	0.0212**	(2.6483)	0.0222**	(3.2108)
Income growth	-13.464	(-4.6206)	-18.933	(-5.386)
Age	0.0007	(0.086)	0.0116	(1.2137)
Age squared	6.87E-05	(0.6986)	-9.06E-05	(-0.8238)
Cohort2	-0.0465	(-2.6355)	-0.0467	(-3.2925)
Cohort3	-0.069	(-2.5763)	-0.0568	(-2.8259)
Cohort4	-0.1083	(-3.0311)	-0.0877	(-3.3523)
Cohort5	-0.0973	(-2.082)	-0.0464	(-1.3417)
Cohort6	-0.1109	(-2.0716)	-0.0474	(-1.2832)
Education	0.015	(1.7552)	0.0219	(3.62)
Number of children	0.0471	(2.107)	0.0629	(5.881)
Area (Taipei)	0.0273	(0.7855)	0.0641	(3.688)
Adjusted R <sup>2</sup>	0.5899		0.43	
Over-identification test			9.975	
Number of observations	70		70	

Notes: Heteroskedasticity-robust errors are calculated and *t*-ratios are given in parentheses. \*\* and \* denote statistical significance of uncertainty measures at the 5% and 10% respectively.

# PERSPECTIVES ON THE ECONOMIC RECOVERY FROM THE ASIAN CRISIS AND THE ROLE OF ECONOMIC, POLITICAL AND CULTURAL DIFFERENCES.

Vincent Dropsy

Dennis Pollard

California State University, Fullerton

## I. Introduction

Following three decades of exceptional economic growth, most Asian nations suffered a severe financial and economic crisis in 1997-98. A large body of literature has been dedicated to understand the causes of this new type of crisis<sup>73</sup>, and it appears that “a combination of macroeconomic imbalances, external developments, and weakness in financial and corporate systems” (IMF, 2000) is responsible for the severity of the Asian crisis. Although the economic recovery in the region has been relatively strong in aggregate terms, it has also varied on an individual country basis and depending on the topical indicators.

The objective of this paper is to shed some light on the economic, political and cultural differences that could explain and potentially predict the variations in the speed and magnitude of economic recovery between major Asian countries. First, we offer some groupings to reflect these differences: (i) the “pragmatic” group (China, Hong Kong, Taiwan, Singapore); (ii) the “oligopolistic” group (Japan, South Korea), (iii) the “centralized” group (Indonesia, Malaysia), (iv) the “versatile” group (Thailand, the Philippines). Second, we examine various “hard” economic and “soft” cultural indicators to rationalize the differences in economic performance and recovery between these groupings.

## II. Economic, Political and Cultural Differences in Asia

**Despite major differences in economic structure, political institutions and cultural attributes, most Asian nations have been victims of the Asian crisis. However, the severity of the economic and financial crisis as well as the nature of the recovery has varied from country to country. DeOcampo (2000), chairman of APEC Finance Ministers Meeting in 1997 when the “Manila Framework” was**

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<sup>73</sup> cf. IMF (2000), Cartapanis, Dropsy and Mametz (2001).

**developed, recently asked whether this economic recovery was sustainable. Some of the insights in this paper come from discussions with this former “Finance Minister of the Year” (from Euromoney in 1995 and 1996, and from Asiamoney in 1997). In an effort to better understand the differences in sustainability of economic growth between the major Asian countries, we first categorize them into the following “business thinking” groups:**

- (i) The “pragmatic” group (China, Hong Kong, Taiwan, Singapore), which is dominated by the Chinese approach to business, where small and medium enterprises, often family ventures, are preferred and where discipline, order, but also flexibility and pragmatism are prevalent.
- (ii) The “oligopolistic” group (Japan, South Korea), which is characterized by large conglomerates, where companies, banks and the government often work hand in hand to create economies of scale and thus oligopolies.
- (iii) The “authoritarian” group (Indonesia, Malaysia), whose “dirigiste” governments have so far successfully united and controlled their respective countries, which are rich in ethnic diversity and in economic resources (e.g., oil).
- (iv) The “versatile” group (Thailand, the Philippines), which combines westernized and traditional values, blends democracy and corruption, with easy adaptability.

These over-simplified groups give a preliminary insight of the economic, political and cultural differences between Asian nations, before refining the analysis of individual and group characteristics. To gain a better understanding of the strength and weaknesses of these various countries or groups, a series of indicators are presented as statistical evidence to support this analysis.

Most Asian economies have experienced very strong growth over the last three decades preceding the Asian crisis in 1997-98. The traditional economic indicator of “per capita real GDP growth” in Table 1 reflects this exceptional performance, with some notable exceptions: the Chinese economy only began to grow very rapidly after the liberalization decided in 1978-79 and the Filipino economy is still functioning below par. The data also clearly shows the collapse in economic growth due to the Asian financial crisis. However, China has not been significantly affected by the Asian crisis (due to strict capital controls) and has the best record of growth over the last five years of the century.

When analyzed in groupings, the pragmatic (Chinese) group also appears to have been the least affected by the crisis (with an average 0.3% positive growth in 1998 and the best ranking in terms of growth between 1996 and 2000), although per capita real GDP growth fell by 5% between 1997 and 1998. The oligopolistic group (Japan, Korea) ranked second (with an average 5.1% drop in per capita output in 1998). The versatile group (Thailand, Philippines) came third (with an average fall of 7.0% of its per capita real GDP per capita), while the authoritarian group (Indonesia, Malaysia) was the hardest hit (with an average 11.5% decline in its per capita output).

In terms of economic recovery, the Chinese thinking group grew 4% in 1999 and 7.7% in 2000 (with the best record among the four groups). The oligopolistic group had a sharp turnaround of 9.6% (as the average growth went from -5.1% to +4.5%), but the year 2000 brought about an average growth of 3.6% (less than one-half of the Chinese thinking group). The authoritarian group had an average turnaround of 13.3%, (from a 11.5% drop in 1998 to a 1.8% rise in 1999), and the year 2000 brought an average increase of 4.9% (still well below the Chinese thinking group). The versatile group had the slowest turnaround with an increase of average per capita real GDP growth by 9.2% (from -7.0% in 1998 to +2.1% in 1999), and the year 2000 returned to a more normal growth rate of 2.6%.

The Human Development Index (from the United Nations), presented in Table 2, gives an idea as to the weight that the countries and groups place upon activities to develop their human capital. This multifaceted index suggests a value and commitment to Human Development efforts, in short, a measure of social efforts to create an atmosphere for individual development. A brief analysis of these results indicates that the government-aided economies of the oligopolistic group have the resources to focus on human development with large social commitments from both the private and public Sector. The pragmatic group, even including Mainland China (last in the individual ranking), is second in the ranking on human development, with both limited government involvement and high private sector involvement in Hong Kong, Singapore (and probably in Taiwan, though figures are not available). The versatile group, is now moving more towards this development effort, with Thailand enacting laws which are offering free education to the ninth grade (future to high school) and Philippines attempting to reduce corruption so that monies will be available for education, training and development. The authoritarian group continues to struggle with society mores somewhat linked to the past traditions which impede development, particularly relative to women. This had a

magnified effect when times get more difficult and may cause conditions that contribute to the deeper plunge and somewhat slower recovery and growth rate of these economies.

Human development is obviously strongly related to literacy (data from the World Bank), illustrated in Table 3. Most Asian nations and groups have made tremendous progress in this area. Only China, Indonesia and Malaysia have not yet reached the 90% literacy ratio, although it appears to be a question of years rather than decades. Another developmental tool, the availability of computers, shown in Table 4 (from the World Bank), is gaining acceptance in Asia, although at significantly different rates, but in the same order than economic growth for the groups. In Table 5, a compilation of key factors results in a single index of world competitiveness (created by the IMD), averaged over the period 1995-99. Again, the desire to be competitive and succeed relates to the methods in which countries and cultures view their needs to compete in all areas of human endeavor. Clearly, the pragmatic (Chinese) group is the most competitive group in terms of the weighted average key index and with the three most competitive economies (Singapore, Hong Kong, Taiwan) in Asia. This shows the ability of the culture to both adapt and meet competitive situations in both domestic and international settings. Japan and Korea, perhaps due to its “group societal” structure, are less competitive and more “group” dependent. The two least competitive groups appear to be slower in adopting a competitive attitude relative to most key elements required in maintaining a competitive edge.

There is also increasing evidence that the economic performance of a country is also related to the well functioning of its markets: Table 6 presents an index of Economic Freedom (from the Fraser Institute) as a measure of governmental and societal control. Once again, even with the addition of Mainland China (last in the ranking, but progressing), the pragmatic group leads the oligopolistic group, closely followed by the versatile group. In terms of the bitter with the sweet, Table 7 introduces the corruption perception index (from Transparency International), for which the group ranking is similar (high freedom corresponding to low corruption). It is interesting to note that the last twenty years during which China has experienced high growth, have also been a period of progress in terms of economic freedom and reduction in corruption. It appears therefore that pragmatism may be more powerful than ideology in the long run. Another

measure of cultural adaptation is the presence of TV sets in the population (from the World Bank), indicated in Table 8. This ratio can also be interpreted as an index of penetration of the commercial markets. Not surprisingly, this ratio is much higher in the more affluent countries than in the less developed nations of Asia.

### III. Conclusions

**This paper has analyzed economic, political and cultural characteristics of individual and grouped Asian countries to reveal their “comparative advantages” in terms of economic recovery following the Asian crisis. Utilizing various topical indicators, it is possible to construct a preliminary analysis to suggest causes that may affect the scope and sustainability of this recovery. It appears that the pragmatic Chinese group ranks ahead of the other three groups in terms of economic turnaround so far as well as in terms of political and cultural factors (even with the inclusion of Mainland China). The oligopolistic group (Japan/Korea) was a close second, whereas the authoritarian group (Indonesia, Malaysia) and versatile group (Thailand, the Philippines) lagged well behind in both economic turnaround and cultural factors. Further research is needed to quantify the implications of these differences for future economic growth in the various Asian countries.**

### References

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<b>TABLE 1: Per Capita Real GDP Growth (% p.a.) and ranking (last column)</b>											
	<b>71-75</b>	<b>76-80</b>	<b>81-85</b>	<b>86-90</b>	<b>91-95</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>96-00</b>
<b>China</b>	2.9%	4.1%	9.4%	6.2%	10.9%	8.5%	7.8%	6.8%	6.1%	7.1%	1
<b>Hong Kong</b>	4.7%	9.1%	4.1%	6.7%	3.8%	2.0%	2.0%	-7.3%	1.8%	10.0%	6
<b>Singapore</b>	6.8%	6.2%	3.8%	6.4%	6.8%	5.3%	6.1%	-1.6%	3.5%	8.1%	3
<b>Taiwan</b>	6.9%	8.7%	5.4%	8.1%	6.0%	5.1%	5.5%	3.4%	4.8%	5.7%	2
<b>AVERAGE</b>	<b>5.3%</b>	<b>7.1%</b>	<b>5.7%</b>	<b>6.8%</b>	<b>6.9%</b>	<b>5.2%</b>	<b>5.3%</b>	<b>0.3%</b>	<b>4.0%</b>	<b>7.7%</b>	<b>G1</b>
<b>Japan</b>	3.2%	3.5%	2.7%	4.2%	1.1%	4.8%	1.3%	-2.8%	0.1%	1.1%	8
<b>Korea</b>	6.5%	5.2%	6.6%	7.3%	4.3%	3.4%	1.7%	-7.4%	9.0%	6.1%	5
<b>AVERAGE</b>	<b>4.9%</b>	<b>4.4%</b>	<b>4.6%</b>	<b>5.7%</b>	<b>2.7%</b>	<b>4.1%</b>	<b>1.5%</b>	<b>-5.1%</b>	<b>4.5%</b>	<b>3.6%</b>	<b>G2</b>
<b>Indonesia</b>	5.4%	5.7%	3.8%	5.4%	6.1%	6.2%	3.1%	-14.6%	-1.3%	2.6%	10
<b>Malaysia</b>	5.2%	7.0%	3.8%	5.9%	8.5%	8.8%	6.3%	-8.3%	4.9%	7.1%	4
<b>AVERAGE</b>	<b>5.3%</b>	<b>6.3%</b>	<b>3.8%</b>	<b>5.6%</b>	<b>7.3%</b>	<b>7.5%</b>	<b>4.7%</b>	<b>-11.5%</b>	<b>1.8%</b>	<b>4.9%</b>	<b>G3</b>
<b>Thailand</b>	2.9%	5.6%	3.6%	8.7%	7.5%	5.3%	-2.3%	-10.9%	3.4%	3.6%	9
<b>Philippines</b>	3.3%	3.8%	-3.7%	1.8%	-0.3%	3.4%	2.7%	-3.1%	0.8%	1.5%	7
<b>AVERAGE</b>	<b>3.1%</b>	<b>4.7%</b>	<b>-0.1%</b>	<b>5.2%</b>	<b>3.6%</b>	<b>4.3%</b>	<b>0.2%</b>	<b>-7.0%</b>	<b>2.1%</b>	<b>2.6%</b>	<b>G4</b>

<b>TABLE 2: Human Development Index (0=lowest, 1=highest) and ranking</b>											
	<b>1975</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>1996-99</b>
<b>China</b>	0.52	0.55	0.59	0.62	0.68	0.68	0.70	0.71	0.72	#N/A	10
<b>Hong Kong</b>	0.75	0.79	0.82	0.86	0.88	0.88	0.88	0.87	0.88	#N/A	2
<b>Singapore</b>	0.72	0.75	0.78	0.82	0.86	0.73	0.74	0.88	0.88	#N/A	5
<b>Taiwan</b>	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	6
<b>AVERAGE</b>	<b>0.67</b>	<b>0.70</b>	<b>0.73</b>	<b>0.77</b>	<b>0.80</b>	<b>0.76</b>	<b>0.77</b>	<b>0.82</b>	<b>0.82</b>	<b>#N/A</b>	<b>G2</b>
<b>Japan</b>	0.85	0.88	0.89	0.91	0.92	0.92	0.92	0.92	0.93	#N/A	1
<b>Korea</b>	0.69	0.73	0.77	0.81	0.85	0.87	0.89	0.85	0.88	#N/A	3
<b>AVERAGE</b>	<b>0.77</b>	<b>0.80</b>	<b>0.83</b>	<b>0.86</b>	<b>0.89</b>	<b>0.90</b>	<b>0.91</b>	<b>0.89</b>	<b>0.90</b>	<b>#N/A</b>	<b>G1</b>
<b>Indonesia</b>	0.47	0.53	0.58	0.62	0.66	0.67	0.68	0.67	0.68	#N/A	9
<b>Malaysia</b>	0.61	0.66	0.69	0.72	0.76	0.84	0.85	0.77	0.77	#N/A	4
<b>AVERAGE</b>	<b>0.54</b>	<b>0.59</b>	<b>0.64</b>	<b>0.67</b>	<b>0.71</b>	<b>0.75</b>	<b>0.77</b>	<b>0.72</b>	<b>0.73</b>	<b>#N/A</b>	<b>G4</b>
<b>Thailand</b>	0.66	0.68	0.69	0.72	0.74	0.75	0.75	0.74	0.76	#N/A	8
<b>Philippines</b>	0.65	0.68	0.69	0.72	0.73	0.76	0.77	0.74	0.75	#N/A	7



<b>AVERAGE</b>	<i>0.65</i>	<i>0.68</i>	<i>0.69</i>	<i>0.72</i>	<i>0.74</i>	<i>0.75</i>	<i>0.76</i>	<i>0.74</i>	<i>0.75</i>	#N/A	<b>G3</b>
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<b>TABLE 3: Literacy (% of the population above 15 years old) and ranking</b>											
	<b>1975</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>1996-99</b>
<b>China</b>	58%	66%	72%	77%	81%	82%	82%	83%	84%	#N/A	10
<b>Hong Kong</b>	82%	86%	88%	90%	92%	92%	93%	93%	93%	#N/A	6
<b>Singapore</b>	79%	83%	86%	89%	91%	91%	92%	92%	92%	#N/A	7
<b>Taiwan (est.)</b>	<i>81%</i>	<i>85%</i>	<i>88%</i>	<i>91%</i>	<i>92%</i>	<i>94%</i>	<i>95%</i>	<i>95%</i>	<i>95%</i>	#N/A	4
<b>AVERAGE</b>	<b>73%</b>	<b>78%</b>	<b>82%</b>	<b>87%</b>	<b>89%</b>	<b>90%</b>	<b>90%</b>	<b>91%</b>	<b>91%</b>	#N/A	<b>G3</b>
<b>Japan (est.)</b>	99%	99%	99%	99%	99%	99%	99%	99%	99%	#N/A	1
<b>Korea</b>	90%	93%	95%	96%	97%	97%	97%	98%	98%	#N/A	2
<b>AVERAGE</b>	<b>95%</b>	<b>96%</b>	<b>97%</b>	<b>97%</b>	<b>98%</b>	<b>98%</b>	<b>98%</b>	<b>98%</b>	<b>98%</b>	#N/A	<b>G1</b>
<b>Indonesia</b>	63%	69%	75%	80%	84%	84%	85%	86%	86%	#N/A	9
<b>Malaysia</b>	65%	71%	77%	81%	84%	85%	86%	86%	87%	#N/A	8
<b>AVERAGE</b>	<b>64%</b>	<b>70%</b>	<b>76%</b>	<b>80%</b>	<b>84%</b>	<b>85%</b>	<b>85%</b>	<b>86%</b>	<b>87%</b>	#N/A	<b>G4</b>
<b>Thailand</b>	85%	88%	90%	92%	94%	94%	95%	95%	95%	#N/A	3
<b>Philippines</b>	87%	89%	91%	93%	94%	94%	95%	95%	95%	#N/A	5
<b>AVERAGE</b>	<b>86%</b>	<b>88%</b>	<b>91%</b>	<b>92%</b>	<b>94%</b>	<b>94%</b>	<b>95%</b>	<b>95%</b>	<b>95%</b>	#N/A	<b>G2</b>

<b>TABLE 4: Computers (per capita) and ranking</b>											
	<b>1975</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>1996-99</b>
<b>China</b>	#N/A	#N/A	#N/A	0.0%	0.2%	0.4%	0.6%	0.9%	1.2%	#N/A	9
<b>Hong Kong</b>	#N/A	#N/A	#N/A	4.7%	15.4%	19.0%	22.9%	25.6%	29.8%	#N/A	2
<b>Singapore</b>	#N/A	#N/A	#N/A	6.6%	20.2%	26.3%	33.2%	37.5%	43.7%	#N/A	1
<b>Taiwan</b>	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4
<b>AVERAGE</b>	#N/A	#N/A	#N/A	<b>3.8%</b>	<b>11.9%</b>	<b>15.2%</b>	<b>18.9%</b>	<b>21.3%</b>	<b>24.9%</b>	#N/A	<b>G1</b>
<b>Japan</b>	#N/A	#N/A	1.7%	6.0%	12.0%	16.2%	20.2%	23.8%	28.7%	#N/A	3
<b>Korea</b>	#N/A	#N/A	#N/A	3.7%	10.8%	13.2%	15.1%	16.9%	18.2%	#N/A	5
<b>AVERAGE</b>	#N/A	#N/A	#N/A	<b>4.8%</b>	<b>11.4%</b>	<b>14.7%</b>	<b>17.7%</b>	<b>20.4%</b>	<b>23.4%</b>	#N/A	<b>G2</b>
<b>Indonesia</b>	#N/A	#N/A	#N/A	0.1%	0.5%	0.7%	0.8%	0.8%	0.9%	#N/A	9
<b>Malaysia</b>	#N/A	#N/A	#N/A	0.8%	3.7%	4.2%	4.6%	6.0%	6.9%	#N/A	6
<b>AVERAGE</b>	#N/A	#N/A	#N/A	<b>0.5%</b>	<b>2.1%</b>	<b>2.4%</b>	<b>2.7%</b>	<b>3.4%</b>	<b>3.9%</b>	#N/A	<b>G3</b>

Thailand	#N/A	#N/A	#N/A	0.4%	1.4%	1.7%	2.0%	2.2%	2.3%	#N/A	7
Philippines	#N/A	#N/A	#N/A	0.3%	1.0%	1.2%	1.3%	1.5%	1.7%	#N/A	8
<b>AVERAGE</b>	#N/A	#N/A	#N/A	<b>0.4%</b>	<b>1.2%</b>	<b>1.4%</b>	<b>1.7%</b>	<b>1.8%</b>	<b>2.0%</b>	#N/A	<b>G4</b>

<b>TABLE 5: World Competitiveness Index (0=lowest, 1=highest) and ranking</b>										
	<b>World Competitiveness</b>		<b>Economic Performance</b>		<b>Government Efficiency</b>		<b>Business Efficiency</b>		<b>Infra-Structure</b>	
	<b>1995-99</b>	<b>Rank</b>	<b>1995-99</b>	<b>Rank</b>	<b>1995-99</b>	<b>Rank</b>	<b>1995-99</b>	<b>Rank</b>	<b>1995-99</b>	<b>Rank</b>
China	0.41	6	0.90	1	0.40	5	0.25	8	0.24	7
Hong Kong	0.86	2	0.71	4	0.95	2	0.80	2	0.72	2
Singapore	0.96	1	0.90	2	0.98	1	0.86	1	0.94	1
Taiwan	0.64	3	0.53	6	0.62	3	0.66	3	0.59	4
<b>AVERAGE</b>	<b>0.74</b>	<b>G1</b>	<b>0.84</b>	<b>G1</b>	<b>0.78</b>	<b>G1</b>	<b>0.64</b>	<b>G1</b>	<b>0.63</b>	<b>G1</b>
Japan	0.53	4	0.76	3	0.38	7	0.40	5	0.66	3
Korea	0.31	7	0.52	7	0.20	9	0.31	6	0.27	6
<b>AVERAGE</b>	<b>0.42</b>	<b>G2</b>	<b>0.64</b>	<b>G2</b>	<b>0.29</b>	<b>G4</b>	<b>0.36</b>	<b>G2</b>	<b>0.47</b>	<b>G2</b>
Indonesia	0.07	10	0.18	10	0.15	10	0.06	10	0.03	10
Malaysia	0.50	5	0.67	5	0.63	3	0.43	4	0.38	5
<b>AVERAGE</b>	<b>0.29</b>	<b>G3</b>	<b>0.42</b>	<b>G3</b>	<b>0.39</b>	<b>G2</b>	<b>0.24</b>	<b>G3</b>	<b>0.20</b>	<b>G3</b>
Thailand	0.23	9	0.44	8	0.34	8	0.13	9	0.17	9
Philippines	0.28	8	0.28	9	0.38	6	0.25	7	0.21	8
<b>AVERAGE</b>	<b>0.26</b>	<b>G4</b>	<b>0.36</b>	<b>G4</b>	<b>0.36</b>	<b>G3</b>	<b>0.19</b>	<b>G4</b>	<b>0.19</b>	<b>G4</b>

<b>TABLE 6: Economic Freedom Index (0=control, 1=freedom) and ranking</b>											
	<b>1975</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>1995-99</b>
China	0.20	0.32	0.43	0.37	0.51	#N/A	#N/A	#N/A	0.58	#N/A	10
Hong Kong	0.94	0.97	0.93	0.92	0.97	#N/A	#N/A	#N/A	0.94	#N/A	1
Singapore	0.76	0.80	0.84	0.90	0.94	#N/A	#N/A	#N/A	0.93	#N/A	2
Taiwan	0.60	0.68	0.71	0.74	0.74	#N/A	#N/A	#N/A	0.73	#N/A	5
<b>AVERAGE</b>	<b>0.62</b>	<b>0.70</b>	<b>0.73</b>	<b>0.73</b>	<b>0.81</b>	<b>#N/A</b>	<b>#N/A</b>	<b>#N/A</b>	<b>0.82</b>	<b>#N/A</b>	<b>G1</b>
Japan	0.69	0.75	0.76	0.81	0.81	#N/A	#N/A	#N/A	0.79	#N/A	3
Korea	0.57	0.58	0.58	0.63	0.70	#N/A	#N/A	#N/A	0.71	#N/A	8
<b>AVERAGE</b>	<b>0.63</b>	<b>0.66</b>	<b>0.67</b>	<b>0.72</b>	<b>0.75</b>	<b>#N/A</b>	<b>#N/A</b>	<b>#N/A</b>	<b>0.75</b>	<b>#N/A</b>	<b>G1</b>
Indonesia	0.50	0.52	0.62	0.67	0.68	#N/A	#N/A	#N/A	0.62	#N/A	9

<b>Malaysia</b>	0.63	0.70	0.70	0.75	0.74	#N/A	#N/A	#N/A	0.67	#N/A	6
<b>AVERAGE</b>	<b>0.56</b>	<b>0.61</b>	<b>0.66</b>	<b>0.71</b>	<b>0.71</b>	<b>#N/A</b>	<b>#N/A</b>	<b>#N/A</b>	<b>0.65</b>	<b>#N/A</b>	<b>G4</b>
<b>Thailand</b>	0.56	0.58	0.60	0.66	0.73	#N/A	#N/A	#N/A	0.68	#N/A	7
<b>Philippines</b>	0.47	0.50	0.50	0.56	0.72	#N/A	#N/A	#N/A	0.76	#N/A	4
<b>AVERAGE</b>	<b>0.52</b>	<b>0.54</b>	<b>0.55</b>	<b>0.61</b>	<b>0.73</b>	<b>#N/A</b>	<b>#N/A</b>	<b>#N/A</b>	<b>0.72</b>	<b>#N/A</b>	<b>G3</b>

<b>TABLE 7: Corruption Perceptions Index (0=corrupt, 1=clean) and ranking</b>											
	<b>1975</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>1996-2000</b>
<b>China</b>	#N/A	0.51	#N/A	0.47	0.29	0.35	0.34	0.31	0.35	0.35	7
<b>Hong Kong</b>	#N/A	0.74	#N/A	0.69	0.73	0.78	0.77	0.77	0.79	0.79	2
<b>Singapore</b>	#N/A	0.84	#N/A	0.92	0.87	0.91	0.91	0.91	0.92	0.92	1
<b>Taiwan</b>	#N/A	0.60	#N/A	0.51	0.50	0.53	0.56	0.55	0.59	0.59	4
<b>AVERAGE</b>	<b>#N/A</b>	<b>0.70</b>	<b>#N/A</b>	<b>0.69</b>	<b>0.63</b>	<b>0.68</b>	<b>0.67</b>	<b>0.66</b>	<b>0.69</b>	<b>0.69</b>	<b>G1</b>
<b>Japan</b>	#N/A	0.78	#N/A	0.73	0.66	0.58	0.60	0.64	0.71	0.71	3
<b>Korea</b>	#N/A	0.39	#N/A	0.35	0.43	0.42	0.38	0.40	0.42	0.42	6
<b>AVERAGE</b>	<b>#N/A</b>	<b>0.58</b>	<b>#N/A</b>	<b>0.54</b>	<b>0.54</b>	<b>0.50</b>	<b>0.49</b>	<b>0.52</b>	<b>0.57</b>	<b>0.57</b>	<b>G2</b>
<b>Indonesia</b>	#N/A	0.02	#N/A	0.06	0.27	0.20	0.17	0.17	0.19	0.19	10
<b>Malaysia</b>	#N/A	0.63	#N/A	0.51	0.50	0.53	0.51	0.48	0.50	0.50	5
<b>AVERAGE</b>	<b>#N/A</b>	<b>0.32</b>	<b>#N/A</b>	<b>0.28</b>	<b>0.39</b>	<b>0.37</b>	<b>0.34</b>	<b>0.33</b>	<b>0.35</b>	<b>0.35</b>	<b>G3</b>
<b>Thailand</b>	#N/A	0.24	#N/A	0.19	0.31	0.30	0.32	0.32	0.32	0.32	8
<b>Philippines</b>	#N/A	0.10	#N/A	0.20	0.31	0.33	0.36	0.28	0.29	0.29	9
<b>AVERAGE</b>	<b>#N/A</b>	<b>0.17</b>	<b>#N/A</b>	<b>0.19</b>	<b>0.31</b>	<b>0.32</b>	<b>0.34</b>	<b>0.30</b>	<b>0.31</b>	<b>0.31</b>	<b>G4</b>

<b>TABLE 8: TV Sets (per capita) and ranking</b>											
	<b>1975</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>1996-99</b>
<b>China</b>	0.0%	0.1%	0.4%	1.6%	2.4%	2.6%	2.7%	2.9%	2.9%	#N/A	6
<b>Hong Kong</b>	1.9%	2.2%	2.3%	2.8%	3.7%	3.9%	4.1%	4.3%	4.3%	#N/A	2
<b>Singapore</b>	1.9%	3.1%	3.1%	3.4%	3.1%	3.0%	3.0%	2.9%	3.1%	#N/A	4
<b>Taiwan</b>	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	5
<b>AVERAGE</b>	<b>1.3%</b>	<b>1.8%</b>	<b>1.9%</b>	<b>2.6%</b>	<b>3.1%</b>	<b>3.2%</b>	<b>3.3%</b>	<b>3.4%</b>	<b>3.4%</b>	<b>#N/A</b>	<b>G2</b>
<b>Japan</b>	3.6%	5.4%	5.8%	6.1%	6.8%	7.0%	7.1%	7.1%	7.2%	#N/A	1

<b>Korea AVERAGE</b>	0.7%	1.7%	1.9%	2.1%	3.2%	3.4%	3.4%	3.5%	3.6%	#N/A	3
	<b>2.1%</b>	<b>3.5%</b>	<b>3.8%</b>	<b>4.1%</b>	<b>5.0%</b>	<b>5.2%</b>	<b>5.2%</b>	<b>5.3%</b>	<b>5.4%</b>	<b>#N/A</b>	<b>G1</b>
<b>Indonesia</b>	0.1%	0.2%	0.4%	0.6%	1.1%	1.3%	1.3%	1.4%	1.4%	#N/A	9
<b>Malaysia AVERAGE</b>	0.4%	0.9%	1.2%	1.5%	1.7%	1.7%	1.7%	1.7%	1.7%	#N/A	8
	<b>0.2%</b>	<b>0.5%</b>	<b>0.8%</b>	<b>1.0%</b>	<b>1.4%</b>	<b>1.5%</b>	<b>1.5%</b>	<b>1.5%</b>	<b>1.6%</b>	<b>#N/A</b>	<b>G4</b>
<b>Thailand</b>	0.1%	0.2%	1.0%	1.1%	1.9%	2.1%	2.4%	2.4%	2.9%	#N/A	7
<b>Philippines AVERAGE</b>	0.2%	0.2%	0.3%	0.5%	1.0%	1.1%	1.1%	1.1%	1.1%	#N/A	10
	<b>0.1%</b>	<b>0.2%</b>	<b>0.6%</b>	<b>0.8%</b>	<b>1.5%</b>	<b>1.6%</b>	<b>1.7%</b>	<b>1.8%</b>	<b>2.0%</b>	<b>#N/A</b>	<b>G3</b>

# FINANCIAL LIBERALIZATION, EMERGING STOCK MARKET EFFICIENCY AND CURRENCY CRISES

Vincent Dropsy

Department of Economics, LH 702  
California State University  
Fullerton, CA 92834, U.S.A.  
Tel : (714) 278-3307  
E-mail : dropsy@fullerton.edu

## ABSTRACT

The liberalization of Latin American and East Asian financial markets resulted in huge capital flows in the first half of the 1990s, but also severe financial and economic crises in the second half of the 1990s. The main objective of this paper is to test the weak efficiency of Latin American and East Asian emerging stock markets before and after their liberalization. In addition, this study examines whether emerging stock markets provide a warning signal of impending currency crises and vice versa.

### I. Introduction

Following the world debt crisis of the 1980s, many developing countries turned to capital markets for their borrowing needs. More specifically, a dozen nations from Latin America and South-East Asia liberalized their stock markets, allowing foreign capital to flow almost freely and finance their development. As a result, most of these countries experienced huge capital inflows in the first half of the 1990s. Table 1 illustrates the tremendous growth of stock market capitalization from the official date of financial liberalization to 1999 for twelve nations selected for this study. Yet, most of these countries became victims of financial and economic crises in the second half of the 1990s.

The objective of this paper is to examine the relationship between financial liberalization, emerging stock market (ESM) efficiency and currency crises. Financial theory postulates that equity markets should become more integrated with world financial markets following liberalization. In this case, the initial capital inflows and the subsequent crises would have simply reflected rational hopes dashed by macroeconomic mismanagement. On the other hand, it is also possible that these emerging markets suffered from inefficiencies, allowed speculative bubbles to develop and ultimately burst. In any case, the liberalizations of emerging stock markets appear to have played an important role. Consistently with financial theory, Bekaert and Harvey (2000), Henry (2000b) find that these liberalizations reduces the cost of capital. Henry (2000a), Bekaert, Harvey and Lundblad (2001) also conclude that these financial liberalizations boost investment and economic growth. On the other hand, Kawakatsu and Morey (1999) conclude that stock markets have not become more efficient following their liberalization. Bacchetta and Van WinCoop (1998) also show that financial liberalization lead to an initial period of asset price overshooting, before a crisis occurs.

The first stage of this study is to test the weak efficiency of these of Latin American and East Asian emerging stock markets before and after their official liberalization to examine its effect. The analysis is then refined by introducing the contemporaneous effect of world stock markets and currency crises on excess stock returns to take into account potential market integration. Finally, this study examines whether emerging stock markets provide a warning signal of impending currency crises or vice versa.

## II. Methodology

The Efficient Market Hypothesis (EMH) states that market prices always fully reflect available information. Its weak version is based on an information set that includes only the history of prices themselves. It also implies that stock returns should not be forecastable based only on their past values. Campbell, Lo and MacKinlay (1997) suggest a series of econometric procedures to ascertain the predictability of asset returns based on their past values (as well as on other variables in other EMH versions, as we will discuss later). To test weak efficiency, we apply Breusch-Godfrey LM serial correlation tests and Wald tests for autocorrelation to excess stock returns, which are defined as the monthly percentage change in stock prices, denominated in U.S dollars (IFCG), minus the world interest rate (one-month LIBOR).

Weak efficiency tests are easy to implement, but they do not take into account risk exposure. The International Capital Asset Pricing Model (CAPM) provides a measure, known as “beta”, of the risk of a portfolio relative to the risk of a diversified portfolio (i.e., the world portfolio). The international CAPM also needs to include a measure of foreign exchange risk, unless purchasing power parity holds. The two-factor model states that local excess stock returns are proportional to world excess returns and on a crisis index defined in Cartapanis, Dropsy and Mametz (2001) as an average of real currency appreciation rates (against the U.S. Dollar) and percentage changes in foreign exchange reserves, respectively weighted by their inverse standard deviation. A currency crisis is therefore characterized by a large negative crisis index, which is expected to correlate positively with local excess stock returns. We can also interpret the value and statistical significance of the world market beta as a measure and test of stock market integration. If ESMs are integrated, we can again apply serial correlation tests to evaluate the degree of efficiency of these markets. We also use Wald tests (with three lags) to investigate the significance of past world returns and currency crises on current ESM returns and

test efficiency. Finally, we use Granger causality tests to investigate the significance of past ESM excess returns on current crises.

### III. Empirical Results and Conclusions

Weak efficiency test results, presented in Table 2, surprisingly reveal none of ESMs, except for Chile, did not become more efficient after their liberalization: on the contrary, four ESMs lost their efficiency after their liberalization. When the contemporaneous effect of world stock markets and currency crises are included, the empirical results, shown in Table 3a and 3b, are similar. In addition, ten of the twelve countries appear to have integrated ESMs after their liberalization (measured by the significance of the world beta), of which only two were integrated before liberalization. However, only three ESMs seem to provide some predictive power in terms of currency crises, as shown in Table 4. We can therefore conclude from these robust results that financial liberalization did not improve the efficiency of ESMS, probably due to the currency crises experienced since then.

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**Table 1 : Stock Market Capitalization and Gross Domestic Product**

	Argentina		Brazil		Chile		Colombia		Mexico		Venezuela	
	1989	1999	1990	1999	1991	1999	1990	1999	1988	1999	1989	1999
<b>Market Cap (bn.\$)</b>	4.2	228.0	16.4	228.0	28.0	68.2	1.4	11.6	13.8	154.0	1.5	7.5
<b>Change of Mkt Cap</b>		5296%		1294%		144%		719%		1018%		408%
<b>GDP (bn.\$)</b>	69.0	283.2	465.0	751.5	34.6	67.5	46.9	86.6	174.2	483.7	38.5	102.2
<b>Change of GDP</b>		310%		62%		95%		85%		178%		166%
<b>Mkt Cap/GDP (%)</b>	6%	81%	4%	30%	81%	101%	3%	13%	8%	32%	4%	7%

	Indonesia		Korea		Malaysia		Philippines		Taiwan		Thailand	
	1988	1999	1991	1999	1988	1999	1990	1999	1990	1999	1986	1999
<b>Market Cap (bn.\$)</b>	0.3	64.1	96.4	305.5	23.3	145.4	5.9	48.1	100.7	376.0	2.9	58.4
<b>Change of Mkt Cap</b>		25231%		217%		524%		712%		273%		1928%
<b>GDP (bn.\$)</b>	84.3	142.5	295.2	406.9	34.8	79.0	44.3	76.6	160.2	275.0	41.7	124.4
<b>Change of GDP</b>		69%		38%		127%		73%		72%		199%
<b>Mkt Cap/GDP (%)</b>	0.3%	45%	33%	75%	67%	184%	13%	63%	63%	137%	7%	47%

(The first date corresponds to the year before the official financial liberalization)

**Table 2 : Weak Efficiency Tests**

	<b>Argentina</b>		<b>Brazil</b>		<b>Chile</b>		<b>Colombia</b>		<b>Mexico</b>		<b>Venezuela</b>	
<b>Sample begins:</b>	<b>76.01</b>	<b>89.11</b>	<b>76.01</b>	<b>91.05</b>	<b>76.01</b>	<b>92.01</b>	<b>85.01</b>	<b>91.02</b>	<b>76.01</b>	<b>89.05</b>	<b>85.01</b>	<b>90.01</b>
<b>Sample ends:</b>	<b>89.10</b>	<b>00.06</b>	<b>91.04</b>	<b>00.06</b>	<b>91.12</b>	<b>00.06</b>	<b>91.01</b>	<b>00.06</b>	<b>89.04</b>	<b>00.06</b>	<b>90.00</b>	<b>00.06</b>
<b>Wald Test: Prob (Lag1=Lag2=Lag3=0)</b>	22.8%	<b>4.9%*</b>	85.2%	55.9%	<b>0.1%*</b>	30.5%	<b>1.7%*</b>	<b>0.1%*</b>	7.4%	48.5%	50.8%	25.4%
<b>Breusch-Godfrey LM test Prob(No Serial Correlation)</b>	12.2%	79.7%	75.1%	<b>3.3%*</b>	15.4%	86.4%	99.2%	39.2%	62.4%	37.0%	37.8%	98.0%

	<b>Indonesia</b>		<b>Korea</b>		<b>Malaysia</b>		<b>Philippines</b>		<b>Taiwan</b>		<b>Thailand</b>	
<b>Sample begins:</b>	<b>76.01</b>	<b>89.09</b>	<b>76.01</b>	<b>92.01</b>	<b>85.01</b>	<b>88.12</b>	<b>85.01</b>	<b>91.06</b>	<b>85.01</b>	<b>91.01</b>	<b>76.01</b>	<b>87.09</b>
<b>Sample ends:</b>	<b>89.08</b>	<b>00.06</b>	<b>91.12</b>	<b>00.06</b>	<b>88.11</b>	<b>00.06</b>	<b>91.05</b>	<b>00.06</b>	<b>90.12</b>	<b>00.06</b>	<b>87.08</b>	<b>00.06</b>
<b>Wald Test: Prob (Lag1=Lag2=Lag3=0)</b>	#N/A	19.2%	94.3%	91.9%	73.3%	<b>3.2%*</b>	<b>0.0%*</b>	<b>0.9%*</b>	89.6%	50.4%	<b>0.1%*</b>	8.4%
<b>Breusch-Godfrey LM test Prob(No Serial Correlation)</b>	#N/A	70.5%	84.2%	80.0%	54.6%	9.9%	97.0%	63.9%	99.9%	<b>4.9%*</b>	95.6%	<b>4.7%*</b>

(The left column corresponds to the sub-sample until the official financial liberalization)

(The right column corresponds to the sub-sample from the official financial liberalization on)

(A star \* means that the null hypothesis is rejected at a 5% significance level)

**Table 3a: International CAPM and Financial Liberalization**

	Argentina		Brazil		Chile		Colombia		Mexico		Venezuela	
<b>Sample begins:</b>	<b>78.01</b>	<b>89.11</b>	<b>83.01</b>	<b>91.05</b>	<b>78.01</b>	<b>92.01</b>	<b>85.01</b>	<b>91.02</b>	<b>78.01</b>	<b>89.05</b>	<b>85.01</b>	<b>90.01</b>
<b>Sample ends:</b>	<b>89.10</b>	<b>00.06</b>	<b>91.04</b>	<b>00.06</b>	<b>91.12</b>	<b>00.06</b>	<b>91.01</b>	<b>00.06</b>	<b>89.04</b>	<b>00.06</b>	<b>90.00</b>	<b>00.06</b>
<b>World Excess Returns</b>	-0.17	0.84	0.59	1.38	0.19	0.71	0.18	0.28	0.57	0.80	-0.08	0.05
	(0.36)	(2.47)	(1.22)	(4.23)	(0.98)	(2.52)	(1.31)	(1.11)	(1.57)	(4.00)	(0.26)	(0.12)
<b>Crisis Index</b>	0.012	-0.006	0.043	0.037	0.007	0.010	0.004	0.007	0.018	0.020	-0.012	-0.002
	(0.89)	(0.56)	(2.31)	(4.53)	(1.46)	(2.44)	(0.67)	(1.22)	(1.84)	(3.11)	(1.09)	(0.16)
<b>R2</b>	4.2%	11.3%	11.9%	34.5%	16.8%	23.1%	21.5%	30.4%	26.3%	34.2%	11.6%	6.0%
<b>Pr(No Serial Correlation)</b>	29.9%	63.8%	44.6%	<b>1.9% *</b>	67.0%	52.8%	67.5%	86.9%	37.2%	34.1%	21.4%	17.1%
<b>Pr (Lag1=Lag2=Lag3=0):</b>												
<b>Excess Stock Returns</b>	74.6%	<b>0.3% *</b>	70.6%	95.9%	<b>0.2% *</b>	46.1%	<b>0.4% *</b>	<b>1.5% *</b>	9.4%	55.8%	60.0%	65.7%
<b>World Excess Returns</b>	29.3%	26.5%	38.9%	46.6%	8.5%	98.3%	24.7%	5.2%	5.1%	26.0%	75.0%	73.7%
<b>Crisis Index</b>	77.5%	78.6%	82.6%	19.5%	6.8%	38.9%	34.4%	82.4%	40.4%	35.2%	49.8%	7.8%
<b>Lags of All Variables</b>	85.3%	<b>1.1% *</b>	39.3%	43.5%	<b>0.1% *</b>	37.5%	<b>1.4% *</b>	<b>0.3% *</b>	9.7%	49.1%	74.0%	5.4%

(The left column corresponds to the sub-sample until the official financial liberalization)

(The right column corresponds to the sub-sample from the official financial liberalization on)

(A star \* means that the null hypothesis is rejected at a 5% significance level)

**Table 3b: International CAPM and Financial Liberalization**

	Indonesia		Korea		Malaysia		Philippines		Taiwan		Thailand	
<b>Sample begins:</b>	<b>78.01</b>	<b>89.11</b>	<b>83.01</b>	<b>91.05</b>	<b>78.01</b>	<b>92.01</b>	<b>85.01</b>	<b>91.02</b>	<b>78.01</b>	<b>89.05</b>	<b>85.01</b>	<b>90.01</b>
<b>Sample ends:</b>	<b>89.10</b>	<b>00.06</b>	<b>91.04</b>	<b>00.06</b>	<b>91.12</b>	<b>00.06</b>	<b>91.01</b>	<b>00.06</b>	<b>89.04</b>	<b>00.06</b>	<b>90.00</b>	<b>00.06</b>
<b>World Excess Returns</b>	#N/A	1.43	0.54	1.03	0.64	0.88	0.94	1.02	0.41	0.77	-0.09	1.36
	#N/A	(5.10)	(3.17)	(3.02)	(1.64)	(4.26)	(3.09)	(4.05)	(0.58)	(2.86)	(0.68)	(5.60)
<b>Crisis Index</b>	#N/A	0.031	0.001	0.033	0.011	0.022	-0.006	0.030	0.009	0.013	0.011	-0.002
	#N/A	(4.78)	(0.22)	(3.21)	(1.08)	(2.68)	(0.90)	(5.27)	(0.50)	(2.11)	(2.39)	(0.34)
<b>R2</b>	#N/A	44.1%	7.2%	39.4%	23.7%	39.1%	31.0%	47.6%	28.7%	22.4%	27.8%	28.3%
<b>Pr(No Serial Correlation)</b>	#N/A	99.9%	69.7%	89.7%	46.2%	<b>4.5% *</b>	27.8%	81.5%	<b>3.6% *</b>	10.2%	67.1%	22.0%
<b>Pr (Lag1=Lag2=Lag3=0):</b>												
<b>Excess Stock Returns</b>	#N/A	<b>0.8% *</b>	88.2%	82.0%	62.2%	8.7%	<b>0.4% *</b>	56.7%	72.3%	65.5%	<b>0.1% *</b>	11.6%
<b>World Excess Returns</b>	#N/A	75.7%	84.9%	23.6%	90.6%	21.3%	5.2%	<b>0.8% *</b>	97.5%	57.3%	34.8%	20.1%
<b>Crisis Index</b>	#N/A	<b>0.5% *</b>	92.0%	5.8%	52.1%	5.3%	35.6%	<b>1.7% *</b>	<b>4.6% *</b>	7.8%	20.7%	39.4%
<b>Lags of All Variables</b>	#N/A	12.3%	98.3%	22.1%	93.8%	<b>0.1% *</b>	<b>0.1% *</b>	<b>0.1% *</b>	33.9%	<b>1.9% *</b>	<b>0.1% *</b>	<b>4.5% *</b>

(The left column corresponds to the sub-sample until the official financial liberalization)

(The right column corresponds to the sub-sample from the official financial liberalization on)

(A star \* means that the null hypothesis is rejected at a 5% significance level)

**Table 4: Predictive Power of Emerging Stock Markets in terms of Currency Crises**

	Argentina		Brazil		Chile		Colombia		Mexico		Venezuela	
<b>Sample begins:</b>	<b>78.01</b>	<b>89.11</b>	<b>83.01</b>	<b>91.05</b>	<b>78.01</b>	<b>92.01</b>	<b>85.01</b>	<b>91.02</b>	<b>78.01</b>	<b>89.05</b>	<b>85.01</b>	<b>90.01</b>
<b>Sample ends:</b>	<b>89.10</b>	<b>00.06</b>	<b>91.04</b>	<b>00.06</b>	<b>91.12</b>	<b>00.06</b>	<b>91.01</b>	<b>00.06</b>	<b>89.04</b>	<b>00.06</b>	<b>90.00</b>	<b>00.06</b>
<b>Granger Causality Test (3 lags): Currency Crises</b>	7.6%	23.4%	5.3%	<b>0.4%*</b>	<b>4.5%*</b>	13.1%	58.5%	5.8%	32.1%	11.0%	71.2%	<b>0.1%*</b>

	Indonesia		Korea		Malaysia		Philippines		Taiwan		Thailand	
<b>Sample begins:</b>	<b>78.01</b>	<b>89.09</b>	<b>78.01</b>	<b>92.01</b>	<b>85.01</b>	<b>88.12</b>	<b>85.01</b>	<b>91.06</b>	<b>85.01</b>	<b>91.01</b>	<b>78.01</b>	<b>87.09</b>
<b>Sample ends:</b>	<b>89.08</b>	<b>00.06</b>	<b>91.12</b>	<b>00.06</b>	<b>88.11</b>	<b>00.06</b>	<b>91.05</b>	<b>00.06</b>	<b>91.00</b>	<b>00.06</b>	<b>87.08</b>	<b>00.06</b>
<b>Granger Causality Test (3 lags): Currency Crises</b>	#N/A	51.8%	12.7%	69.7%	34.4%	57.5%	19.5%	<b>2.4%*</b>	22.8%	18.6%	13.5%	47.9%

(The left column corresponds to the sub-sample until the official financial liberalization)

(The right column corresponds to the sub-sample from the official financial liberalization on)

(A star \* means that the null hypothesis is rejected at a 5% significance level)

# THE STRUCTURAL REFORMS OF 1990 AND THEIR IMPACT ON COLOMBIAN COMMERCIAL BANKS<sup>74</sup>

:  
Edinson Caicedo Cerezo  
Universidad del Valle, Colombia

## I. INTRODUCTION

This document presents a synthesis of the results of the investigation of the impact of the Structural Reforms of 1990 and its influence on the performance of the Colombian Commercial Banks. We will understand for Structural Reforms the elimination of restrictions to make competitive to the Domestic financial market including the opening from these markets to the international competition. This process is frequently call “Financial Liberalization” and it is understood as the step of a régime in which the financial market is strongly intervened by the government controls (“financial repression” like it is defined by McKinnon (1973)), to a régime which there are less restrictions (“liberalized régime”).

The sector that is more affected by the financial liberalization it is the sector of the commercial banking. The commercial banking can be it affects direct or indirectly. Directly for that the commercial banks are generally the immediate objective of the liberalization process. Indirectly for that the liberalization usually modifies the parameters used by both the financial banks and clients of banks non financiers for the taking of financial decisions. The liberalization can also modify the type and the quantity of the volume of the credit in the intermediation process carried out by the commercial banks and other financial institutions.

In a general form, the financial repression implies a group of restrictions in a competitive market that produces a protection atmosphere for the financial middlemen. Among the most common restrictions they are: 1) intermediation margin guaranteed through the fixation of we lend and rates of deposits or programs of direct subsidy (Gibson and Tsakalotos (1994)); 2) exit barriers for frequently accompanied financial middlemen for sure limitless of I deposit. ;3) outlet barriers to the biggest industrial clients or financial middlemen; 4) guarantee of managerial activities through the credit subsidized by the government by means of the placement of programs keys

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for the economic sectors. The financial Liberalization generally consists on the elimination of all or for the most part these controls, changing the environment of the business of the financial intermediary. Among other things this implies: Elimination of the controls of the rates of interests, Galvis(1985)<sup>75</sup>; modification or elimination of the assignment of quotas of credits and their politicians; elimination of the subsidies of the interest rates and the financing outlines sponsored by the government; opening to the foreign capital and reduction or elimination of the government's explicit guarantees.

The effects of the financial liberalization on the both profitabilities and the taking risk can be summarized in the following way. The financial liberalization frequently offers to the banks new opportunities of obtaining profitabilities. However, this accompanied by a growth of the rates of interests and exposition to the risk in the credits. The effect will probably be relative to the size of the banks. The small banks will be able to be less beneficiaries to the new opportunities of obtaining earnings while they are equally exposed to the growth of the rates of interests and the risk in the credit. These differences combined with the value of the guarantees that the government offers to some banks, it will probably conclude in that the big banks absorb to the small banks or that some of these they are liquidated.

Many investigations on the programs and effects of the financial liberalization has been developed from both theoretical and empiric point of view: Beaver(1966), Alman(1968), Mckinnon(1973), Alman(1977), Merton(1977, 1995), Davidson and Mackinnon(1981), Keeton(1984), Corbo, De Mello, and Tybut(1985), Galvis(1985), Mejia(1987), Pantalone and Platt(1987), Furlong(1988), Figueroa(1989), Furlong and Keeley(1989), Herrera(1989), Nadine(1989), Keeley(1990), Leite and Sundararajan(1990), Mountain(1990), Putnam(1983), Roe(1991), Bodie(1992), Breeden and Isaac(1992), King(1992), Wojnilower(1992), Haubrich and Wachtel(1993), Thakor(1993), Alman, Marco and Barreto(1994), Berguer and Udell(1994), Fernandez(1994), Gibson and Tsakalotos(1994), Lora (1994), Mancera(1995), Marquez(1994), Mçlure(1994), Vittas and Cho(1994), Whitelaw(1994), Clavijo(1995), Fischer(1995), Merton(1995), Carrasquilla and Zarate(1996), Chavez, Fischer and Ortiz(1996), Sundarajan(1996), Cabellos (1997), Hair(1997), Caicedo and Fischer(1998); This paper has as main purpose to contribute to the answer of the question: Which is the effect in the performance of the commercial banks of the programs of financial liberalization carried out in Colombia in 1990?.

The motivation of the answer to the previous question, it can be described in the sense that the Structural Reforms of the Developing Countries has caused bank crisis with serious implications in terms of economic and social costs in this countries. Obviously of the Colombian experience they can benefit a great number of Developing Countries that work under the régime of financial repression. This is also certain for some countries that are in transition of a régime centralized to a market régime as they are the socialist republics. Given the recent tendency that at the moment observe in the world<sup>76</sup>, we could visualize a dependence toward the liberalization processes on the part of the countries.

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<sup>75</sup> The author affirms that "The financial liberalization consists on the elimination of the financial restrictions. That is to say, to allow that the interest rates ascend until their balance point, with the purpose of to promote a good rate of saving and to avoid the bad placement of real and financial resources."

<sup>76</sup> Fischer(1995), in carried out consultation to 50 Emergent Markets (located in Africa, Asia, South of Europe and Latin America) found that 12 countries operated in a liberalized régime, 24 operated in a



## II. THE COLOMBIAN STRUCTURAL AND FINANCIAL REFORMS OF 1990

At the end of 1989, inside the opening program, modernization and internationalization of the Colombian economy, the Reforms begins to the Financial System (which is materialized in the Law 45 of 1990 Lora(1994)) that had as objective<sup>77</sup>: To liberate the interest rates that were permanently controlled on the part of the economic authorities; Decrease in the specialization of the intermediary in the both activities assets and liabilities; simplification of the norms of fitting of the mandatory investments; Capitalization of the financial sector; external Indebtedness and foreign investment in the sector and the modifications in the accounting and the regulation (to see Carrasquilla and Zárata. (1996)).

In the measures adopted in the process of financial liberalization, the mandatory investments were eliminated dedicated to the financing of the agricultural activities and of construction; these historically, they had constituted an important obstacle to a quicker development of the financial intermediation, when exercising a pressure on the breach among the active and passive interest rates. Between 1980 and 1990 they represented 12.4% of the total placements of the system on the average<sup>78</sup>.

The financial funds were disassembled in the Central Bank, which were taken charge of to administer and to execute the rediscount system and directed credit. Through this, one had the purpose of channeling the financial resources at low cost toward productive sectors, which one showed off that the financial system was not in capacity of assisting by itself. Additionally, one of these funds farming – has separated the Central Bank completely and their orientation was changed; it implied it, on one hand that its financing was achieved to nearer rates at the levels of the market, and for other that was decreasing the component of subsidy content substantially in the respective credits<sup>79</sup>.

These actions are in great measure of the recognition that the financial system was achieving a such development that was able to grant loans of longer term, and therefore making less necessary the direct presence of the State in the orientation of the financial reinforcements<sup>80</sup>.

Besides the measures characteristic of the processes of financial liberalization, they took other complementary ones that sustained the process, when modifying the conditions under which operate the financial institutions. An action field was represented in measures that were guided toward the development of the market of capitals: The Labor Reforms of 1990, which established the transfer of the administration of the cessations from the employees to private funds; it was expected that these captured entities an appreciable quantity of resources, they were under very favorable conditions to participate actively in the investments of the market of

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transitory régime of repression to financial liberalization. The 14 remaining countries operated under a régime of financial repression. That is to say 38 countries face problems of financial liberalization some but advanced that others.

<sup>77</sup> An enlarged version of the objectives of the Financial Reforms describes it Carrasquilla y Zárata(1996)

<sup>78</sup> Revista del Banco de la Republica. (May of 1992). P. 4.

<sup>79</sup> Revista del Banco de la Republica. (May of 1992). Op. Cit. P. 4.

<sup>80</sup> Ibid. P. 5.

capitals. On the other hand, through the emission of funds of the state, like instrument of conversion of foreign debt, it was introduced quite attractive papers for the public, that which would be in a growing participation in the market of capitals<sup>81</sup>.

With regard to the discharge witnesses of the State in the system, in the year of 1990 a process of privatization of entities began that 80's were intervened soon after the financial crisis of the years. It was programmed in 1991 the sale to the private sector of five commercial banks and a company of commercial financing, the banks were: Banco de Colombia, Banco del Comercio, Banco del Estado, Banco de los Trabajadores y Banco Tequendama and the Compañía de Financiamiento Comercial Pronta<sup>82</sup>.

With the financial reforms, the economic opening and the modernization of the productive apparatus, a process of changes guided began to solve problems like the fiscal deficit and the inflation rate, relatively high in the previous periods. It was looked for that the opening process, when modifying the relative prices of the goods that offer to the exterior, favored the amplification of the import markets and export<sup>83</sup>.

In the year of 1990, the economic opening resulted in an improvement in the scale of payments, which was represented by a gap between the exchange politics and the decisions in tariff matter. This contributed to accentuate the surplus phenomenon in the average bill of the scale of payments and gave place to the economic difficulties suffered by the Colombian economy in 1990<sup>84</sup>. Therefore, the economic policy challenge during the year 1990, had to do with the necessity of counteracting the important resurgence of the inflation, caused by coordination lack in the setting in march of a development strategy conceptually well conceived<sup>85</sup>.

The monetary policy orientation in the year of 1990, looked for that the growth of the monetary offer was always compatible with the purposes of stabilization of prices and chord with the development of the monetary instruments and of supervision of the monetary authorities. For it, the Junta Directiva del Banco de la Republica settled down like goal an annual growth in the payment means in a fringe between 24% and 27% that little by little was decreasing until being between 20% and 23.8%<sup>86</sup>.

As having measured guided to counteract the expansion of the reservations an aggressive politics of placement of OMAS(Operation of Opening Market) it was adopted, which reached a balance of \$406 thousand millions at the end of 1990, superiors in \$245 thousand millions to those of the previous year. These included: OMAS with matters, OMAS with the financial sector and conventional OMAS, which included: increases in the investments of the Fondo de Amortización TAN, investments of FINDETER and the Instituto de Seguros Sociales, among others<sup>87</sup>.

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<sup>81</sup> Revista del Banco de la Republica. (May of 1992). Op. Cit. P. 6.

<sup>82</sup> Revista del Banco de la Republica. (May of 1992). Op. Cit. P. 6.

<sup>83</sup> Revista del Banco de la Republica. (December of 1990). P. V.

<sup>84</sup> Revista del Banco de la Republica. (December of 1990). P. V. Revista del Banco de la Republica. (December of 1990). P. V.

<sup>85</sup> Revista del Banco de la República. (January of 1991). P. 4.

<sup>86</sup> Revista del Banco de la República. (December of 1990). Op. Cit. XVI P

<sup>87</sup> Revista del Banco de la Republica. (December of 1990). Op. Cit. XVI P

As regards change policy, which was affected in form negative by a real devaluation of 31% and accompanied by the fall of the dollar and of high inflation indexes, politicians settled down guided to improve the level of the rate of real change, what allowed a gain of 11% in the indicator of the real rate; this explained the increment in the commercial scale and the surplus in US \$634 millions in the scale of payments<sup>88</sup>.

During 1990 the exports arrived to US \$7.064 millions, presenting an increment of 17.1% with relationship at 1989. The most dynamic products were: petroleum, coal and some non traditional lines as: make, leather and their factories, the common metals, cement, crustaceans, mollusks, sugar, banana and tobacco<sup>89</sup>.

The monetary offer presented important changes in the year 1990, keeping in mind that in December of 1989, the payment means were located in 15.4% less than in January of 1990. The monthly variation was caused by the increase in the monetary base<sup>90</sup>.

To reduce the fiscal deficit at the end of 1990, they took actions directed to the cutting of appropriations you budget them for investment of the Central Government, freezing in the Banco de la República of resources of the Fondo Nacional del Café, increment of 10% in the price of the gasoline in the month of additional August of 1990, to the correction for inflation approved at the beginning of the year, decrease in real terms of the total of public investment, due to a nominal increase of 23.7% in the Sector Electrico, Ecopetrol and the Metro de Medellín, among others<sup>91</sup>.

### **III. METHODOLOGY AND RESULTS**

#### **A. THE DATA**

The analysis included the information of the financial states, reported the biannually Superintendencia Bancaria and the FOGAFIN from 1980 to 1999, of 34 Colombian banks: 13 with private national capital, 1 with private and state national capital, 11 with foreign and state capital, 3 only with foreign capital, 3 officials and 3 cooperative banks.

The indicators were calculated keeping in mind the Plan Unico de Cuentas of the company of the financial sector; the source of information was the Superintendencia Bancaria and the FOGAFIN. The trial of the data was carried out by into RATS and SPSS.

#### **B. THE MODEL**

To measure the impact of the Structural Reforms of 1990 in the acting of the commercial Banks thirty indicators those they were used which grouped in six categories. For each category you builds a partial indicator by means of the use of the analysis of Principals Components (Sharma(1996)) in the following way (equation 1, table 1).

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<sup>88</sup> Ibid. P. IX.

<sup>89</sup> Revista del Banco de la Republica. (December of 1990). Op. Cit. XVI P.

<sup>90</sup> Revista del Banco de la República. (January of 1990). P.1.

<sup>91</sup> Ibid. XIV P.

$$Y_{1j} = \sum_{i=1}^{i=p} \gamma_{ij} X_{ij} \quad ; \quad \sum_{i=1}^{i=p} \gamma_{ij}^2 = 1 \quad (1)$$

Where the  $Y_{1j}$  is the first principal component of the category  $j$  ( $j$  denotes the partial indicator of the bank acting associated to the profitability, operative efficiency, financial efficiency, administrative efficiency, risk and participation of the banks during the studied period).  $X_{ij}$  is the financial indicator  $i$  centered the mean around, associated to the category  $j$ .  $\gamma_{ij}$  is the weighing of the first principal component associated to with  $X_{ij}$ .

**Table 1 . Results of the Indicator Performance Parcial of the Colombian Commercial Bank Weighing the First Principal Component and % Explicated Variations**

Inditator of Performance Parcial (Y1j)	Ratio financial (Xij)	Weighing The First Principal Component	% Explicated Variations for First Principal Component
<b>Profitabilities</b>	Gross Financial Margin	0,850	51,87
	Yield Average of the Productive Asset	-0,726	
	Sufficiency of the Financial Margin	0,849	
	Return on Assets (ROA)	0,734	
	Return Operational on Equity	0,456	
	Return on Equity (ROE)	0,628	
<b>Operative Efficiency</b>	Cost of Deposit	0,702	51,53
	Level of Assets Unproductive	0,780	
	Cost Liabilities Average	0,974	
	Utilizations of Deposit	0,147	
<b>Financila Efficiency</b>	Cost of External Resources Average	0,874	76,38
	Return Average of Loans	0,874	
<b>Administrative Efficiency</b>	Ratio of Administrative and Labor Expenses	1,000	99,19
	Ratio of Operational Expenses Not Financial	0,993	
	Ratio of Labor Expenses	0,995	
<b>Risk</b>	Ratio of Total loans	0,709	32,83
	Degree provisions total Loans	0,078	
	Quality in Guarantees Loans	0,551	
	Patrimonial Exposure	0,521	
	Ratio of Debt	0,740	
	Ratio of Subnormal and Faulty Loans	0,703	
	Ratio of Loans of Difficult Collection and Unrecoverable	0,725	
	Ratio of Commercial Loans Conquered	0,779	
	Ratio of Consumption Loans Conquered	0,719	
	Ratio of Real estate Loans Conquered	-0,244	
	Provisions Degree Commercial Loans Conquered	0,331	
	Provisions Degree Consumption Loans Conquered	0,520	
	Provisions Degree Real estate Loans Conquered	0,234	
<b>Participation of Productive Assets</b>	Participation of the Loans	0,772	59,55
	Participation of the Investments	-0,772	

Source: Results obtained by the author into RAST and SPSS. Universidad del Valle, Cali September of the 2000.

Once obtained the first principal components of each category, you builds the global indicator of bank acting ( $Z_1$ ), applying the analysis of main components again (equation 2, table 2).

$$Z_1 = \sum_{j=1}^{j=6} \delta_{1j} Y_{1j} \quad ; \quad \sum_{j=1}^{j=6} \delta_{1j}^2 = 1 \quad (2)$$

Where  $Z_1$  is the first principal component of the partial indicators of bank acting associated to the profitability, operative efficiency, financial efficiency, administrative efficiency, risk and participation of the banks during the studied period.  $Y_{1j}$  is like it was mentioned previously.  $\delta_{ij}$  is the weighing of the first principal component associated to with  $Y_{1j}$ .

Table 2 . Results of the Indicator Performance Global of the Colombian Commercial Weighing the First Principal Component and % Explicated Variations

Inditator of Performance Parcial (Y1j)	Weighing The First Principal Component	% Explicated Variations for First Principal Component
Profitabilities	0,850	47,17
Operative Efficiency	0,702	
Financial Efficiency	0,874	
Administrative Efficiency	1,000	
Risk	0,709	
Preoductive Assets Participations	0,772	

Source: Results obtained by the author into RAST and SPSS. Universidad del Valle, Cali September of the 2000.

Specifically, to validate the impact of the Structural Reforms of 1990 in the performance of the banks, the values obtained for both the  $Z_1$  and  $Y_{1j}$  they were divided in two sub-periods: the first, form 1980 to 1989 and the second from 1991 to 1999. The comparison of each indicator in the corresponding sub-periods was carried out by means of the application of the test of Wilcoxon (Table 3).

Table 3 . Impact of Structural Reforms of 1990 on Performance Colombian Commercial Bank 1980 -1999 Results of Test Wilcoxon

	U de Mann-Whitney	W de Wilcoxon	Z	Sig. asintót. (bilateral)	Sig. exacta [2*(Sig. unilateral)]
Global Performance	105,000	276,000	-2,193	,028	,028
profitabilities	141,000	351,000	-1,140	,254	,264
Operaative Efficiency	162,000	333,000	-,526	,599	,613
Financial Efficiency	111,000	321,000	-2,017	,044	,044
Administrative Efficiency	88,000	298,000	-2,690	,007	,006
Risk	19,000	190,000	-4,707	,000	,000
Participations	47,000	257,000	-3,888	,000	,000

Source: Results obtained by the author into RAST and SPSS. Universidad del Valle, Cali September of the 2000

#### IV. CONCLUSIONS

With the data observed in this study and for the performance indicators, of the Colombian Commercial Banks, built through the applying the technique of the Principals Components, for a significant level the 5% and application of the test of Wilcoxon, we could not reject the hypothesis that the Structural Reforms of 1990 had an impact in the performance of the Commercial Banks in Colombia.

The results of the research also allow to conclude that we cannot affirm that the Structural Reforms of 1990 had an impact in the profitability and in the operative efficiency of the Banks. However, we could not say the same point for the risk, the financial efficiency and the administrative efficiency as for the level of participations of the productive assets that the Colombian Banks experienced starting from the changes made in 1990.

In general terms after the year 1990, an increase of the bank performance is observed seen through a permanency of the margins of profitability and in the operative efficiency of the banks, accompanied point of a decrease of the levels of risk of the accounting receivable, increasing the financial and administrative efficiency as well as of an increment in the levels of the participation of the productive assets and of the investments inside the productive assets of the Commercial Banks in the country.

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# AN ANALYTICAL EVALUATION OF THE *TESHIMA* CASE How Illegal Dumping of Post-Consumer Waste Happened

Eiji Furuyama  
Nihonbashi Gakkan University, Japan

## 1. Flow of market value vs. flow of materials

A standard method adopted to describe the performance of a nation's economy is to illustrate a flow of aggregate value added, measured in the market prices, of a nation's industries.

There is another method known as "material balance approach" developed and promoted mainly by Allen V. Kneese and Robert U. Ayres.<sup>xviii</sup> This method assumes a boundary separating an economic system from the environment. It describes economic activities as an interaction of materials between environment and systems. Physical unit is used instead of prices to aggregate the flow. An economic system takes in materials from the environment to consume or to generate energy from them. No matter how materials are consumed or generated, the total weight of the mass remains unchanged in accordance with the conservation principle. The materials are eventually channeled economically into two categories, i.e., material wealth and waste. As far as the material generates utility, it is regarded as wealth and if it loses utility, it becomes waste. Wealth remains within the system and waste is thrown out of the system back to the environment. The boundary between the environment and the system is drawn arbitrarily. Indeed, in a global sense there is no boundary between the system and environment.

Viewed in the light of material balance approach, the performance of the Japanese economy in 1996 can be described as shown in the following Table.

Material balance of the Japanese economy in 1996

*Unit: million metric tons*

Input		Output	
Domestic resources	1,260	Domestic accumulation	1,290
Imported resources	690	Evaporation	70
Imported products	70	Exports	93
Total	2,020	Consumed as food	130

Recycled	230	Energy generation	420
		Ind. waste (ex. recycled)	250
Hidden input		Munici. Waste (ex. recycled)	50
Feed for cattle	10	Total	2,303
Indirect felling	80	Recycled (ind. and munici.)	230
Soil erosion	140		
Waste minerals (imp.)	2,300		
Excavated soil	1,100		
Waste minerals (dom.)	38		
Total of hidden input	3,668		

Computed from data in *Environment White Paper (Outline) 1998*, (Japanese Government) p.36

The weight of input is 283 million metric ton less than the weight of output, because output contains more water than input.

In 1996 the industry emitted 405 mmt waste, out of which 8% was buried in landfills without treatment, 13% directly recycled, both within the original emitters and 79% was disposed for treatment. The weight of disposed waste totaled 318 mmt, which was reduced to 132 mmt after treatment involving separation and incineration. After the treatment 97 mmt was recycled and 34 mmt were disposed in landfills. The weight reduction, which totaled 187 mmt, was due to incineration. Incineration is a process to separate solid waste into gas and ash or residue. Therefore, the reduced weight should be interpreted as disposed as a gas in the atmosphere.

## 2. Waste emitted by industries

The criteria of waste classification can broadly be divided into two types; one is based on the sources of waste and the other on the properties of the waste. In the United States, for example, waste is classified into two categories: non-hazardous and hazardous waste. German laws, on the other hand, classify waste into (1) *Abfall* (waste) and (2) *Siedlungsabfall* (household waste). Under the Japanese legislation, the classification criteria are similar to those of Germany. The Law Concerning Management and Cleaning of Waste Matter (hereafter abbreviated as Waste Cleaning Law), which passed in December 1970 after a full revision of the former Law Concerning Waste Matter and Its Cleaning, classifies waste in two groups, i.e., industrial waste and general waste.

The Waste Cleaning Law was revised sixteen times since its promulgation in 1971

until the latest version was put into force in December 1999. The latest available statistical information concerning industrial waste management is the one compiled for 1996 and this information classifies the industrial waste according to the definition stipulated in Article 2 of the Waste Cleaning Law effective as of 1996.

The industrial waste was then defined in 19 kinds as follows: 1.cinders from power plants, 2.sludge from factory drainage, 3.waste from lubricant and cleansing oil, 4.waste acid, 5.waste alkali, 6.plastic waste, 7.paper waste, 8.wood waste, 9.textile waste, 10.animal remnants from food processing industry, 11.waste rubber, 12.waste metal, 13.glass and ceramic waste, 14.slag, 15.waste from building demolition, 16.livestock excreta, 17.carcass of livestock, 18.smuts from gaseous waste from factories and 19.solidified matters from any of the above.

The 405-mmt emission of industrial waste, classified after this definition, consisted of 193 mmt of sludge from factory drainage, 72 mmt of livestock excreta, and 61 mmt of demolition waste. These three kinds occupied 81% of the total weight of industrial waste emitted in 1996. Waste matter other than those 19 kinds was classified under the category of general waste and it is stipulated under Chapter 1 General Provision of the Waste Cleaning Law that industrial waste is the waste matter emitted from industrial activities. It is further stipulated in the Law that the emitters themselves are responsible to the management of industrial waste. In case that the emitters are not able to manage the waste by themselves, so states the Law, they may entrust the waste management to waste management firms, which are licensed by the public authorities. The central government, though it enacts legislation for waste management, does not directly participate in the administrative control of waste management. The competent authority for the Waste Cleaning Law was the Ministry of Health and Welfare<sup>xix</sup>. The Ministry delegates administrative power to local government bodies, which form a hierarchical structure of prefecture, city, town, and village.

In addition to industrial waste and general waste, which is mostly municipal refuse and sewage, there is one more type of waste separately specified within the category of general and industrial waste. Such kinds of general as well as industrial waste as possessing combustive, toxic and infectious properties are classified as “general or industrial waste requiring special management” (hereafter abbreviated as special management waste). This category is similar to hazardous waste in the United States. Prefectural governments are competent offices to issue licenses to industrial waste

management firms and city, town, and village governments provide the residents of their jurisdiction with free of charge services for collection, transportation, and disposal of household refuse and sewage. Any firm can apply to the prefectural government for a license to collect, transport and dispose the industrial waste on a contract basis with emitter firms.

Kinds of special management industrial waste are defined by the decrees concerning technical criteria for disposal of general as well as industrial waste. The decrees were enacted in 1977 and revised five times until January 2000. The decrees stipulate in detail technical requirements for those who collect and transport industrial waste of special management. Among those technical requirements the most important are the designs of landfills. While inert waste such as glass and ceramics can be buried in landfills for inert waste, special management waste must be buried either in shield type landfills or controlled and monitored landfills.

As of 1996, approximately 50 kinds, such as mercury, cadmium, lead; cyan, PCB, TCDD (2,3,7,8-Tetrachlorodibenzo-p-dioxin) and so forth were specified as special management industrial waste. Those materials, however, had been emitted, handled and buried in landfills in the same way as ceramics and glass waste before they were added to the list of hazardous waste. Furthermore, those materials were added to the list only after a hazard had actually taken place.

Japan's real GDP growth rate, for the most of the decade 1960 to 70, was above 10%.<sup>xx</sup> A serious social cost of a high rate of growth resulted in the "pollution disease". In 1971 *itai-itai* [ouch-ouch] disease, so called because of its extremely painful effects, was caused by cadmium poisoning through water contaminated by industrial waste. The cause of *Minamata* disease, a neurological disorder discovered in Niigata and Kumamoto, was traced back to methyl-mercury discharged in the industrial wastewater, which was taken into human bodies through food cycles of marine products. *Minamata* trial lasted for seven years and the executives of the emitter firm were convicted in 1979 for professional negligence resulting in injury and death. Chronic asthma suffered by the residents of Yokkaichi city was apparently caused by SO<sub>2</sub> in the smoke belched from petroleum refineries. The asthma patients initiated litigation in 1967. In 1972, the court ordered the firms to pay the patients compensation.

The Diet sessions in December 1970, when the Law Concerning Waste Matter and its Cleaning was fully revised to form the present Law Concerning Management and

Cleaning of Waste Matter, were often referred to as “pollution Diet”. The sessions confirmed a legal recognition of public hazards caused by industrial waste. The principal targets of control and regulation were hazardous emission from factories and plants.

Waste other than industrial waste is defined as general waste, which is “collected, transported and buried in landfills by local governments, so that the living environment of the residents may be preserved.” (Section 6 of Chapter 2 of the Law)

“In the 1970’s the [Japanese] government greatly transformed its industrial policies, attempting not only to make domestic industries strong enough to withstand international competition but also to pursue objectives other than growth. The government’s new objectives included achieving pollution control, or industrial development harmonious with environmental needs.”<sup>xxi</sup>

### **3. Post-consumer Waste and Teshima Case**

The emitters of industrial waste are organized firms, who themselves are capable to manage the waste or entrust its management to licensed firms. Individual consumers, however, have only to rely on someone, who can remove the end-of-life vehicles and electric home appliances somewhere out of their sight. Before the 1998 revision of the

Waste Cleaning Law there was no specific regulation concerning the waste management for shredder dust from end-of-life vehicles as such.<sup>xxii</sup> Just as hazardous industrial waste of cadmium, methyl-mercury and SO<sub>2</sub> gas prompted the full revision of the Law Concerning Waste Matter and Its Cleaning, there was an incident, which led to a comprehensive revision of the Law Concerning Management and Cleaning of Waste Matter.

The incident occurred in a small island, measured 14.6km<sup>2</sup> in area, 19.8km in circumference and inhabited with 1,600 people. The island is called Teshima, located at the northeast corner of the Inland Sea of Japan with a distance of 278km from Osaka.

The residents of Teshima felt little incentive to invite manufacturing (and polluting) industries to their island because of their relatively stable economy supported with agriculture and fisheries. Naoshima, a neighbor island of Teshima, with no mentionable agriculture and fisheries, introduced copper smelting as early as 1917. Copper smeltery use sulfuric acid. Bald hills of Naoshima exhibit a striking contrast to green Teshima.

In November 1990 Kobe prefectural police prosecuted Teshima Tourism and Development Company (hereafter abbreviated as TTDC) for a violation of the Law

Concerning Management and Cleaning of Waste Matter. TTDC was a firm licensed by Kagawa prefecture for collecting and transporting garbage. The company was also licensed to recycling organic household waste into compost by culturing earthworms in huge hollows, which were made after the excavation of beach sand that was sold to glass manufacturing firms as a source of silicon.<sup>xxiii</sup>

The same man who once excavated sand from the island applied for a license to collect, transport, process and dispose “industrial waste”. Food scraps mostly originate in household and they are classified as general waste. The applicant, however, maintained that the quantity of garbage by 1,600 residents of Teshima<sup>xxiv</sup> was too little to feed his earthworms and he had to collect more food scraps from restaurants in major cities such as Osaka. In 1976, a group of active residents started a petition opposing the plan. In 1977, a ferry carrying dump trucks from the industrial district in Osaka, pulled into the wharf. The cargo consigned to TTDC was not a food scrap. It was apparently industrial waste, mostly consisting of metal scraps. The government of Kagawa prefecture hardened its attitude and suspended the license negotiation for a while. An obstinate and incessant application for a license continued and the prefectural government finally conceded to award a license in February 1978. The license specified the kinds of waste as sludge from food processors and paper mills, wood waste and livestock excreta. When TTDC started its operation, it immediately turned out that earthworm composting was a mere excuse to obtain the license. A continuous stream of dump trucks ferried to the wharf several times a day drove to the beach roaring along narrow and winding unpaved roads of the island. The cargo was dumped in the beach, incinerated in the open air and buried in the hollows. The prefectural government promised the residents that it would dispatch inspectors to the island to watch for kinds of waste handled. The local government further assured the islanders that if TTDC were operating with the materials other than specified in the license, the local government would take necessary administrative measures.

It was much too apparent that there was a serious violation of the law. Although TTDC was composting food scraps to some extent, the majority of industrial waste treated in the beach was shredder dust of automobile. However, TTDC insisted that “metal scrap”<sup>xxv</sup> was not industrial waste but valued goods. As evidence, TTDC showed the local government their contracts with the emitters of waste. The contracts stated that TTDC should receive ¥2,000 per metric ton as handling fees when it received “metal scrap”

from the “suppliers” and later pay the “suppliers” ¥300 per metric ton to purchase “scrap”.

It simply meant that TTDC contracted with the waste emitters to collect, transport, and incinerate their shredder dust and bury them in landfills in the property of TTDC at a cost of ¥1,700 per metric ton. This trick was indeed a kid’s stuff and the local officers were not so idiotic to accept it.<sup>xxvi</sup> However, no administrative guidance by the local government was implemented and “where might was master justice was servant.”

Under the present regulation, ash and residue from the shredder dust incineration must be buried in controlled and monitored landfills. In Teshima, no such caution was taken and residue was dumped in the hollow of the beach.<sup>xxvii</sup>

The Hyogo prefectural court convicted TTDC on a charge of transporting and accommodating such items of industrial waste as not specified in the license. The company was fined ¥500,000 (about US\$3,500) for a breach of the Law Concerning Management and Cleaning of Waste Matter and three executives of the firm were sentenced to 10 to 6 month imprisonment with probation. Even after the prosecution in November 1990, an official view was repeated by the prefectural government of Kagawa that TTDC was composting food scraps and “metal scraps” were valued goods, not industrial waste. When the Hyogo prefectural police made public a chemical analysis of the waste, the local government of Kagawa prefecture finally admitted that TTDC violated the law and ordered the firm to remove the dump out of the island. The administrative order by Kagawa prefecture resulted in a removal of only 1,340 out of 560,000 metric ton deposit from the site.

The Teshima Residents Council against Waste Disposal, which was organized for a concerted action of the residents opposing the waste disposal, brought the case to Environmental Dispute Coordination Commission of the Prime Minister’s Office in November 1993. “The major task of the Commission is to provide mediation, conciliation, arbitration and adjudication services in environmental pollution disputes.”<sup>xxviii</sup> The petition filed by the Council was that a huge quantity of illegally disposed industrial waste contaminated groundwater of the island, endangering the safety of the residents’ living conditions. It also stated that the illegally disposed waste should be removed from the island in its entirety and those residents who were exposed to the danger should be compensated.

In July 1997, Kagawa prefecture and the Residents Council accepted an arbitration offered by the Commission. The arbitration stipulated: (1) The prefecture shall find a



place outside of Teshima to construct a plant for re-processing to make the illegally disposed waste allowable in terms of the present standard for industrial waste landfills;(2) The prefecture shall remove the illegally disposed waste in its entirety from the island as soon as the re-processing plant is constructed; (3) The cost for waste removal, construction of a plant and its operation shall be born by the prefecture and the emitters of the waste; and (4)The Ministry of Health and Welfare shall subsidize the prefectural government.

The prefectural government of Kagawa persuaded Naoshima Town to accept the prefectural proposal to construct a plant for intermediate processing of the waste disposed in Teshima. Mitsubishi Material Company (former Mitsubishi Metal) has been operating a copper smeltery since 1917 and Naoshima is known as an “island of sulfuric acid”. A total cost for the plant construction, its operation and transportation of the dumped waste from Teshima to Naoshima is estimated at 32 billion yen (about US\$270 million) and the operation is estimated to take 10 years. The contract for plant construction was signed between Kagawa prefecture and a group of civil engineering companies in December 2000. When the author visited the dumpsite of illegally disposed waste in March 2001, power shovels and bulldozers were working for the construction of roads and a wharf in preparation for a massive removal of 560,000 metric tons of shredder dust muddled up with waste oil, dust and soil

#### *4. Concluding Remarks*

Industrial waste such as sludge from liquid waste, waste acid or alkali, scrap metals, remnants of animals slaughtered for meats, exhaust fume from smoke stacks, chemical residue from cleansing oil and so forth are all intermediate or process waste emitted by industries. Post-consumer waste such as end-of-life-vehicles, -electric home appliances, -container and packaging, -furniture, -houses and buildings or in short, end-of-life-consumer durables are waste from “final consumption” and emitted by consumers. The hazardous effect of the former on environment was recognized in the late 1960’s and effective statutory measures were provided in the 70’s. However, as to the latter category, the legal recognition of its hazard came only in 1990’s. Teshima case, when it was revealed, came as a shock and played a significant role in prompting the Japanese government to prepare statutory measures to regulate and control the post-consumer

waste.

In 1994, the Government of Japan voluntarily contributed a fund to OECD to initiate a project on extended producer responsibility (EPR) programs in the OECD area. As a part of the project, a workshop was organized by the OECD in Washington D.C., on March 29-31, 1995. It was co-hosted by the United States, Canada and Mexico. The workshop took up five waste streams to reduce and they were packaging, lead-acid batteries, electrical and electronic scrap, end-of-life vehicles, and metal plating waste<sup>xxix</sup>

#### Footnotes

<sup>1</sup> Kneese, A.V., Ayres, R. U., d'Arge, R.C., *Economics and the Environment—A Materials Balance Approach*— (1976 Johns Hopkins Press)

Ayres, Robert U., Ayres, W., *Accounting for resources, one: economy-wide applications of mass-balance principles to materials and waste* (1998 Edward Elgar)

<sup>1</sup> In 2000, the administrative organization of the Japan's central government was thoroughly re- formed and the new system started on January 6, 2001. Till January 5, 2001 Water Supply and Environmental Sanitation Department, Environmental Health Bureau of the Ministry of Health and Welfare was the competent office for all pollution problems, waste management and environmental protection. Since January 6, 2001, this department was transferred to the Ministry of Environment, which was newly established as a part of the reformation.

<sup>1</sup>The annual growth rate of real GDP measured in benchmark=1990 constant yen was:

59 to 60 13.3%, 60 to 61 11.9%, 61 to 62 8.6%, 62 to 63 8.8%, 63 to 64 11.2%, 64 to 65 5.7%, 65 to 66 10.2%, 66 to 67 11.1%, 67 to 68 11.9%, 68 to 69 12.0%, 69 to 70 10.3%.

<sup>1</sup>Ito, Takatoshi, *The Japanese Economy* (MIT Press 1992) p.200

<sup>1</sup> At the end of 1998, the Law was revised so that licensed industrial waste management firms must submit a written manifest to list up the waste matter they handle specifically item by item. The following items have been added to those 19 kinds listed in p.5 of this paper: □shredder dust of automobiles, □end-of-life vehicles,

□pinball play machines, □printed circuit board, □TV set and computer, □telephone, □vender machine, □florescent lump, □lead-acid battery, and □dry cell

<sup>1</sup> Worm composting is a method for recycling food waste. “The two municipal categories of material most amenable to composting are yard trimmings and food scraps. According to EPA, 32.8 million tons of yard trimmings and 13.8 million tons of food scraps were generated in 1993 [in the United States], accounting for 22.5% of the total amount generated from residential, commercial, and institutional sources.” (Hitchens, Lynnmann and Kashmanian, Richard M., “Composting: Programs, Process, and Product” in Landreth, Robert E., Rebers, Paul A., edit, *Municipal Solid Wastes, Problems and Solutions* (1996, CRC Press), p.84.

<sup>1</sup> Administratively the whole island was a part of Tonosho Town located in its neighboring and larger Shodo Island.

<sup>1</sup> In Japan, there was even no terminology such as auto-shredder dust in those days.

<sup>1</sup> In a protocol of the police examination which was recorded when 9 persons, including the owner-president of TTDC, were arrested by Hyogo Prefectural Police for a violation of the Law Concerning Management and Cleaning of Waste Matter in November 1990 there was the following statement by a staff member of the Kagawa prefectural government: “Mr. M. [M stands for Matsuura or the owner-president of TTDC] was very rude in manner and I was afraid of his physical violence. I had no choice but saying, “yes” to his insistence.”

<sup>1</sup> The demand for shredder dust landfills increased remarkably over a decade from the mid 1980's to the mid 1990's. This corresponds to a rapid increase of passenger car sales. In 1965, 580,000 new cars were registered. The number increased to 2,370,000 in 1970 and in 1982, it was over 3 million. One estimation goes that about two thirds of the automobile shredder dust emitted in Kyoto-Osaka- Kobe area was dumped in the island of Teshima.

<sup>1</sup> <http://www.kouchoi.go.jp/>

<sup>1</sup> OECD, *Washington Waste Minimisation Workshop* (1995 Washington D.C.)

# CONTROLLING THE RISK: A CASE STUDY OF THE INDIAN LIQUIDITY CRISIS

1990-1992

Ephraim Clark and Geeta Lakshmi

Middlesex University, England

## **Abstract**

In this paper we analyze India's response to its liquidity crisis from 1990-1992 in terms of how successful it was in maintaining the country's creditworthiness measured as the risk premium associated with foreign borrowing. We estimate the risk premium with respect to the evolution of the prices of government guaranteed Indian foreign currency bonds on the secondary market. We use observed bond data of supranational borrowers to generate risk free term structures over the period, which we then apply to the Indian bonds as a means of estimating their "theoretical riskless price". We find that the price discount, defined as the difference between the observed and the theoretical prices, did indeed increase during the crisis. However, we show that this was due to sensitivity to changes in the term structure rather than to any perception of increased risk on the part of bond investors. Changes in the theoretical price explain almost 97% of changes of the market price. Furthermore, the rating downgrades by international agencies over the period contribute nothing to explaining secondary market prices and only one of the three is significant. We conclude that the Indian authorities were successful in maintaining the country's creditworthiness throughout the liquidity crisis.

**JEL Classification: 0530, 0160, G150, P330, F340**

**Key Words: solvency crisis, euro-bonds, country creditworthiness, ratings migration**

## **I. Introduction**

**Over the period 1990-1992, public reports of India's liquidity problems generated rumors of an impending crisis and caused the rapid downgrading of Indian Eurobonds from A2 to Baa1 to Baa3 to Ba2 within the short space of a year.<sup>92</sup> The situation was further complicated by political turmoil surrounding the general elections of 1991, the assassination of Rajiv Gandhi, a prominent candidate, in May 1991 by Sri Lankan guerillas and a stock market scam involving government and**

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<sup>92</sup> Defined by Moodys. A2 indicates a good ability to repay while Baa3 is indicative of junk bonds and Ba2 is speculative.

banking officials in April-May of 1992. As a result, international loans became scarce and shorter-term rollover debt became more costly. Indeed international bond issues ceased completely for several years. However, India never defaulted or rescheduled its debt. In spite of its foreign exchange difficulties, it put a brake on its foreign borrowings and with the help of foreign exchange loans and advice from the IMF, after 44 years of socialism, proceeded with a structural, market oriented reform of the economy. By 1993 the crisis had passed<sup>93</sup>. The question that we ask in this paper is whether the international capital markets viewed the crisis and the government's response to it as a simple problem of liquidity or whether they called into question the fundamental creditworthiness of the country as they did in the subsequent Mexican, Russian and South East Asian crises later in the decade.

We measure fundamental creditworthiness in terms of the risk premium associated with official foreign borrowings. A first innovation of the paper is that we use the market prices of traded bonds to measure the risk premium. Most other studies focus on bank debt.<sup>94</sup>

The problem with secondary market discounts on bank debt is that the debt of many countries, including India, is not traded<sup>95</sup>. Furthermore, the loan market, while a popular

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<sup>93</sup> For details of the evolution of the crisis and the aftermath, see various annual issues of Economic Survey (Govt. of India)

<sup>94</sup> Boehmer and Megginson (1990), Anayitos and De Pines (1990), Dropsy and Solberg (1992) and Clark and Zenaidi (1999), for example, consider discounts on the series of secondary market prices of bank loans, Edwards (1984), Burton and Inoue (1985) and Rockerbie (1993) consider spreads over base rates, Kapur (1977) looks at the supply of bank lending and Abassi and Taffler (1982) look at the maturity of the loans. Other security related measures tested by Erb, Harvey and Viskanta (1996) such as equity returns, while potentially useful, were unavailable with reference to India for this point in time as portfolio investment was not allowed till after 1992. A totally separate approach has been adopted by some researchers, for example, Angeloni and Short (1980), Feder and Uy (1985) and Sand and Mascarenhas (1989) using the subjective rankings given by bankers, as regressands to be explained by economic explanatory variables in order to determine the components of perceived risk. See, for example, Cosset and Roy (1991), Lee (1993), Feder and Uy (1985), Johnson, Srinivasan and Bolster (1990) and Kounodiya (1993).

<sup>95</sup> Using rate spreads as a risk proxy is also tricky in that spread disparities exist even intra country, depending on (i) fees (ii) timing of loan due to the demand and supply conditions of bank credit, (iii) tax treatment of the bonds, and (iv) loan features such as (a) length of the loan, (b) size of the loan, (c) type of borrower - whether private or public, (d) currency of the issue and (e) any options/swaps attached to the loan. The supply of bank debt as a risk measure does not take into account that some countries may voluntarily shrink debt or that lenders, such as the IMF, may come to the rescue, as was the case in India. Although the length of loans granted is supposed to shorten in times of distress according to some researchers, this is a dubious assumption. Palac-McMiken (1995) argues that since the debt crisis, maturities in general have fallen. A longer maturity may reflect concessions due to rescheduling and foreign aid obtained by the riskiest and least able to transform their economies. Thus, amount and

source of risk assessment, may fail in many cases to provide adequate risk perception in the case of a short-term crisis that we consider in this paper<sup>96</sup>. For the same type of reasons the “willingness to pay” aspect of country risk is often ignored as the loan market reacts more sluggishly.<sup>97</sup> Moreover since India was reported to have difficulties, it was unclear lower debt levels were a matter of choice or the levels was exogenously decided.

A second innovation of the paper lies in the methodology, which uses observed prices and maturities of straight risk-less bonds to determine the term structure of international interest rates that are then applied to determine the theoretical prices of outstanding Indian bonds in different currencies<sup>98</sup>. We proceed in three steps. First, we apply McCulloch’s cubic spline methodology (1971, 1975a and b) to a wide selection of AAA rated supranational bonds in order to estimate the international term structure of interest rates. We then apply this structure to a selection of Indian Eurobonds to estimate their “theoretical riskless price”. Finally, we use these “theoretical riskless prices” to analyze investor behavior and risk perception towards India, reflected in the actual market prices of the bonds. The empirical results clearly suggest that reports of Indian political, economic and financial difficulties over the period 1990-92 had little or no effect on the bond prices. The same is true for rating downgrades over the period. None except one, of the three downgrades, had any significant explanatory value. Only the characteristics of the individual bonds and changes in the term structure had any significant explanatory effect on market prices and the risk premium

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duration do not by themselves mirror difficulty unless the assumptions of similar borrowers and similar global conditions are used.

<sup>96</sup>Folkerts-Landau (1985), for example, argued that interest rates charged in the loan market may not reflect the true risk of lending as bank syndicates enjoy significant information gathering, monitoring and enforcement advantages over bond holders. Edwards (1986) concurs with this and suggests that due to the cohesive nature of these syndicates, the existence of cross default clauses typical of loan agreements, the ability to negotiate across borders and guarantees given by their national monetary authorities, default in bank loans is less likely than in bond markets.

<sup>97</sup> For an exception to this, see Clark and Zenaidi (1999)

<sup>98</sup>This methodology has two advantages over other methods that use the bond market to measure country risk. The first advantage is that it lends itself to analyses of short periods of turbulence in that the necessary data is available continuously. The second advantage is that there is no “benchmarking” problem in the risk measure because the theoretical prices do not reflect the characteristics of the individual bonds that went into their estimation. This is not the case with studies such as Edwards (1986) and Burnie (1994) that have used bond yield spreads instead as a measure. As Schaefer (1977) points out, the yield of a bond is unique to the structure, amount and length of the payoffs, the term structure prevailing and the price at that point in time and hence its use is theoretically open to criticism and at best crude. Moreover, yield comparisons in different markets such as euro markets and domestic markets are meaningless.

The rest of the paper is organized as follows. Section II presents the model specification for measuring the risk premium and Section III deals with the data set and the methodology. The results are discussed in Section IV and conclusions are presented in Section V.

## II. Model Specification

In order to estimate the risk premium associated with foreign borrowings, we need to estimate the term structure of interest rates. In this section, we present the methodology for estimating the international term structure of interest rates using McCulloch's spline model<sup>99</sup>.

The model involves fitting a smooth discount function to information obtained from observed prices of straight bonds with various coupons and maturities by estimating the coefficients for a linear combination of smooth approximating functions forming a cubic spline. This estimated discount function could then be inverted to obtain the term structure of interest rates. It can be used to price bonds, obtain the par yield curve, zero coupon yield curve and other related data and is the standard procedure in term structure theory.

Any coupon bond price maturing at par value and paying a coupon at time 'i' can be expressed as:

$$P + AI = C \sum_{i=1}^n \frac{1}{(1 + R_i)^i} + \frac{100}{(1 + R_n)^n} \quad (1)$$

where

$P$  = clean price or the price quoted in the market (as % of par value),  $C$  = coupon,  $R_i$  = discount rate applicable for period  $i$  with  $n$  as the final maturity date and  $AI$  = accrued interest.

Replacing  $\frac{1}{(1 + R_i)^i}$  by  $d_i$ , gives

$$P + AI = C \sum_{i=1}^n d_i + 100d_n \quad (2)$$

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<sup>99</sup> Although several models such as Carleton and Cooper (1976), Schaefer (1981), Vasichek and Fong (1982), Chambers, Carleton and Waldman (1984), Mastronikola (1991) exist to estimate the term structure, Shea (1985) has analyzed some of these and finds McCulloch's cubic spline model empirically tractable, easily computable by OLS and parsimonious. Furthermore, Litzenberger and Rolfo (1984), Luther and Matatko (1992), Deacon and Derry (1994 a and b) and Bradley (1991) have successfully applied this model in several empirical studies.

The discount function  $d$  can be expressed as a combination of smooth approximating functions and defines the present value of 1 unit of any numeraire receivable in  $i$  years. McCulloch (1975a and b) suggests that mathematically the discount function can be expressed as

$$d(i) = 1 + \sum_{j=1}^k a_j f_j(i) \quad (3)$$

Where  $k$   $f_j(i)$  functions are chosen (the value of  $k$  varying with the exact model) to estimate  $d(i)$  by a cubic spline and the  $a_j$  are the estimated parameters of the linear regression. The  $f_j(i)$ , ( $j=1..k$ ) are chosen so that  $f_j(0)=0$  to force  $d(0)=1$  and to enable it to be smooth and monotonically non-increasing. Substituting (3) into (2) we have the price of a bond maturing in  $n$  years and paying a coupon at time  $i$  as follows

$$P + AI = C \sum_{i=1}^n [1 + \sum_{j=1}^k a_j f_j(i)] + 100 [1 + \sum_{j=1}^k a_j f_j(n)] \quad (4)$$

In terms of discrete time when the form assumed is a discount function with two cubic splines

i.e.  $k=5$  and  $\sum_{j=1}^5 a_j f_j(i) = \alpha i + \beta i^2 + \gamma i^3 + \gamma_1 DV_1 i(i - t_1^*)^3 + \gamma_2 DV_2 i(i - t_2^*)^3$

then the discount function is:

$$D(i) = 1 + \alpha i + \beta i^2 + \gamma i^3 + \gamma_1 DV_1 i(i - t_1^*)^3 + \gamma_2 DV_2 i(i - t_2^*)^3 \quad (5)$$

where  $DV_1$  and  $DV_2$  are dummy variables shifting the cubic term of the polynomial for time points. These are the knot points for the cubic spline. When (5) is substituted in (4) and an error term is added then:

$$P + AI = C \left[ n + \alpha \sum h_i + \beta \sum h_i^2 + \gamma \sum h_i^3 + \gamma_1 \sum DV_1 h_i (h_i - t_1^*)^3 + \gamma_2 \sum DV_2 h_i (h_i - t_2^*)^3 \right] + 100 \left[ 1 + \alpha h_n + \beta h_n^2 + \gamma h_n^3 + \gamma_1 DV_1 h_n (h_n - t_1^*)^3 + \gamma_2 DV_2 h_n (h_n - t_2^*)^3 \right] + e \quad (6)$$

where  $P$  is the clean price,  $AI$  is the accrued coupon,  $n$  is the total number of coupons left,  $h_i$  is the date to the first coupon,  $i=1$  to number of coupons left to maturity i.e  $n$  and  $h_n$  is the date of the last cash flow.  $DV$  represents dummy variables representing the spline knots if time left to

maturity of the bond is greater than  $t_{(j)}^*$ . Taking a large cross section of bonds in a market at a point in time with differing market prices, of diverse coupons and times to maturities and using regression allows the estimation of  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\gamma_1$  and  $\gamma_2$  using (6). The error term in the regression ensures that random effects are captured. Repeating this exercise over time ensures a time series of  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\gamma_1$  and  $\gamma_2$ .

### **III. Data Set and The Research Methodology**

The data to model the term structure and obtain market prices of Indian bonds was obtained from the Handbooks published by the International Securities Market Association (ISMA), which was formerly known as the Association of International Bond Dealers (AIBD). The criteria for choosing bonds to model the risk-less term structure was finding a sample set, usually of not less than 50 bonds<sup>100</sup> from the supranational class<sup>101</sup>, in the individual markets, with AAA rating.

The number of bonds in the sample set used to estimate equation (6) represented a large sample of over 50, at the very least, as it was felt this would carry the desirable asymptotic qualities of consistency and sufficiency. The economic criterion was to get an equal number of bonds with term left to maturity of three years, three to six years and over six years in order to meet the requirements of defining a term structure. In addition the market prices of straight Indian bonds issued by public sector and quasi public sector borrowers<sup>102</sup> were also observed. The fixed rate Indian issues in the euro market in the study are given in yen, US dollar and DM and were of various amounts and maturities.

We proceed in three steps. First, we apply McCulloch's cubic spline methodology (1971, 1975a and b) to the wide selection of AAA rated supranational bonds in the currency markets in which Indian companies had issued the eurobonds - the U.S Dollar market, the Yen market and the DM market<sup>103</sup> - in order to estimate the international term structure of

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<sup>100</sup> Most studies like Brown and Dybvig (1986) use the same dataset. However, even when the currency market was the same, in this study, the data set was varied to enable the use of very short bonds. This was to prevent the underestimation of the very short end of the yield curve to the extent of the time between June 1990 and September 1992. The June 1990 observations would have had to otherwise include observations at least 27 months away from maturity.

<sup>101</sup> In the euro-market there is no single risk-less government issuer unlike national markets.

<sup>102</sup> There were no direct sovereign issues made but the above corporate bodies were under the control, management and ownership of the Government of India and were guaranteed by it. Apart from ONGC, all of them are financial institutions.

<sup>103</sup> ISMA handbooks devote a separate section to the U.S. dollar and the DM supranational markets; but do not give an isolated listing under the Japanese yen supranational market. However supranationals have been



interest rates. This exercise was done on a cross-sectional basis using equation (6) for each of the markets, thus giving rise to three currency yield curves at a point in time. Repeating this over time generated a time series of US\$, yen and DM yield curves. We then apply this structure to the selection of Indian Eurobonds to estimate their “theoretical riskless price”. Finally, we use these “theoretical riskless prices” to analyze investor behavior and risk perception towards India, reflected in the actual market prices of the bonds.

The data sets were quarterly from the last Friday of the months starting from June 1990 till September 1992. The time period was chosen for years when the same subset of Indian bonds was in existence throughout. We also considered the Fung and Rudd (1986) argument that the time period should not be too close to the issue date of any bond, since these prices often mirror issue costs along with interest-rate driven price movements.

We used two spline knot points of three and six years (see equation 5). The choice of these two points was based more on lines of economic intuition than any 'golden rule'<sup>104</sup>. The Eurobond market tends to bonds with a life of ten to twelve years unlike domestic markets where bonds exist with much longer terms to maturity. Thus, we reasoned that the break points for investor perceptions of uncertainty, liquidity and risk could reasonably be represented as relatively short term: up to three years, relatively medium term: between three and six years, and relatively long term: above six years.

Bond prices are quoted clean in the Eurobond market i.e. they are quoted free from any accrued coupon in order to facilitate yield comparisons. The actual sale is on the basis of the dirty price i.e. the clean price cum accrued interest<sup>105</sup>. In order to take this into account, dirty prices were computed accordingly, on the basis of days the bond was not held by the buyer. The ask prices were used to compute the dirty prices.

Ordinary Least Squares regressions were run on SHAZAM to estimate the parameters alpha ( $\alpha$ ), beta ( $\beta$ ), gamma ( $\gamma$ ), gamma1 ( $\gamma_1$ ) and gamma2 ( $\gamma_2$ ) in equation (6) using observed values of prices, coupons and times to maturity. We computed the discount curve in equation 5 for twelve years and the spot rate curve.

The parameters describing the term structure were used to find the implied or theoretical risk free prices of Indian bonds. These prices reflect how the market would price the Indian

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reasonably active under this market and indeed prior to 1984 they were the ones who met the stringent conditions laid down by the Ministry of Finance of Japan. There were very few corporate borrowers.

<sup>104</sup> McCulloch (1971) suggested that the number of knots should be based on trial and error and may be equal to the square root of the number of bond observations.

<sup>105</sup> See equation 1.

bonds, if India enjoyed the same risk-less stature as the supranationals. The comparisons between these theoretical benchmark prices and the actual market prices, hence, provides a first estimate of the inherent risk associated with each individual bond. The risk estimated in this way reflects the particular characteristics of each bond as well as the country risk involved. Larger discounts on the observed market prices, however, do not necessarily indicate increased country risk. The discount could be due to the particular characteristics of the bond in question. Thus, we must try to distinguish between discounts due to the structure of the yield curve and the particular bond characteristics and discounts due to investor reaction to perceived political risk.

#### *IV. Summary of Results*

Five parameters were estimated for the regressions from equation 6. The results of the 30 regression coefficients viz. the three currency markets over ten time periods are available in tabular form. The results of the Breusch Pagan Test showed that the null hypothesis of homoscedasticity could not be rejected in most cases at the 10% significance level<sup>106</sup>.

The estimated coefficients were usually negative and highly significant for  $\gamma$ . Similarly the  $\beta$ 's were mostly negative. The  $\alpha$ 's were positive in many cases. Generally for the dollar and the yen markets the first dummy variable was negative while in the DM market it was positive. These parameters were subsequently used to estimate the discount functions (equation 5) and the yield curves.

Not all the parameters were statistically significant. The fit between the spot rates for dollar, yen and DM computed for a year and the market interest rates for these currencies are good. The correlation between the 6 month eurodollar interest rates and the corresponding theoretical rates is 0.986, between German Lombard rate and the theoretical one year DM spot rate is 0.891 and for the Japanese long term prime rate and the implied one year euro-yen spot rate it is 0.922.

The shape of the two ends of the yield curves seemed satisfactory after investigations. Using the parameters from equation 6, the implied prices of Indian bonds were calculated given their payoff structure and length. In all 80 observations were collated (10 quarters  $\times$  8 bonds) from thirty yield curves (3 currency markets  $\times$  10 quarters); three bonds in the dollar market, one in the yen market and four in the DM market. These implied or theoretical

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<sup>106</sup>Results are available from the authors and are not shown in this paper due to space constraints.

prices thus had the same coupon and time left to maturity as the original Indian bonds but the discount factors emanated from a risk free market. The model overvalued the market (dirty) prices of Indian bonds in every instance (except four), as expected, as even in times of relative risk free environment, India's risk was never perceived to be as low as that of the supranationals. For every bond, the average theoretical prices were higher than those of the corresponding market prices. It is interesting that short-term interest rates were generally decreasing for the dollar and the yen while mark rates were mixed. It is also interesting that the discount on the actual bond prices with respect to the theoretical price was at first increasing and then decreasing over the period. The change in the discount could be due to variations in the risk premium. On the other hand, it could also be due to variations in the term structure or some combination of the two. Since there is no risk premium associated with the theoretical price because it is estimated with the riskless term structure, the theoretical price will vary only with respect to the particular bond characteristics or variations in the term structure. To see to what extent the discount is due to the structure of the yield curve and the particular bond characteristics we test the actual prices with respect to the theoretical prices (8 bonds X 10 time periods) in the equations

$$P = a_0 + a_1 T + \varepsilon \quad (7)$$

$$dP/P = a_2 + a_3 dT/T + \varepsilon \quad (8)$$

where  $P$  is the actual market price,  $T$  is the theoretical price, and  $\varepsilon$  is the error term.

In table 1, panel A shows that variations in the theoretical bond price explain almost 97% of changes in the actual market price. Both the constant and estimated coefficient is highly significant with p-values close to zero. Panel B confirms this result and shows that 87% of percentage changes in  $P$  are explained by the percentage changes in  $T$ . This suggests a strong and stable relationship between the two over the period and leaves very little scope for variations in prices due to changes in the country's perceived creditworthiness.

To confirm this we use dummy variables to account for changes in perceived riskiness. One the first change had any impact while others were insignificant. Thus, we conclude that there is no perceptible risk effect on the market price of the bonds.

### **Table 1 Regressions results**

<p><b>Panel A</b></p> <p>1. <math>P = a_0 + a_1 T + \varepsilon</math></p> <p>BUSE [1973] R-SQUARE = 0.9691  DURBIN-WATSON = 1.9015  AKAIKE (1973) INFORMATION CRITERION - LOG AIC = -0.17432  SCHWARZ (1978) CRITERION - LOG SC = -0.11477</p>		
<b>Variables <math>a_0, a_1</math></b>	<b>T ratio</b>	<b>P value</b>
31.188	23.02	0.00
0.64385	49.43	0.000
<p><b>Panel B</b></p> <p>2. <math>dP/P = a_2 + a_3 dT/T + \varepsilon</math></p> <p>BUSE [1973] R-SQUARE = 0.8699  DURBIN-WATSON = 1.8870  AKAIKE (1973) INFORMATION CRITERION - LOG AIC = -0.175  SCHWARZ (1978) CRITERION - LOG SC = -0.11322</p>		
<b>Variables <math>a_0, a_1</math></b>	<b>T ratio</b>	<b>P value</b>
-0.0052596	-1.847	0.069
0.79192	21.63	0.000

## ***V. Conclusions***

In this paper we analyze India's response to its liquidity crisis from 1990-1992 in terms of how successful it was in maintaining the country's creditworthiness, which we measure as the risk premium associated with guaranteed Indian foreign currency bonds on the secondary market. To this end, we estimate risk free term structures from observed bond data of supranational borrowers over the period, which we then apply to the Indian bonds as a means of estimating their "theoretical riskless price". We find that the price discount, defined as the difference between the observed and the theoretical prices, did indeed increase during the crisis but that this increase was due to sensitivity to changes in the term structure rather than to any perception of increased risk on the part of bond investors. Furthermore, the rating downgrades by international agencies over the period contribute nothing to explaining secondary market prices and only one of the three is

significant. We conclude that the Indian authorities were successful in maintaining the country's creditworthiness throughout the liquidity crisis.

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## **Exchange Market Pressure and Reserve Fluctuations: The Mid 1990s Mexican Experience**

EDWARD GHARTEY

**University of West Indies, Jamaica**

The peso crisis that occurred in Mexico following the devaluation of the national currency in December 1994 has been widely studied by international financial institutions and economists, probably because of the size of the country, its position as a then new member of the North American Free Trade Area (NAFTA), and the herd like effect the crisis had on countries south of it (what is also dubbed as the Tequila effect), not to mention, even the experience of South-East and East Asia and Eastern Europe in its aftermath. Unfortunately, there is no clear consensus as to the primary cause of the crisis. Two incidences that indubitably precipitated the crisis that brought Mexico to the verge of outright financial crisis are the enormity of the destabilizing activities of speculators and the 15% devaluation of the peso above what was originally intended on 20 December 1994. In this paper, we seek to find out after the fact, the mechanism by which exchange market pressure was being released in 1995, and measure the effectiveness of the sterilized intervention, which the monetary authority (MA) employed to avert the destabilizing speculation. Hopefully, the study can shed more light to collaborate or reject some of the many varying views that have been attributed to the peso crisis.

Following the introduction is a brief review of the causes of the crisis in section 1. In section 2, the exchange market pressure and international capital flow models are developed. The empirical evidence is presented and discussed in section 3, and the study is summarized and concluded with some policy recommendations in section 4.

### **1. Activities before December 1994**

In no year in the history of Mexico has there been a flurry of activities that fed speculation as it was in 1994. Francisco Gil-Diaz and Augustin Carstens (1996) argue that these activities that can be summed as financial reform, political shocks, and external factors are the primary cause of the peso crisis. The speculative pressure on the peso started in 1993 when the US Congressional debates placed Mexico's accession to NAFTA in doubt. This was followed by the 1994 election, its associated

campaigns and accession of Mexico to the NAFTA. It was further intensified by the Chiapas' insurrections to influence the outcome of the 1994 election.

In March 23, 1994, Luis Donaldo Colosio, the incumbent political party's presidential candidate was assassinated, and a month later the destabilizing activities of speculators had to be fended off by the MA through intervention which according to Gil-Diaz and Carstens (1996) raised the Cetes (domestic denominated bond) interest rates - London interbank offer rates (LIBOR) differential above 10%. Amidst this development, the government which was bent on gaining entry to NAFTA introduced financial reforms by abolishing the reserve requirement rate, the withholding tax rate on foreign borrowing, and restrictions on foreigners to hold Mexican government bonds (Cetes, Bondes and Tesobonos) by liberalizing the capital market. As a result, the treasury bills' rates and the average cost of funds fell from 34.8% and 37.1%, respectively, in 1990 to 14.1% and 15.5%, respectively, in 1994. From 1990 - 1994, the narrow and broad money supply, M1 and M2, grew by 221.5% and 104.6%, respectively.

However, as these sweeping liberalization policies were not preceded by sound regulatory and supervisory machinery, the laxity in banking safeguards and in prudential practices caused the public sector loan - GDP ratios from Development Banks to grow by 3.6% from the 3% in 1993, and private expenditure as a percentage of GDP grew by 5.9% in December 1994, which increased moral hazard problems. These hurried reforms in the midst of an election campaign were indirect-attempts to reflate the economy without monetizing the fiscal deficit to surreptitiously influence the electorate. There was fiscal expansion as argued by Paul Krugman (1995), as the budget surplus fell from M\$46,921m in 1992 to a deficit of M\$386m in 1994, although Gil-Diaz and Carstens (1996) argue that the public expenditures - GDP ratios fell by 0.5% in 1994. Household and government consumption expenditures grew by 97.6% and 165%, respectively, from 1990 - 1994. See Table 1.

Guillermo A. Calvo and Enrique G. Mendoza (1996) cite "... surging capital inflows, combined with radical financial liberalization, induce a lending boom in a set up prone to financial fragility." The financial fragility resulting from the politically induced financial reforms in 1994 was grounded on a soil of moral hazard which was watered by the pegged exchange rate and the MA's readiness to intervene to defend the banks which were actively selling Tesobonos (dollar-denominated bonds) to foreigners who

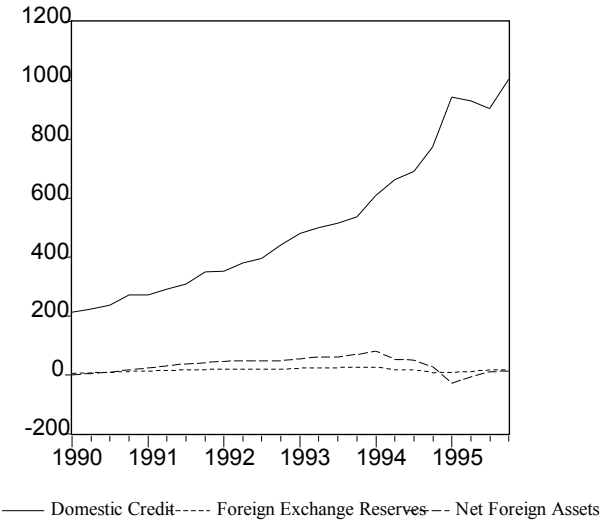
were mostly US nationals. Calvo and Mendoza (1996) argue that the Mexican debt was 5.5 times larger than its net international reserves, and the foreign denominated debt (Tesobonos) was about twice the net international reserves in 1994. See also Ronald I. McKinnon and Huw Pill (1996). The foreign exchange reserves of US\$25.9b in the first quarter of 1994 dropped to US\$6.3b below the US\$10b which was the required Bank of Mexico's minimum threshold of tolerance by the close of 1994, making it inadequate to support sterilized intervention. In such a situation, it became futile for the MA's to intervene the foreign exchange market to defend the peso. So even though Gil-Diaz and Carstens (1996) pointed to a smouldered Chiapas' insurrection and accusations of a former Assistant Attorney General, *inter alia*, as important factors to tip off speculation, that news

**Table 1: Important economic indicators**

Year	BB (M\$b)	HCE (M\$b)	GCE (M\$b)	CAB (US\$b)	OB (US\$b)	M1 (M\$b)
1990	-18.67	514.12	61.95	-7.45	2.22	50.95
1991	27.69	669.16	86.16	-14.89	7.97	113.63
1992	46.92	808.12	111.75	-24.44	1.74	131.73
1993	6.45	903.17	138.56	-23.40	7.23	157.04
1994	- 0.39	1016.13	164.16	-29.66	-17.20	163.83

Notes: BB is balance budget, HCE is household consumption expenditure, GCE is government consumption expenditure, CAB is current account balance, OB is overall balance, M1 is narrow definition of money supply, b is billions, m is millions, and M\$ is Mexican pesos. The data is taken from Washington based International Monetary Fund's (IMF) Financial Yearbook 2000.

Figure 1: Graphs showing domestic credit, foreign exchange reserves and net foreign assets in billions, 1990:1 - 1995:4. alone could not have been the cause of the peso crisis that followed in December 1994



following a renewed rumor of Chiapas' insurrection. The country was simply ill prepared to defend the peso with sterilized intervention because of the events outlined above<sup>107</sup>, and according to Pedro Aspe Armella (1995) there were several attempts by the MA's to sterilize the exchange rate. But the nagging question is, did sterilize intervention succeed to stabilize the peso in 1993 but failed in 1994? Was the pesccrisis caused by the Mexican government's mistaken adherence to pegged exchange rate, a regime which although useful in fighting inflation in the 1980s<sup>108</sup>, simply outlived its usefulness in 1994 as argued by Sachs (1996)? Could different timing and margin of the devaluation have succeeded to ease off the exchange market pressure to avert the ensuing peso crisis? These issues are examined from the empirical evidence.

## 2. The Models

The exchange market pressure (EMP) model developed by Lance Girton and Don Roper (1977) is employed to estimate the optimum exchange rate regime and the degree of monetary autonomy. We shall also test how exchange rate and official settlements or foreign reserves adjusts simultaneously, and the role of sterilized intervention during the period.

A stable money demand for Mexico is specified as a function of real income (Y) and national price (P) as

$$L = L(P, Y, \mathbf{X}, \epsilon), \quad *L/*P > 0, \quad *L/*Y > 0 \quad (1)$$

Interest rate is eliminated from the specification to avoid introducing simultaneous equation bias problem in the analysis since capital flows affect domestic interest rate. See Pentti J.K. Kouri and Michael G. Porter (1974). Equation (1) is a version of the classical money demand function,  $\epsilon$  is the error term, and  $\mathbf{X}$  is a vector of other relevant variables, which is added to improve the functional form of the model. There

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<sup>107</sup>See Calvo and Mendoza (1996), McKinnon and Pill (1996), Jeffrey D. Sachs, Aaron Tornell and Andres Velasco (1996) and Krugman and Maurice Obstfeld (2000).

<sup>108</sup>The exchange rate was fixed only in 1987 as a part of extensive reforms and exchange rate policies to reduce inflation from its peak of 159% in 1987 to 7% in the last quarter of 1994.

is no a priori restriction imposed on it.

The money supply is specified as a function of domestic credit (DC) and net foreign assets (FA) and is consolidated from the banking system. The liabilities of the banking system are consolidated from the central and private banks and are denoted by the money stock (M). The resulting identity is

$$M = FA + DC \quad (2)$$

The purchasing power parity is introduced as

$$E = P/P^f \quad (3)$$

where E is the nominal exchange rate which describes the peso denominated value of the US dollar, and  $P^f$  is the foreign or US prices. The US is used as the reserve country, and as compared to Mexico in the NAFTA, the latter is assumed as a small country despite its absolute size. Thus, it is assumed that in case of any need for official settlement adjustment, Mexico will be forced to bear the burden of adjustment.

By invoking the Walras Law, the monetary inter reaction when money supply is equal to demand yields

$$FA + DC = L(P, Y, X, \dots) \quad (4)$$

The demand for money component of equation (4) is log-linearized to obtain

$$\Delta fa + \Delta dc = \Delta p + \Delta y + \Delta x + \dots$$

(5)

where  $\Delta fa = \Delta FA/PY$ ,  $\Delta dc = \Delta DC/PY$ , and the small case letters are logarithmic form of P and Y. Note that we have deflated  $\Delta FA$  and  $\Delta DC$  by GDP instead of  $(FA + DC)$  which was used by Girton and Roper (1977). This is a modeling procedure employed to obtain reasonable results.<sup>109</sup> By substituting for P with the purchasing power parity expression into equation (5) and for X with a first quarter seasonal dummy (s1), a

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<sup>109</sup>The regression of  $\Delta FA/GDP$  on  $\Delta DC/GDP$  yields the same coefficient as the regression of  $\Delta FA/(FA + DC)$  on  $\Delta DC/(FA + DC)$  or  $\Delta FA$  on  $\Delta DC$ . The choice of deflator or specification is a modeling procedure to minimize the variance between foreign reserves and domestic credits.

crisis dummy (DUMMY), and the national inflation rate, and re-arranging the results, we obtain the following EMP model:

$$\Delta e = -\delta \Delta c + \beta_0 \Delta p^f + \beta_1 \Delta y - \beta_2 \text{DUMMY} + \beta_3 \Delta s - \beta_4 \Delta p + \epsilon \quad (6)$$

where all the parameters are non-negative,  $\epsilon$  is the error term, and the offset coefficient  $\delta$  is unity and measures the extent of monetary policy independence in the country. A significant unit coefficient of  $\delta$  with the rest of the explanatory variables insignificant will mean that if the Mexican MA increases money growth, then they should either allow the peso to depreciate or lose foreign reserves or have a combination of depreciation and loss of foreign reserves. If the Mexican MA increases their base money by buying domestic assets through open market operations, then they can maintain their exchange rate only if they raise the foreign reserves to the same extent as the initial increase in the base money. Thus, under a pegged rate, the Mexican MA's scope to pursue independent monetary policy will be restricted.

Equation (6) also conveys the message that an increase in real income and foreign inflation rates, and a fall in national inflation rates and crisis dummy, all other things being equal, will either cause the exchange rate to appreciate or there will be inflow of foreign reserves or combination of both.

The sensitivity of the EMP to its composition allows us to measure and test the reaction of the Mexican MA, and it is calculated by adding the ratio of  $MW = \Delta e / \Delta c$  to the expression in equation (6). If the coefficient of MW is negative and significant, then all other things being equal, the EMP is sensitive to its composition, meaning that the Mexican MA should ease off exchange market pressure by losing reserves assuming that the underlying exchange rate is pegged. If the coefficient is positive and significant, then the EMP must be released by depreciation under a floating rate or devaluation under a pegged rate. An insignificant coefficient of MW irrespective of the sign means that the EMP is removed by combination of both devaluation and loss of foreign reserves.

Sterilized intervention is modeled after the studies of Kouri and Porter (1974), and Obstfeld (1982). International capital flow (ICF) as a mechanism for removing excess money demand is expressed as a function of change in domestic money -

GDP ratio ( $\Delta dc$ ), growth in foreign real income, change in current account balance - GDP ratio (CUR), foreign inflation rate, and first quarter seasonal dummy.

$$\Delta ICF = \alpha_0 + \alpha_1 \Delta dc + \alpha_2 y^f + \alpha_3 CUR + \alpha_4 p^f + \alpha_5 s1 + \epsilon \quad (7)$$

where, ICF is the change in capital account balance to GDP ratio, and  $\epsilon$  is the error term. The rest of terms maintain their definitions. Interest rates are removed from the above equation also to avoid simultaneous equation bias problem. The complete offset coefficient which is measured by  $\alpha_1$  is minus unity. Jerry A. Hausman's (1978) test is used to measure sterilized intervention formally by adding the forecast values of  $\Delta dc^R$  which is the least squares regression of  $\Delta dc$  on the instrumental variables consisting of domestic credit, real income, prices, foreign prices, first quarter seasonal dummy, and intercept term to equation (7).

The data sources are the various issues of the IMF Financial Yearbooks, and the web site of the Federal Reserve Bank of St. Louis, over the period 1970.1 to 1998.4.

### 3. The Empirical Evidence

The empirical evidence of the EMP is reported in Table 2. The leading equation in Table 2 is DIV which is the dynamic two stage least squares (2SLS) estimated by instrumental variables using the method of W.K. Newey and K.D. West (1987) which employs the more general Parzen's windows to yield a more general positive semi-definite covariance matrix when the residuals of regression contain different forms of heteroscedasticity and autocorrelation. The EMP model is well explained by changes in domestic credit, foreign and national inflation rates, growth in real income, the first quarter seasonal dummy, a crisis dummy variable to capture events during 1974.1, 1982.1, 1982.4, 1984.1, 1991.4, 1992.1, and 1994.4. The periods, 1974.1 and 1991.4 represent financial liberalization; 1982.1 and 1992.1 represent the beginning of banking crisis; 1984.1 represents the peaking of the banking crisis; 1982.4 and 1994.4 represent the closest balance of payments crisis. See Graciela L. Kaminsky and Carmen M. Reinhart (1999).

The inflation rate, change in domestic credit, and crisis DUMMY variable lead



to outflow of foreign reserves and/or depreciation of the Mexican peso, while foreign inflation and growth in real income and the first quarter seasonal dummy lead to inflow of foreign reserves and/or appreciation of the Mexican peso. The results are confirmed by all five estimators, namely: least squares (LS), Cochrane-Orcutt iterative technique (CORC), dynamic least squares (DLS), two-stage least squares using instrumental variables (IV), and DIV. This means that the auto correlation problem revealed in the least squares estimates do not change the primary implications of the EMP estimates. There is no serious simultaneous equation bias problem in the LS results either, as the results are very consistent with the estimates from both the IV and

DIV. The estimates of the sensitivity of EMP to its composition using  $\Delta dc$ ,  $\Delta p^f$ ,  $\Delta p$ ,  $\Delta y$ , DUMMY,  $s_1$ , intercept,  $MW(-1)$  and  $MW$  as instrumental variables is

$$\begin{aligned} \Delta fa - \Delta e = & -0.131[0.70]\Delta dc + 2.236[2.33]\Delta p^f - 0.461[2.86]\Delta p \\ & + 0.114[0.77]\Delta y - 0.158[2.37]DUMMY + 0.028[1.13]s_1 \\ & - 0.032[1.09] - 0.006[8.92]MW \end{aligned} \quad (8)$$

It is also clear that from the EMP estimates, the sterilized intervention is very weak in both magnitude and significance. The offset coefficient in Table 2 and equation (8) ranges from - 0.131 to - 0.095 and are insignificant meaning that monetary policy in Mexico was not autonomous.

To study the sensitivity of the EMP to its composition, the ratio of exchange rate to foreign assets denoted by  $MW$  is added to the EMP model and estimated. The result in equation (8) shows that the exchange market pressure model is sensitive to its composition. Exchange market pressure is removed by the loss of foreign reserves, but the result is weak in magnitude, albeit, it is highly significant. It is important that for Mexico to successfully peg or fix the peso, it must have substantial foreign reserves to intervene the market. Unfortunately, the weak offset coefficients and the - 0.006 coefficient of the sensitivity of EMP to its composition mean that Mexico's policy to sustain the removal of EMP by losing reserves to maintain its pegged exchange rate within the band by market intervention is otiose. Thus, without

an adequate significant sterilization of external shocks, when the foreign reserves dropped to US\$6.3b by the end of 1994 because of adverse speculative activities initiated by international investors following the expectation of rising treasury bills' rates in the US at the beginning of 1994, the balance of payments deficits became unsustainable so the country capitulated and plunged to the near brink of financial crisis in the mid-1990s.

It is important to note that from the empirical evidence, the EMP need not to have been triggered off exclusively by external shock such as foreign interest rates hike. Any of the political events that occurred in 1994 could have set the country on the course of near financial crisis, as the MA could not adequately sterilize any loss of reserves. During the period in question, foreign interest rates began to rise, and the US economy was enjoying periods of tranquility and growth, to the extent that international portfolio managers' interest in emerging markets including Mexico's securities began to wane. It must also be noted that, maintaining the exchange rate at the ceiling of the band as argued by others could not have been the exclusive reason behind the crisis. No exchange rate regime nor level and duration of devaluation of the peso, could have averted the crisis, as the MA was incapable to sterilize loss of reserves, and the reserves available to the country were limited.

Additionally, the capital flow result of the dynamic 2SLS using  $\Delta dc$ ,  $\Delta p^f$ ,  $\Delta y^f$ ,  $\Delta y$ , intercept,  $s_1$ ,  $s_2$ , and CUR as instrumental variables yields

$$\Delta ICF = -0.11[3.9]\Delta dc - 0.64[2.0]\Delta p^f - 0.63[1.6]\Delta y^f + 0.00[1.7]CUR - 0.00[0.1]s_1 + 0.10[10.2] \quad (9)$$

**The result shows that the current account deficit during the period could not have contributed to the crisis because its effect was negligible as judged by its near zero insignificant coefficient. This finding is consistent with Gil-Diaz and Carstens (1996) arguments that current account deficits could have been easily financed by the capital account surplus as the overall balance of payments was in a surplus in Table 1 until 1994, a period of unusual speculative pressure.**

The DIV result which is tested by using Hausman's method is estimated by 2SLS using

**Table 2: Estimates of exchange market pressure model**

Vars.	LS	CORC	DLS	IV	DIV
$\delta$	- 0.095 [1.08]	- 0.126 [1.36]	- 0.095 [0.47]	- 0.097 [1.10]	- 0.097 [0.48]
$\rho^f$	2.496 [1.85]	1.861 [1.12]	2.496 [2.19]	2.064 [1.47]	2.064 [2.00]
$\rho$	- 0.484 [2.47]	- 0.452 [1.77]	- 0.484 [2.80]	- 0.491 [2.51]	- 0.484 [2.85]
$\gamma$	0.465 [1.26]	0.544 [1.44]	0.465 [1.38]	0.464 [1.26]	0.465 [1.41]
DUMMY	- 0.140 [3.17]	- 0.154 [3.26]	- 0.140 [2.60]	- 0.160 [3.36]	- 0.140 [2.57]
s1	0.057 [1.70] <sup>c</sup>	0.059 [1.90]	0.057 [1.62]	0.056 [1.67]	0.057 [1.60]
int	- 0.054 [1.83]	- 0.047 [1.27]	- 0.054 [1.48]	- 0.047 [1.56]	- 0.054 [1.37]
R <sup>2</sup>	0.28	0.29		0.28	
DW	1.56	1.99		1.574	
F	6.54	4.41		6.69	
$\Pi^2_{SC}$	6.35			6.11	
$\Pi^2_{FF}$	0.75			0.18	
$\Pi^2_N$	66.48			61.02	
$\Pi^2_H$	6.79			7.68	
$\Pi^2_{SG}$				0.07	

Notes: LS is least squares, CORC is Cochrane-Orcutt iterative technique, DLS is dynamic least squares, IV is a 2SLS based on instrumental variables, and DIV is dynamic 2SLS based on instrumental variables.  $\Pi^2_{SC}$  based on the Lagrange multiplier test of residual serial correlation,  $\Pi^2_{FF}$  is based on Ramsey's RESET test using the square of the fitted values, and  $\Pi^2_H$  is based on the regression of squared residuals on squared fitted values, and  $\Pi^2_{SG}$  is based on Sargan's. The instruments are  $\delta$ ,  $\rho^f$ ,  $\rho$ ,  $\gamma$ , DUMMY, s1, intercept, and MW(-1). DLS and DIV are the dynamic least squares and 2SLS based on Newey-West adjusted standard errors and Parzen weights. R<sup>2</sup> is the adjusted coefficient of determination, and DW is Durbin-Watson statistic. DLS and DIV based on Newey-West adjusted standard errors Parzen weights. DUMMY = 1 for 1974.1, 1982.1, 1982.4, 1984.1, 1991.1, 1992.1, and 1994.4; and zero otherwise.

$\Delta dc$ ,  $\Delta p^f$ ,  $\Delta y$ , intercept,  $s_1$ ,  $s_2$ ,  $\Delta dc^R$ , and CUR as instruments and is reported as

$$\Delta ICF = -0.78[2.0]\Delta dc - 2.35[2.0]\Delta p^f - 0.16[0.3]\Delta y^f - 0.00[0.5]CUR \\ - 0.03[2.1]s_1 - 0.20[3.4] + 0.70[1.7]\Delta dc^R \quad (10)$$

The result shows that the current account deficit is easily financed by the capital account inflow; besides, its magnitude is closer to zero to threaten the capital inflow to the Mexican economy.

The offset coefficient from equation (10) is -0.78, which compares favourably with -0.77 results of Kouri and Porter (1974) for West Germany, although Obstfeld (1982) obtained -0.62 for West Germany. There is a clear indication of sterilization bias in Mexico, as the coefficient of  $\Delta dc^R$  is 0.70 and is significant at 0.10 levels although it is less than the 0.78 magnitude of the offset coefficient, which compares poorly with the exact coefficient of 0.62 obtained by Obstfeld (1982) for West Germany. Thus, Mexico's monetary policy is not autonomous from foreign monetary developments, although its sterilization power was weak. With inadequate foreign reserves, huge proportion of liabilities in foreign currency, and the buoyancy of the financial market in the US, the MA in Mexico could not sterilize to fend off loss of reserves forced upon the country by speculators. Households in fear of losing their assets' value disposed off domestic bonds for foreign currency<sup>110</sup> to reduce private bond holdings, thereby increasing the bank domestic credits. See Figure 1. The resulting speculative pressure exacerbated the capital outflow, which resulted in loss of foreign reserves and precipitated a balance of payment crisis as the overall balance surplus of US\$7.2m in 1993 plunged into a deficit of US\$17.2m in 1994. As a result, the country experienced a credit crunch, which increased asymmetric information, bankruptcies, and was driven to a near financial crisis.

#### 4. Conclusion

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<sup>110</sup>Foreign currency rose to its peak at M\$193.9b in 1994 from M\$53.1b in 1993, a growth rate of 265%.

There is no monetary autonomy in Mexico based on the result of the offset coefficient. The country's monetary policy is dependent on foreign monetary developments. There was sterilized intervention as admitted by Armella (1995), but it is either weak and/or ineffective.

The empirical evidence from the insignificance of the offset coefficient indicates that increase in domestic credit has insignificant effect on removing exchange market pressure by both loss of reserves and devaluation. Monetarist views are insignificantly validated by the result. The decomposition of the EMP shows that excess pressure is removed by reducing reserves. Devaluation of the peso was ineffective in removing exchange market pressure as suggested by other studies. This means that a fixed exchange rate was optimal, so neither the crawling peg regime nor the other managed float regime classified by the IMF in September 1993 caused the peso crisis. Rather, it was the imbalance between the foreign denominated short-term debt and net foreign reserves that was the dominant problem.

The 1993 sterilized intervention succeeded not because monetary policy was effective but because the capital inflow raised foreign reserves to US\$30b. In December 1994, the capital inflow had dropped to US\$5b, which could not have supported the sterilization policy.

Additionally, the foreign owners of Tesobonos were jittery and there was also a rising expectation of the US treasury bills' rates, which made Mexican securities less attractive to international investors; and the growing Mexican government spending that reduced the national budget from a surplus into a deficit in 1994 only added to a dreary future to investors. This mindset and the rising political and country risks exacerbated the imbalance causing speculators to drive the peso into crisis of such magnitude as experienced by Mexico with its herd like effect. It is a little wonder that with Clinton's Administration and IMF's US\$50b loan assistance in foreign reserves in 1995, Mexico recovered from the peso crisis rather quickly.

Considering that Mexico is now a full member of the NAFTA, dollarization or any credible exchange rate regime that will avert the future occurrence of an

imbalance between short-term debt and foreign reserves will be a part of the solution to deal better with such a future exchange rate crisis with its attending herd like characteristic.

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# TRADE FLOWS IN THE CONTEXT OF THE NORTH AMERICAN FREE TRADE AGREEMENT

ARTURO GUILLÉN

Universidad Autonoma Metropolitana, Iztapalapa, Mexico

## 1. Introduction

The objective of this paper is to analyze trade flows between the United States, Canada and Mexico from 1980-1998. I would like to evaluate changes to the size and structure of these trade flows, since the application of policies focused on opening up trade in Canada and Mexico in the 1980s and, specifically, since the North American Free Trade Agreement (**NAFTA**) went into effect in 1994. Furthermore, I would like to analyze the impact of economic opening and the **NAFTA** on economic development and the wellbeing of its populations, particularly in the case of Mexico.

## 2. Main Hypotheses

- a) International trade is not a subject among equal partners, exchanging goods or services according to comparative advantages or the endowment of productive factors, but a relationship between unequal States and economic agents.

Economic firms from each country and within the region are different in their size, bargaining power and in the very relationship they maintain with their respective States (Perroux, 1961) <sup>1</sup>.

According to a new theory of international trade (Krugman, 1979) <sup>2</sup>, trade flows are not determined by the comparative advantages of production costs but by the increasing profits enjoyed by transnational companies. These profits are derived from *internal economies of scale* (determined by the firm's size) and from **external economies of scale** (dependent on agglomeration processes in the sector they operate in), where the role of the State is vital in several forms.

- b) The driving forces behind **NAFTA**, defining the terms of the agreement, were highly globalized capital fractions from the United States and Canada, as well as the larger Mexican groups and transnational companies that operated in its domestic market.

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<sup>1</sup> Francois Perroux (1961). *L' Economie du XXe siècle*. Grenoble, 1991, Presses Universitaires de Grenoble. 814p.

<sup>2</sup> Paul Krugman (1979). *Increasing Returns, Monopolistic Competition and International Trade*. Journal of International Economics.



- c) In the international arena, **NAFTA** was not negotiated between equal partners, but by one single nation, the United States—not only dominant on a regional scale, but also a hegemonic on a global one—with 1) Canada, a developed nation, but still dependent on the United States; and with 2) Mexico, an underdeveloped nation, historically dependent on this hegemony's power and in a situation of structural crisis since the 1970s.
- d) Mexico, Canada and the United States constitute, in Krugman's own words (1991)<sup>3</sup>, *a natural economic space*, that is to say an area within which intra-regional trade is more intense than trade with the rest of the world. Mexico and Canada's commercial and financial dependency on the United States is nothing new. The **NAFTA**—as the US-Canada Free Trade Agreement (**FTA**)—only constituted a legal instrument, through which the integration process was formalized. For geographic, strategic and historical reasons, these countries became the preferred areas of US power.
- e) **NAFTA** is not a classic free trade agreement, since it incorporates a set of rules for the operation of globalized capital (national treatment to direct foreign investment, the elimination of performance requirements to this investment, the opening up of services, property rights, and unrestricted opening up of capital account), which the United States and globalized capital have attempted to promote in other forums and instances, such as the World Trade Organization (**WTO**), the Organization for Economic Cooperation and Development (**OECD**), etc. (Weintraub, 1997; McDougall, 2000)<sup>4</sup>.

### 3. The Extent of Economic Opening in the North American Countries

The opening up of the American continent's economies over the last two decades has been a generalized phenomenon. From 1990-1996 exports from Latin America increased by 73%, with imports increasing more rapidly at 127%. These figures represented 20% of the GDP, when in 1990, they barely amounted to 10% of the GDP (Devlin and French Davis, 1999)<sup>5</sup>.

In North America's case, the opening up of its economies has been a general process, but not a uniform one. The opening up of Canada's economy began in the 1970s. In 1970, foreign trade was only 11.7% of the GDP, but in 1980, it had reached the same levels as the European Union and went on to hit 53.3% in 1981. During the 1980s, the level of opening remained relatively stable, nonetheless, during the 1990s, after signing of a bilateral trade agreement

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<sup>3</sup> Paul Krugman (1991). *Geography and Trade*. Cambridge, Mass, MIT Press. p.142.

<sup>4</sup> Sydney Weintraub (1997). *The North American Free Trade Agreement* in Ali M. El-Agraa ed. *Economic Integration Worldwide*. London, Macmillan Press. p. 203-229. John McDougall. *National Differences and the NAFTA*. International Journal. Vol. LV.No. 2, Ontario, Spring 2000. p.281-290.

<sup>5</sup> Roberto Devlin and Ricardo French Davis (1998). *Hacia una evaluación de la integración de América Latina*. Revista Comercio Exterior. Vol. 49. No. 11. Mexico, BANCOMEXT, November 1998. p. 955-956.

with the United States in 1989 and the **NAFTA** in 1994, this indicator registered a sharp increase reaching 83.5% in 1999 (table 1).

In Mexico's case the degree of opening remained low during the entire period of import substitution; in 1970 it was only 11.4% of the GDP. However, during the 1970s, opening increased as a result of increased crude oil exports and mainly because of the growth of imports feeding by foreign debt. By 1980 foreign trade had reached 23.3% of GDP.

As a consequence of the foreign debt crisis of 1982, a radical change occurred in the economic strategy<sup>6</sup>. The opening up process began to take effect in 1985. At the end of the 1980s, the degree of opening had reached 38.3%, 15 percentage points higher than in 1981<sup>7</sup>. This level remained constant until the **NAFTA** came into force. From this point an unprecedented increase was registered on this indicator. In 1999 it had reached 62.8%, almost double the figures registered before the **NAFTA** went into effect (table 1).

The United States has historically been a relatively closed economy. At the end of the Second World War, foreign trade barely represented 10% of the GDP (Perroux, 1954)<sup>8</sup>. During the period under analysis, the extent of North American economic aperture progressed slowly, despite globalization, which proves the importance and strength of its domestic market. During the 1980s this indicator stood practically still, but in the 1990s it increased almost four percentage points, from 20.6%, in 1989, to 24%, in 1999. This change responded not only to increasing exports from new trade agreements and progress made at the General Agreement on Tariffs and Trade (**GATT**) Uruguay Round, but was also due to the growing dependency of the North American economy on imports that were driven up by a strong dollar and by increased capital flows.

#### 4. The Recent Development of Trilateral Trade

Trade between Mexico, Canada and the United States increased sharply over the last two decades. From 1981-1998 trilateral trade between the three North American nations almost quadrupled, increasing from 133.6 billion dollars to 518 billion dollars (see table 2 and figure 1).

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<sup>6</sup> For economic reform in Mexico, see author's *Mexico hacia el Siglo XXI: crisis y modelo económico alternativo*. Mexico, 2000, Plaza y Valdés ed.-UAMI. 319p.

<sup>7</sup> The extent of opening of the Mexican economy is overvalued, as figures include assembly plant or *maquiladora* imports and exports. *Maquiladoras* perform the simple function of transforming imported goods, and as exports should only be considered, as the Bank of Mexico did before, added value.

<sup>8</sup> Francois Perroux. (1954). *L'Europe sans Rivages*. Grenoble, 1990, Presses Universitaires de France, p. 99

The rapid growth of foreign trade in the region over the last two decades was the result of the global tendency to project productive systems internationally. This came as a result of a structural crisis that began at the end of the 1960s, at the end of the lengthy economic boom after the Second World War. Globalization became a crisis “exit” strategy for the most powerful and internationalized transnational companies. From 1993-1998, trade between its members increased by 70.5%. As a percentage of world exports, regional exports increased from 5.7%, in 1981, to 6.6%, in 1990 reaching 9.7%, in 1998.

## 5. Intra-Regional Trade Vs Trade with the Rest of the World

The North American tendencies to form a regional bloc have a long history. However, since the **FTA** with Canada and subsequently since the **NAFTA** came into effect, regionalization has strengthened as never before. In effect, intra-regional trade increased from 184.9 billion dollars, in 1988, to 518 billion dollars, in 1998, representing 180% growth during this period. Inversely, even though trade with the rest of the world also increased in absolute terms, from 661.1 billion dollars, in 1988, to 1,106.8 billion dollars, in 1998, this only meant it increased by 67.4%. As a proportion of the area’s global trade, intra-regional trade increased more than 7 percentage points, from 21.9% of the total, in 1988, to 29.3%, in 1998. In the mean time, trade with the rest of the world decreased from 78.1% to 70.7% (see table 3 and figure 2).

It is true that the percentage of North American intra-regional trade is lower than that of other regions of the world, such as the European Union or Asia, (Guillén, 1994) <sup>9</sup>. However, it is undeniable that North America’s tendencies to regionalize are very pronounced and that this process is moving forward at a fast pace. This should not be surprising, as apart from being the expected outcome of any non-multilateral economic integration agreement; it was also the intentional objective of US trade policy. The **FTA** and the **NAFTA** were signed with the intention of creating a regional trade bloc faced with the European and Asia Pacific trade blocs.

In triggering the onset of regionalization, the **NAFTA** has generated a trade diversion away from other areas of the world, owed to the raising of trade barriers within the region and other mechanisms such as the *rules of origin*. Nevertheless, it is also true, at least for the moment, that there is no danger of the **NAFTA** constituting an exclusive economic bloc. It is a process of *open regionalism* (to use a slightly ambiguous term used for the first time by the Asia Pacific Economic Cooperation (**APEC**) and popularized by the Economic Commission for Latin America and the Caribbean (**CEPAL**), that is to say –a process that is not opposed to globalization.

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<sup>9</sup> Arturo Guillén R. (1994). *Bloques regionales y la globalización de la economía*. Revista Comercio Exterior. Vol.44.No.5. BANCOMEXT, May 1994. p. 379-386.

The regional concentration of North American trade is demonstrated clearly in an analysis of each country of the zone. This is more so in the dominated economies (Canada and Mexico) than in the United States.

Canada and Mexico carry out over three-quarters of their foreign trade with North America. The ratio of intra-regional trade is as high as levels reached by countries of the European Union. In Canada's case, this ratio increased from 69% of the total, in 1988, to 81.8%, in 1998. In Mexico's case, intra-regional trade that last year was 75.7% of the total.

In the case of the United States, intra-regional trade also increased consistently with the rest of the region: increasing over 7 percentage points from 23.8%, in 1989, to 31.9%, in 1998. However, trade with the rest of the world continues to play a very important role, representing 68.1% of the total this last year.

Changes in sector orientation and regions to trade flows respond to changes in productive system configuration. The determining factors have been the movements of foreign direct investment and of portfolio capital.

## **6. Regional Integration, National Disintegration**

It is irrefutable that **NAFTA** has been an important instrument of foreign trade expansion in North America; however, this analysis cannot focus solely on this facet of the agreement. Integration is not an objective in itself, but only an instrument used by countries that follow this path to achieve higher levels of economic development and social wellbeing.

In order to create an objective balance of the effects of integration, it is firstly necessary to answer questions set forth by Francois Perroux (1961) *who integrated whom? And who is benefiting from integration?*

**NAFTA** implied a commitment between governments and economic forces that saw the agreement as an important lever for integration to expand markets and areas of operation and influence, as well as to maximize upon its benefits. Fundamentally, the most globalized groups and US financial capital companies, as well as the most powerful groups of Canada and Mexico promoted this commitment.

North America's most globalized financial capital, that is the capital that operates with a world market logic, saw the **NAFTA** as an instrument to raise levels of competition in relation to other regions of the world (mainly Europe and Asia) and to put into practice a series of rules (intellectual property, services, etc.) that the US government promoted in multilateral forums and attempted to apply on a global scale. Large Canadian and Mexican

companies were looking to modify their strategies and redirect their companies towards the foreign market, in order to insert them into a growing global world economy.

If US transnational companies and large Canadian and Mexican groups and companies were those who promoted the agreement and defined integration, with the support of the respective governments, then it is not surprising that these are the main beneficiaries of the **NAFTA**.

Transnational companies carry out the majority of foreign trade in North America. Around 70% of Canadian exports are tied to transnational operations. Of this total, 40% is intra-firm trade between signatory nations and 30% is derived from the strategic licenses or alliances of Canadian corporations with foreign corporations. In the case of the United States, around 50% of its manufactured exports to Canada is intra-firm trade. In Mexico's case, in 1992, 40% of foreign trade was intra-firm trade and this percentage has increased substantially with NAFTA (Weintraub, 1997) <sup>10</sup>.

The strategy of transnational companies in Latin America over the last two decades has been to focus on establishing assembly plants in the region in order to construct an export platform to the United States and the world market. This strategy has been particularly successful in Mexico, in the case of the automotive, auto part, plastics, electronics, clothing and manufacturing industries. Assembly plants in the clothing and manufacturing industries have also sprouted up in the countries of the Caribbean Basin (Mortimore, 2000) <sup>11</sup>.

**As a result of The NAFTA being an agreement between countries with asymmetric productive systems, the strengthening of economic integration between the three nations has triggered an intense process of restructuring—disarticulation – destruction of its productive systems.**

In Canada and Mexico, the restructuring process has implied the rupture of productive chains of former productive systems that operated in their respective domestic markets. With the onset of economic aperture, the relative price structure of the predominant economy imposed itself on the integrated markets. This caused all kinds of distortions to productive systems due to lower levels of development and productivity of the integrated economies.

The breaking up and restructuring of “national” productive chains coincided with the creation of new regional chains (in North America) in the exporting sector. Transnational companies are central to these new “supranational” chains that operate within the economic space of **NAFTA**. These chains and the financial capital that circulates around them cause

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<sup>10</sup> Sydney Weintraub (1997). p. 206.

<sup>11</sup> Michael Mortimore (2000). **Corporate Strategies for FDI in the Context of Latin America's New Economic Model**. World Development. Vol. 28. No. 9. Great Britain. p. 1611-1626.

concentration and agglomeration phenomena. In the spaces that regionalized companies operate (many of which—the most powerful—have a world market logic), forces of “attraction” and “brake” are developed at the same time. On one hand they stimulate integration processes, as well as the creation and/or reinforcement of development poles, however they also cause the destructuring and /or destruction of other companies and activities oriented towards the domestic market and that have not connected to this new regional economic space.

In Mexico’s case, **NAFTA**, and in more general terms of external opening, it has accentuated the heterogeneous structure of the productive system and social structure. This has in turn provoked marginalization, social exclusion and decomposition and cultural disintegration. Regional differences within the country are now more pronounced: the “rich” north has distanced itself further from the “poor” south that is isolated from global integration.

Instead of diminishing, the old problem of structural dualism, typical of underdevelopment has worsened, in addition to becoming more complex. Along side the manufacturing *maquilador* exporting sector, which has become a dynamic axis in the system, there coexists the former modern sector created during the import substitution era, that is largely separated from this and anchored in the domestic market, as well as the backward sectors such as: 1) old traditional activities of an urban and rural nature and 2) the ever increasing informal economy.

Technical progress made in the exporting sector is not transmitted to the whole productive system. Progress concentrates itself, as in the times of the pre-war agrarian-export model, in the economy’s dynamic sector and only shifts minimally to other activities.

The reorganization of the productive system, as a result of the neoliberal model, accentuated the structural tendencies of trade deficit, with increased dependency on imports. The ratio of imports, that is the participation of imports on global supply, increased sharply as a consequence of commercial aperture and the **NAFTA**.

Greater dependency on imports is a sign of the rupture of domestic production chains and substitution with regional chains, which reflect the increased importance of intra-firm trade and new forms of articulation between the globalized capitals and their suppliers and distributors. It also reveals, the major tendency to import, stemming from higher levels of income and the possibility of acquiring luxury consumer goods with greater facility through eliminating trade barriers.

It was hoped that **NAFTA** would promote manufactured food exports from Mexico and reduce the weight of *maquiladoras* in the economy, by causing the industrial structure to modernize. In reality, it has done the opposite. Instead of the “industrialization” of assembly plants, Mexico is undergoing a process of “*maquilización*” of industry. More and more assembly plants are being constructed, not only on the northern border, but also within the

country itself.

The free entry of agricultural goods from abroad has deeply affected traditional farming in Mexico. The idea outlined by promoters of the Treaty was that the agreement's implementation would reduce immigration to the United States, but this does not correspond to the facts. The deterioration of the farming sector, together with recurrent economic crises in Mexico has accelerated migratory flows.

The fragility of the productive system in Mexico goes hand in hand with financial fragility. The new accumulation model increased foreign sector restrictions, instead of reducing them. When the economy grows, the trade balance deficit increases faster than during the period of import substitution. Faced with the impossibility of moderating this process, its financing depends on the entry of foreign private capital flows, whose volatility, after the 1994-1995 Mexican economic crisis and the Asian crisis of 1997-1998, is well known.

In order to keep attracting foreign capital, monetary and fiscal restrictive policies are applied, which have recessive affects on the "real economy" and increase the fragility of the banking system and domestic financing. The entry of foreign capital, on the other hand, overvalues the national currency, which contributes to an increased current account deficit.

The financial logic of the new accumulation model is a source of instability and of recurrent financial crisis.

## **7. Conclusions**

The results obtained from research show increasing integration between Canada, the United States and Mexico over the last two decades, especially since **NAFTA** went into effect. This has led to reinforced tendencies to create a future North American regional bloc, under the hegemony of the United States.

In other words, **NAFTA** has been an important lever to create trade in the region, although, at the same time it has also put in to motion a process of trade deviation away from other regions of the world (Latin America, Europe and Asia). This can be seen specifically in the automotive, auto parts, electronics, textiles and clothing industries.

Greater economic opening of the region's economies has triggered the clear restructuring of domestic productive systems. This has meant the rupture of national productive chains, which took shape during a previous stage of development, and their substitution by regional chains in activities and/or leading companies that are a motoring force in the creation of *development poles*. These companies and activities also have an important influence on the globalization and regionalization processes of the world economy.

In Mexico's case, regionalization has allowed for the modernization of the economy's exporting sector, but the price has been to marginalize the rest of the productive system, which continues to be dependent on national and local markets. The heterogeneous structure of the productive system has become more pronounced than ever, leaving several sectors and social groups on the margins of the benefits of globalization.

As the new economic model works on a base of low real wages on the periphery and the restricted direct participation of the State in the economy, the domestic market has stagnated instead of expanding, seriously affecting the majority of companies and activities that depend on it. Contractionist affects on economic activity strengthened in virtue of the financial fragility of the new model. As foreign sector imbalances has become more pronounced instead of reducing, the continuity of accumulation lies in attracting highly volatile and speculative foreign capital flows, which increase the possibility of recurrent crises.

The main beneficiaries of integration have been transnational companies and large private groups that operate in the foreign market. Social inequalities between the three signatory nations and domestically have increased. Profits, in terms of employment related to exports have not compensated for job losses in relocated sectors, nor for losses registered by disassembling national production chains. Wage differences between the three nations have increased instead of decreasing. The decreasing tendency of real wages in Mexico has not declined with integration.

To put commercial and economic integration at the service of the population is not something that can be left to market laws, as has been the case in Mexico, where the State abandons its responsibilities and becomes merely the active agent of external globalizing forces. On the contrary, the State is needed to moderate regional imbalances and to take action to diminish social inequalities.



**TABLE1**  
**DEGREE OF OPENING OF NAFTA'S ECONOMIES**  
**% Total trade / GDP**

<i>YEAR</i>	<i>MEXICO *</i>	<i>CANADA</i>	<i>U.S.A.</i>
1981	23.3	53.3	19.9
1982	25.7	47.8	18.1
1983	28.4	47.6	17.2
1984	27.0	53.2	18.1
1985	25.9	54.0	17.2
1986	30.9	53.7	17.5
1987	32.9	51.8	18.6
1988	38.5	52.1	19.8
1989	38.1	50.8	20.2
1990	38.3	50.8	20.6
1991	35.6	49.9	20.7
1992	35.5	52.7	21.0
1993	34.4	58.2	20.7
1994	38.5	64.8	21.8
1995	58.2	70.8	23.3
1996	62.8	73.0	23.5
1997	60.7	77.2	24.0
1998	64.5	81.3	23.7
1999	62.8	83.5	24.0

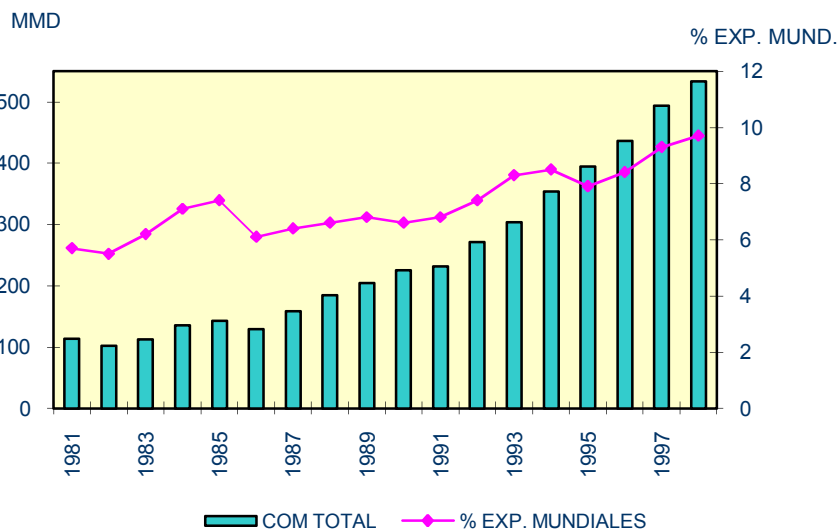
SOURCE: IMF. International Financial Statistics.

TABLE 2  
 NAFTA: TRILATERAL TRADE  
 Billions of dollars

<b>1</b>	<b>2</b>	<b>3</b>	<b>4 (2/3)</b>
<b>YEAR</b>	<b>TOTAL TRADE</b>	<b>WORLD EXPORTS</b>	<b>% OF WORLD EXPORTS</b>
<b>1981</b>	113.2	1976.3	5.7
<b>1982</b>	102.2	1857.5	5.5
<b>1983</b>	112.5	1817.9	6.2
<b>1984</b>	136.1	1921.3	7.1
<b>1985</b>	142.5	1921.0	7.4
<b>1986</b>	129.8	2120.6	6.1
<b>1987</b>	158.2	2485.2	6.4
<b>1988</b>	184.9	2814.1	6.6
<b>1989</b>	204.2	3022.8	6.8
<b>1990</b>	225.0	3425.0	6.6
<b>1991</b>	232.1	3418.0	6.8
<b>1992</b>	271.8	3661.4	7.4
<b>1993</b>	303.7	3652.0	8.3
<b>1994</b>	354.4	4169.1	8.5
<b>1995</b>	394.3	4970.0	7.9
<b>1996</b>	436.8	5173.2	8.4
<b>1997</b>	494.2	5337.1	9.3
<b>1998</b>	518.0	5,337.1	9.7

SOURCE: United Nations. *Yearbook of International Trade Statistics*. Varios años

Gráfica 1  
COMERCIO TRILATERAL DEL TLCAN



Fuente: ONU, Yearbook of International Trade Statistics. FMI, Estadísticas Financieras Internacionales, Varios Números

TABLE 3  
TRADE OF NORTH AMERICA'S COUNTRIES

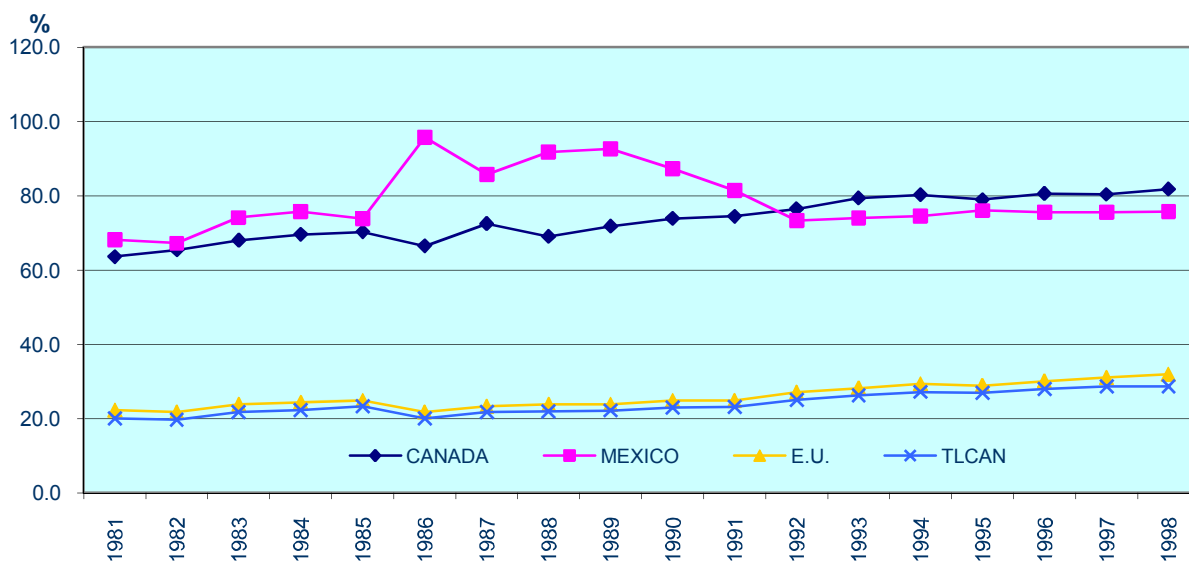
Billions of dollars

YEAR	1 TOTAL TRADE	2 INTRA-REGIONAL TRADE	3 TRADE COUNTRIES	4 OTHER (2/1 100) % INTRAR	5 x (3/1 x 100) % OTHER COUNTRIES
1981	565.3	113.2	452.1	20.0	80.0
1982	518.4	102.2	416.2	19.7	80.3
1983	518.4	112.5	405.9	21.7	78.3
1984	611.6	136.1	475.5	22.3	77.7
1985	611.3	142.5	468.8	23.3	76.7
1986	649.5	129.8	519.7	20.0	80.0
1987	729.8	158.2	571.6	21.7	78.3
1988	845.9	184.9	661.0	21.9	78.1
1989	920.8	204.2	716.6	22.2	77.8
1990	976.2	225.0	751.2	23.0	77.0
1991	1000.7	232.1	768.6	23.2	76.8
1992	1085.1	271.8	813.3	25.0	75.0
1993	1157.5	303.7	853.8	26.2	73.8
1994	1301.2	354.4	946.8	27.2	72.8
1995	1467.9	394.3	1073.6	26.9	73.1

1996	1561.2	436.8	1124.4	28.0	72.0
1997	1723.2	494.2	1229.0	28.7	71.3
1998	1624.8	518.0	1106.8	31.9	68.1

Source: United Nations. Yearbook of International Trade Statistics.

Gráfica 2  
COMERCIO INTRARREGIONAL DEL TLCAN %



Fuente: ONU, Yearbook of International Trade Statistics. FMI, Estadísticas Financieras Internacionales, varios números.

## **MONEY MANIA**

### **When Wealth Is More Important Than Happiness**

Walter W. Haines  
New York University

A well-known ancient myth tells us that Midas was granted a wish by Dionysius in exchange for one of his favors. Midas wished that every-thing he touched should turn to gold. All his food turned to gold; his daughter turned to gold when he kissed her. Gold, indeed, wasn't what he wanted at all. But the moral was lost on the people of that day, just as it is lost on us.

When a rich young ruler asked Jesus what he should do in order to gain eternal life, he was told, "If thou wilt be perfect, go and sell all that thou hast and give to the poor", for "it is easier for a camel to go through the eye of a needle than for a rich man to enter into the kingdom of God." (Matt 19: 21, 24) That advice seems also to be lost on most people, even those who say that they take the Bible literally.

#### **The Poor Little Rich Girl**

Present-day society has its own myths similar to the King Midas story. The poor little rich girl has been an icon for over a century; a "bird in a gilded cage" that has everything that money can buy--and nothing that she wants. Love, least of all.

We also have some questionable humor on the other side of the issue. There is the woman who says, "I know that I should marry for love, and I sure love money." She is now on her fourth husband, and still hasn't found what she really wanted.

The counterfoil to the myth of the poor little rich girl is the "rich little poor girl", though I am not aware of any personification in those words. Yet our literature is full of portraits of those born to poverty that are among the happier people of this world. Tiny Tim comes to mind and his father, Bob Cratchet, the heroes of Dickens' *A Christmas Carol*, mired in abject poverty, but still beaming over the wonders of life, still pitying poor Scrooge, who, with all his money, is the epitome of misery. Fiction of course--a myth—but it catches the popular fancy as a realistic portrayal of the ability of the poor to rise in spirit above their shabby surroundings and, in the fullness of

their joy, to say, "God bless us, every one".

Pollyanna is so well known that her very name has entered our language as the archetypical optimist. Orphaned and demeaned, she nevertheless loved life and laughed at misfortunes. Our folklore is full of tales of ordinary people who rose above their troubles and "lived happily ever after." This is fiction, of course, but our daily experience too is full to overflowing with experiences of the poor who found life good. Is it money that makes people happy? Or something else?

### **The--Very Narrow--Scope of Economics**

Economics, the discipline most closely associated with the study of money, has a tremendous influence these days, whether directly or indirectly. The easiest way to demonstrate this is to ask the question: How do we measure the "success" of a country? Almost invariably we do so by comparing various countries' Gross Domestic Product (GDP), the monetary value of all commodities and services produced in a given period of time. If this number is rising, people are assumed to be better off, that is, happier, and we all rejoice. When we speak of "growth", we refer to a rise in GNP, not more democracy, or better education, or greater wisdom, or even more power.

Such growth is the Holy Grail. President Bush is going around the world fighting against several international agreements that have wide support because he believes that they would tend to reduce the "growth" of the United States. For him, health, the environment, and arms reduction take a back seat to greater wealth. Yet most people and the majority of nations seem to be more concerned with the quality of life.

GDP is only a small part of the quality of life. Its public prominence overemphasizes the importance of the economist's work and obscures the fact that the underlying structure of economics is less firmly established than public acclaim implies. The basic economic proposition is that **prices** (the stuff of GDP) are determined in **markets** by the interaction of **supply** and **demand**. Economists legitimately know a great deal about supply: the resources (materials, labor, and organization) that goods are produced from. There is really no doubt that these resources are scarce in today's crowded world. Economists then *assume* that

demand, based on people's wants, is infinite. It is the tug of war between these infinite wants and scarce resources that is the essence of economic reasoning. But economists know very little (and admit that they know very little) about wants. Wants are "given"; they are not investigated.

This emphasis on markets and prices looms so large in economists' minds and so dominates the thinking of all "intelligent" people that those societies that are not fixated on the market--and they apparently are the majority of humankind--are considered to be irrational, or ignorant, or simply "primitive". One might conclude from this rash judgment either that most ordinary people are irrational or that economists know very little about real people.

The confusion here arises from the fact that success in the output of goods is not the ultimate gauge of happiness, for people "do not live by bread alone", and the psychologists assure us that bread is not high on most people's priority lists, as I shall shortly show. While economists concentrate on the piles of stuff and how they are produced and distributed, they sometimes seem unaware of the many noneconomic aspects of life--the satisfaction of nonmaterial wants--that also contributes to well-being.

We economists assume that wants are material, that they are given, and that it is not our job to explore where they come from, but only to find ways by which they may be satisfied. But who says that wants are given? What do human beings basically want? Just stop for a moment and answer that basic question for yourself. What do you want? A million dollars? A loving spouse? The esteem of your colleagues? Good health? Peace? A happy family? A clean environment? A friendly community? A feeling of competence?

While each individual might answer these questions differently, the behavioral scientists are the specialists who have studied the subject of what people want. What have they found?

### **What Do the Behavioral Sciences Say about Wants?**

For an earlier paper (Haines, 1979) I examined a large number of books by psychologists who explored the nature of human wants. There are differences

among their findings, and the most interesting thing that they seem to agree on is that economic wants are relatively minor. Freud, for instance, says that the basic motivators are libido, aggression, and anxiety. Economic activity may result from any one of these, but there is no economic motivation as such (Haines, 1979, p. 6).

Henry Murray, whose classification of wants has often been referred to as one of the most influential, lists abasement, achievement, affiliation, aggression, autonomy, counteraction, deference, defendance, dominance, exhibition, harm avoidance, inferiority avoidance, nurturance, order, play, rejection, seclusion, sex, succorance, and understanding (Murray, 1938, pp. 144-145). In that whole catalogue one is hard put to find anything that resembles economic terminology. Play is there, but work is not. Achievement looks somewhat familiar, but of Murray's fifteen examples of achievement, not one is economic

K.B. Madsen (1968, 1974) reviewed forty different psychological analyses of motivation and summarizes what he finds "widely accepted" into three categories: Primary motives: hunger, thirst, sex, nursing, temperature, pain avoidance, excretory, oxygen, rest and sleep, and activity. Emotional motives (partly primary, partly acquired): security (fear), aggression (anger); Secondary motives: social contact, achievement, power, and possession. Here there is much more economic content. Hunger and thirst have strong economic meaning, temperature somewhat less. Possession is included in economics, though it can have other meanings.

The one psychologist whose work is grounded in economics is David McClelland. He classifies all motives into two categories: needs, the satisfaction of which produces pleasure, and fears, the avoidance of which reduces pain. Thus his work, from the very beginning, fits the utility/disutility, satisfaction-maximizing concept of economics. But he absolutely denies that specific wants are inherent in human nature. "All motives are learned," he says categorically (McClelland, 1951, p. 466). No motives are innate; all are conditioned by society [by economists?] And while McClelland is probably best known for his emphasis on achievement, he says that the achievement drive, like all others, is learned in early childhood from parents, whose attitudes rely on culture, social relationships, religion, and life style. Thus society determines not only the strength of the achievement motive, but also what direction it



will take.

In the last thirty years the psychologist whose concepts of wants or needs has been most widely circulated is Abraham Maslow. His concept of wants tends to be cross-disciplinary, thereby enclosing ideas from other branches of learning beyond psychology and economics. He differs from most other psychologists in that he ranks human needs along a hierarchy of maturation and complexity from the lowest and earliest to the highest. Very briefly, his five categories develop in order as follows:

1. Physiological needs: hunger, thirst, sex
2. Safety needs: security, health, structure, order, limits
3. Belongingness needs: love, affection, contact, intimacy
4. Esteem needs: self-respect, competence, status, recognition,
5. Need for self-actualization: self-fulfillment (Maslow, 1970, pp. 35-47)

The order is important. Until one fulfills the physiological needs, it is difficult to think much about the next higher category, and then to the next, and so on to the climax of self-fulfillment, the highest achievement of which humans are capable. Achievement of the lowest needs clearly depends on economic resources. Somewhat the same might be said of health. To a certain extent structure and order rely on the resources of society rather than of the individual. But love cannot be bought, nor self-respect, nor self-fulfillment. Status perhaps; but it hardly fits into the supply-demand paradigm.

### **Public Opinion Polls**

But if we want to know what people want, why don't we simply ask them? That's exactly what public opinion pollsters do.

One of the most revealing sets of responses to this basic question was gathered by a Roper poll that covered a national sample of 800 respondents over age 18 in the United States in January 1995. The question was, "Which one of the following factors has the greatest influence on your personal happiness?" In order of importance, these were the answers:

- |              |              |
|--------------|--------------|
| 47.8% Family | 4.8% Romance |
| 13.8% Health | 2.5% Other   |

3.5% Personal Accomplishments	1.9% Not sure
9.4% Friends	0.5% Power
5.3% Money	0.4% Attractiveness (Harris, 1995)

Family, friends, health, romance, attractiveness, and personal accomplishments beat out money and power combined by a ratio of more than fifteen to one. Or, even more starkly, family, friends, and health alone are thirteen times as important as money. Where do the economists get the notion that money is what people want most?

An interesting approximation to an answer to that puzzle is contained in a second question that was asked in the same survey quoted above. It reads, "Which one factor do you feel has the greatest influence on most other people's personal happiness?" (emphasis added) The answers, again in numerical order, are:

39.7% Money	5.1% Not sure
22.8% Family	4.0% Power
9.9% Personal Accomplishments	2.7% Romance
9.0% Friends	0.9% Attractiveness
5.4% Health	0.5% Other (Harris, 1995)

The results, compared directly with the preceding question, are startling. A great number of people, according to these results, seem to be saying, "I don't value money very highly, but other people sure do." Economists--trained by their profession to think of money as the measure of all things--obviously tend to believe that monetary values are the center of their study and, by extension, of the universe they are studying. They must; for if money and prices aren't important, then their professional concentration would appear to be trivial. They need to emphasize money in order to support their self-respect. (Question: is self-respect more important than money?)

This aspect of the issue also provides some insight on another common attribute of economists. Many of them will say that data on expressed wants, such as those I have quoted above, are necessarily erroneous because people simply don't

know what they want, or at least can't express their wants in language. So these economists simply dismiss public opinion polls as erroneous or irrelevant. Economists know what people want because they see the reality of goods being sold for money in the marketplace. But how can anyone tell, when I pay \$25,000 for a new car, whether I value that car more or less than I value my wife's love? I could well say that my wife's love is priceless. Economists are likely to accept that statement at face value and reply that since my wife's love is priceless, that means precisely that it is worthless, since price and value are the same thing. This is what comes from dealing too much with numbers rather than with the reality that numbers attempt, often without success, to measure.

One could go on and on with public opinion polls, but time and space are limited. To a remarkable extent the people who answer such polls support empirically what the psychologists have discovered. Economists just don't seem to get it. They seem to teach that it is greed that makes the world go round, not love. But the world knows better.

### **The Continuing Lure of Gold**

Not all the world, of course. The Forty-Niners in the United States are fabled for their mad rush to the California gold fields, and for the misery of the majority of them in what they didn't find. Yet even in the rush for gold there is not a universality of the common belief that gold smothered most humane attributes of the miners. In the early days of the Yukon (Canada) gold rush (1880-1890), one finds a community of reciprocity that is somewhat unusual. In that period, when the number of miners was small (not exceeding 300 by 1890), a wholly informal, but dependable. Support system existed within the prospecting community. The diaries of the miners report "numerous instances where food supplies were freely shared in the face of shortages, where in the case of accident or sickness men took responsibility for one another, including visiting, monitoring, supplying, and nursing them as necessary, and where assistance in the form of both labor and loans of equipment was freely given...It was also in keeping with the 'code' of the country that news of any significant discovery should be disseminated as soon as practicable by the discoverer to others in the

region." (Stone, pp. 541-542)

But when the big gold rush of 1896-1898 hit the area, the hectic frenzy of the stampede, estimated at as many as 50,000 in 1898, totally changed the moral environment of the gold mining community, and dog-eat-dog became the order of the day. (See Stone, 1964, p. 68). More recently, however, gold has been somewhat eclipsed by diamonds, which carry much more value in a smaller package. Today nations are almost literally bought and sold for diamonds. The World Bank reports that a significant fraction of the civil wars raging in Africa, Asia, and elsewhere are not conflicts over ideologies or politics of any stripe, but over access to the diamond mines or the diamond links that bring wealth and power. In this diamonds-mad rush thousands, if not millions, of innocent people become the victims of the lust for "gold". (Kahn, 2000) What a way to run a world.

In another sense the modern-day "gold rush" takes place (or perhaps has taken place) in a theatre far removed from the wild and woolly west of a century and a half ago. Some of it on the floors of stock exchanges around the world, some of it over the wires of the internet, or even through the ether, as insubstantial as it is possible to get.

The lure of gold (symbolic in this case) has once again crazed the minds of those who, like Midas, dreamed of riches beyond measure; of those who felt that money was the most important goal in life and who imagined that they saw a means of achieving an immense quantity of it at very small cost; of those who believed that gambling was preferable to work, and who didn't realize (or more likely, didn't care) that getting their hands on money didn't increase by one iota the real goods available in the world.

### **The Meaning of Money**

As a medium of exchange, money began in the form of goods that were so readily available that it was easy to reckon the value of other things in terms of these much used items: shells (wampum), cattle, beads, and finally metals. These were goods as well as money, and they could not lose all of their value as long as they had some practical use.

Paper money was originally redeemable in gold and retained the symbolic value of its metallic backing; then became a mere token with no inherent worth except in the historical memory of its users. Bank accounts have not even that claim to real utility, and are only notations in the ledger. Now that ledgers are primarily ephemeral data stored in computers, it is far-fetched, but conceivable, that the greater part of the "money" in the world could be instantly destroyed by some sort of cataclysmic interference with global computer operation. The gold, the factories, the real goods would remain, but money as such would simply evaporate.

Cattle must be bred, and gold must be mined (both real production processes), but money can be created by the punch of a computer key. It is valuable only in our minds, not in our pockets. Yet at least it bears a number that has some operational relation to a monetary system. And while its real worth (in terms of goods) rises and falls with changes in price levels--which are themselves to a great extent caused by fluctuations (usually increases) in the quantity of money that is issued--its value seldom drops to zero except in rare cases of hyperinflation. One of the major functions of modern governments is to keep the stock of the country's money under control so that prices are not forced up by "too much money chasing too few goods".

Economists once thought that price levels should be stabilized over time so that money did not lose value. And for a while they were. The wholesale price index of the United States, while it fluctuated a great deal from year to year, particularly in time of war, maintained a relatively constant value over longer periods of time. For instance, it was at almost exactly the same level in the period 1920-1940 as it was in 1800-1820 (Haines, 1961, pp. 394-395). But since 1940 the price level in this country has risen by more than 1200 per cent.

### **The Stock Rush**

While prices have been rising, stock prices have been advancing even more rapidly, no matter what measure one use. Total dollar trading volume as a percent of GDP, for instance, shows that in the former peak year of 1929 that ratio was 133 percent; in 2000 it was 325; that means that 3-1/4 times as much stock was traded as

all commodities and services put together. ([www.cross-currents.net/charts.htm](http://www.cross-currents.net/charts.htm))

Yet stocks do not embody any monetary value at all, and the present market value of a share of stock at any instant of time is merely what potential buyers and sellers imagine in their own minds that it is. For the past twenty years, while there have been a couple of bumps along the way, the stock market in this country has been going up, up, up. The Dow-Jones industrial average, the oldest measure of stock prices, rose from its low of 777 in 1982 to a peak of 11,723 in January 2000, an increase of over 14 times in not quite twenty years.

Technology stocks were rising even faster. The outstanding example was Qualcomm, which rose 2,619 percent in the year 2000 alone. Prices have dived since then, but we need to remember the frenzy with which investors grabbed at every initial placement of internet stocks that had never made a cent, often did not even have a product, but that promised the moon with a diamond necklace around it. The record rise for a new placement in 2000 was web Methods, which increased in price 507.5 percent on its first day of issue. Have you ever heard of it? On the other hand, have you ever heard of the South Seas Bubble?

### **The Great Bubbles**

The present stock-market slump may be unique in its particulars, but it is sadly reminiscent of similar fiascos in the past. The old saying is that those who do not know history are condemned to repeat the mistakes of history. How true. The present Stock Market Bubble (1999-2001?) is one of the four great financial fiascos of the Western World.

About 1560 Turkish tulips were first imported into Holland, where their rarity and exotic beauty made them much prized. As prices soared, many people rushed into the market in the belief that a continuing rise would make them rich. A profit was a "sure thing" as each new transaction pushed prices ever higher, and many went deeply into debt in order to get in on the action. By 1637, with the price of a particularly rare species exceeding \$20,000 for a single bulb, the inevitable crash occurred, with devastating results, particularly for those who had gotten into the game too late or held on too long. Literary--and cautionary--fallout from the Dutch

experience is that Brewer's Dictionary of Phrase and Fable gives "stock-jobbing speculation" as a synonym for "tulip mania". (1898) The tulip mania has received a great deal of attention during our recent run-up in the stock market, with several web sites using it as a cautionary tale, one as early as 1982.

A century later came the Mississippi Bubble. In 1716 John Law was given letters patent to establish a bank in France, which was at that time on the verge of bankruptcy. The success of this bank encouraged Law to start a company the following year whose stated purpose was colonization of the Mississippi valley, but whose real purpose was to buy government bonds. In a very short time this company obtained a monopoly of France's foreign trade, took over the operation of the mint, of other government agencies, and finally the management of the whole public debt. Under the impetus of success Law created more bank notes to finance not only its business operations, but also the rapidly rising speculative fever for its stock. Within three years shares were selling at thirty times their face value. Then the bubble burst, panic grew, and there was a run on Law's bank, during which a dozen people were trampled to death, and Law barely escaped with his life. The trauma was so great that no other bank was chartered in France for over fifty years. "Many of Law's ideas were truly brilliant, but he made the common error of mistaking money for wealth." (Haines, 1969, pp. 95-96)

The third (almost simultaneous) bubble occurred across the channel in England, where the South Sea Company had been established in 1711 to engage in trade with South America. It was so successful that by 1718 investors were receiving 100 percent interest, and extravagant ideas of the riches of South America encouraged further investment in the company's shares as well as the establishment of scores of other companies attempting to ride on the coattails of its success. In 1720 alone at least 185 of these get-rich-quick companies were chartered (Lawson, 1852, pp. 117-119). It was in that year that the South Sea Company bought the whole government debt, issued stock to raise the necessary capital, and speculative fever pushed the price of the stock to thirteen times its face value in just three months. Then stocks plummeted, and many companies, including several banks failed. The Bank of England, which up to this time had been relatively insignificant,

had refused to have anything to do with this stock mania, came through the collapse unscathed, emerged as England's most powerful bank, and gradually turned into the world's first central bank, the only real winner in the midst of this general debacle.

The current stock market mania, the fourth in the series, is merely a current example of this confusion of money with wealth and some of the idiocies that result there from.

### **The Lure of GNP**

Although the public opinion polls report that money is a relatively minor objective in the scale of most ordinary Americans, we all continue to measure our progress in gross domestic product, a monetary yardstick. This emphasis on GNP is a silent--in a sense invisible--message that says that nothing else matters: money conquers everything. It pervades our news, our advertisements, our politics, and our conversation. The winner is the one who dies with the most toys. And, as an economist, I want to acknowledge that it is the economists who lead us on. Money is their mantra and their life's work.

Perhaps the most outstanding example of this emphasis on economics as all embracing comes from the well-known and highly respected economist and Nobel Laureate Gary Becker. His strange assertions in *A Treatise on the Family* include statements such as: "the economic approach is a comprehensive one that is applicable to all human behavior" (Becker, 1976, p. 8), coupled with the statement that preferences are both logical and unchangeable. Becker upbraids both Keynes and Adam Smith for saying that actions are sometimes motivated by "folly and ignorance" (p. 12), cavalierly dismisses the idea that "education [or advertising?] can change preferences", and maintains that no behavior can be "dominated by ignorance and irrationality, values and their frequent unexplained shifts, custom and tradition, the compliance somehow induced by social norms, or the ego and the id." (p. 13) He reaches the ultimate conclusion that "most (if not all) deaths are to some extent 'suicides' in the sense that they could have been postponed if more resources had been invested in prolonging life." (p. 10)

Becker is an extreme example, but he has many followers. More significantly, his effort to insist that everything has a price and a market is a travesty of the real



world that is, unfortunately, believed and expounded by thousands of economists, along with millions of business people, politicians, and players in the stock market, and far too many ordinary citizens. The last group may not do much theorizing about the situation, but merely follow the example or the advice of those who make the news. The mass result is a world gone mad.

The stock market is merely an example of the problem, but it is a highly visible symbol--as well as a motivating force--for the mania for "making a buck" that invades and pervades our life today. The deification of the business format--along with its poltergeist, the stock market-- emphasizes, epitomizes, and glorifies the making of money, as if this were the purpose of life.

### **Beyond Money**

Money is the unholy grail. Money not only can't buy love, but often poisons all kinds of human relationships. The race for money, particularly by the corporations, rides roughshod over the poor, the ill, the environment, peace, and perhaps ultimately the existence of the world itself. We can spend billions on death in the form of our military budget, but our schools languish, our neighborhoods deteriorate, our politics are polluted. As a result of greed thousands of individuals and companies have been accused of graft, embezzlement, fraud; and similar crimes and hundreds are convicted every year. In each of those cases the criminal gets the money, even after paying the fine, while honest citizens lose their shirts.

Why this madness for gold? You cannot eat it, wear it (with slight exceptions in the form of jewelry), make love to it. You might paper your wall with stock certificates, but they do not in themselves have any real value. Will a severe stock market crash teach us a lesson? Not likely. The materialist seed is embedded too deeply within our "developed" culture. We sneer at the "primitive" peoples who get their deep satisfaction from nature, community, and religion, in ways that we cannot understand. But the polls say that they are just as happy, often more so, than we are. Surely it isn't that we don't value happiness; we have forgotten how to get it. It isn't measured by gross domestic product. Economists don't set their sights on it. Why?

In conclusion, let me come back to Becker. I have castigated him for his belief

that all human wants are satisfied only through prices and a market. But he is to be admired for his insistence that there are many human desires besides physical goods and services. He recognizes love, altruism, charity, democracy, justice, absence of prejudice and discrimination, quality of children, education, art, equality, genetics, even families in nonhuman species (1981, pp. 202-218), along with what he agrees are such negative factors as egoism, envy, and hatred. He even has a word to say about irrational behavior (1976, pp. 156-166).

He is well aware that economists do not normally study many important human qualities, and he wishes to fill in the gaps. That is all to the good. But he proceeds to do so by bringing all of these human characteristics within the realm of economics, markets, and prices. For my part I insist on leaving them, not to the economists, who don't really understand them, but to the behavioral scientists, who do (within human limitations).

Let us take Maslow at face value. Economic wants are primary, but after they are satisfied, most of the higher qualities of life don't fall within the scope of economics at all. That doesn't mean in the least that we should ignore them. On the contrary we should simply recognize how limited our economic viewpoint is and understand that markets and prices are a minor part of life. The gross domestic product is one measure of well-being, but only one. Let us get beyond thinking that money is the be-all and end-all of existence. Let us recognize that human well-being (of all people) should be our goal, not just the success of the captains of industry, or their stockholders.

If we do that, we can concentrate on such goals as greater economic equality, better education, universal health care, an improved and responsible democracy, a clean and green environment, reinvigorated communities, and more just plain fun. That's where the good life really lies. The emphasis on gross domestic product, the stock market, the world trade organization, and such financial matters, unfortunately obscures the reality underneath this economic and monetary activity.

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## Evolution of the Unemployment Benefit System in Poland in Transition

WALENTYNA KWIATKOWSKA

University of Lodz, Poland

The paper attempts to present the basic rules that have underpinned the unemployment benefit system in Poland during the transformation period so far. In the presentation of the system the stress has been put on showing how the system evolved.

The program aimed to transformation of the economic system in Poland that was initiated at the end of 1989 (Balcerowicz, 1997, pp. 360-361) assumed setting up of the labor market as an important market economy institution. In parallel, new laws were put in force that regulated the labor market and provided primarily social protection to persons being laid off by instituting a system of unemployment benefits and setting aside resources for training and retraining, as well as creation of new jobs.

The unemployment benefit system incorporated in the program was addressed to all jobless persons. But it was to provide special protection to persons dismissed under the so-called mass lay-offs caused by the reduction of employment due to economic or production-related factors, as well as those who lost jobs because of liquidation or bankruptcy of their enterprises.

According to the employment and unemployment act of December 19, 1989 (Dz. U. No 75, article 446) the unemployment benefit system was an element of a system providing social protection for those out of job. The key objective of the benefits was to secure a pre-defined minimum amount of income to the unemployed persons, shielding them from a sudden deterioration in their present living standard.

It was stressed, however, that unemployment benefits should also play the role of incentives, i.e. to mobilize unemployed persons to search for job opportunities and take jobs.

It was assumed that the source to cover costs of unemployment benefits and contributions to social insurance to be paid by persons drawing benefits would be the Labor Fund. The main source of the Fund's incomes has been contributions paid in by employers (first amounting to 2 per cent of the gross wage bill, and 3 per cent from

1994) enhanced with a subsidy from the state budget.

The act of 1989 defined precisely who was an unemployed person and detailed the rules for granting an unemployment benefit by stipulating requirements that determined eligibility for the benefit.

According to the act an unemployed person was one that

- remained jobless, was able to render work and ready to take it and registered at the local labor office relevant to the person's place of residence,
- did not own or held a farm with acreage exceeding 1 ha,
- did not run any other business activity,
- did not draw an old age pension.

The right to the unemployment benefit was granted to unemployed persons after 7 days from the date of their registration. All unemployed persons were eligible for the benefit, irrespective of how long they had worked before or if they had worked at all.

A benefit for those who had already worked was tied to the wage they received from their last employer. The benefit amounts were fixed degressively, with reference to the duration of unemployment. Amounts of the unemployment benefits could be:

- a) 70 per cent of monthly wages during the first three months of unemployment,
- b) 50 per cent of the wages during the next six months of unemployment,
- c) 40 per cent after that period.

Unemployed persons who had not worked before received a benefit amounting to the minimum wage. Also school-leavers were eligible for unemployment benefits within 12 months from graduation. Unemployed school-leavers received a benefit being:

- 200 per cent of the minimum wage within first three months,
- 150 per cent of the minimum wage within next six months,
- 100 per cent of the minimum wage after 9 months of drawing the benefit.

Persons leaving secondary and vocational schools were entitled to benefits amounting to:

- 150 per cent of the minimum wage for the first three months,
- 100 per cent of the minimum wage after three months of drawing the benefit.

The period of drawing the benefit by an unemployed person was unlimited. The person was entitled to receive it until a job was found.

When evaluating the 1989 solutions concerning the mode of becoming eligible for the unemployment benefit we need to note their positive and negative effects. Unemployment benefits, fixed at a relatively high level, provided an essential protection to unemployed persons from a radical deterioration of their living standard, as well as their families. They were therefore an important element of social security of the unemployed persons and their families. On the other hand, the unemployment benefit system produced certain negative effects. The soft requirements for granting benefits, an unlimited drawing period, and their relatively high amounts undermined their motivating function. The unemployment benefit system did not encourage the unemployed to search for employment opportunities and take jobs, or participate in training courses. Thus it added to the generation of unemployment. (see Kabaj, 1990, p.43).

The negative consequences of the 1989 act forced its amendment as early as 1990 (act of 27 July 1990, Dz. U. No 56, item 323). Above all, more rigorous regulations concerning the eligibility requirements were imposed.

Only those unemployed persons became eligible for the benefit that had worked at least 6 months during the year prior to registration. The condition requiring a period of employment to receive a benefit was not applied to school-leavers and employees with many years of service. The seven-day waiting period for the right to the unemployment benefit and the unlimited time of its payment until a job was found were sustained. The lower limit of the benefit was reduced to 95 per cent of the minimum wage, the upper limit was also cut down to the level of the average wage in the state-owned sector. The benefit still amounted to 70 per cent of the previous wage during the first 3 months of unemployment, 50 per cent of the wage during the next six months and 40 per cent of the wage afterwards, but it was adjusted according to the lower limits for setting its levels.

Benefits for unemployed school-leavers were abated. University graduates were entitled to 125 per cent of the minimum wage. Benefit for the secondary school graduates was at the level of 110 per cent of the minimum wage for the period of 6 months, and then 95 per cent of the minimum wage.

Other significant changes in the unemployment benefit regulations valid so far were introduced by the act of October 16, 1991 (Dz. U. no 106, item 457) that was put in

force on December 1, 1991. According to that act the unemployment benefit was available as soon as the next day after an unemployed person registered at the labor office. The new law stipulated limitation of the benefit drawing period to 12 months, as well as granted a sick benefit and maternity allowance.

An unemployed person became illegible for the benefit after one refusal to accept a job corresponding with the person's skills,

The act of February 15, 1992 (Dz. U. no 21, item 84) essentially amended the primary methodology of setting and the amounts of the unemployment benefits. A uniform benefit for being out of work was introduced. It amounted to 36 per cent of the average wage in the economy.

Other changes rationalizing the unemployment benefit system incorporated the act of March 10, 1994 (Dz. U. no 43, item 16). By virtue of this law a new type of benefit was introduced, amounting to 52 per cent of the average wages, for unemployed persons with long employment history and laid off due to reasons on the side of the enterprise in areas imperiled by high structural unemployment.

Significant changes in the extent of laws regulating the unemployment benefit system were introduced by virtue of another employment and unemployment combating act (Dz. U. of 1995, no 1, article 1) that was put into force on January 1, 1995. The status of an unemployed person and the right to draw the benefit was preserved by persons that accepted regular employment or any other paid job within 30 days from the date of registration at the labor office, if the income earned was lower than half of the minimum wage. According to the act, there were three obligatory levels of the unemployment benefits: 36 per cent of the average wage as in the previous quarter for the majority of the unemployed, 52 per cent of the average wage for persons laid off because of reasons on the company side, in regions particularly exposed to high structural unemployment, 75 per cent of the employee's individual wage received from the last employer.

Unemployed graduates were offered two rates of unemployment benefits being: 12 per cent of average wages for underage persons until maturity, 28 per cent of average wages for mature graduates.

With employment history equal to 25 years for women and 30 years for men the

benefit payment period was extended 6 months - to 18 months.

The benefit-awaiting period was prolonged to 90 days if an employee gave up a job voluntarily. The status of an unemployed person and the right to the benefit were terminated when the unemployed person turned down a job offer three times, the result being a ban on registration for six months.

The act of December 22, 1995 (Dz. U. 1996, no 5, article 34) introduced, in particular, several notable changes concerning the status of an unemployed person of school-leavers. By virtue of this act, since March 1, 1996, school-leavers have not been eligible for the unemployment benefit.

It has been replaced by the so-called activity bonus being a kind of a stipend. This stipend is funded by the Labor Fund. It has been introduced to activate the school-leavers on the labor market.

The stipend can be drawn by unemployed school-leavers registered at a labor office during training or an internship period at employers. It is paid out not longer than the period of holding the status of a graduate, i.e. to 12 months after completion of a school or education. The stipend's amount has been set at 1/40<sup>th</sup> of the unemployment benefit for each day of internship or training.

According to the act of 1995 the benefit at 36 per cent of average wages has been replaced with a benefit set as an amount of 260 PLN (from March 1, 1996). It was assumed that the benefit would be subject to a quarterly valorization relative to the change in the CPI.

Another act was passed on December 1996, the provisions of which were put in force on January 1, 1997 (Dz. U. no 147, article 687). This act introduced new solutions aimed at rationalization of the rules for granting and payment of unemployment benefits and restricted the possibility to abuse one's eligibility.

The act of January 1, 1997, changed the definition of an unemployed person. The status has been lost by persons who: draw a pre-retirement benefit or receive a pre-retirement allowance, have taken on a job or other paid employment, irrespective of the number of hours they work and the amount of the wage.

Unemployed persons have become entitled to receive a benefit after 7 days from the date they have registered at the local labor office. The right to draw a benefit hold unemployed persons who worked 365 days during 18 months prior to the registration at



the labor office and earned at least half of the minimum wage.

The amount of the unemployment benefit has become variable in relation to the duration of employment of the unemployed person. Three levels of the unemployment benefits have been distinguished: 80 per cent of the basic benefit, with employment history to 5 years; basic amount, defined in the act as a specific sum of money and valorized every quarter in relation to the CPI, for service longer than 5 years, but shorter than 20; 120 per cent of the basic benefit for employment period longer than 20 years.

The benefit-drawing period has been related to the rate of unemployment on the local labor market. The length of this period is: 6 months if, when drawing the benefit, the unemployed person resides in an area subject to the local labor office, where the rate of unemployment has not exceeded the average rate of unemployment in the country; 12 months, if the unemployed person lives in an area where the rate of unemployment is higher than average in the economy, 18 months when the unemployed resides in an area where the rate of unemployment doubles the average rate, has at least 20 years of service.

The act in question has amended periods for becoming eligible for the benefit. The following periods have been fixed:

90 days if an unemployed person gave up work voluntarily within 6 months before registration at the labor office, and 180 days if the person was dismissed because of disciplinary reasons in the same period.

The main provisions of the 1996 act that regulate eligibility for the benefit, amounts of benefits, benefit-drawing periods generally remained the same and are still in force since 1998 (Dz. U. 1997, item 128). The directions of changes in the unemployment benefit system outlined in the previous discussions are presented synthetically in Table 1.

**The rocketing unemployment and soft eligibility requirements for unemployment benefits at the outset of the transformation caused that the number of benefit receivers was growing very fast. In the years 1990-1991 almost 80 per cent of the registered unemployed persons received benefits (see Table 2). In 1992 the rate of beneficiaries rapidly declined because of tightened requirements for receiving an unemployment benefit (amongst others, the benefit drawing period was cut down to 12 months). In the next years the number of**

**benefit receivers grew to the year 1995 to essentially decline between 1996-2000. One of the reasons for that decline could be a further restriction of provisions regulating unemployment benefits.**

**Table 1. The unemployment benefit system in Poland, since 1989 (main changes)**

Specification	1989	1990	1991	1992	1994	1995	1996	1997
Qualifying conditions	- registered - no pension - no farm	old-age employed for 6 months in last year			as before and pay in present job below 50 % of minimum wage			employed for 365 days in last 18 months
Waiting period	7 days		none		90 days if quit job without notice			7 days  90 days as before 180 days if dismissed
Disqualification	2 refusals of suitable job within 30 days		1 refusal		3 refusals within 6 months			paid job pre-retired benefit
Duration	no limit		12 months		12 months 18 months in special cases			6,12 or 18 months dependent on local unemployment rate
Rate of benefit	70% of previous wage for 3 months		monthly		36% of average wage of previous quarter		fixed rate in zlotys	rate dependent on duration in employment

	50% for next 6 months 40% thereafter	52% of average wage in special cases
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**Table 2. Unemployed and benefit receivers, Poland, 1990-2000, data at the end of years**

Year	Registered unemployed (thousands)	Unemployed entitled to benefits (thousands)	Entitled/unemployed (%)
1990	1126.1	891.7	79.2
1991	2155.6	1703.0	79.0
1992	2509.3	1312.4	52.3
1993	2889.6	1394.3	48.2
1994	2838.0	1422.7	50.1
1995	2628.8	1548.9	58.9
1996	2359.5	1224.0	51.8
1997	1826.4	556.5	30.4
1998	1831.3	430.2	22.9
1999	2349.8	554.1	23.6
2000	2702.5	548.6	20.3

*Source:* Registered Unemployment in Poland, CSO, Warszawa; for the years 1992-2000.

## Conclusions

- The unemployment benefit system introduced at the beginning of the transition period was very soft. It mainly aimed at the income role of the benefits, whereas it was less focused on the motivation role. This was mostly revealed in the lax benefit entitlement conditions (benefits could be drawn also by those who had never worked) and unlimited period of drawing them. This triggered a high inflow of persons outside the labour force to the registered unemployment.
- The unemployment benefit system as assumed in Poland shaped behaviors of benefit drawers on the labour market. Empirical surveys confirm that the beneficiaries search for jobs less intensively and thus have slimmer chances for finding a job. Many of them delay a more intensive job-search activity until expiration of the benefit-drawing period.
- Despite improvements, the unemployment benefit system in Poland still needs further modifications. The amounts of benefits should be tied to wages earned before. Moreover, the level of benefits should be going down over the period of unemployment. It is necessary to build the unemployment benefit system on the insurance principle. Such insurance should be obligatory and contributions to insurance should be paid by both employers and employees. In addition, the trend to increase the number of persons taking advantage of the pre-retirement benefits and pre-retirement allowance seems unsustainable because of the large fiscal burden

on the central budget. This problem should be solved under obligatory unemployment insurance.

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# MACROECONOMIC COMPARISON OF TRANSFORMATION PROCESSES IN CENTRAL AND EAST EUROPEAN COUNTRIES

Zofia Wysokińska and Janina Witkowska  
University of Łódź, Poland

## INTRODUCTION

The aim of our paper is to present our research and comparative data concerning the decade-long transformation process in four countries of Central and Eastern Europe: The Czech Republic, Slovakia, Hungary, and Poland. The economic accomplishments of these four countries are closely intertwined with two parallel processes: the transformation to a market economy; and the process of European integration. Our paper focuses on the results achieved by the aforementioned countries in terms of foreign trade and foreign direct investment (FDI). We also try to formulate some answers to the question to what extent the economic policies implemented in the respective countries have been effective aids in strengthening their ongoing economic transformation.

### **1. An assessment of the economic and financial stability of the countries of Central and Eastern Europe.**

Overall economic growth in the so-called “Wyshehrad Group” of Central and Eastern European countries (Poland, Czech, Hungary, and Slovakia) during the period 1992-2000 was characterized by systematic economic growth of approximately 2 percentage points higher than the overall worldwide average<sup>113</sup>. In Poland economic growth grew from 2.6% to 7% between 1992-1995, following, which its tempo declined and fell to 4.1% in 1999. In the Czech Republic economic growth increased from 2.2% to 4.8% between 1994-1996, after which it declined in the later 1990's and fell to 3.1% in 2000. Hungary, on the other hand, was characterized by a stable economic growth trend in the second half of the 1990's, growing from 1.5% in 1995 to 5.5% in 2000. Slovakia experienced its greatest economic growth in the period between 1994-1996, when it fluctuated between 6.5% and 6.9%, while in the latter half of the 1990's it fell to 2%.

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<sup>113</sup> According the IMF, the overall worldwide average was 2.8% from 1995-1997, and 3% in 1996/97.

GDP per capita in Poland, measured in terms of USD, rose from \$2155 per annum in 1992 to \$3056 in 1995 and \$3725 in 1999. For comparison purposes, the same economic indicator for 1999 was \$4790 for Hungary, \$3662 for Slovakia, and \$5161 for the Czech Republic, where it was the highest among the CEFTA countries. If one revises the GDP per capita for Poland to take into account actual purchasing power, then the Polish GDP per capita becomes approximately doubled, equaling \$8650 USD. This level, however, is about three times lower than the actual average GDP per capita, measured in USD, for the member-states of the European Union, which was \$22, 588 in 1999.

The inflation rate in the CEFTA countries analyzed herein systematically declined during the 1990's: in Poland it fell from 480% in 1990 to 7% in 1999; in the Czech Republic from 24% to 4%; in Slovakia from 16% to 6%; and in Hungary from 36% to 10%.

The CEFTA countries were also bound to implement the WMF criteria aimed at creating monetary stabilization, in particular to consistently reduce the size of their budget deficits in the 1990's in relation to GDP: in Poland the annual budget deficit fell from 6% of GDP in 1992 to 2.1% in 1999; in Hungary from 7.3% in 1992 to 3.5% in 2000; and in the Czech and Slovak Republics their budget deficits at the end of the 1990's did not exceed 2.4% and 3.3% of GDP respectively.

The relatively high costs of credit in the CEFTA countries analyzed constituted a significant barrier to the development of small and medium-sized domestic enterprises throughout the 1990's. The highest annual interest rate for credit was recorded in Poland following implementation of Poland's "shock therapy" economic program in 1990, when the inflation rate reached 480% and the annual credit interest rate 540%! The situation quickly stabilized according to plan, however, and the annual credit interest rate fell to 54.6% in 1991 and has been characterized by a systematic declining trend thereafter, falling to 17% in 1999. This pattern of declining bank interest rates can be observed throughout the entire region, in Hungary falling from 35% in 1991 to 12% in 2000; in the Czech Republic from 14% in 1993 to 7.2% in 2000; and in Slovakia to a lesser degree, where the annual bank interest rate fell from 21% to 14.4%.<sup>114</sup>

## 2. An assessment of the foreign trade patterns for the countries of Central and Eastern Europe.

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<sup>114</sup> All the statistics given in this section were gathered from official national publications of the countries analyzed.



In the 1990's the countries of Central and Eastern Europe implemented policies of fundamental reorientation in foreign trade, shifting the direction from the East (the former Soviet Union and satellite countries) to the West (primarily the European Union). This was closely connected with the fact of signing Association Agreements between the CEFTA countries and the European Community and EFTA. The most drastic reorientation occurred in the Czech Republic, followed by Poland and Hungary, while the shift was the weakest in Slovakia.

The process of implementation of the Association Agreements, which mandated the mutual liberalization of foreign trade restrictions, led to a worsening of the foreign trade deficits in the CEFTA countries. While Hungary, the Czech Republic, and Slovakia managed to reverse this trend in the 1990's and even obtain small foreign trade surpluses, Poland's foreign trade balance has systematically worsened and reached a deficit of 10.5 billion USD in 1999. The asymmetry built into the liberalization provisions of the Association Agreements, as well as the delayed access to EU markets for so-called "sensitive products", which encompass textiles, steel, coal, and agricultural products, led to a significant restructuring in the patterns of foreign trade between the countries analyzed herein and the EU in the 1990's. As regards the export of coal and coal-derived products, the most significant restructurization occurred in the Czech Republic and Poland; as regards steel and steel products, in the Czech Republic, Hungary and Poland; while as regards agricultural products the most significant changes occurred in Hungary and Poland. As regards textile and clothing products, where the CEFTA countries enjoyed a significant comparative advantage due primarily to the low costs of labor, a trend of gradual worsening can be observed beginning in 1997-1998, which is especially evident in the cases of Poland and Hungary. (Z. Wysokinska, 2000).

Beginning in 1998-1999, the CEFTA countries analyzed gained access to the EU market for their industrial products free from tariff and quota restrictions. As a result of this process, the share in exports to the EU of natural resource-consuming goods, earlier usually classified as "sensitive", was significantly reduced. The share in the exports of such goods in the overall exports of Poland, the Czech Republic, and Slovakia to the highly industrialized countries fell by approximately 50%, falling in Poland from 37% to 17%, and in the Czech Republic and Slovakia from 10% to 5%. This reduction in the share of such goods in relation to overall exports is also connected with the application of EU ecological norms and standards to such products. For example, the share in Poland's overall export of

goods classified as “environmentally harmful” fell from 57% in 1992 to 46% in 1998 as a result of the application of EU norms. (Z. Wysokinska, 2001).

As a result of the twin processes of systemic transformation and European integration, an improvement was noted in the competitive position of high tech goods and products exported worldwide from the CEFTA countries analyzed. In the case of Poland this is especially evident as regards telecommunications equipment; in the case of Hungary as regards computers; in the case of the Czech Republic as regards telecommunications, space and aeronautics, and research and development equipment. As regards Slovakia, this improvement is less evident and concerns primarily research and development equipment.

### 3. Economic policies designed to encourage export

The financial instruments available to the CEFTA countries to encourage exports must be consistent with the international agreements between these countries and the European Union (the Association Agreements), the OECD (within the framework of the so-called “OECD Consensus”), as well as the multi-lateral WTO Treaties. Accordingly, the following policies have been implemented (in varying degrees) by the CEFTA countries analyzed:

- Income tax investment credits, on the condition that such credits do not constitute illegal State Aids under EU law
- Insurance and guarantees for export, including export credit insurance guaranteed by National State Treasuries
- insurance for businesses investing in foreign markets

This category includes the provision of insurance against lack of access to foreign markets, guarantees of supply credit offered by foreign banks, guarantees of production credit offered for goods produced for export, guarantees of export contract insurance and contract insurance taken as a hedge against fluctuations in currency exchange rates

- Financing of export credit for national enterprises from public funds
- Governmental Export Credit for the export of goods and services connected with developmental aid

Developmental aid is regulated by the OECD Consensus<sup>115</sup> as well as the regulations of the ODA (Official Development Assistance). Such aid may be the subject of either bi-lateral or multi-lateral treaties. Since 1998 Poland, Hungary, and the Czech Republic have observer status in the Consensus group.

- Interest rate subsidies for export credit

The authorizing regulations for the grant of such subsidies will expire in January, 2002, after which time the analyzed countries “in transition” will need WTO approval in order to offer such subsidies.

- Export credit granted at preferential interest rates pegged to the CIRR referential rate

Poland is presently considering authorizing the introduction of a new credit rate mechanism allowing commercial banks to grant medium and long-term export credit in both major foreign currencies and Polish zloties at interest rates pegged to the CIRR referential rate. This rate, established by the CIRR with reference to the major currencies of the OECD countries and calculated on the basis of 2.5 and 7-year Government bonds, is published monthly. The legislation under consideration in Poland would allow banks to tie interest rates established for the entire term of loans to the CIRR rate.

#### 4. Foreign direct investment in the economies of CEE countries.

Foreign direct investment (FDI) first entered the countries of Central and Eastern Europe as early as the 1970's. However, the fundamental contradiction between the market principles guiding foreign investors and the principles of a planned economy caused such FDI to be marginal.

The implementation of far-reaching systemic transformations throughout Central and Eastern Europe radically changed the attitudes of foreign investors toward the region as a location of FDI. The countries quickly adopted new laws granting foreign investors the necessary protections for their investments, including the right to transfer profits abroad, the retransfer of capital in the case of liquidation or sale, as well as the right to compensation in the event of nationalization or a taking by eminent domain. In addition, the very process of rapid transformation lured investors with the prospects of new markets.

The annual flows and accumulated investment of FDI into Central and Eastern Europe in the 1990's demonstrate the positive reaction of foreign investors to the changes taking

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<sup>115</sup> See the “Arrangement on Guidelines for Officially Supported Export Credits” – a treaty establishing guidelines for the establishment of officially supported export credit, known in short as the OECD Consensus

place throughout Central and Eastern Europe. At the beginning of the transformation period investment of FDI inward stock in the entire region was estimated at 3 billion USD, and by 1999 it comprised 103 billion USD worth of investment, a 34-fold increase.

The annual flow of FDI into the region was approximately 2.4 billion USD in 1991, and reached 21 billion USD by 1999. Although this constituted only 2.5% of total FDI worldwide, still the amount was of great significance to the region. About 70% of FDI into the entire Central and Eastern European region was invested in Poland, Hungary, the Czech Republic, and Slovakia. Their relative positions as countries receiving FDI have varied throughout this time. In the early phase of the transformation wave the most attractive country in the region for foreign investors was Hungary. By the latter half of the 1990's, Poland occupied first place in terms of total FDI invested in the region, a position now occupied by the Czech Republic. The reasons for this variation in terms of locating FDI in the region are connected with the varying paces of privatization, fluctuating changes in the indicators of economic growth, and the attractiveness of varying investment incentives offered to foreign investors.

The relative scale of FDI engagement in the overall economies of the countries analyzed herein can be seen by examining some basic economic indicators, such as: 1) inward FDI stock as a percentage of GDP; (2) inward FDI flows as a percentage of gross fixed capital formation; and (3) inward FDI stock per capita. Viewed in these terms, the scale of FDI in the region overall is comparable to the scale for the rest of the world. On the other hand, the relative scale of FDI engagement in the respective countries analyzed herein varies greatly. The relativity indicators are highest for Hungary, which testifies to the great importance of FDI in the economic development of that country. For example, the share of inward FDI stock relative to the GDP of Hungary was 33% in 1998, while inward FDI flows constituted more than 18% of Hungary's gross fixed capital formation for the same year (UNCTAD, 2000), averaging a per capita flow of almost 1900 USD. Slovakia is at the other end of the scale among the analyzed countries, where the values for the same indicators listed above constituted just 12.1% and 6.1% respectively, and per capita flow was only slightly greater than 460 USD. While data for the entire region is incomplete, there is no doubting the increasing penetration of FDI throughout the region in the 1990's. Its effects are most evident in Hungary, where for example foreign affiliates were responsible for 27% of overall employment in Hungary in 1997, including almost 43% in industry, and the share of foreign

affiliates in total turnover reached 48%, including 67% in industrial turnover (Measuring globalization, OECD, 2000).

In terms of the structure of foreign investment according to country of origin, it is readily visible that the dominating position is held by investors from the European Union Member States. Their share in overall FDI in the region fluctuates between 65-87% (OECD, 2000; PAIZ 2000). This can be explained by the twin factors of proximity as well as the ongoing process of European integration, which significantly improved the climate for investment beginning with the signing of the Association Agreements at the beginning of the 1990's.

The sectoral structure of FDI in the region is characterized by certain common and long-term trends. At the beginning of the transformation period, 2/3 to 4/5 of FDI in the region was located in industrial manufacturing (Sector II), while by the end of the 1990's the share of this Sector in overall FDI in the region fell to a range between 2/5 and 1/2. (OECD, 2000; PAIZ 2000). The share of FDI in service industries (Sector III) has risen in proportion to its decline in industrial manufacturing. FDI in Sector I industries has been minimal throughout the entire analyzed period. A close analysis of the data concerning FDI in industrial manufacturing reveals that the pattern of such investment has been very similar in all the countries analyzed. Of greatest interest to foreign investors have been the food processing and automotive industries, and of least the advanced technology industries. In the service industries a significant proportion of FDI has been located in financial services as well as in trade and maintenance services. It is worth noting that a general overview of the sectoral structure of FDI in the region is similar to that pertaining throughout the world.

##### 5. Government Policies of the countries of Central and Eastern Europe towards foreign investors.

In the world economy, the process of removing barriers to the free flow of capital has been underway for more than twenty years. The various countries of the world - both the highly developed and developing nations – compete among themselves for DFI capital. The basic strategies are the same: either the offering of foreign investment incentives (benefits, exemptions, special regulations) or implementing a policy of strengthening economic “fundamentals” (infrastructure, education, economic stability, etc), or both, with the aim of improving the attractiveness of their respective countries as a location for DFI (Ch. Oman, 2000). During the early phase of the transformation most countries in the region implemented policies which granted foreign investors a specially privileged status vis a vis

domestic enterprises, inverting the national treatment principle. While presently the countries of Central and Eastern Europe have readjusted their policies to providing similar treatment for foreign and domestic enterprises, they still compete for foreign investment. One only need look at the legal regulations in place in the Czech Republic, the extensive government programs in Hungary, or the draft legislation being worked on in Poland to see that support for attracting foreign investment continues to be high.

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# Globalization and Labor Disarticulation: Issues and Perspectives

*Kwan S. Kim*

University of Notre Dame

## 1. Introduction

In today's global markets, multinational corporations deliver products and capital to any corner of the world for the prospects of profits. As a result, economic growth in many parts of the world has been accelerated. This is attributed to the increased efficiency of the economy gained from unfettered competition that has been facilitated by the rapid spread of cost-reducing electronic information technologies. Nonetheless, those who argue for the beneficial effects of global capitalism often overlook its dark side. For instance, one recognizable factor contributing to global mega-corporations' success has been the ability of the global economy to produce products at slave wages in poor countries and to sell them at the worldwide market at enormous profits. One lives today in a polarized and ever polarizing world. As domestic businesses are forced into a global village business culture, a dramatic conflict that defies a facile resolution has emerged between economic classes of "haves" and "have-nots."

This essay addresses the issues of polarization in the global economy. The questions that are posed include: How will global free trade and the advent of the new information economy affect the working poor? What do those mega-business deals mean to the main streets in poor and rich countries? What will the future portend unless appropriate actions are taken now? This essay thus focuses on the equity implications of globalization and argue for global actions to ensure a sustainable global economy.

## 2. Epochal Transitions in International Economy

Before answering these questions, one must first appreciate **two** significant events that occurred in the international economy in recent past:

### (1) The Triumph of Global Capitalism

The collapse of the Berlin wall in 1989 led to a swift surge in the spread of capitalism on a global scale. Not only the former socialist countries entered into the orbit of capitalism but also the extended family farms, small shops, and cottage industry producers in the developing world of Latin America, Asia and Africa started to give way to capitalistic enterprises. Globalization of capitalism was epitomized by the 1994 GATT agreement when representatives of 109 countries signed the "Uruguay Round" that would drastically reduce national barriers to international movements of goods and services under the governance of the World Trade Organization (WTO) that now encompasses virtually all nations on the planet. At the regional level, such free trade areas as North American Free Trade Agreement, European Union, Association of South Eastern Asian Nations and others have been established. The shift toward to freer movements of goods, money, knowledge, and services on a global scale can now be taken for granted as no other viable options seem available for any countries to stay out of it.

### (2) Information superhighway

Even before the Berlin Wall, there was a new revolution in electronic technologies that began to facilitate the spread of capitalism. Rapid development of computers and microchips has drastically changed communication systems, generating a revolution in communications with the capacity to receive, analyze and transmit vast masses of data at any moment from all over the world. As citizens of one country become connected to those of other countries via interactive voice, image, and data all over the world, many things began to be done in a similar way for global markets. Facilitated by freer trade, profits of individual producers and gratification

of individual consumers have come to matter in borderless competitive markets. While the collapse of communism removed a strong anti-liberal force from the world scenery, the revolution in information technology has reduced transaction costs in production and in movements of capital. They together have served as the prime forces contributing to the rapid globalization of capitalism.

### **3. Economic Governance and Implications**

As the nations embrace capitalism in the process of global economic integration, the private sector plays increasingly larger roles in the economy. Greater private initiatives and less state have in turn profound impacts on the economy – both positive and negative. On the positive side, both producers and consumers can make a choice in broader arenas of goods and services; there will be more intense competition on a global scale and investors can move money and resources to most profitable places. Efficiency in production is bound to increase, enabling the firms to produce more goods cheaply and tailored for a broader consumer choice. The global economy will have a sizable economic pie that can be shared widely by every nation and every citizen in it. Our global economy today is far richer compared to 10 years ago. (World Bank, 2000)<sup>116</sup>

The downside to all this, nonetheless, is that given the current institutional structure of the global economy, greater competition and economic integration alone are not likely to deliver the benefits equitably to all countries. The current form of globalization has been fostering greater concentration of power in the hands of a few mega-corporations, posing new threats to our physical environment and imposing restrictions on social programs. Most serious of all, a new wave of persistent poverty has been generated, with the gains and losses from the new global environment grossly uneven between nations and economic classes in a nation. Most developing countries still remain marginalized in a “prosperous” global economy. Within the weakening of the state as globalization proceeds, the underdogs in society continue marginalized in the developing world.

The next two sections examine how the benefits from global integration are shared between and within societies on both theoretical and empirical grounds.

### **4. Globalization as the Cause of Polarization**

It will be expedient to explore the causes, first at the level of relations between nations and then at the level of domestic relations. Internationally, there has been the tension between the industrialized and the developing countries. Within a nation, there are two forms of inter-class tensions; one between capital and the other between skilled labor and unskilled labor. These causes of polarization should not be considered as mutually exclusive of each other.

#### **A. Tension between developed and developing states.**

Although a torrent of international capital and new technologies unprecedented in world history has been unleashed in global markets, the majority of developing countries are still saddled with the external debt, remain deficient in absorptive capacity to acquire, adapt and use new technologies. With the foreign aid dwindling, people living in the developing world have been denied access to appropriate training programs and capacity building. For the non-oil producing developing nations that specialize in low value-added, primary commodities, the

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<sup>116</sup> The new GATT accord alone is presumed to add global income annually by another \$235 billion, about 1% of the total village income, which is not a bad beginning at all.



old terms of trade problems continue to militate against any potential benefits from global markets.<sup>117</sup>

Even for more advanced developing nations, the impact of globalization has not been all that positive. In particular, unregulated speculative capital movements have recently done much havoc in these economies. Freer capital movements fueled a spectacular boom in parts of the developing world, making rich countries' banks, mutual funds, and investment brokers to easily access the host investors looking for quick returns in less-productive projects, such as condominiums and even golf courses. Under this Anglo-American-style globalization, less competitive developing countries with a form of governance different from the United States, in particular the countries with a weaker financial institutional structure have been vulnerable to global capital invasion (Krugman 2000, Ch.2). This has been witnessed in a series of the recent economic crises in Southeast and East Asia, Mexico and Brazil, Russia, and Turkey. The financial panics that ensued in these nations had a devastating impact on the livelihood of more vulnerable people (Kim, 2000; Krugman, 2000).

### **B. Tension between capital and labor.**

In the industrialized West, a powerful combination of economic forces leads to a growing income gap between capital and labor. The decline of organized labor, a flood of new low-skilled immigrants, a surge of imports from low-wage countries and the spread of new technologies that displaced low-skilled workers and rewarded the better-trained have been the examples of these forces. Moreover, politics in global business has become the art of preventing the economic underdogs in society from taking part in affairs. As the domestic corporations seek access to low-wage labor pools in developing countries, the country's low-skill workers are mired in the homeland, accepting a lower wage or an alternative of being laid off. The outsourcing of production, which weakens domestic labor's position, is facilitated by the ease in transnational capital mobility. Globalization has thus led to rapidly rising profit incomes relative to wage earnings, more so in capital-exporting countries (Wolff, 1995). The contemporary arms' length capitalism assures a system of command and control of labor by capital. In its worst form, it has led to a race to the bottom for underclass labor (Kosters and Ross 1988; & Bluestone, 1990).

### **C. Widening Gap between skilled and unskilled.**

That the working poor are increasingly left behind from the benefits of new technologies and trade can be explained in terms of labor saving technology, capital movements seeking lower wages, relative abundance of unskilled workers, and the financial globalization facilitated by the advent of electronic trading and internet. Faced with increasing global competition, manufacturers are forced to seek new technologies, which tend to be laborsaving, and to raise demands for skilled workers at the expense of unskilled ones (Wood, 1995 & 1997). Moreover, the shift in consumer demand towards high-value, differentiated products away from standardized goods discriminates against use of unskilled labor. As the shortage of talent in terms of both geographical areas and skill intensity emerges, wage disparities between skilled and unskilled labor increase. In the industrialized world there has been increased concentration of employment in high-wage, professional occupations and gradual diminution of blue-collar positions.

For illustration, in Figure 1 the labor market is divided into two sectors producing outputs using skilled labor and outputs using unskilled. The skill-intensive sector is represented by the knowledge-intensive, high-tech industries; and the unskilled sector by manufacturing branches

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<sup>117</sup> Africa Recovery, 8. No3. (December 1993 – March 1994).

producing standardized products. The supply of the workers in the short run is given at the OL amount, with the units of skilled workers indicated by distance OW and those of unskilled by WL. The D and A curves are labor demand in the skilled and unskilled sector respectively. The vertical axis measures the real wage rate. In the short run the labor market is assumed rigidly segmented. The initial wage gap, shown by distance ab, is shown as the difference between skilled wages aW and unskilled wages bW. As the labor demand curve reflects labor productivity, technology that improves the efficiency of skilled workers causes an upward shift of its demand. Alternatively, increased demand for knowledge intensive products similarly causes a shift to the right of labor demand curve D, say, to curve E. As a result, real wages for skilled workers rise to c from a. On the other hand, the decline in consumer demands for standardized products - which may result from increased import penetration from global competitors - causes a downward shift in unskilled labor demands. This is shown by the B curve. Now, if unskilled real wages stay rigid, there will be increased unemployment by bg units. If wages are flexible, they fall from Wb to Wh, thereby widening the initial wage gap between skilled and unskilled. Finally, as capital moves from the North to the South, demands for unskilled workers in the North will further decline. This effect is shown by a downward shift of the labor demand curve from B to C. Unemployment rises to as much as bk units in the case of a rigid labor market; or unskilled wages could fall to Wm in a flexible labor market with the resulting wage gap rising to cm.

Turning to the labor market in a capital- importing developing economy, globalization in theory benefits the host country's labor. The conventional theory further asserts that freer trade raises demands for the country's relatively abundant factor, which would be unskilled labor for developing countries, and contract demands for relatively scarce factor, which would be skilled labor. This narrows the wage gap between skilled and unskilled as the wages of the former would be lowered and those of the latter raised.

In the context of today's global economy, however, the conventional view is challenged by the recent evidence for wage inequality in virtually all regions of the developing world. There are two factors that can be considered as contributing to wage inequality. First, new technologies are generally biased against use of unskilled workers (Robbins, 1996). Unlike in the 1960s when the East Asian countries could find comparative advantage in low skill, labor-intensive products, recent technical progress is largely labor replacing and is biased toward specific skill and knowledge use. The developing world is well endowed with unskilled labor that are not so much demanded by capital of the industrialized North in the age of high-tech industrialization. New technologies raised demands for skilled and better-trained labor in even the labor-rich developing countries.

Secondly, the openness to trade forces the firms to move into high-value, sophisticated consumer products, the production of which requires use of labor with some skill intensity. This is particularly the case with multinational investment abroad because the products produced by their subsidiary plants are largely to be re-exported in competitive global markets. They need to hire reasonably skilled, yet lower wage (relative to the Northern workers) workers in the South. Unskilled or illiterate workers with very little training would be virtually of no use in today's globally linked production network. Moreover, global competition forces multinational corporations to invest in the selected sectors or geographical areas - for example, in urban agglomerates - where host country workers tend to be better educated and skilled and where physical infrastructure for production and marketing is more adequate. The working poor in developing countries is mostly located in the low-value, traditional sectors, including the subsistence rural economy. Since the workforce in these backwater sectors is least affected by globalization, economic integration can result in increased wage inequality within the country.

The widening wage gap between skilled and unskilled has been more conspicuous for the

middle-income countries, where the ratio of skilled labor endowment to unskilled labor typically is higher compared to low-income labor-rich countries (Robbins 1996). Moreover, the entry of labor-rich China and other southeast Asian countries into global markets further reduced the demands for unskilled workers in the middle-income countries as in Latin America (Wood; 1995 & 1997). As low-skill intensity goods exports from China, India, Indonesia and other South and Southeast Asian countries expanded, the comparative advantage of middle-income countries in Latin America has shifted toward intermediate skill intensity goods. Growth in the intermediate sectors further raises the relative wages of the skilled for the middle-income countries.

### 5. Global Inequities: Some Evidence

The most troublesome impact of globalization is the relative impoverishment of the working poor in both the developed and developing worlds. As the 1990s-style corporate restructuring took hold in the industrialized world, substantial costs have been incurred in terms of jobs lost, incomes of the working poor reduced, and bankruptcies of smaller firms. As a result, a widening gap has emerged between labor and capital. In the industrialized Europe (Germany, France, and Nordic European countries) where unlike in the USA, labor markets are less flexible, unemployment rates have in recent past soared to unprecedented levels.<sup>118</sup>

Table 1 shows unemployment rate by level of educational attainment, classified into the “less than secondary” level and the “tertiary” level. Since the new economy technologies introduced across national borders would require fairly sophisticated human capital development, for purposes of a rough comparison the “less than secondary” category is identified as the unskilled; and the “tertiary” as the skilled. Aside from some inter-country variations, the figures generally display relative predominance of unemployment in the unskilled category.

Also, the rise of capitalists is accompanied by weakened workers' bargaining strength as technological changes and global opportunities for business have worked against less skilled workers. In the US, for example, the rewards from the new global economy have been uneven against the workers, who have been losing economic grounds (Wolff, 1995; Sachs & Schatz, 1996; Kim, 1999). When the workers demand higher wages, the company may move to another location where wages are lower and workers are poorly organized. Even when the company does not move, it may subcontract some of the work and buy parts from foreign sources; or it may simply threaten to move. The results were lower wages and rising inequality in income. The average weekly earnings in the non-agricultural part of the U.S. economy in 1992 were 19% below their peak of the early 1970s, lower in every year since then. Despite the sustained boom in the US, the gap between the rich and the poor further widened; the top quintile in 1999 earned almost 20-fold what the bottom quintile made; that margin has doubled over the previous two decades. The CEOs of large US firms earned an average total compensation of \$12.4 million in 1999, up from \$2 million in 1990, with the ratio of CEO to worker pay continuously ascending from 42 to 1 to as high as 691 to 1 over the period.<sup>119</sup> In terms of the share of wealth held by the top 1 percent of households, it rose from 24.8% in 1980 to 40.1% by 1997.<sup>120</sup> On the other hand, by the end of the decade some 11 million more Americans were added to the group living below the poverty line.

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<sup>118</sup> A few European countries such as the Netherlands, England, and Ireland, which adopted more flexible labor market approach, have noticeably lower unemployment rates. For OECD unemployment figures, see *OECD Economic Outlook*, No.65, May 1999.

<sup>119</sup> Based on the survey data for the 365 largest U.S. corporations. *U.S. News & World Report*, February 21, 2000.

<sup>120</sup> Census Bureau data, quoted in the previous note

Economic polarization is similarly widespread throughout the developing world. Crony capitalism practiced in many developing nations accentuated the process of widening wealth disparity. Business elite, with close ties to their country's political elite, usurps the opportunities of rent seeking in global business. The middle class who traditionally was supported by government subsidies or trade barriers to keep inefficient firms alive has shrunk. The working poor, with their fragile safety net has been strained by fiscal austerity measures from the international financiers, are getting more desperate. Growing income disparities thus translate into the marginalization of a large segment of the population. No particular regions of the developing world appear as an exception to this phenomenon. The incidence of poverty rose in Sub-Saharan Africa (Kim, 2000), Latin America (Altimir, 1999; Dussel Peters, 1997)<sup>121</sup>, South Asia (Goodno & Miller, 1997) and the former East European bloc.<sup>122</sup> Disparities also occurred in the financial-crisis-impacted, more-prosperous emerging countries in East Asia and Latin America. While incomes in the world's richest countries have soared, those in the poorest nations have stagnated or plummeted (World Bank, 1996; Dussel Peters 1997, Kim 1997, Rahman, Griffin & Zhao, 1996). Recent United Nations data (Table 2)<sup>123</sup> show that over the period from 1980 to 1987, the ratio of richest 20% to poorest 20% of world population jumped from 44.6-fold to 80.8-fold. Despite recently sustained growth in global output and investment in the developing world, poverty continued to increase, with the resulting income gap between nations and within the nations. In total numbers, some 4.7 billion people live in the Third World and out of this some 1.3 billion live below \$1 a day. In reference to the global village analogy, out of every 100 residents in it, 20 own 83% of wealth, with 80 sharing 17% of the village resources. Forty out of 100 who mostly hail from "the Third World" are in dire poverty living in cardboard, shack houses, working on the leased land as landless laborers on the farm or as peddlers in the urban streets. Ten in this village share a meager one percent of the village's total revenue.<sup>124</sup>

Microeconomic evidence of wage deprivation in the Third World abounds. In an episode of Haitian labor exploitation by Disney, Kernaghan's study<sup>125</sup> finds:

"The workers in Haiti are paid just six cents for every \$19.99 Disney "101 Dalmatians" outfit they sew, which means that their wages amount to just three tenths of one percent of the sale price. If the Disney company were to redirect the \$181 million in stock options it gave CEO Michael Eisner in 1996 - the largest corporate grant in the history of the world —it could double the wages of all 19,000 assembly workers in Haiti for the next fourteen years."

Another well-known case of labor exploitation is the sweatshop operation in El Salvador,<sup>126</sup> A recent survey has found deplorable working conditions in sweatshops.<sup>127</sup> In a typical El Salvadoran sweatshop factory, wages to women workers sewing jacket were 84 US cents per piece, which accounted for 0.4% of the garment retail price of US\$ 198. Average working

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<sup>121</sup> Costa Rica and Uruguay with their state-run social-welfare systems represent the exceptional cases.

<sup>122</sup> Some declines in disparity index were reported in China, the Middle East and North Africa

<sup>123</sup> Counting the global poverty incidence is blurred by including the data from China, which accounts for some 30% of the total number of the poor in the world. The Chinese figure is questioned for its unique methodology of defining poverty.

<sup>124</sup> Notre Dame Commencement speech by Kofi Anan, the General Secretary of the United Nations, May 18, 2000

<sup>125</sup> Charles Kernaghan is director of the National Labor Committee, New York, quoted in The San Francisco Examiner, summer 1999.

<sup>126</sup> El Salvador is currently the 8th largest exporter worldwide of apparel to the US.

<sup>127</sup> Marc Breslow, David Levy & Abby Scher in *Real World International*, (5th ed.). (Summerville, MA: Dollars and Sense Economic Affairs Bureau, 1999). 32-34.

hours were up to 15 hours a day; many worked 7 days a week.<sup>128</sup>

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<sup>128</sup> The team found that the typical worker was paid about \$4.79 a day. " It costs 80 cents a day to go back and forth from work by bus, 91 cents for breakfast and \$1.37 for a very small lunch - chili, tortillas, some rice. Just to survive and get back and forth to work cost them \$3.08. When you make \$4.79 that leaves you with \$1.71. The cheapest rent in the factory area would be \$80 a month, for dilapidated living conditions - and \$80 a month is \$2.63 a day. Obviously, if they pay their rent they have no money for food. The workers would work eleven hours a day making garments. Many workers felt that they could scrape together 28 cents to have tortillas and eggs for supper To climb out of misery and just reach the poverty line, the minimum living wage would have to be about \$1.18 an hour, which would be only eight-tenths of 1% of the retail price of the garment

## 5. Concluding Remark: Challenges Ahead.

As the nations today have virtually no options but to move in the global village, the urgent questions that pose are: What will be this global village like? Will this be an amicably livable village for all to live in? The village is prosperous in terms of the wealth and income, and yet paradoxically, a large number of residents will be left behind than the benefited in sharing the benefits of prosperity.<sup>129</sup> With the world population growing at 80 million a year, in three decades from now some 3 billion people from the current 2 billion will survive under \$2 a day. Environmental degradation will be much worse. Instead of 4 percent of tropical forests lost due to impoverishment of the working poor could reach as high as 24 percent (World Bank 2000). Without economic hope and a better sense of economic equity we will not have a globally stable political and economic system. Darwinian global capitalism could threaten the very stability of an open democratic society. Recalling the alarm bell sounded by George Soros in the wake of the Russian crisis, who can assure that indigenous political movements seeking to expropriate the multinational corporation to recapture the national wealth will not occur in a marginalized developing society? Recall how global financial systems and misguided harsh politics led to economic depressions and enormous human sacrifices in developing countries of Asia, Africa, and Latin America in the 1990s. Recall the recent past riots and violence over the IMF-backed sharp price rises by the working poor in Venezuela, Indonesia, Thailand and Turkey. Unless we take actions now, social violence, terrorism, and conflicts could become more widespread and frequent. Crime, drugs and famine have not stopped at borders.<sup>130</sup> Securing global stability is a challenge the world cannot afford to overlook. It is equally relevant to understand that the rich nations receiving the lion's share of benefits from globalization have self-interest in seeing sustained growth for the other 80 percent of the left-behind. Within a nation also, the main sources for sustained demand come from the grass roots masses. Only when the lower and middle classes' economic activities are organically linked to the top elite, capitalism could survive. Thus, solidarity for the community of the nations, economic as well as moral imperative call for increased equitable sharing. After all, the prosperity of the rich nations has largely come from developing country resources that have not been paid for adequately.

In conclusion, the globalization debate must not be whether or not the country should be isolated from the global economy but on what kind of policies should be adopted to help those people and countries that are left behind. The current globalization model fails to provide any effective means to produce a widespread and equitable form of economic growth.<sup>131</sup> Thus unless we take actions now, any sense of socioeconomic justice would be lost, further threatening global peace and security. Relegating the search for an alternative globalization model to another space, it suffices to note here that the key issues must address the inclusion and productive capacity of the working poor,<sup>132</sup> living wage guarantees, and reductions of

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<sup>129</sup> Presumably in this village, some 6 billion humanity reside; about 40% are Chinese and Indians, the rest mix of some 200 ethnic origins; there will be an ongoing transfer of power in economic governance from the nation state to microeconomic civilian agents. There will be no centralized system in governance for some time.

<sup>130</sup> In 1999 alone, there were twenty-six interstate wars and 23 million refugees in the developing world.

<sup>131</sup> Ironically, as demonstrated by East Asia's experience in the 1960s and the 1970s or more recently by China, the countries with restrictive trade policies achieved more rapid growth and most reductions in poverty compared to those that are most globalized and liberalized.

<sup>132</sup> For many working poor in the developing world, informal- sector activities are the only possible source of improved incomes and a better quality of life. Unfortunately, many of them cannot simply make markets work to their advantage as they are denied access to the requisite means to appropriate technologies, to market information and to business support.

disparities within and between societies.<sup>133</sup> In this context, Minister Lee Kuan Yew's statement<sup>134</sup> is resounding:

"We will not have a stable world if many developing countries in Africa and Asia do not enjoy the rising benefits of capitalism that accrue to America, Europe and Japan, and some newly industrialized economies. The developed nations cannot afford to have a permanent underclass as America has. Or their societies will become too divisive and fractious."

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<sup>133</sup> The solutions to the problems are by no means hard to find, provided that there will be a political consensus to do so in the international community.

<sup>134</sup> Cited in Wall Street Journal, September 27, 1999.

Wood, Adrian, 1997. "Openness and Wage Inequality in Developing Countries: The Latin American Challenge to East Asian Conventional Wisdom," *The World Bank Economic Review*, 11(1), January.

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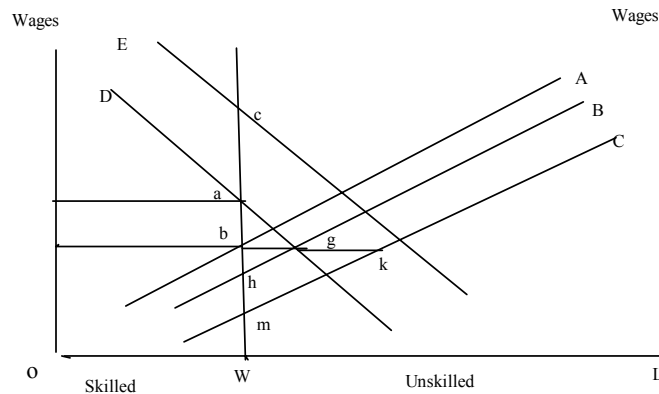
World Bank: 2000. *Entering the 21<sup>st</sup> Century*, World Development Report 1999/2000, Oxford Press.

**Table 1. Unemployment Rate (%) by Educational Attainment.**

		<b>Less than Secondary</b>	<b>Tertiary</b>
Austria	1997	95	5
Canada	1997	64.4	35.6
Japan	1996	76.3	23.7
Jordan	1996	67.6	32.4
Peru	1997	74.3	25.7
Poland	1997	95.4	4.6
Russian Federation	1996	91.7	8.3
Thailand	1997	79.4	20.5
Venezuela	1996	86.9	13.1
Zimbabwe	1997	99.9	0.1

World Bank: 2000 World Development Indicator. 57

*Figure 1. Globalization and Labor Markets*





**Table 2. Percentage Increases of income of the richest 20%  
v. The poorest 20% of world population.**

	<i>Richest 20%</i>	<i>Poorest 20%</i>	<i>Ratio of richest to poorest</i>
1980	76.3%	1.7%	44.9
1989	82.7%	1.4%	59.1
1997	88.9%	1.1%	80.8

UN Development Programs; also Wall Street Journal, April 20, 2000.

## **Artificial Data Stars and Beyond**

Joseph King  
Florida International University  
Biscayne Bay Campus  
Miami, Florida United States

Presented:  
August 16, 2001  
The International Society for  
Intercommunication of New Ideas  
6<sup>th</sup> International Congress  
Miami, Florida United States

### **INTRODUCTION**

During the grand futurist age of the early 1980's, large corporate and governmental research and development teams were grossly engaged in the development of two highly requested technologies. The first was the ability to manipulate and transport an object, either living or inanimate, through the portals of time. Hence, time-travel. The second was considered at that time to be of a greater challenge, if not impossible, than the first challenge. This was the alteration, and adjustment of the speed of light while maintaining all of the properties of light. This was considered to be more perplexing than the concepts of time travel do to the railing debate over the structure of light. Was light the manifestation of electro-magnetic waves, or that of the propagation of substances called photons? And to increase the dilemma to a higher level of perplexity, what were the relationship between time travel and the speed of light? Were these theories, or scientific facts? Could one in fact move into an alternate dimension, possible the time dimension continuum, if they were accelerated to speeds beyond the absolute upper limit of

the speed of light? Furthermore, could light be accelerated beyond the stated and prescribed upper limits set forth by the rules of physical science?<sup>1</sup>

Work began to investigate these mysteries, while also working toward the profit goals that awaited the futurist teams assigned to these projects. Special attention and funding was allocated to the second goal of light speed manipulation in the hopes that the more profitable first goal of time travel would be discovered. It should be solely noted that the profit potential overwhelmingly outweighed the intrinsic value of the research, and impact on humanity. The greatest break occurred when researchers at American Telephone and Telegraph [AT&T] Bell Laboratories confirmed that in fact light consisted of particle like elements known as photons.<sup>2</sup> While photons possessed wave like characteristics, they contained peculiarities only associated with elements of substance. Quickly the theory arose, with reference to light's new platform of understanding, that if there is substance, at any level, there is the potential for manipulation, at any level.<sup>135</sup> The "think-tanks" of the world now possessed new and fresh concept material to work with in the development of future profitable endeavors. But what about time-travel, and time-manipulation, was this a forgotten frontier that had already received billions of dollars in research funding? The answer is, that time-travel and time-manipulation has not been forgotten, but both have been abandoned.

With the advent that light had properties beyond the well-accepted theories of electro-magnetic waves, and therefore in theory could be manipulated, the potential for time-travel suffered a major blow in further development. Since time-travel theories were directly connected, in totality, to the event of exceeding the upper limit of the speed of light, than what would occur if light broke its speed limits? Would, in fact, time-travel be accomplished? To the dismay of the researchers and futurist engaged in this mission of time-travel and time-manipulation the

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1 Let me extend my grateful appreciation to the Futurist Team that I had the honor to be associated with during this time at AT&T as we worked diligently on these projects.

2 Photon research and findings are available at AT&T's web site [ //www.att.com ] under the category of research and development. The data base was too extensive to list all references, but is available for further insight by the reader.

3 Let me extend my grateful appreciation to the Futurist Team that I had the honor to be associated with during this time at KAPPA Group International as we worked diligently on the feasibility of these concepts.

simulations on the acceleration of the speed of light proved that light maintained its status even when breaking through barriers of accepted limitations. It was found that light did not slip, jump, migrate, or propagate into another dimension, or time attribute. Light remained as light at the higher undeclared speeds, and within the present time frames occupied by light's human co-occupants.

All components and theories, old and current, associated with time-travel and time-manipulation failed, and was atoned in the late 1980s, and has not been resurrected to date. The conclusion was, in reference to time-travel and time-manipulation, that time was the absolute factor, not the speed of light. Light could be manipulated, and maneuvered to respond in characteristics never thought possible. This was to be further proven during the next decade.

The resulting outcome was that time-travel and time-manipulation research was abandoned worldwide, and resources were diverted to the perfection of accelerating the speed of light. The future gleamed bright for futurist and researchers with the feasibility of altering the speed of light. It should be mentioned at this point, that one specific futurist team realized and conceptualized the aspects of accelerating the speed of light beyond its limits, as well as the ability to slow the speed of light down, even to the point of stopping the speed of light. This was based upon the convection that if the speed of light could be accelerated beyond its limits, than the speed of light could also demonstrate reverse properties. In retrospect these individuals approached the entire matter with the position that light, with all of its inherent properties, possessed no limitations physically. That light's sub-component properties known as photons could perform at any dictated level of activity, within current time frames, as set forth by the user. The potential for the utilization of various speeds of light was staggering to the research teams and futurist engaged in this developmental exploration.

## **FUTURE IMPACT FROM THE SLOWING OF THE SPEED OF LIGHT**

While it is not the direction of this presentation to investigate, and detail the procedures that engineers have utilized in modifying the speed of light, it would be prudent to give a gentle overview of the process for better appreciation of forthcoming material in this presentation.

In the acceleration of the speed of light, engineers have found that through the application of concentrated magnetic fields round and about a light source that they can produce a “pumping” effect that will boost the speed of light to upper ranges that are being described as inconceivable and infinite. Current research is also revealing encouraging results that light can be “pumped up” with the introduction of another light source acting as a somewhat carrier vehicle to the first light source. A kind of turbo-charger for light that rockets the light beam through a media breaking both speed and performance levels unlike the scientific world has ever conceptualized. There is no doubt that this frontier will continue to expand, and new performance records will be revealed routinely over the next decade.

In slowing light the process is the opposite of the above-mentioned procedures both in theory and application. By utilizing “reverse pump” technology the photon flow is held back in somewhat of a “sucking” mode that resembles a magnetic field vacuum that should not be confused with an atmospheric vacuum. The results are that the speed of light is decelerated, even to speeds that represent a crawl, or less than five miles per hour.

While these engineering feats are astonishing and magnificent, the true revelation in this technology dwells with its commercial implications and applications. We will examine this area in a systematic and futuristic manner.

By altering the speed of light to various levels of acceleration and deceleration we open the potential for greater bandwidth on a media source such as a fiber optic, or coaxial cable. Different speeds of light encoded, and carrying data from one point to another can be assigned a

“speed” and then multiplexed onto the media of choice. Layered light data transmission and data stores can now occupy the same media with no interference or disruption. Multiplexing could be achieved over a single media utilizing current technologies in frequency modulation and time division data packets, combined with various speeds of light transmitted simultaneously over the same media source. Bandwidth could approach infinite levels of feasibility over a single media source by eventually utilizing a combination of these technologies. This would be a major accomplishment in meeting the demand for increasing transmission bandwidth by the communication industry in order to deliver new services to the consumer base.

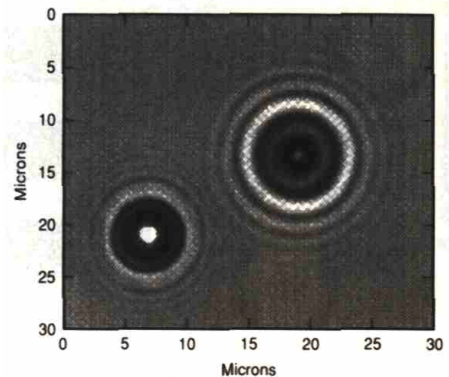
With this increased, and wide-open bandwidth exhibiting virtually no limitations, the transference of data, or any digital format [current or future] from one point to the other is feasible and unlimited. Capacity to deliver a digital signal of any magnitude could be achieved through the above processes. This opens the doors of the future for the following possibilities:

- < Tele-Transportation of matter that can be digitally encoded, including both organic, and inorganic substances, even at the cellular or molecular substrate
- < Holographic Encoded Messaging [HEMs] that visually display in the atmosphere in the presents of the recipient
- < Holographic Entertainment Centers [HECs] that visually display multi-media entertainment, educational, and informative programming in the confinements of a dedicated entertainment room of an individual’s abode

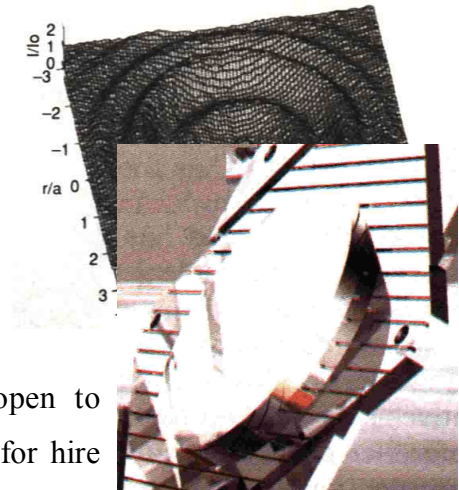
- < Targeting Defense Weaponry [TDWs] that mark an enemy target with a non-detectable, non-visual light beam packet that acts as a transport and navigating signal with no generated residual energy that is detectable by any surveillance or tracking device, not even infrared or magnetic x-ray scanning imaging
- < Radiating Light Force Field Sweeps that are produced by emitting slow moving ripples of light energy that pulse through the atmosphere engulfing and cooking any organic matter in its path. This is similar to Halogen Light cooking on the top of more modern household stoves available now through the consumer appliance market.

### **FUTURE IMPACT FROM THE STOPPAGE OF THE SPEED OF LIGHT**

As engineers and researchers achieved various reductions in the speed of light, and found evidence that the properties of light remained intact even at the lower speeds, the technological push was on to stop light while preserving, and maintaining its integrity as light. The scientific world was elated recently when engineers accomplished this objective. They had, in fact, stopped the travel, and speed of light to zero while retaining its material possession as light. This was achieved by utilizing a combination of “reverse pump” technology and a sub-zero cold atomic cloud that a light beam pulse was directed through at various levels of intensity. The results were that the light stopped within the atomic cloud, and held itself in suspended animation without any form of degradation or alteration in structure. In quintessence

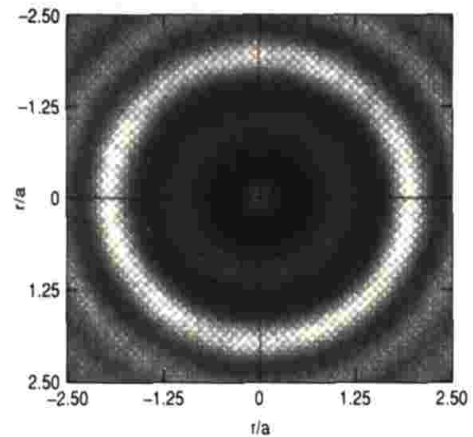


a self-contained light star of the purest form had been created. The potential of this technological advancement is mind boggling with respect to its future applications and commercialization.



What the futurist of the early 1980s had predicted and planned had been accomplished. The door had been open to implement plans developed at that time for future services for hire and ultimate profitability centered on the technology. Let us look at a few of these applications that loom on the horizon of the future:

As we know light can be an excellent vehicle for the encoding and transmission of digital data. With the increased bandwidth that the process of slowing the speed of light has offered, we can now digitally encode light with compression methods that advance beyond DVD, or [M]-JPEG. We now have the ability to encode enormous amounts of digital data utilizing Ultra-Compression, and stopping that digitally encoded light in a geographic



location in the form of a free positioning, free standing star. Thus, an “Artificial Data Star” has been formed, and positioned containing archived data, programs, and coding schemas from any digital source material. Furthermore, the capacity to share data in a “Artificial Data Star” has the potential to be the greatest storage method available in the future with the absolute minimum of space sacrificed for containment. The ratios could feasibly reach levels of one trillion bytes in space required to one byte of storage space. This would far surpass any storage capacity developed utilizing biological storage methods.

□ Keeping with the above point, let us consider this probability to expand the concept. Engineers at General Electric Laboratory have been successful in developing and producing “perfect diamonds” containing no flaws or fractures in the diamond. These man-made diamonds are %99.99997 percent pure in composition. So pure that they glow in the dark



do to the light that has entered the diamond and remained within the prism walls of the interior of the diamond reflecting back and forth. This “perfect diamond” constitutes a perfect vehicle, and storage media to form an “Artificial Data Star” in the scope of massive data storage. Digitally encoded light could be optically injected into a “perfect diamond” and stopped within the interior of the man-made diamond. This could result in an ideal storage compartment for containing data in a stopped light format, as well as the splendid transportability of a one, two, or more carat “Artificial Data Star Diamond Unite”. Also, the results of combining these two technologies open the possibility, if not the probability, of a storage device the size of a three carat diamond containing all the volumes of books shelved in a great university library

Now if a diamond is still too large of a vehicle to store digitally encoded data into a “Artificial Data Star” we can consider a smaller container known as a “quantum well”. As compression algorithm and methodologies advance with this technology, something as large as a one carat diamond will take on the appearance, in ratio, to storing data in large buildings and vaults when compared to a “quantum well” measured in microns. By further compressing the digitally encoded data before placing it into an “Artificial Data Star” the space required to stop the light containing the data could be exponentially reduced to the point that a “quantum well” of just a few microns in space could adequately host several fully laden stars:

If the desire is to permanently etch the digital data in an “Artificial Data Star” [similarly to the old concept and proverb “etched in stone”], ever arises we can explore the utilization of placing the star in a “colloidal crystallized substrate”. In doing so the digitally encoded data contained in the star is permanently etched and encapsulated in the crystal formation for eternity. This could be accomplished by incorporating the activity of the formation of the “Artificial Data Star” with the production of the crystal. The star during its genesis could actually form the crystal as a byproduct of its actions, and congruently reside within the crystal chamber.

## COMMERCIALIZATION OF ARTIFICIAL DATA STARS

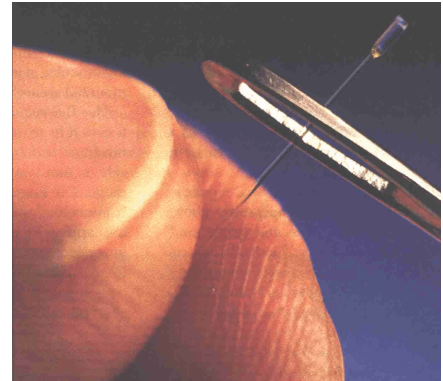
This is the beginning of some very promising technology that will deliver applications across a wide spectrum of usage and operations. While we have looked at a few up-front utilities for an “Artificial Data Star”, we should discuss some universal implications for this potentially developing technology.

First, let us consider that “Artificial Data Stars” that are positioned in a stacked array could produce layered data stores of ultra massive capacity in a minimum of space. We should consider that within the space that a current desktop computer occupies in an office, trillions of these stars could be positioned in the same space, containing all of the digital data currently held in electronic storage devices globally. Physical space currently occupying massive printed, electronic, and magnetic data storage could be reallocated into a 2-meter cubic space. Consequently, releasing that previously occupied space for reallocation to other uses. However, the questions arises, would international entities be willing to store their data along with other world-wide organizations and institutions in one venue? Certainly the questions of control and security would be of great importance, and there would be tradeoffs in these areas. But the release of massive amounts of space would, hopefully, offset any of these issues.

Secondly, ultra massive amounts of digitally encoded data could be transported through the atmosphere from one point to another. Consider that the entire contents of the United States Library of Congress could be digitally encoded into an “Artificial Data Star” and propagated through the lower atmosphere depositing its data load at predetermined, or on demand, data hubs, or user sites. This could feasibly create “Artificial Data Star Transport Corridors” similar to commercial aviation flight paths used today. Furthermore, and for consideration, if the star did not acquire [from a command post] a final destination point, it could continue to cycle through the corridor creating a low level orbiting data star for the function of on-loading and off-loading of digitally encoded data.

Thirdly, by combining the future technology of “stopped light” and “Artificial Data Stars” with the developing domain of micro “electro-mechanical systems” [MEMS], we could produce self-contained light driven molecular pumps that never exhaust their energy source. This concept alone opens the avenues of possibilities that reach enthusiastically into the field of medicine and biochemistry. For example, a light driven implantable cardiac pump for a failed heart, or a sub-dermal micro pump for any aspects of the human endocrine system requiring accurate hormonal level monitoring, and control.

Industrial application should also be considered. Light driven molecular pistons are achievable through the use of the “Artificial Data Star” as the source of light energy for the piston. This alone has the potential to create a device that could function as a micro energy-generating device that is self-contained and self-fueling, and could be utilized to power other devices as a clean source of power.



### **EXTREME FUTURE APPLICATIONS FOR ARTIFICIAL DATA STARS**

Let us conclude this exploration of this sophisticated technology by looking far into the future. In doing so we must take the position that this technology will continue to develop and prove itself as a feasible and cost effective transference to the commercial and consumer market. With this predisposition in mind, let us consider the truly great applications associated with this technology.

First, let us propose the concept of “Inter-Dimensional Optical Transportation” of cargo, animals, and humans. This concept is based upon the position that any form of matter could eventually be converted into its own unique digital code representing that substance’s energy profile, atomic structure profile, and composition matrix. These factors and

characteristics could ultimately be digitally encoded into an “Artificial Data Star”, and subsequently transported to another location.

The propulsion method to deliver the “Inter-Dimensional Optical Transport Artificial Data Star [TADS] ” with its digitally encoded cargo could very well be a “laser light pump” that operates as a highly efficient thrust engine. Propulsion from this “laser light pump” thrust engine could be adjusted for speed, payload, critical mass, and conditions of the transport corridor. In essence light is moving stopped light containing a payload.

Secondly, by utilizing one of the residual components in stopping light, namely the sub-zero atomic cloud (*and there is a high probability that this phase in the process will be engineered out and replaced with a less intensive process*) has great value as an ultra-cryogenics depot. The utilization of the sub-zero atomic cloud component could lend itself exclusively to cold storage, and flash-frozen transport of cargo. The atomic cloud could appreciably lend itself as an excellent cryogen, and could very well render an excellent source for cryonics, and cryogenics. If this form of cryonics was eventually combined with the digital encoding of humans into light, and the light star was then halted, the production of “optical cryonics” would be achieved. Mass storage of deceased human or organic organism could be achieved at a fraction of cost, and held in this state until advancements in medical technologies could be formulated to cure or reverse the cause of death. Also, this method might be utilized one day to transport living human crews, and organism into deep space for extended terms of space exploration.

Upon discovery of medical cures, or upon arrival at a deep space outpost, the procedures for “optical cryogenesis” would be reversed, and reanimation of the humans or organisms would take place.

The key to the success in this technology is the accurate encoding of the data, organism, or matter into its digital code prior to encoding into the “Artificial Data Star”, and freeze-down by the sub-zero atomic cloud. No doubt, these concepts and procedures will be tested first on inanimate and inorganic objects, and migrate toward strands of DNA and stem cells

to determine the feasibility and viability of storage in a optical digital format. If this sequencing proves to be productive, than it is this presenters position that all substances, both organic and inorganic, could eventually be digitally encoded, and stored in ether a moving or fixed position light star for an indefinite period of time.

While time-travel and time-manipulation is demonstrating all of the indices of failure, time is, however so, on our side in the development of “Artificial Data Stars”.

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ARGENTINA: ORIGEN Y FUTURO DE LA CONVERTIBILIDAD

Director : Prof. Dr. Juan Carlos Lavignolle

**Redactores:**

**Investigador Principal:** Prof. Dr. Domingo José Mazza  
Prof. Dr. Jorge Emilio Salvel

**Asistencia en edición:** Prof. Dr. Juan Carlos Bonzano  
**Con la colaboración de:** Dr. Alejandro Julio Martínez  
Dr. Adrián Sancci

***ISINI – FLORIDA INTERNATIONAL UNIVERSITY- MIAMI USA- Agosto 2001***



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## **Presentación**

Este trabajo que me ha tocado dirigir para presentar en la Sexta Reunión Internacional de la Sociedad Internacional para la Intercomunicación de las Nuevas Ideas (ISINI) ha contado con la activa participación de los profesores Domingo Mazza, Jorge Emilio Salvel y Juan Carlos Bonzano. Quiero agradecerles su gran dedicación y la seriedad con que afrontaron las tareas de investigación y redacción de sus distintos capítulos

Tampoco quiero pasar por alto la valiosa contribución de los profesores Alejandro Julio Martínez y Adrián Sannici.

En un ambiente internacional como es el de ISINI ha sido nuestra intención poner en la mesa de debate la implementación de la convertibilidad en la Argentina que a no dudarlo señaló un camino novedoso para que nuestro país pudiera salir de la crisis inflacionaria e hiperinflacionaria que caracterizó a su economía hasta el año 1991.

Como corresponde a un trabajo universitario hemos puesto la cuota de objetividad irrenunciable en una presentación de esta naturaleza. Al mismo tiempo que proponemos nuestras soluciones con la responsabilidad de comprometer nuestra opinión.

Estamos seguros de que el debate de ideas que el mismo va a generar enriquecerá este trabajo y se concretará en aportes que mejoren substancialmente nuestras recomendaciones.

Juan Carlos Lavignolle

Agosto, 2001

## RESUMEN

Tras padecer en los años 1989 y 1990 dos de las hiperinflaciones más virulentas de la historia de la humanidad, el 1 de abril de 1991 el Ministro de Economía Domingo Felipe Cavallo establece un esquema de caja de conversión impura, basado en un tipo de cambio fijo que tendría pilares bien establecidos, aunque complejos de implantar. Entre otros la desregulación y apertura económica, la modernización del Estado y reforma previsional, la flexibilización laboral, el establecimiento de un programa de privatizaciones, todas medidas a revertir lo que había sido la construcción de un sector público elefantiásico con déficit fiscal y cuasifiscal crónico.

Como resultado de estas medidas en su conjunto, Argentina logra un crecimiento económico del 16 % entre 1991 y 1992, que se prolongará hasta Diciembre de 1994, conviviendo, a su vez, con una brusca caída de la inflación y el logro del superávit fiscal primario en momentos en que la balanza comercial era deficitaria en 3000 millones de dólares.

El contexto actual evidencia una aguda concentración de capitales y desocupación, con el retorno de un déficit fiscal convergente con un elevado gasto público y pronunciada evasión tributaria, más un endeudamiento que busca sostener un claro tipo de cambio real sobrevaluado, si se lo mide contra el dólar de un Estados Unidos, que en la última década ha tenido una baja con una superior inflación a la Argentina, con crecimiento económico interrumpido, y con controversias con su principal socio comercial del MERCOSUR, Brasil, como consecuencia de haber producido en una década varios ajustes en el valor de su signo monetario.

Las alternativas de una canasta de monedas, una eventual devaluación, la dolarización, la libre flotación limpia o sucia o seguir sosteniendo a una de las pocas convertibilidades monetarias de derecho del mundo, en su décimo año, hoy con el mismo ministro de entonces, pone a la Argentina en una encrucijada que nos convoca y desafía en este trabajo.

## **La convertibilidad.**

Para señalar los efectos de la Convertibilidad Monetaria en la Argentina de los 90, en relación con los movimientos de precios relativos y con la evolución del tipo de cambio real es que debemos comenzar mencionando, que en marzo de 1991 el Congreso Nacional sancionó la Ley de Convertibilidad, que es el punto de partida de un programa de política económica cuyos objetivos principales son la estabilización y un proceso de reforma estructural en términos económicos. La fijación del tipo de cambio nominal, fue establecida según la ley antes mencionada, y como tal haciendo sólo posible su modificación del mismo modo. Es pilar del esquema de conversión que el BCRA garantice la base monetaria con reservas suficientes, en un contexto de total eliminación de restricciones a los movimientos de divisas. Simultáneamente, se renuncia al denominado impuesto inflacionario, dado que limita la creación de dinero a los resultados positivos del balance de pagos. La política de ingresos se orienta a eliminar la inercia del proceso inflacionario. Se establece la restricción legal de indexar contratos.

## **Precios relativos y tipo de cambio**

La fuerte perspectiva de que, sobre períodos prolongados los precios se mantendrían casi constantes, señaló que los movimientos en los valores de bienes individuales fueran interpretados definidamente como cambios de precios relativos, frecuentemente con un grado importante de persistencia. La estabilidad facilitó considerablemente la labor por parte de los compradores tras la búsqueda de mejores precios, lo que posiblemente contribuyó a acentuar las respuestas de la demanda frente a cambios de estos. Por otro lado, las oscilaciones en la tasa de variación de los índices, desaparecieron en la práctica como elemento tomado en cuenta en las expectativas definidas a efectos de la formación de precios y salarios, y de la oferta y demanda de activos financieros.

Aunque el tipo de cambio nominal permaneció fijo durante gran parte de los noventa,

los movimientos de los precios internos no fueron paralelos a los de los EE.UU. En los primeros años del período; la tasa de inflación en la Argentina, si bien muy moderada en una comparación con aquella observada previamente, superó netamente a los valores internacionales. De tal modo, el nivel de precios (IPC) acumuló una suba apreciable al tiempo que la cotización del dólar permanecía invariable.

La estabilización de los precios al por mayor fue prácticamente inmediata, ya que en los nueve últimos meses de 1991 el ÍNDICE DE PRECIOS MAYORISTAS (IPM) registró una suba total de menos del 3%, mientras que el componente de precios industriales de ese índice mostró una reducción nominal.

La variación del IPC se desaceleró marcadamente. Sin embargo, aunque en los primeros meses del programa, las tasas de aumento de los precios al consumidor fueron las mas reducidas en mucho tiempo, producto de una inflación residual, en diciembre de 1991 el IPC fue 21 % mayor que en marzo de ese año y a fines de 1992 la variación acumulada superó el 40 % .

Las alzas estuvieron claramente lideradas por los precios de los servicios privados. La suba a diciembre de 1992 era mas del 60%; los precios al consumidor de los servicios públicos tuvieron en ese período aumentos mucho más pausados, totalizando un 26%. Las grandes disparidades en la evolución de diferentes categorías de precios, estuvieron asociadas con la participación de los artículos en el comercio exterior.

La estabilidad persistió al recuperarse el nivel de actividad en el trienio 1996-1998, el incremento acumulado del IPC rondó el 1%, y la previsión de que la inflación sería cercana a cero quedó firmemente instalada en las expectativas. Los cambios en el nivel general de precios, dejaron de ser tema público y, toda alteración de precios individuales era interpretada como un desplazamiento en términos reales. Al mismo tiempo, al estabilizarse los precios se redujo marcadamente la volatilidad de los precios relativos, tal como lo señalan los artículos que hemos estudiado.

Los grandes desplazamientos en los flujos del intercambio externo, y en los precios relativos, más las consideraciones que hemos hecho sobre el tipo de cambio real, se

convirtieron en tema de discusión.

Siguiendo entonces el sentido que señalan las consignas, también se observan que algunas acciones son tomadas seguramente como incompletas, tal vez y no de forma exclusiva, por los vaivenes cíclicos a los que la economía internacional nos ha sometido.

## DESARROLLO DEL PLAN

En función a lo expresado en el abstract podemos indicar entonces algunas situaciones notorias en la evolución del último programa económico que caracterizó la década de fin de siglo. Surge entonces que ha habido una doble brecha signando la evolución de la economía Argentina en los años 1990: la insuficiencia del ahorro interno con relación a la inversión y el crecimiento de las importaciones por encima del valor de las exportaciones. Nos propusimos analizar cómo se han financiado o cubierto dichas brechas y qué vinculación existe entre dichos modos de financiamiento o cobertura.

### **Consumo e Inversión**

Podemos señalar que en los primeros años de la década de 1990 se produjo un fuerte incremento en el volumen del consumo, intensificado por un deflactado tipo de cambio. Al mismo tiempo el recupero de la inversión fue todavía superior. La suba de la demanda interna en un período donde se reducían apreciablemente las trabas a las importaciones, generó incentivos de corto plazo para la producción de mercancías dirigidas al mercado local, al considerarse al mismo tiempo incrementos en los volúmenes de ventas como en los precios relativos de los bienes no transables. El hecho de que una parte significativa de la inversión se dirigiera hacia la producción de esos bienes parecía corresponder no sólo con el atraso que había mostrado tal acumulación de capital en los años previos, sino también con la percepción de que en el futuro se sostendrían más altos niveles de demanda.

En la expansión que se prolongó hasta 1994 actuaron, entonces, importantes impulsos tanto del lado de la oferta como de la demanda de bienes y servicios. Sin embargo,

predominó netamente la ampliación del gasto, lo que se reflejó en un considerable déficit en el intercambio comercial.

Las privatizaciones que se dirigieron a Ibero América, las operaciones de crédito del gobierno, especialmente en el extranjero, y el reflujo de fondos por parte de residentes privados, jugaron en esos años un papel importante en la cobertura de la brecha en cuenta corriente y la acumulación de reservas asociadas con el incremento de la demanda de dinero. Se observó poco dinamismo en las exportaciones y un marcado déficit de intercambio externo. Todo esto ligado a un esquema de tipo de cambio fijo basado en un programa de conversión impura y déficit fiscal.

Sobre el final de los 90, el achatamiento de la demanda proveniente de Brasil que ya se había observado en 1998 y la súbita depreciación del real luego de un ataque especulativo a comienzos de 1999, afectó los flujos de comercio exterior, en circunstancias en que la Argentina mostraba ya signos recesivos. Se dio así un contexto de financiamiento externo menor, y por condiciones poco favorables a las exportaciones.

Durante la primera mitad de la década, el proceso de ahorro e inversión marcó el abaratamiento de los bienes de capital, y permitió que la tasa de acumulación física fuera netamente más elevada en los 90 que en los 80, sin una suba equivalente en el valor de los recursos destinados a ese propósito. Así, la inversión fija a precios constantes creció más del 21% del PBI. en 1991-1998, mientras aumentó considerablemente el ahorro externo que se asoció a los déficit comerciales señalados antes.

El impacto mayor de capitales externos dirigidos a privatizaciones alcanzó su punto máximo en 1993. Este tipo de participaciones netas disminuiría sensiblemente más tarde, aunque las demás Inversiones Extranjeras Directas siguieron asociadas al ingreso de fondos para privatizaciones llegando a ser en 1997 el 45% de los ingresos netos de capitales. Se buscó así, a través de políticas anti-dumping, limitar el ingreso de ciertos bienes competitivos de la producción local, mientras se facilita la compra de insumos y especialmente de bienes de capital. Entre 1990 y 1998 la expansión estuvo acompañada por un fuerte repunte de la inversión.

Se produjeron bajas en las tasas de intereses, mientras que la demanda interna y el nivel de actividad retomaron un fuerte impulso ascendente. Entre el primer trimestre de 1993, y el primero del año siguiente, el PBI se elevó casi un 11% mientras la inversión retomaba un veloz ritmo de aumento por encima del 30 %.

### **El crédito**

La aguda suba de la absorción de bienes y servicios estuvo asociada con una gran demanda de crédito, que se encontró como promedio del período con una fuertemente ampliada oferta de fondos. Así, el ahorro externo representó un papel central en el financiamiento del mayor volumen de inversión. el comportamiento del ahorro interno pareció basarse implícitamente en la expectativa de que el ingreso agregado mantendría un apreciable ritmo de crecimiento.

El conjunto de comportamientos señalados antes, fue acompañado por el liderazgo en el dinamismo impulsado por el gasto interno y un aumento de la inversión con relación al período hiperinflacionario, pero con una disminución del ahorro interno que fue a su vez compensado con recursos externos para su financiamiento. Así mismas, a pesar del crecimiento del nivel de actividad interna y la caída de los precios internacionales, las exportaciones se mantuvieron en iguales valores y las importaciones más que triplicaron su valor, determinando una variación del signo del balance comercial. A su vez la cuenta corriente del balance fue negativa, siendo compensado por el notable ingreso de capitales anteriormente comentado.

### **La industria Argentina frente a la convertibilidad de los 90**

En los 90 se incrementó de forma muy intensa la inversión, especialmente en equipos; lo cual redujo la antigüedad media del parque de bienes de capital y se observaron apreciables aumentos de productividad, particularmente de la mano de obra, del capital y otros insumos, difundidos en diversos sectores de producción que se vieron facilitados por las condiciones de estabilidad de precios, el aflojamiento de las restricciones financieras y la disponibilidad de insumos y bienes de equipos ampliada en razón de la apertura externa.



La composición de las colocaciones externas muestra un cambio a favor de los sectores transables y en especial de los productores de bienes de consumo durable, tal caso de las exportaciones de automóviles. En cambio, declinan fuertemente su participación las ventas externas de bienes intermedios, que habían sido al final de los años 80, las que habían liderado el crecimiento de las exportaciones de manufacturas.

Uno de los rasgos que define el desempeño industrial en los 90 es el abultado y creciente déficit de divisas que presenta el sector. El mismo, se origina en el reducido dinamismo de las exportaciones en contraste con el fuerte crecimiento de las importaciones; en especial, si se tiene en cuenta que se partió de una situación de Superávit de divisas en los comienzos de los 90.

### **Gasto Público y Sector Fiscal**

En el intervalo 1991-2000, las necesidades del financiamiento del sector público nacional fueron, en promedio, cercanas al 1% del PIB; el déficit cuasi-fiscal se anuló, mientras que las provincias (después de transferencias desde el gobierno central) registraron, en conjunto, un déficit promedio de cerca del 0,7 % del PIB. El ajuste de alrededor de 4 puntos del PIB en las cuentas del sector público nacional tuvo varios orígenes, pero no se produjo mediante una disminución del valor del gasto corriente del gobierno. Por el contrario, éste creció como proporción del PIB (de 14,8 % de ese agregado en 1982-1990 a más de 18 % en 1991-2000.

(Daniel Heymann – Políticas de Reforma y Comportamiento Macroeconómico)

### **Conclusiones**

- Como se ha señalado el plan de convertibilidad fue sustentado en el mediano plazo bajo las premisas que bajaran los costos mediante el mejoramiento de la productividad con una fuerte dependencia del endeudamiento externo. En el largo plazo la viabilidad del plan estaba supeditada a que no se interrumpieran los flujos externos. (Lavignolle, 1993).
- Se consiguió reemplazar el viejo modelo de sustitución de importaciones pero la industria, si bien alcanzó importantes incrementos de la productividad quedó

fuertemente expuesta al endeudamiento externo, a tasas locales de interés excesivas por efecto del crowding out impulsado por el endeudamiento del estado y al nivel de demanda de sus socios regionales.

- La eliminación de la política de sustitución de importaciones generó la expulsión de empresas del mercado con la consiguiente desocupación y el país a partir de 1999 entró en una fuerte rescisión económica de la cual hasta la fecha no ha podido salir, agravando el porcentaje de los sectores que se han ubicado bajo la línea de pobreza alcanzando un 25 %.
- El nuevo modelo industrial atendió los requerimientos de la globalización pero sin alcanzar niveles de competitividad incrementándose las importaciones en mayor medida que las exportaciones.
- El gasto público tampoco estuvo a la altura de las circunstancias creciendo en forma desmesurada y financiándose con endeudamiento produciendo el efecto señalado de alza de las tasas de interés locales.
- Por último, el quiebre del financiamiento externo y las elevadas tasas locales para el corto plazo (letras de tesorería) han colocado al país en situación de default.
- Frente a esta situación el gobierno ha propuesto el déficit cero y un recorte de los gastos estatales afectando los sueldos de los empleados del estado y las jubilaciones proyectando para el mes de julio una merma del 13 %.
- Para los liberales está es la solución correcta por cuanto al retirarse el estado del mercado monetario las tasas de interés disminuirán y las empresas volverán a tomar créditos iniciando el camino de la reactivación. (Alemann).
- Otros propugnan la devaluación y la salida de la convertibilidad con una activa política fiscal (Conesa, Lascano). Hay quienes piensan en ajustar el tipo de cambio con una reprogramación de la deuda (Terragno). Economistas vinculados con los sectores laborales quieren volver al viejo modelo proteccionista.

- A nuestro juicio, la solución es mucho más compleja y por consiguiente abarca distintos aspectos tales como la paridad cambiaria (este dólar no es eterno dijo su creador Cavallo); una reforma tributaria que privilegie la producción y no la renta monetaria y un fuerte ataque a la evasión y a la elusión; una disciplinada política fiscal que no implica necesariamente el déficit cero sino un adecuado gasto público; políticas activas que ayuden a la reactivación y que no solamente encuentran su camino en subsidios monetarios por parte del estado. Una equitativa red de protección social.
- Por último se impone revisar los alcances y funcionamientos de la globalización y escuchar las quejas del cada vez más engrosado movimiento llamado antiglobalización. Algo de esto han comenzado a admitir los países que integran el G-7. No hay dudas que las redes de estabilidad financiera creadas para evitar los shocks de confianza ya no son suficientes. A la luz del análisis profundo y objetivo hay que encontrar la solución.

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### **Bank stock price, inflation and interest rate-a cointegration approach**

Girijasankar Mallik

Greg Walker

Simon Sim

University of Western Sydney

### **Summary**

This paper tests the impact of inflation and interest rates on the stock prices of four major banks in Singapore. We test for a long run relationship using a cointegration and error correction model for this relationship. Results are mixed with some evidence of a significant long run relationship for inflation but not for interest rates.

### **Introduction**

The impact of inflation on the stock prices has been heavily researched. The empirical evidence generally finds a negative impact. Arguments supporting a negative impact include the adverse impact of inflation of economic activity on economic growth and thus company profitability (Geske and Roll, 1983, Fama, 1981, Lucas, 1978, Danthine and Donaldson, 1986).

The relationship between inflation and stock prices in the banking industry is theoretically more important due to the link between inflation and interest rates. In a Fisherian world, inflation is translated into nominal interest rates and banks (and other financial institutions) are more exposed to interest rate risk than non-financial

corporations. As banks are net holders of financial assets, the nominal contracts hypothesis would predict a negative relationship between inflation and bank stocks.

Recent studies of the impact of inflation and interest rates on bank stock returns include, Saunders and Yourougou (1990), Yourougou (1990), Choi, Elyasiani and Kopecky (1992) and Lajeri and Dermine (1999). In the latest of these studies, Lajeri and Dermine apply an APT three factor model to test for the sensitivity of bank returns to market returns, inflation and interest rates. They resolve the issue of potential multicollinearity by testing (and rejecting) for a Fisher relationship. They report a negative relationship between bank stock returns and both inflation and interest rates. They also confirm the earlier findings from Saunders and Yourougou (1990) and Yourougou (1990) that impact of inflation and interest rate factors is greater for banks than for non-financial corporations.

This study tests for long run impact of inflation and interest rates on individual bank stocks for four major banks in Singapore.

## Methodology

The fundamental theory of stock prices is that they reflect the discounted present value of the expected future profit stream of a corporation.

$$SP_t = E_{t-1} \left\{ \sum_{k=1}^{\infty} \frac{\Pi_{t+k} (Y_{t+k}, Inf_{t+k}, Int_{t+k})}{(1 + r_{t+k})} \right\} \quad (1)$$

Where,  $SP_t$  is the share price in period  $t$ ,  $E_{t-1}$  is the expectations operator,  $\Pi_{t+k}$  denotes future profits,  $Y_{t+k}$  denotes all factors other than inflation and interest rates that may impact on future profits,  $Inf_{t+k}$  is inflation and  $Int_{t+k}$  is the interest rate.

We further simplify the analysis but ignoring other factors  $Y_t$  that impact on stock prices  $SP_t$  to consider inflation and interest rate factors only.

Our model is thus simplified to:

$$SP_{it} = \alpha_i + \beta_{1i} Inf_t + \beta_{2i} Int_t + \mu_{it} \quad (2)$$

for banks  $i = 1$  to 4 and where  $SP_{it}$  is the share price of bank  $i$  (measured in natural logs),  $Inf_t$  is the inflation rate measured as the change in the natural log of the monthly consumer price index,  $Int_t$  is the natural log of interest rates and  $\mu_{it}$  is the error term.

## Data

All data are monthly observations expressed in natural log form for the period 1989 to 1999. The four banks are the “big four” of Singapore: the Overseas Chinese Banking Corporation (OCBC), the Development Bank of Singapore (DBS), the United Overseas Bank (UOB) and the Overseas Union Bank (UOB).

## Model Estimations

In principle, there can be a long-run equilibrium relationship among three series in a multivariate relationship only if they are stationary or if each series is at least integrated of the same order (Campbell and Perron, 1991). That is, if three series are integrated of the same order one, then the three series are said to be cointegrated and the regression on the same levels of the three variables is meaningful (not spurious), and we do not lose any long-run information.

Thus we first test for the existence of stationarity in the series for  $SP_{it}$ ,  $Inf_t$  and  $Int_t$ , using the standard Augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1979; 1981) test for both with and without trend. The lag length  $n$  is determined by the Akaike’s Information Criteria (AIC) to ensure serially uncorrelated residuals.

The ADF results for unit root tests for  $SP_{it}$ ,  $Inf_t$  and  $Int_t$  and the residuals  $\mu_{it}$  are presented in Table 1. From these results we conclude that  $Inf$  and  $SP$  have unit roots, and they are integrated of order one, with the exception of  $SP$  for OCBC.

**Table 1: Unit Root Test for  $SP$ ,  $Inf$  and  $Int$ .**

Bank	Variables	ADF (Level)		ADF (1 <sup>st</sup> difference)	
		C	C & T	C	C&T
Singapore	$Int$	-3.09**	-3.25***	-2.98**	-2.96
	$Inf$	-2.10	-2.70	-3.15**	-3.12
OCBC	$SP$	-2.21	-2.31	-2.54	-2.33
DBS	$SP$	-1.54	-4.21*	-5.19*	-5.05*
OUB	$SP$	-2.71***	-2.69	-3.28**	-3.25***
UOB	$SP$	-2.27	-2.28	-3.98*	-3.97**

Notes: \*, \*\* and \*\*\* indicate significant at 1%, 5% and 10% levels respectively.

Figures within the brackets represent the lag length. C=Constant, C & T=constant & trend

We next test for evidence of cointegration between individual bank share prices, inflation and interest rates. We will begin by following the Engle-Granger (1987) cointegration procedure to test the presence of cointegration among the four variables. Of the various techniques available for testing for and estimating cointegrating relationships, the Johansen (1988), and Johansen and Juselius (1990) maximum likelihood test procedure is the most efficient as it identifies the number of cointegrating vectors in the context of a vector error correction model.

**Table 2: Johansen's maximum likelihood procedure**

Country	Eigen value	Null	Alternative	LR Statistic
OCBC	0.2258	k = 0	k = 1	42.50*
	0.0979	k <= 1	k = 2	16.65*
	0.0599	k <= 2	k = 3	6.24
DBS	0.2008	k = 0	k = 1	39.46*
	0.1233	k <= 1	k = 2	16.83**
	0.0344	k <= 2	k = 3	3.53
OUB	0.1582	k = 0	k = 1	40.37*
	0.1304	k <= 1	k = 2	22.98*
	0.0840	k <= 2	k = 3	8.86*
UOB	0.1607	k = 0	k = 1	36.38*
	0.1020	k <= 1	k = 2	18.69**
	0.0745	k <= 2	k = 3	7.82**

Notes: \*, \*\* and \*\*\* indicate significant at 1%, 5% and 10% levels respectively

From the results of Johansen tests presented in Table 2, we cannot reject the hypothesis that there is one cointegrating vector in all four banks. In most cases, the

Eigen value statistics drop sharply for alternative hypotheses of  $k = 3$ . Thus, we can conclude that our model with three variables is a fair representation for all four banks.

As our interest is in the long-term relationship between our variables for the four Singapore banks, we estimate the long-run relationships between  $SP_{it}$ ,  $Inf_t$  and  $Int_t$ . These estimations are found in Table 3. The results are mixed. Signs are consistent across all banks but positive for inflation and negative for interest rates. However whereas the interest rate coefficients are consistently negative three of the four are not significant. Inflation coefficients are significant for three of the four banks and of close magnitude for the two largest banks. The inflation sign is opposite to that reported in most of the literature, however Lajeri and Dermine (1999) report a change in sign (to positive) for their inflation variable for the post 1987 period.

**Table 3: Long Run Cointegrating Normalized Coefficients:**

Bank	<i>Constant</i>	<i>Inf</i>	<i>Int</i>
OCBC	2.18	2.37 (4.40)*	-0.25 (-1.74)***
DBS	1.83	2.34 (3.90)*	-0.12 (-0.77)
OUB	1.74	3.51 (2.07)**	-0.43 (-1.13)
UOB	1.83	8.75 (0.93)	-0.82 (-0.77)

Notes: \*, \*\* and \*\*\* indicate significant at 1%, 5% and 10% levels respectively

Figures within the brackets represent the t - statistics

If  $SP_{it}$ ,  $Inf_t$  and  $Int_t$  are cointegrated, then there must exist an associated error correction model (Engle and Granger, 1987) that may take the following form:

$$\Delta SP_{it} = \phi_{10} + \sum_{i=1}^p \phi_{1j} \Delta SP_{t-i} + \sum_{k=0}^r \phi_{2i} \Delta Inf_{t-k} + \sum_{l=0}^s \phi_{3i} \Delta Int_{t-l} + \rho_{1i} \mu_{i,t-1} + e_{it} \quad (3)$$



Where,  $\Delta$  denotes first difference operator,  $\mu_{i, t-1}$  are the error correction terms,  $p, q, r$  and  $s$  are the number of lag lengths (determined by AIC) and  $e_{1t}$  are the random disturbance terms. Here,  $i$  begin at one and  $j, k$ , and  $l$  begins at zero in order for the series to be related within a structural ECM (Engle and Yoo 1987). The error correction terms,  $\mu_{i, t-1}$ , who are the residual series of the cointegrating vectors normalized for the  $SP_{it}$ ,  $Inf_t$  and  $Int_t$ , measure the deviations of the series from the long run equilibrium relations. For the series to converge to the long run equilibrium relation  $-1 \leq \rho_1 \leq 0$  must hold. Moreover, cointegration implies that not  $\rho_1$  should be zero.

We therefore estimate the error correction mechanisms for each bank, as specified in equations (3). The results are presented in Table 4. The error correction term (ECT) has a negative sign and is significant for all the four banks. This implies that share price adjusts to long-run equilibrium as represented by the structure of the cointegration regression (2). The estimated value of the coefficient of the error correction term shows that the system corrects its previous period's level of disequilibrium by  $100\rho_1$  per cent a month.

**Table 4: Error Correction Model (according to equation (3))**

Variables	OCBC	DBS	OUB	UOB		
Const.	0.003	0.0021	0.005	0.006		(0.35)
	(0.24)	(0.40)	(0.61)			
ECT			-0.11	-0.11	-0.15	-0.09
			(-2.53)**	(-2.35)**	(-2.65)*	(-2.08)**
$\Delta SP_{t-1}$	0.06	0.29	-0.20	-0.10		(0.69)
	(2.84)*	(-2.06)**	(-1.04)			
$\Delta SP_{t-2}$	-----	-0.02	-----	-----		(-0.23)
$\Delta INF_t$	-0.002	-0.002	-0.02	0.004		(-0.10)
	(0.08)	(-0.49)	(0.15)			(-0.08)
$\Delta INF_{t-1}$	0.005	0.004	0.008	-0.003		(0.21)
	(0.19)	(0.23)	(-0.12)			

$\Delta INT_t$	0.009 (0.28)	0.01 (0.68)	0.04 (-1.53)	-0.076	(0.22)
$\Delta INT_{t-1}$	-0.07 (-1.50)	-0.06 (-1.29)	0.005 (0.07)	-----	
$\Delta INT_{t-2}$	----- (1.63)	0.07	-----	-----	
$Rbar^2$	0.07	0.08	0.11	0.05	
DW	1.99	1.95	2.02	1.98	
FF	0.51	9.04	6.56	1.85	
Het.	0.06	0.28	31.36	10.70	

Note: DW=Durbin Watson statistics, FF=Functional form, Het. =Heteroscedasticity.

Hence it be deduced that each bank's share price is adjusting to disequilibrium at fairly similar rates of between 9 to 15 per cent per month. However the results also reveal minimal influence attributable to our inflation and interest rates variables in this adjustment process. It would appear that our bank stock prices, although positively related to inflation in the long run, are not significantly impacted upon by interest rates and that neither variable has a significant role to play in any long run adjustment mechanism associated with these stock prices.

### Concluding Remarks:

The aim of this paper was to test for a long run relationship for the impact of inflation and interest rates on individual bank stock prices. The results are quite mixed but the research is still in a preliminary state. There is a long run relationship among these variables, but the impact of inflation and interest rates on share prices for different banks are very small and non significant. Our results are also similar to other studies, especially with Lajeri & Dermine (1999). We extend the model by including dividend yield as an additional factor and find a significant negative relationship for this factor for two of the four banks. Inclusion of dividend yield also improves the estimation results for the error correction mechanism and this factor is a significant factor in the adjustment process of for all four banks. Due to the deregulation, banks profit is not strongly influenced by interest rate and inflation. It may be due to the fact that the banks can transfer their funds and increase their profits on fees etc. Recently due to the globalization the offshore activities of the banks have been increased and therefore, the effect of domestic interest and inflation rates may not very important to the banks.

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**THE THEORY BEHIND AND AN APPLICATION OF  
THE MARKET FORCES OF DEMAND**

**Auke R. Leen**

**Wageningen University, The Netherlands**

**ABSTRACT**

Gary Becker tried to solve the puzzle "why many successful restaurants, plays, sporting events, and other activities do not raise prices even with persistent excess demand (1991, p.1109)?" He assumed that the consumer's demand depends positively on the quantities demanded by others. This can be so strong that the market demand curve raises. The state of the market that evolves solves the puzzle. But, if this is the situation let us look at the underlying forces of demand. Consumers react. Market forces exerted by the sum of their short-run demand curves don't solve but---at the opposite---do let vanish the puzzle. Probably, the traditional

downward sloping market demand curve---the bandwagon effect, however, still present---would have served better.

The puzzle itself---the persistence of the queue---can be solved by an all-or-nothing demand curve: the choice for the consumer is to have either a certain quantity (mostly only one) or nothing at all. The problem only looked like an excess demand situation from the perspective of the traditional marginal demand curve. From the all-or-nothing perspective the situation is stable---not withstanding the long queues. There simply is no pressure on the producer to raise prices.

## Introduction

I don't know if the seafood restaurant in Palo Alto, California, Gary Becker wrote about in 1991, is still popular. I even don't know if it exists anymore. I think, however, the puzzle he wrote about still exists. When the price is below the equilibrium price: "Why doesn't the popular restaurant [with persistent excess demand] raise prices, which would reduce the queue for seats but expand profits?" (Becker 1991, p. 1109). Becker solves the puzzle by assuming "that a consumer's demand for some goods depends [positively, the so-called bandwagon effect (Leibenstein 1950) on the demands by other consumers" (1991, p. 1110). This can be so strong that the market demand curve (DD)(See the following figure 1) raises. By charging  $p_{max}$  the restaurant has a permanent gap between demand  $D_g$  and supply  $S$ . But if this is the situation, price cannot be raised without losing all consumers; for Becker, the puzzle is solved.

Let us look, however, at the underlying market forces of demand. "We must," Pigou wrote, "probe deeper in the relation that exists between the aggregated demand schedule and the

demand schedule of the separate sources of demand" (1913, p. 19). Only to look at the result of aggregation could be a handicap (cp. Morgenstern 1948, p. 176 and Friedman 1976, p. 87).

### Market forces of demand

The long-run market demand curve can slope upward. The short-run individual demand curves (ceteris paribus the total quantity that is supposed to be demanded), and the sum of them slope downward (Leibenstein 1950, p. 107). The points on the aggregated short-run demand curves, however, will not be there for long. (Except those, of course that coincide with the long-run demand curve.) Sooner or later the consumer discovers that the total quantity demanded differs from the one he thought. He adjusts his behavior: the points on Becker's long-run demand curve (DD) emerge.

Since the quantity traded---at its maximum---cannot be greater than the one supplied, realized demand cannot be greater either. The sum of the individual short-run demand curves, that fits the quantity supplied, ic.  $SS$ , is  $\Sigma D_i$ , see Figure 1.

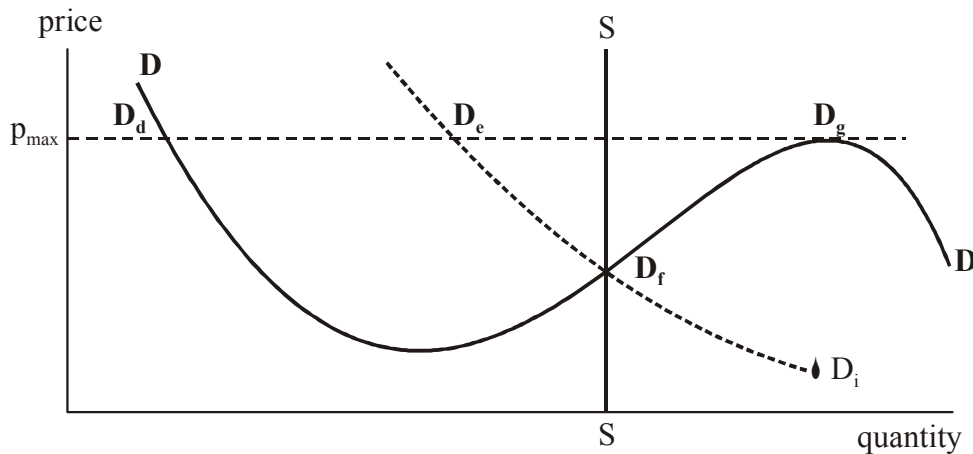


Fig. 1

Why is this curve relevant? In other words: "Why does the consumer look at realized demand to ascertain the quantity he demands at a certain price?" Why does he look at copies sold of a book? And why doesn't he---for the same reason---look at waiting lines?

Waiting lines for restaurants, theaters, or books to sell are unreliable signs of the total quantity demanded. Is the length of the line at the moment I pass by---or read in the paper about---typical of the quantity demanded? And, how long are they waiting, or are going to wait anyway? And above all, you can create and manipulate waiting lines. To fake a full house, however, night after night, to manipulate the number of books sold is difficult. Capacity, e.g., the seat capacity of a theater, is usually rationed---as Becker (1991, p. 1109) says---by delays in seeing a play. Given a certain period of time, seat capacity and copies sold of a book are reliable signs of quantity demanded. Signs that are not that easily available for most other goods. Hence, the relevant short-run demand curve is  $\Sigma D_i$ .

With  $\Sigma D_i$  and the price set by the restaurant at  $p_{max}$ , quantity demanded is much smaller than Beckers long-run demand curve suggests. There is no excess demand of  $D_g - S$  but an excess supply of  $S - D_e$ .  $D_e$  is no equilibrium; consumers lower their demand.  $\Sigma D_i$  shifts back down and up the DD curve to  $D_d$ : Beckers solution to the puzzle vanishes. In other words, since we do have direct evidence of the queues the solution is, not only logically but empirically too, impossible.

Market demand curves, however, need not be so extreme as to be upward sloping. Let us look at a situation with a moderate bandwagon effect; the market demand curve DD, as in Figure 2, is more elastic than it would have been otherwise. At  $p_{max}$  it's a puzzle again why the producer doesn't raise his price.

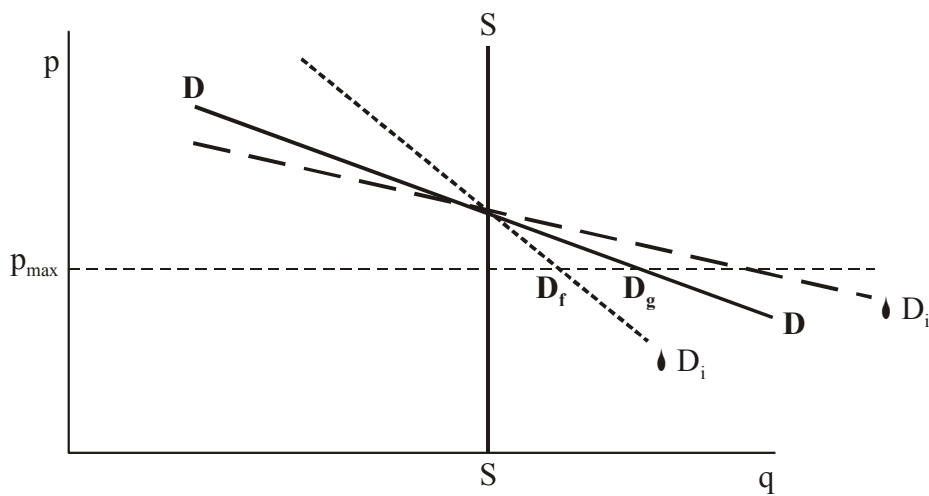


Fig. 2

At  $P_{\max}$  realized demand will be equal to the amount supplied. The consumer, again, takes this as a sign of the quantity demanded. From the short-run demand curve, that fits that quantity,  $\Sigma D_i$ , it follows that at  $P_{\max}$  the pressure on the price to rise is much smaller ( $D_f - S$ ) than it is thought to be ( $D_g - S$ ). A more elastic short-run demand curve, e. g.,  $\Sigma D_i'$ , would---indeed---give a large excess demand and pressure on the price to rise. This, however, would suggest the good to be a snob good. Obviously, since there is a bandwagon effect, this is not the case. Also Becker's logic better fits to this less extreme situation, not the former extreme one.

The market forces of demand just exemplified show formal similarity to those of supply. Compare the foregoing situation with the one where individual supply curves give rise to a total supply curve that slopes (up) downwards because of external (dis)economies. The supply curve consists of virtual points. Except the point where the curve cuts the total supply curve. But here too---if there is an effective minimum or maximum price, the supply curves have their influence (Friedman 1976, pp. 98-102).

### **The all-or-nothing demand curve**

If we draw a downward-sloping, total demand curve and interpret it as usual, Beckers puzzle is hard to explain. There is no obvious reason why prices should not rise, excess demand to vanish, and equilibrium be restored. Let's, however, have a close look at the situation it describes.

First, what about the goods we are talking about? As a rule, they are bought in quantities no more than one. Who buys more than one copy of a best-selling book? May be one to give as a present, another one if the first falls apart, and a last one if a new edition comes out with a new foreword. But that is all. Or who sees a favorite Broadway show or movie twice? Indeed, some have seen *The Sound of Music* a hundredth times and make it to the *Guinness Book of Records*. But these are the exceptions not the rule. To dine out every evening in the same restaurant would be possible. So if total demand in- or decreases it is because of a change in the number of buyers. No intra-marginal goods are sold. There is no typical consumer to base the total demand curve on. Second, if more than one good is bought---e.g., you visit a play or a restaurant with your wife---you face an all-or-nothing choice. Either you buy two tickets or meals, or you buy none at all. You don't leave your wife at the door behind.

The all-or-nothing demand curve (Friedman 1976, pp. 16-7) is the curve we get if the consumer can choose either nothing or the whole chosen quantity. You aren't free to buy (for



whatever reason: your own/the sellers), with a certain price, as much or as little as you want to. Often not the best way to describe the choice you faces. For most goods you are free to buy at a given price as much as you want to. And for most goods also you are not satisfied with less the goods---as may be the case for a newspaper---you can consume, at a given price. There is no saturation at that price.

"The discussion," as Morgenstern (1948, p. 167) said, "of demand should not be limited to the marginal curves." It may be of interest to make a distinction between how much you want to buy at a certain price and how much you value a certain quantity. The normal demand curve does not show how much a consumer is willing to pay for a certain quantity. It shows what quantity he wants to buy. But, if he is asked how much he wants to pay if it is either nothing or a certain quantity, he is willing to pay more. Instead of  $p_d$  he wants to give  $p_d'$ , as in the following Figure 3. If it is either-or, he is willing to sacrifice his whole consumer surplus. Triangle A is equal to triangle B.

What do the two points imply for the interpretation of the demand curve? What does it mean when the normal demand curve (DD), which shows the situation where goods are bought by many, continuously, and in large amounts, becomes an all-or-nothing curve (DD', see figure 3)?

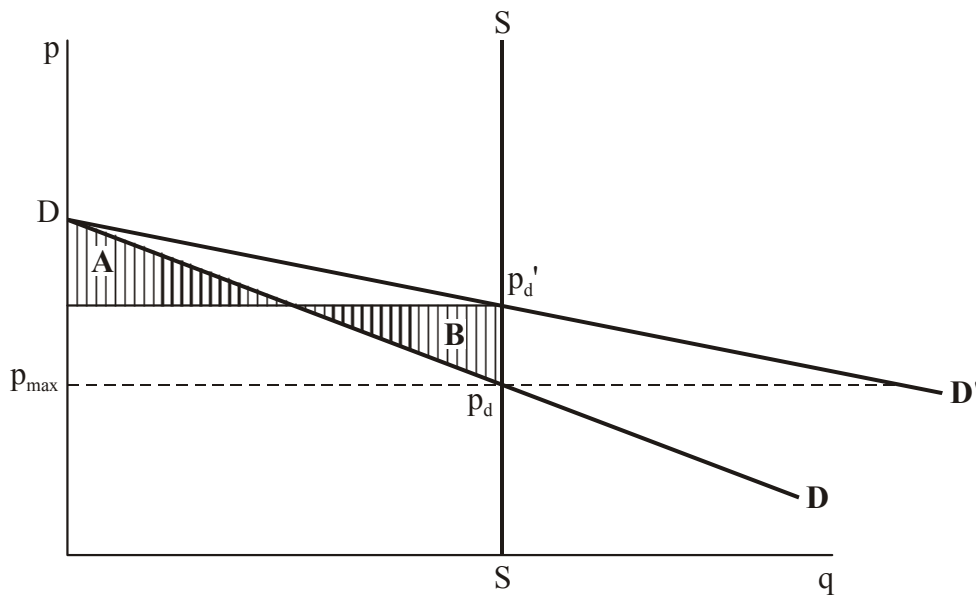


Fig. 3

If it is the DD' curve we observe when we see a permanent excess demand, the gap cannot be closed by raising prices that easily. Why? You have to get the consumers---excluded by the higher prices---back. You have to, because goods are rationed---as said before---by delays in

waiting. You cannot, as is usually implicitly assumed in the long run, wait till demand has reconstituted itself at the higher price. Those who have paid the high price don't come back. Only one good is bought. If you want to sell, the next price has to be lower. The demand curve isn't based on a good like Coca Cola: a good sold world wide, bought continuously and where new consumers enter all the time. By charging the high price, you lose all contact with your future market: the market you cannot do without. Mostly you lose, by raising prices, each buyer gradually: he buys less. Now you lose him all-at-once and because of the bandwagon effect in great quantities too. Advertising has to start from scratch again. A typical problem for the goods we are talking about; they all depend on the bandwagon effect. Then the most effective way to signal the good may be a waiting line. And that exactly is what you give up.

### **Conclusion**

Things aren't what they seem they are. The less known all-or-nothing curve is taken for the well-known traditional demand curve. If taken for what it really is, the puzzle Becker tried to explain, is solved. There is no typical consumer under the demand curve. The excess demand situation is more-or-less stable. If the producer does raise his price, he loses, because only one good is bought, the buyers he later needs. There are no repeat buyers. The choice for the producer is either to build himself a complete new group of consumers at the high price (Morgenstern 1948, pp. 170-2), or try to keep in contact again with his formerly excluded potential buyers: the one who stood in line. If he chooses the last, the cheapest way, however, may be not to raise the price in the first place.

And if things are what they seem they are---an upward sloping demand curve---they are only so for a moment. Market forces exerted by the consumer soon make things change. If the bandwagon effect should (partly) explain, only a weak not a strong one does.

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### **Diseño y Construcción De Un Deshidratador De Productos Alimenticios A Partir De Energía Solar.**

**Lerma Rojas, Leonel Salvador<sup>\*(1)</sup>; Guerrero Simental, María De Lourdes<sup>(1)</sup>; Lerma Rojas, Olga Margarita<sup>(2)</sup>; Galván Ismael María Quetzalcihuatl<sup>(3)</sup>; González Lazalde Iván<sup>(3)</sup>; Domínguez Romero José Juan De Jesús<sup>(3)</sup>; . <sup>(1),(3)</sup>Departamento de Ingeniería Industrial; Maestría En Planificación De Empresas Y Desarrollo Regional. Instituto Tecnológico De Durango, Blvd. Felipe Pescador 1830 Ote., Durango, Dgo., México 34080. Tel: 18184871, Fax: 18184813. <sup>(2)</sup>Centro de Bachillerato Industrial y de Servicios (CBTIS) No. 110, Mártires de Sonora 401, Fracc. Infonavit, Durango, Dgo., México 34220, <sup>\*(1)</sup> Profesor Investigador Del ITD. <sup>(1)</sup> Profesor Del ITD. <sup>(2)</sup> Profesor CBTIS 110. <sup>(3)</sup> Exalumno de Posgrado ITD. Email: [leolerma@omanet.com.mx](mailto:leolerma@omanet.com.mx). Proyecto CoSNET 786.98-P.**

**Descriptor:** Secado, Frutas, Vegetales, Energía solar, Diseño, Construcción, Secador, Deshidratador.

### **INTRODUCCIÓN**

Existe tendencia creciente a utilizar la energía solar para deshidratar productos y ayudar en su conservación y por ende su comercialización bajo condiciones

controladas. La utilización de energía solar es interesante por el hecho de su disponibilidad en la mayor parte del territorio nacional, su economía, y la cantidad de calor que puede ser aprovechado. Considerando lo anterior el presente trabajo tuvo como objetivo el diseño y la construcción de un secador que sea utilizable para deshidratar productos vegetales y que aproveche la energía solar como fuente de calor y por tanto la conservación de dichos productos.

De acuerdo a lo anterior, la descripción del problema se centra en las siguientes vertientes:

1. Existe demanda de alimentos por parte de la población.
2. No hay producción suficiente de alimentos para la población en la actualidad.
3. Es necesario evitar la pérdida de la poca cantidad de alimento existente, a través de su conservación.
4. Se requiere la utilización de fuentes alternas de energía, las convencionales se están agotando.
5. Existe una gran cantidad de energía proporcionada por el sol, la cual no se aprovecha.

El objetivo de esta investigación fue construir y evaluar el comportamiento de **un soporte de túnel cilíndrico anular rotatorio**, provisto de canastillas con mallas, las cuales permitieron dar al alimento un movimiento constante a la vez de proveer una buena aereación, para el secado de frutas y vegetales tratando de lograr con ello mayor eficacia con respecto al secado de charolas e inclusive empleando cilindros.

El presente proyecto fue una propuesta de investigación orientada a profundizar en el conocimiento de los procesos de **deshidratación de frutas, vegetales, frutos**, y **en el aprovechamiento de la energía solar**. El trabajo se enmarcó dentro del área de la ingeniería de alimentos, en particular, sobre la conservación de alimentos por deshidratación. El trabajo pretendió dos objetivos fundamentales. Por una parte, contribuir a la disminución de pérdidas de frutas que se producen en el estado de Durango y en el país; tales pérdidas se producen por daños y por descomposición. Por otra parte, se desea aportar trabajo de diseño de equipo que permita hacer uso de la energía solar, buscando con ello disminuir el consumo de energéticos convencionales. Esto último es para evitar la alteración del medio ambiente y bajar costos de operación de equipo de deshidratación, esto es, costos de combustibles y electricidad.

El secador solar consiste esencialmente de una cabina provista en su interior de ventiladores que circulan aire a través de un calentador (colector solar), además de ductos de entrada y salida de aire los cuales permitían la pérdida de humedad en los alimentos y la expulsión del secador de la misma. La unidad tenía además en su interior 12 canastillas rotatorias provistas con charolas contenedoras de alimento, existiendo una masa de aire en el interior de  $3.76\text{m}^3$ . Para permitir la rotación de las canastillas se diseñó un eje de rotor que permitía la revolución de las mismas a 2 rpm, aprox. La ventaja que ofrecía el rotor era permitir una alimentación semicontinua y una mejor exposición al fluido secante, y dar una mejor apariencia final.

En dicho prototipo sobre la base experimental se trabajó al igual que en la experimentación preliminar con diferentes alimentos, calabaza rebanada en rodajas de 3mm de espesor, papas en rodajas de 1cm de espesor y chiles enteros (chile puya, chile ancho verde y chile ancho rojo). Los tiempos de secado fueron diversos, las calabazas 5 horas, las papas, el chile puya y el chile ancho 19, 28 y 41 horas aproximadas respectivamente. La temperatura máxima registrada en el interior del secador fue de 45 °C, y la temperatura máxima obtenida en el colector fue de 65 °C, la pérdida de peso en promedio fue de 83.68%.

## **Materiales, Métodos y Procedimientos De Cálculo**

El diseño y construcción del prototipo, se diseño y construyo en las instalaciones del Instituto Tecnológico de Durango, y con consideraciones de diseño para prototipo:

**I. Capacidad De Producción:** Calor absorbido, Cantidad de calor a generar, Manera de transmitir el calor, Regulación de flujo, Determinación de pérdidas, **El área de la superficie de secado.**

**II. Economía Y Rendimiento Térmico:** Calor almacenado en las paredes, Pérdida de calor, por radiación, y arrastrado, Diferencia de temperaturas entre la superficie de secado y el aire, **Coefficiente de transferencia de calor.**

**III. Resistencia Y Duración:** Materiales empleados, Expansión / Compresión / Resistencia

**IV. Movimientos De Los Gases:** Variaciones inherentes a los gases

**V. Preservación Ecológica:** Polución, / combustible / energía / uso de energía.

### **Equipo Usado.**

Secador cilíndrico rotatorio.

El secador cilíndrico fue construido en una primera versión de lámina negra y varilla negra, esto es para el túnel cilíndrico; y el panel colector de energía solar, de lámina, acrílico y pintura negra; el túnel se construyó de tal forma que el perímetro, conjuntamente con el ancho y el largo, dieran exactamente las medidas de un túnel vertical de  $1 \times 1.83 \times 1.84 \text{ m}^3$ , el colector brindó el calor colectado suficiente para alcanzar una temperatura óptima de 55 - 60 °C en el interior de la cámara de secado, se emplearon dos motores, para mover el fluido caliente a una velocidad de 4 -7 m/s y 900 rpm,

### **Balanzas**

Se usarán dos balanzas, una granataria marca OHAUS, modelo 1205, con capacidad de 2610 gr, la cual puede registrar hasta décimas de gramo, para el muestreo en el secado y poder construir las curvas de secado. La otra, una balanza de humedad marca OHAUS, provista de una lámpara de 600 wats, modelo 6010, con capacidad para 10 gr, con el fin de determinar los sólidos secos de cada alimento y las humedades iniciales de los mismos.

Otros equipos de laboratorio:

- 1 estufa de laboratorio.
- 1 desecadores.
- 1 balanza granataria.
- 1 balanza analítica.
- 1 balanza para determinación de humedad.
- 10 termómetros de laboratorio, de -10 a 110°C.
- 5 termómetros bimetálicos (aguja y carátula), de 0 a 100°C.
- 3 higrómetros de bulbo húmedo.
- 2 anemómetros.
- 2 higrómetros (con indicación de aguja).
- 1 higrotermógrafo.
- 1 aparato para determinación de textura de alimentos.

### **Materiales**

Se usaron algunos alimentos, susceptibles de ser secados tal como: calabaza, chile verde ancho y guajillo, papa, en los casos convenientes, se usó una rebanadora manual marca BORNNER modelo 9504, y otros se secaron enteros.

### **Variables Del Proceso**

No todas las variables fueron tomadas en cuenta, se citan aquellas que para efecto del presente trabajo como más importantes.

Para la velocidad del aire, todas las pruebas, se mantuvieron con velocidades que fluctuaron entre 4 y 7 m/s, sobre la base de lo dicho por Walker et al. (1973), quien afirma que en trabajos de investigación los rangos de velocidades de aire deben situarse entre 4.5 y 7.5 m/s.

Todas las pruebas se realizarán entre 55 y 60 °C. La temperatura no se registró como exacta debido a limitaciones del equipo. De cualquier modo, durante todos los procesos se estuvo monitoreando la temperatura con un termómetro de mercurio y con un termómetro de carátula, los termómetros de mercurio registraron la temperatura del bulbo húmedo, por la introducción de otro termómetro de mercurio cuya cápsula se envolvió en algodón y gasa, los cuales se humedecieron constantemente.

Se ensayaron tres velocidades de rotación: 2, 4, y 5 rpm, para determinar cuál fue la mejor velocidad. La humedad relativa, no se controló, debido a que no parece tener una influencia decisiva, de este modo, las pruebas se sujetaron a la humedad del medio ambiente, la humedad relativa se determinó mediante el monitoreo de las temperaturas de bulbo seco y bulbo húmedo, con los cuales se consultaron las cartas psicrométricas.

Tomando en cuenta un producto vegetal como es el chile ancho,

### **Humedad relativa**

Debe adaptarse a la del material que se seca, generalmente se elige como 7/10 del valor correspondiente al equilibrio higroscópico de la humedad del chile, considerando con temperatura en el bulbo seco 50 °C y como temperatura en el bulbo húmedo de 35-40 °C, de acuerdo a un nomograma psicrométrico, se obtiene una humedad relativa de 40-60%.

### **Humedad inicial del chile base seca**

$wH_0$  = Humedad inicial del chile base húmeda = 0.94

$wS_0$  = Humedad inicial del chile base seca =  $wH_0 / (1 - wH_0)$   
=  $0.94 / 0.06 = 15.7$  Kg de agua/ Kg de chile seco.

$wH$  = Humedad final del chile base húmeda = 0.04

$wS$  = Humedad final del chile base seca =  $wH / (1 - wH) = 0.04 / 0.88 = 0.0417$  Kg de agua/Kg de chile seco.

Se desearon obtener  $0.26\text{m}^3$  de chile seco a una densidad de  $288\text{Kg}/\text{m}^3$  y 4% de humedad equivalente a  $0.0417\text{Kg}$ . de agua /Kg. de chile seco cada 14 horas, entonces se puede obtener  $5.35\text{Kg}/\text{h}$  de chile seco.  $5.35 \times 0.0417 = 0.223\text{Kg}$ . de agua/h que contiene el chile seco al final. Sea S los kilogramos de chile seco/h, entonces  $S = 5.35 - 0.233 = 5.117\text{Kg}$ . de chile por hora.

El agua evaporada por hora,  $A_w$  :

$A_w = S(wS_0 - wS) / Z = 5.117(15.7 - 0.0417) / 14 = 5.723\text{Kg}$ . de agua evaporada/hora.

### **Calor sensible**

Calor sensible necesario para calentar el chile más la humedad que la acompaña desde la temperatura ambiente hasta la temperatura del bulbo húmedo del medio secante

$q_1 = S \cdot C_p(T_w - T_1) + S_w \cdot S_0(T_w - T_1)$

$T_w$  Temperatura del bulbo húmedo de los gases secantes = 50 °C, para las condiciones de 60 °C de temperatura en el serpentín.

$T_1$  = Temperatura ambiente en el aire antes del colector = 25 °C

$C_p$  = Calor específico del chile Kcal/Kg °C = 0.95 y los demás factores definidos anteriormente.

$q_1 = 5.117 \times 0.95 (35 - 25) + 5.117 \times 1.5 (35 - 25) = 125.75\text{Kcal}/\text{h}$

### **Calor latente**

Calor latente necesario para evaporar el agua eliminada en el secador a la temperatura del bulbo húmedo, más calor sensible para calentar el vapor de agua hasta la temperatura de salida:

$q_2 = S(wS_0 - wS)e + S(wS_0 - wS) \times 0.45 \times (t_2 - T_w)$

$e$  = Calor latente de vaporización del agua a 35° C = 275Kcal/h

$t_2$  = Temperatura de los gases de salida = 40 °C

$q_2 = 5.117(15.7 - 0.0417) \times 275 + 5.117(15.7 - 0.0417) \times 0.45(40 - 35) = 22,214.3\text{Kcal}/\text{h}$

### Calor sensible para calentar el chile

Calor sensible para calentar el chile más el agua residual desde la temperatura del bulbo húmedo hasta la temperatura de salida del chile seco:

$$q_3 = S.C_p(T_2 - T_w) + S.wS(T_2 - T_w)$$

$$T_2 = \text{Temperatura de salida del chile seco} = 40 \text{ }^\circ\text{C}$$

$$q_3 = 5.117 \times 0.95(40 - 35) + 5.117 \times 0.0417(40 - 35) = 51.87 \text{ Kcal/h}$$

### Calor para calentar el aire

Calor necesario para calentar el aire junto con su humedad desde la temperatura ambiente hasta la temperatura de salida del secador:

$$q_4 = Gs(t_2 - t_1)$$

$$G = \text{Cantidad de aire seco en Kg./h}$$

$$s = \text{calor húmedo del aire en Kcal/kg.} = 0.253 \text{ Kcal/Kg. de aire seco}$$

$$t_2 = \text{Temperatura del gas a la salida del secador} = 40 \text{ }^\circ\text{C}$$

$$t_1 = \text{Temperatura de entrada del aire} = 25 \text{ }^\circ\text{C}$$

Calores específicos medios molares			
Temperatura	Cpm H <sub>2</sub> O	Cpm N <sub>2</sub>	Cpm aire
100 – 0° C	7.9	6.8	6.9
32.2 – 0° C	7.8	6.7	6.8

Considerando la carta psicrométrica, los valores de temperatura, y los valores de los calores específicos medios molares, se determinó la humedad del aire a la entrada del secador, H<sub>1</sub> y la humedad final del aire a la salida del secador H<sub>2</sub>; los valores son:

$$H_1 = 0.011 \text{ Kg. de agua/Kg. de aire}$$

$$H_2 = 0.030 \text{ Kg. de agua/Kg. de aire seco}$$

Con los datos anteriores se encuentra la cantidad de aire por hora que se debe introducir al secador, lo que se logra por medio de un balance de agua:

$$G(H_2 - H_1) = S(wS_0 - wS)$$

$$G = S(wS_0 - wS)/(H_2 - H_1)$$

$$= 5.117(15.7 - 0.0417)/(0.030 - 0.011)$$

$$= 4,217 \text{ Kg. de aire seco/h}$$

El calor necesario para calentar el aire junto con su humedad desde la temperatura ambiente hasta la temperatura de salida del secador es:

$$q_4 = 4,217 \times 0.253(40 - 25)$$

$$= 16,003.59 \text{ Kcal/h}$$

El calor total será  $q_1 + q_2 + q_3 + q_4 + \text{Pérdidas Kcal/h}$

$$Q_t = 125.3665 + 22,214.3 + 25.372 + 16,003.59 = 38,368.62 \text{ Kcal/h}$$

### Eficiencia del secador

El calor total para efectuar el secado es 38,368.62 Kcal/h y la eficiencia se calcula por:

$$E_f = S(wS_0 - wS)/Q_t$$

Se agregan 5.20 kwh/m<sup>2</sup> - día, lo que proporciona un calor de 40,248 Kcal/h

Calor necesario para efectuar el secado = agua eliminada por hora x calor latente del agua a 35 °C, y



$$E_f = 5.117(15.7 - 0.0417) \times 275 / 38368.62 = 0.5742$$

Eficiencia térmica = 57.42%

El calor perdido por radiación y para calentar las charolas, puertas y persianas:  
 $40,248 - 38,368.62 = 1,879.38 \text{Kcal/h}$

### **Cálculo de la longitud del túnel**

Para este cálculo se hizo uso del concepto de longitud de unidades de transferencia.

$$N_t = (t_a - t_2) / (t)_m$$

$N_t$  = Número de unidades de transferencia.

$t_a$  = Temperatura del gas a la entrada del secador = 60 °C

$t_2$  = Temperatura del gas después de la transferencia de calor, 50 °C, se considerará una temperatura del chile seco al salir de 40 °C para efecto de cálculo.

$(t)_m$  = Diferencia media logarítmica de temperaturas entre el gas y el chile.

$$(t)_m = (60 - 25) - (50 - 40) / \ln[(60 - 25) / (50 - 40)] = 20$$

El gas se enfría de 60 a 25 °C. El chile se calienta de 25 a 40 °C

$$N_t = (60 - 25) / 20 = 1.75$$

Longitud de una unidad de transferencia:

$$L_t = 19.5(b)(G')^{0.2}$$

$b$  = espacios entre unidades de secado y el techo = 0.55ft

$G'$  = Lb de aire seco por hora por  $\text{ft}^2$

$$G = 4,217.02 \text{ Kg. de aire seco/h} = 9,277.44 \text{ lb. aire seco/h}$$

Área transversal del secador, se propone de 0.91m de alto por 0.5m de ancho.

$$A = 2.9857 \times 1.6405 = 4.89 \text{ft}^2$$

$$G' = 9,277.44 / 4.89 = 1,897.22 \text{ lb. aire seco/ft}^2$$

La longitud total del secador será:

$$L_t = 4.89 \times 0.55 \times (1897.22)^{0.2} = 12.17 \text{ft} = 3.7 \text{m}$$

La longitud del túnel será de 3.7m, por lo que las medidas del secador serán: 2.0m de ancho, 0.4m de radio interior y 1.165m de radio exterior, de la cámara, para colocar el ventilador y el serpentín, se utilizará una área intermedia igual a la mitad del área definida anteriormente, el número de charolas que se manejarán será de 36, en total, esto es 12 canastillas con 3 charolas cada una.

### **Velocidad del movimiento de aire**

La velocidad del movimiento de aire se considera adecuada a 0.30m/seg, la temperatura de operación está comprendida en el rango de 25 a 60 °C. De acuerdo al volumen de aire seco es suficiente para obtener los resultados deseados.

Se pretende dar una renovación de aire de continua, sin proceso de inversión, es decir, sin cambio alternativo del sentido de rotación, para obtener un secado más uniforme. El ventilador estará situado a una distancia de 1.0m del colector.

### Tipo De Unidad Secadora

El secador consiste esencialmente de una cabina o envoltura similar aislada, está provista interiormente de un ventilador que circula aire a través de un calentador; el aire caliente sale por una rejilla de láminas ajustables y es dirigido verticalmente a través de las charolas perforadas y el alimento. El secador contará con regulador para controlar la velocidad de entrada del ambiente y la cantidad deseada de aire de recirculación. En la mayoría de los casos, los secadores de charolas operan por lotes y tienen la desventaja de no secar uniformemente el producto, para uniformizar el secado, se requiere la rotación de las charolas.

### Dimensiones

Se construyó una estructura (prototipo) de un diámetro exterior de 2.33m. y un diámetro interior de 0.80m., en el interior, 12 canastillas con 3 charolas cada una de 0.63m<sup>2</sup> c/u. Existiendo una masa de aire en el interior del secador de 3.76m<sup>3</sup>.

Contó con un ducto de entrada de aire caliente el cual permite que los alimentos pierdan humedad. También contó con un ducto de salida de aire para expulsar la humedad.

### Materiales

Los materiales empleados para la construcción del secador: ángulo de ½ x 1/8", varilla de ½", lámina negra calibre 22, acrílico de 3mm, soldadura eléctrica, y pintura negra.

### Requerimientos De Energía Solar En El Prototipo De Secador.

El suministro de calor se consideró por medio de un colector solar, con una capacidad de 900BTU, se estableció que en la región se logra una captación en promedio de 2700grados-día, mismos que pueden proporcionar 5.20KWh/m<sup>2</sup> -día en un ambiente de temperatura de 30 °C, en promedio. Con ello se pretende lograr una temperatura en el interior del secador de 45 a 60 °C:

El secador trabajará 1400h y el consumo anual de energía será de 138.25KW, el costo, más gastos indirectos, es de \$ 0.00

### Condiciones Climáticas De La Región De Trabajo.

La tabla presenta un resumen de las temperaturas máximas y mínimas registradas a lo largo del experimento así como la humedad relativa máxima y mínima obtenida.

Temperatura en ° C	Media	Mínima	Máxima
Interior	34.39	21.00	45.00
Después de 4 min.	31.61	21.00	37.00
Lámina	34.89	22.00	45.00

Colector	48.63	21.00	65.00
Sombra	24.23	13.00	34.00
Mínima por día	11.18	5.90	17.30
Humedad en %	22.25	11.00	43.00

Las pruebas se realizaron en días en los que la humedad relativa se presentaba alta por las mañanas, sin embargo se alcanzaron temperaturas muy altas en el colector que favorecieron el tiempo de secado, la temperatura mínima presentada a lo largo de la prueba fue de 11.18 °C por lo que se puede afirmar lo anterior.

## RESULTADOS Y DISCUSIÓN

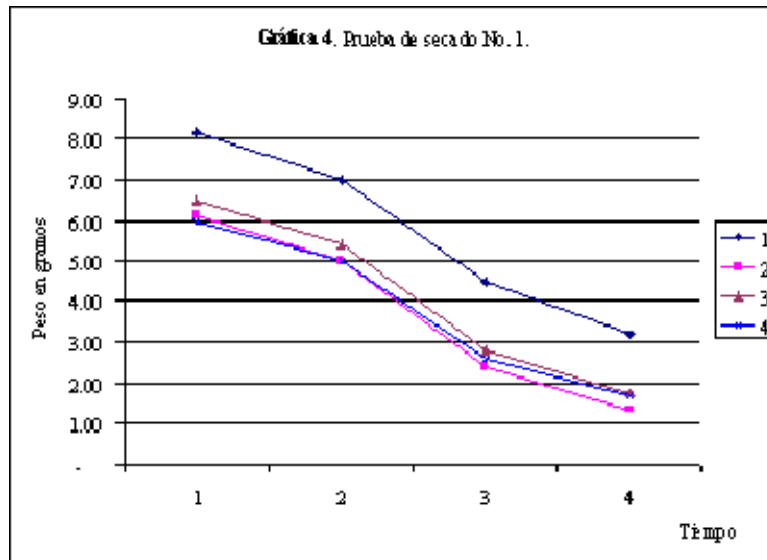
### Experimentación En El Prototipo De Secador Y Curva De Temperatura De Secado.

En dicho prototipo, sobre la base experimental se trabajó al igual que en la experimentación preliminar con diferentes alimentos, calabaza rebanada en rodajas de 3mm de espesor, papas en rodajas de 1cm de espesor y chiles enteros (chile puya, chile ancho verde y chile ancho rojo). Los tiempos de secado fueron diversos, las calabazas 5 horas, las papas, el chile puya y el chile ancho 19, 28 y 41 horas aproximadas respectivamente. La temperatura máxima registrada en el interior del secador fue de 45 °C, y la temperatura máxima obtenida en el colector fue de 65 °C, la pérdida de peso en promedio fue de 83.68%.



Se realiza la prueba de secado No. 1 colocando en 24 charolas un aproximado de 25Kg de calabaza. En aproximadamente una hora de secado el producto pierde el 16.56% en promedio de su peso.

El producto después de haber sido expuesto a dicha prueba presenta una pérdida de peso en promedio de 71.1% de los testigos escogidos (**figura 1**).

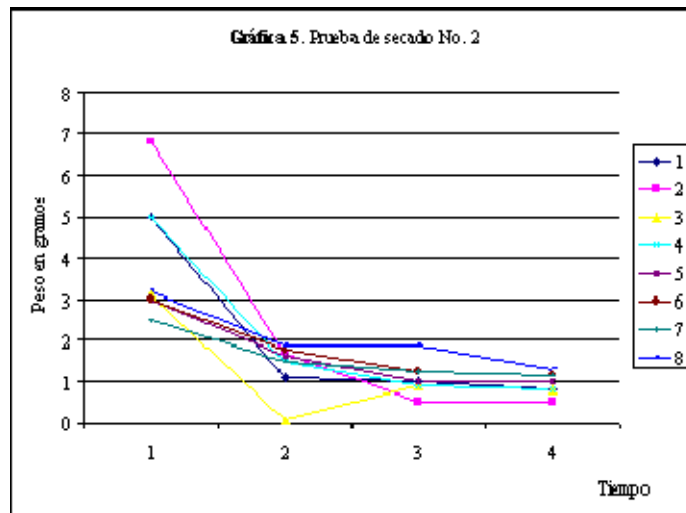


**Fuente:** Tabulación y graficación de resultado obtenidos.

**Figura 1** Pesos obtenidos en la prueba de secado No. 1 (25Kg de calabaza).

Testigo 1	60.98 %
Testigo 2	77.87 %
Testigo 3	73.00 %
Testigo 4	72.50 %

Una vez terminada la prueba se saca el producto y se pesa, 1.7Kg, concluyendo que sufrió una pérdida de peso del 92.44%. El producto una vez seco presenta sabor agradable y buena presentación. La **figura 2** muestra las variaciones en peso alcanzada a través de la prueba con una temperatura, la cuál fue de 38 °C a las 15:00 hrs. Debido a que el rebanado del producto presenta variación significativa existen grados de deshidratación desiguales. Los productos delgados se adhieren a las charolas.



**Fuente:** Tabulación y graficación de resultado obtenidos.

**Figura 2** pesos registrados en prueba de secado No. 1 (25Kg de calabaza

### Conclusiones

El presente documento es un resultado de investigación orientado a profundizar en el conocimiento de los procesos de deshidratación de frutas, vegetales, frutos, e inclusive carnes, mariscos, y en el aprovechamiento de la energía solar. El trabajo se enmarca dentro del área de la ingeniería de alimentos, en particular, sobre la conservación de alimentos por deshidratación.

Con el trabajo se pretenden dos objetivos fundamentales. Por una parte, contribuir a la disminución de pérdidas de frutas que se producen en el Estado de Durango y en el país; tales pérdidas se establecen por daños y descomposición. Por otra parte, aportar trabajo de diseño de equipo que permita hacer uso de la energía solar, buscando con ello disminuir el consumo de energéticos convencionales. Esto último es para evitar la alteración del medio ambiente y bajar los costos de operación de equipo de deshidratación.

El diseño, desarrollo, construcción y operación del prototipo, se establece que es promisorio, para desarrollo de un proyecto formal a futuro, se fija el potencial de producción en aproximadamente de 60 a 250 Kg, dependiendo del producto. Se trabajó diariamente durante seis horas en las cuales se tomaba la temperatura cada dos horas. Dependiendo del tipo de material a secar y la presentación, se dieron diversos tiempos de secado. Las calabazas que se expusieron a secado tardaron en secar 5 horas, perdiendo el 93.18% de su peso. El chile puya tardó 27 horas 50 minutos, el chile ancho 41 horas 30 minutos, en peso se observó una pérdida del 50%, en el chile puya, y el chile ancho. Y las papas 18 horas 50 minutos, el peso perdido también fue de un 50%. La temperatura máxima alcanzada fue de 45 °C en el interior del secador, en cuanto al colector, la temperatura máxima fue de 65 °C. no-polución, y no uso de combustible. La prueba se realiza en uno de los meses en el que la radiación solar es baja por lo que los resultados obtenidos se consideran ventajosos.

Algunas consideraciones para llevar a cabo el diseño del deshidratador, dependen de la cantidad y tipo de material que ha de secarse por hora y las superficies expuestas del producto para el caso, tiempo de sometimiento a temperatura, tamaño de los productos, y de la cantidad de calor que pueda liberarse sin utilizarse, aunado a la duración de los materiales que se usen indicarán que el tipo y tamaño del deshidratador sea más correcto.

Fijando el peso, el área expuesta y el tamaño de las piezas, que se calientan, se puede especificar el área del deshidratador, incluyendo la longitud del mismo.

En el presente trabajo, los valores de las variables de interés, se recopilaron con el auxilio de estudiantes que como recursos humanos se iban a formar, estas variables fueron, presión barométrica, temperatura en bulbo seco y húmedo, humedad relativa, precipitación pluvial, insolación, radiación solar, dirección y velocidad del viento, los valores obtenidos representan alguna irregularidad, por haber considerado el promedio de todo el tiempo de estudio, generado en forma diaria, y acumulado y promediando mensualmente

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## **Tratamiento Experimental Para Efluente De Planta Tipo BCTMP, Con Polvo De Lenteja Y Ácido Cítrico (Quelante Y Enmascarador De Color).**

**Lerma Rojas, Leonel Salvador<sup>(1)</sup>; Lerma Rojas, Olga Margarita<sup>(2)</sup>;**  
**<sup>(1)</sup>Departamento de Ingeniería Industrial; Maestría En Planificación De Empresas Y Desarrollo Regional. Instituto Tecnológico De Durango, Blvd. Felipe Pescador 1830 Ote., Durango, Dgo., México 34080. Tel: 18184871, Fax: 18184813. <sup>(2)</sup>Centro de Bachillerato Industrial y de Servicios (CBTIS) No. 110, Mártires de Sonora 401, Fracc. Infonavit, Durango, Dgo., México 34220, <sup>(1)</sup> Profesor Investigador Del ITD. <sup>(2)</sup> Profesor CBTIS 110, Email: [leolerma@omanet.com.mx](mailto:leolerma@omanet.com.mx).**

**Descriptor:** Tratamiento, Efluente, Diseño Experimental, Experimento, Quelante, Antioxidante y Enmascarado.

### **INTRODUCCIÓN**

Uno de los mayores problemas, en los tratamientos de efluentes (aguas residuales), en las plantas de celulosa, que se emplea un proceso termo-mecánico con blanqueo (BCTMP) a base de peróxido, es precisamente la eliminación del peróxido remanente, el que usualmente permite que el efluente sin tratamiento presente por lo general un pH aproximadamente neutro y tal condición no permita emplear los tratamientos tradicionales reportados por la bibliografía.

De acuerdo a lo anterior, la descripción del problema se centra en las siguientes vertientes:

1. Carencia de Tecnología en tratamiento de efluente, durante la elaboración de celulosa por proceso BCTMP.
2. Deterioro creciente del medio ambiente.
3. Ineficiente uso de agua.
4. Pérdida de agua por no recuperar rápidamente el efluente.
5. Inhabilidad para tratar el agua.
6. Inadecuación de factores productivos.

Debido a que actualmente la ecología está muy dañada y que es necesario mejorar el tratamiento de efluentes, mismo que permita reciclar el agua y no seguir empleando el agua fresca de los mantos freáticos, se desarrolló el diseño experimental, que permitió establecer un tratamiento final tentativo, que brindó una calidad de agua que no presenta turbidez y poca demanda de oxígeno.

## **Materiales, Métodos y Procedimientos De Cálculo**

En forma consecutiva, se estuvieron tomando y tratando muestras de efluente en la planta, con variables que pueden ser importantes(DQO, DBQO, Turbidez, Sólidos, pH), y el objetivo de lograr obtener un efluente satisfactorio, se diseñó y desarrolló un experimento considerando variar agregados tales como Sulfato de Aluminio(0.1 a 0.3), Sulfato de Aluminio y Potasio(0.05 a 2.5), Hidróxido de Calcio(0.1 a 0.3), Carbonato de Calcio(0.05 a 0.3), Polvo de Lenteja(0.05 a 0.15) como quelante, el antioxidante y enmascarador de color, Ácido Cítrico(0.05 a 0.1) estos químicos en g./100 ml, la temperatura de trabajo de 39 a 50 °C, y pH inicial de 7.0, también se agitó, el valor fue de 100 rpm.

Se desarrolló el proceso en cuatro etapas, en las instalaciones del I.T.D., como agregados primarios: Hidróxido y Carbonato de Calcio; Secundarios: Sulfato de Aluminio, de Aluminio y Potasio, contemplando una combinación de ambos; Terciario: Polvo de Lenteja micropulverizado; el agregado final fue el Ácido Cítrico.

Se realizó una prueba de porcentaje de transmitancia (%T) y Absorbancia(ABS), se utilizó un aparato SPECTRONIC 30, de BAUSCH & LOMB, después de los experimentos tratados, en el aparato, primero se procedió a encenderlo, se dejó calentar por 15 min., enseguida se estableció a cero la escala, con un aproximador rápido, se establecieron varias longitudes de onda(450, 550, 650), insertando un tubo con agua patrón(destilada), se llevó a completar la escala(100% T), con el aproximador fino, insertando enseguida muestras desconocidas de agua de efluente en crudo y diluida, se consideró la longitud de onda de 650, por proporcionar mejor lectura de transmitancia y que al insertar el tubo, con agua patrón diese un 100% de transmitancia; posterior a ello, se introdujeron los tubos de ensaye, con efluente tratado en los diferentes experimentos.

### **Requerimientos De Aire Y Temperatura Para Tratamiento Del Efluente.**

En el desarrollo de los experimentos, se requirió proporcionar temperatura, que osciló entre 39 y 50 °C para emular las condiciones iniciales del efluente, en la planta elaboradora de celulosa; no se proporcionó areación, éste pudiera ser un factor de importancia, que se prevé emplear en el futuro y alcanzar un grado de optimalidad superior en el tratamiento que se propone, no es en este caso necesario aplicar velocidad del aire y gasto de aire, bajo ninguna dosificación..

### **Requerimientos De Combustible En el Tratamiento.**

Para un desarrollo formal de la planta de tratamiento de agua residual, se requeriría energía para mover los agitadores y el efluente por medio del cárcamo de bombeo. en este caso, de los experimentos, no fue necesario algún combustible.

## **RESULTADOS Y DISCUSIÓN**

### **Experimentación En El Prototipo De Horno Y Curva De Temperatura De Cochura.**

Los resultados de la fracción experimental, importantes, por los resultados observados



Tabla de Desarrollo Experimental  
Tratamiento de Agua Residual

Condición Muestra	1	2	3	4	5	6
pH inicial	7.0	7.0	7.0	7.0	7.0	7.0
Temperatura °C	50	50	50	39	50	50
Agregado primario	0.2	0.3	0.4	0.2	0.3	0.4
pH intermedio	11.0	11.0	11.5	7.5	7.5	7.5
Agregado secundario	0.2	0.3	0.2	0.2	0.3	0.2
pH intermedio	7.0	7.0	11.0	7.0	7.0	7.0
Agregado terciario	0.02	0.02	0.02	0.02	0.02	0.02
pH terciario	7.0	7.0	7.0	7.0	7.0	7.0
Agregado final	0.1	0.1	0.1	0.1	0.1	0.1
pH final	5.9	5.9	5.9	5.9	5.9	5.9

Fuente: Resultados experimentales

Los agregados se hicieron en g/100 ml, de agua residual sedimentada

Agregado Primario, muestras 1, 2, y 3;  $\text{Ca(OH)}_2$ ,  
muestras 4, 5, y 6;  $\text{CaCO}_3$ ,

Agregado Secundario, muestras 1;  $\text{AlK(SO}_4)_2$ ,  
muestras 2, 4, y 5;  $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ ,  
muestras 3, y 6;  $\text{AlK(SO}_4)_2$ ,  $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ , cantidades  
iguales.

Agregado Terciario, muestras 1, 2, 3, 4, 5, y 6; Lenteja en polvo,

Agregado Final, muestras 1, 2, 3, 4, 5, y 6; Ácido cítrico,

Los resultados encontrados se consideraron como buenos, procediendo a realizar una prueba de transmitancia y absorbancia para la fracción experimental de interés, la tabla que a continuación se muestra:

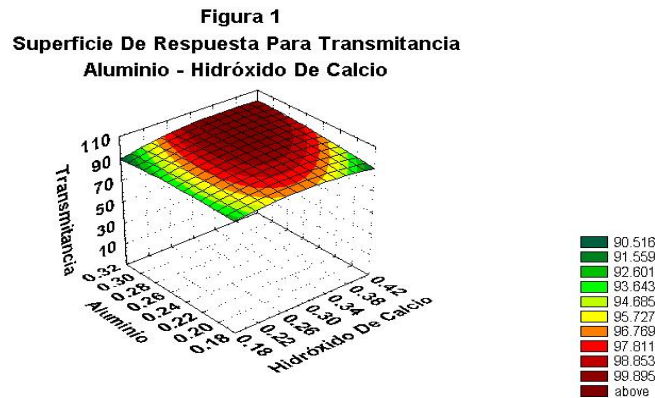
RESULTADOS DE TRANSMITANCIA Y ABSORBANCIA  
6 mejores experimentos

Exp	1	2	3	4	5	6
%T	94	100	94	95	90	90
ABS	0.02	0.00	0.02	0.02	0.04	0.04
	5		5		8	8

Fuente: Resultados Experimentales

Al revisar los resultados, se puede afirmar que el mejor experimento es el 2, seguido del 4,

posteriormente el 1 y 3, finalmente 5 y 6, cabe aclarar, que después de un tiempo razonable (tres meses) el experimento 6, perdió el grado de transmitancia y absorbancia alcanzada, desconociéndose hasta el momento las causas recesivas, pero indicativo de necesidad de investigarlo.

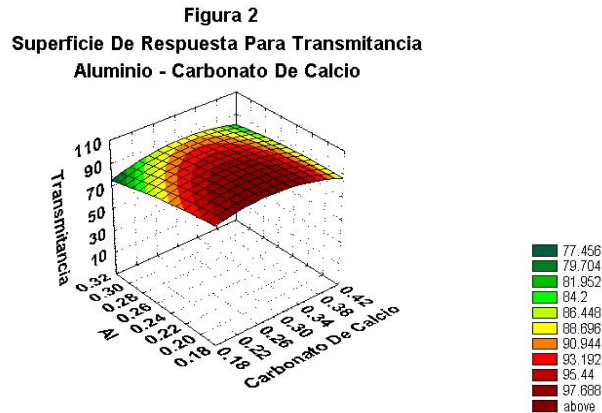


Fuente: Desarrollo experimental de Tratamiento de agua Residual

Revisando la figura, suponiendo una superficie de respuesta cuadrática, el área de optimización está acotada por una lado para el hidróxido de calcio, desde 0.26 a 0.42 g/100 ml, y en el caso del sulfato, inicialmente 0.24 finalizando en 0.32 g/100 ml, de efluente en los experimentos, se utilizó después de haberlo sedimentado.

Los experimentos posteriores para comprobar los valores óptimos, no se llevaron a cabo, la novedad en el desarrollo de tratamiento experimental para el efluente, es el uso del ácido cítrico, como enmascarador de color, y dada la sugestividad de los resultados, funcionó de acuerdo a lo propuesto en forma inicial.

De manera similar, para el caso de sulfato y carbonato de calcio,



## Fuente: Desarrollo experimental de Tratamiento de agua Residual

Suponiendo también una superficie de respuesta cuadrática, el área de optimización está acotada por una lado para el carbonato de calcio, desde 0.22 a 0.38 g/100 ml, y en el caso del sulfato, inicialmente 0.18 finalizando en 0.34 g/100 ml, formando en este caso, un paraboloide como área de optimización, el efluente en los experimentos, se utilizó después de haberlo sedimentado

Al llevar acabo el desarrollo de los experimentos, el pH se incrementó, se neutralizó y finalmente se estandarizó a 5.9. los agregados en el experimento clasificado como #2, secuencialmente fueron:  $\text{Ca}(\text{OH})_2$ , 0.3 g./100 ml;  $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ , 0.3 g./100 ml; Lenteja, 0.02 g./100ml; Ácido Cítrico, 0.1 g./100 ml; la temperatura se fijó en 50 °C. En el caso del #4, secuencialmente fueron:  $\text{CaCO}_3$ , 0.2 g./100 ml;  $\text{AlK}(\text{SO}_4)_2$  0.1 g./100 ml;  $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ , 0.1 g./100 ml; Lenteja, 0.02 g./100ml. ; Ácido Cítrico, 0.1 g./100 ml; la temperatura se fijó en 39 °C.



Respecto a las demandas, Química y Bioquímica de oxígeno, no se determinaron, de manera total, pero por observación y dada la sugestividad, se pudo fijar que prácticamente son nulas, la razón fue, al inicio, con efluente sin sedimentar y aun sedimentado, no se observó presencia de insectos y ningún crecimiento de algún tipo de microorganismo, después de cada tratamiento, se dejó los recipientes sin ningún cuidado, y tras varias horas, se observó presencia de insectos y crecimiento de algún tipo de microorganismo, esto último sin verificar o caracterizar.

### Conclusiones

El agregado de polvo de lenteja y de ácido cítrico, cumplieron la función de servir como quelante y enmascarador de color, de acuerdo a los resultados obtenidos.

Se establece, que es posible lograr optimizar gradualmente el proceso de tratamiento de efluente, buscando reducir al máximo los parámetros nocivos, posterior a ello, se puede proceder a llevar a cabo el diseño y construcción de la planta piloto.

El proceso completo requiere del diseño de instalaciones en donde se contemple, un sedimentador de lodos, una laguna para agregado primario, con agitación, y en secuencia, dos más para el resto de los agregados, en la última, es deseable una agitación al inicio y sedimentación al final, para reciclarla al proceso, no se requiere temperatura, en virtud de la condición inicial, en este caso, se tomaron lecturas, y la temperatura, oscilaba entre 50 y 55 °C.

Algunas consideraciones para llevar a cabo el diseño de la planta de tratamiento, dependen de la cantidad y tipo de efluente que ha de someterse por hora, la temperatura y agitación para el caso, tiempo de sometimiento a temperatura, volumen por hora de productos necesarios para formar el flóculo, y de la cantidad de calor que pueda liberarse, variaciones y duración en el momento del pH indicativo, brindarán que el tipo y tamaño de la planta de tratamiento sea más correcta.

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Ecological indicators

**JULIA LITKEI, ILDIKÓ SZABÓ KOMLOVSZKY, CHRISTOS CHRISTIAS**

Tessedik Sámuel College, Hungary

### Introduction

10 percent of territory of Hungary is currently protected nature reserve out of which 48 percent is covered by woodland. There are nine national parks, four of which have been established during the last years. Biodiversity within Hungary remains relatively high. There are increasing numbers of species reaching „endangered status”, the result of a decreasing number of natural habitats. The clear cutting of forests, ploughing of meadows, and use of pesticides and insecticides has largely contributed to this trend, owing to the intensification of agriculture and forestry. As a result, populations of animal and plant species have become more and more fragmented, and isolated from each other. Fortunately, the extent of these processes is still not as high as in some West European countries.

### **Air, Water and Soil Quality**

Air quality has improved in Hungary, with the levels of emissions having declined over the last decade. CO emissions, for example, dropped from 800 kilotons in 1980 to 500 kilotons in 2000. SO<sub>2</sub> declined from 1600 kilotons in 1980 to 800 kilotons in 2000. This has been result of declining industrial activity, and technical improvements in the energy sector, which have also brought about a decline in particulate matter emissions in 2000. On the other hand, the deterioration of air quality within major cities has become increasingly apparent as a result of a growth in road traffic. Consequently, 29 percent of the population lives in air-polluted areas and an additional 24 percent in moderately polluted areas.

Plantations of dwarf fruit trees that require high levels of agricultural chemicals have decreased in the region, but there are pollutions of the lakes with pesticides, fertilizers, and petroleum waste. Nitrogen-rich runoff from near farming has gradually entered the lakes waterways. They have been severely affected by decades of nutrient enrichment from phosphates and nitrates. This led to the growth of algae, loss of water plants and a serious decline in the wildlife.

Regarding groundwater and soil, any sources are polluted owing to uncontrolled runoff, the discharge of untreated sewage, and contaminated soils arising from dump sites. Surface waters, including rivers, suffer from transboundary water pollution originating within up-stream countries.

More than 80 percent of Hungary's soils are cultivated by agriculture, and forests cover 18 percent. Unlike other European countries, more than 90 percent of Hungary's land area is sustainable for agricultural use, based on its soil fertility. Transfers in land ownership have led to some improvements, although industrial dumpsites and former Soviet army barracks contribute to contaminated areas.

The National Meteorological Institute operates a national air quality monitoring system that on stations within larger towns. Regional Environmental Inspectorates measure water quality in rivers and water basins in several places every second week. Groundwater monitoring systems have been established in areas of major contaminated sites, like former Soviet army barracks.

A national programmed and list of hazardous contaminated land sites exists corresponding to an annually approved clean up programmed managed by some projects. It is a public list that has been approved for governmental assistance. The list has not been yet made accessible electronically.

A national inventory of pollution sources that threaten groundwater exists, set up as the result of the Phare Waste more than 150 projects. This inventory contains data about the location, amount and components of pollution sources. This database is not yet accessible electronically, although it is available for local government use. Since the management of hazardous waste is entirely supervised by the state, although private firms are active in this area and operate special dumps. Regional Environmental Inspectorates

tend to maintain data about hazardous waste sites and their emissions and threats (Nagyhazi, 1998).

## **Risk and Emergency Management**

Civil Defense is responsible for emergency management, which is organized in close co-operation with local governments. There is no special local emergency support system, but the national framework includes a radioactivity monitoring system with several regional measuring stations. The Danube River also hosts a monitoring and emergency warning network, which is still in the process of being established with Western financial support. Public warnings of incidents are usually undertaken by police patrols. Generally, anyone is eligible to receive public information and or environmental information in Hungary. There are no requirements or personal conditions imposed by any of the major regulations dealing with the disclosure of information. The Ministry of Environment operates a public relations office and question and answer service that directly serves the population and responds to the requirements of this legal framework.

Environmental protection also receives more attention in mass media. Local governments are not yet operating special environment based information system, but there is a new emerging network, that will shortly serve most of Hungary's municipalities

Agricultural water and soil pollutions are becoming a major concern not only in Central Europe such as Hungary but also in many European countries. The intensification of agricultural practices in particular, the growing use of fertilizers, pesticides, and concentration of crop and livestock production has had an increasing impact on water quality. Rising nitrate concentrations threaten the quality of drinking water, while high pesticide use contributes substantially to indirect emissions of toxic substances. Increasing levels of nitrates and phosphorus in surface waters reduce their ability to support plant and animal life and make them less attractive for recreation. Controlling water pollution from agriculture is made difficult by its particular nature. In most circumstances, agricultural pollution occurs over a wide area, and its sources are diffuse and difficult to identify. It also varies unpredictably over time and space, and depends not only rainfall patterns and the land slopes and soil characteristics but also on farmers' land use and crop choices, production techniques, and fertilizer and pesticide use. Farmers' decisions, in turn, are affected by market prices for inputs and outputs, as well as by governments' agricultural

support policies. In contrast to many industrial and municipal situations, few pollution treatment alternatives are readily available for installation on farms. Pollution control measures must rely heavily on approaches that affect farmers' land use and production decisions. Thus, agricultural policy, which directly influences these decisions, and environmental policy to control agricultural water pollution need to be coordinated and pursued with the same goals in mind.

## **Policy challenges**

A policy for controlling agricultural soil pollution needs to specify the level of water quality desired and what measures should be adopted to achieve the goal. Various problems, including incomplete information about the costs and benefits of pollution abatement, make it difficult to determine the optimal level of water quality in terms of economic efficiency. Therefore, the choice is often made based on other criteria, such as human health concerns or the protection of current uses of the water.

Policies that can affect farmers' land use and production decisions include voluntary measures such as education and training, moral suasion, and technical assistance, regulatory measures such as performance standards maximum discharge rates or maximum pollutant levels and direct controls on inputs or technology, and incentive – based measures such as taxes, subsidies, and transferable discharge permits. Agricultural emissions' sources are diffuse; they cannot be addressed directly with an emissions tax or subsidy.

## **Ecological Indicators-Case Study**

The main aim is to create a national programmed to integrate the monitoring and assessment of ecological and environmental indicators with management practices. The programmed provides the applied scientific development; review of traditional indicator approaches as well as theoretical, modeling and quantitative applications.

### **Chapters of programmed:**

1. All aspects of ecological and environmental indicators
2. New indicators, and new approaches and methods for indicator development, testing and use
3. Analysis and research of resource, system-and scale-specific indicators



4. Methods for integration of social and other valuation metrics for the production of
  - a. Scientifically rigorous and politically relevant assessments using indicator-based
  - b. Monitoring and assessment programs
5. How research indicators can be transformed into direct application for management
6. Broader assessment objectives and methods, e. g. biodiversity, biological integrity, and sustainability, through the use of indicators
7. Resource-specific indicators such as landscape, agroecosystems, forests, wetlands

Contaminated areas often support characteristic plants, fungi, bacterial species; some of them are able to accumulate high concentrations of toxic materials in their tissues (Baker and Brook, 1989).

Many recent studies have demonstrated the feasibility of using and indicating such plants fungi, bacteria in decontamination of xenobiotical components (Baker et al., 1996, Raskin et al. 1994). The toxical materials accumulating organisms remain to be discovered. In addition, since contaminative materials uptake and tolerance depend on plants, soils, water, microbes, environmental factors and their interactions.

The micro and macroflora are able to indicate the environmental pollutions.

#### **The objectives of this case study:**

Determine the microbial and fungal population of research site

Culturing the indicator fungi

Taxonoming the indicator soil-borne fungi

Knowing the life-cycles of indicator soil-borne fungi

Trapping the indicator soil-borne fungi

#### **Materials and Methods**

## **Location**

The study area characterized in this study was located in Tac- Gorsium, it lies about 80 km south of Budapest. The contaminated site consisted pesticides, nitrates, phosphorus. The uncontaminated reference site consisted of nearby open forest.

## **Sampling**

The soil samples were taken to a depth of 5-15 cm from contaminated soils. They were transported to the laboratory to study the microorganisms contained inside the samples.

Microbes were cultured on PDA artificial tests. The morphologies of fungi were studied with different types of microscope.

## **Microbial Population**

The microbial populations of contaminated and uncontaminated soil samples determined by serial dilution and plating of soil suspensions on differential culture media. For total bacterial count, plate count agar (PCA) plates were used. Sabouraud agar was used to isolate and enumerate total fungal population from soil samples (Harley and Perscott, 1993).

## **Results and Discussion**

The presence of bacterial species on the contaminated site is possibly helpful in indication in contaminated areas. Pseudomonas strains are capable of indicating a wide array of xenobiotical materials (Chatterjee et al., 1982, Kilbane et al., 1987, Pettigrew and Sayler, 1986, Jain et al., 1987, Blackburn et al., 1987, Barkay and Loson, 1986).

Alcaligenes and Bordetella are ecologically interesting very much; genera grow well at temperatures over 70 Celsius, and have been isolated hot springs and hot water tanks and laundromats (Brock, 1981).

Ecological indicators can be the Am (arbuscular mycorrhisal) fungi, Glomus, Gigaspora species; in contaminated soils they show some special morphological degenerations.

Human-induced land degradation as a central theme of desertification in the world refers to the decline or loss of biological and economic productivity caused by human activities. About 3,6 billion ha of land in over 100 countries have been affected by desertification or land degradation. The direct economic loss is equivalent to 42,3 billion U.S. dollar, and indirect loss is two to three times or even ten times higher. To measure the main losses in different soils can be by ecological indicators, indicators of soil-borne fungi.

Decomposing of different organic materials by microorganisms is very important processing in different soils. Rich diversities of populations of microorganisms and their composed interactions to each other and to environment can result the healthy decomposing phenomenons. In contaminated soils the disorganized processes are often inhibited due to lack of sustainable qualitative, quantitative microorganisms. To measure, in what respect may lack of microbes cause the deficient of decomposing processing is difficult, because the disorganization phenomenons are multicomponents and they have multi-outputs.

Communities of microbes involve obligate soil-borne fungi, taking their life cycles some years needed some special biotical and abiotical parameters in soil, which were developed during their evolutions. Obligate soil-borne fungi can be trapped with special methods in different soils. Methods and applications of trapping of soil-borne obligate fungi can be important parts of some pedobiological researches. Some soil-borne fungi indicate some special, healthy processes in soils.

The authors carried out investigations with some indicator soil-borne obligate fungi.

The most important results

1. *Sporidesmium sclerotivorum*
2. *Teratosperma oligocladum*- are special ecological indicators.

These soil-borne obligate fungi can exist and multiply in some special decomposing processes indicate long terms healthy microecological processes in soils. It is the first time to announce them as special ecological indicators. These two soil-borne fungi can be trapped by a special fungal structure so called „sclerotia”, and if the trapping isolation cannot be successful after a standard time period in that case some several important soil microbial populations are absents and it means that the soil microbiological system is not healthy.

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# THE PRECARIOUSNESS OF THE WORKERS IN THE PRODUCTIVE CHAINS OF THE STEEL INDUSTRY.

Maria Antonieta Martin Granados  
**Universidad Nacional Autonoma de Mexico**

This paper reports the results of a descriptive survey applied to a sample of companies located in Lázaro Cardenas, Michoacan, companies which participate in the productive chains of the steel industries located there. This paper is complemented with deep interviews to the owners, directors and/or administrators of these companies.

## **INTRODUCTION**

A current subject is the labor flexibility and the versatility of the workers, which have been implemented, in the Mexican companies –through work contracts or in a tacit way- despite of the fact that the Mexican labor legislation has not been modified. This relaxation and versatility have benefited the companies but, on the other hand, for most of the workers it has meant job instability, entailing a minimum participation of the labor unions in the decisions of production and modernization of the plants. Combined to the previous statement the precariousness of the wages subject to productivity bonds and the spreading of the sub hiring

of works –works that were made before by the own company personnel- have contributed in anything to the improvement of the workers´ standard of life.

The privatization of the steel industry, its modernization and the labor precariousness in the sub hiring (out sourcing)

Before the privatization of SICARTSA (1990), the government proceeded to the dismissal of workers, having new adjustments after the privatization. Although, the diminution of the labor staff is not exclusive of Lazaro Cardenas (as it might be seen in chart 1), after the privatization of the industry, the number of employed personnel has diminished mainly because of the incorporation of new equipment and technologies and the sub hiring of some processes or jobs.

Chart 1

Mexico: Total employed personnel in the steel industry.

Year	Total	Steel Industry		
		Total	Workers	Employees
1992	27 160 072	45 265	31 835	13 430
1991	27 467 478	35 921	25 803	10 118
1994	28 165 783	34 103	24 442	9 661
1995	27 347 482	32 799	23 434	9 365
1996	28 270 286	34 128	24 394	9 734
1997	29 342 386	35 528	25 406	10 122

From: INEGI, La industria siderúrgica en México, Edition 1998.

According to interviews made with staff members of SICARTSA<sup>134</sup>, from 8000 employees that they had in 1994, in 1998 there was another personnel adjustment when the oxycopula oven was settled and, at the current time they have 3700 employees, including those from the

<sup>134</sup> Interview to Juan Manuel Velasco, Communication’s director of SICARTSA

filial companies. Referring exclusively to SICARTSA, at the current time it has 2700 employees.

### **The competitiveness of the Mexican industry**

An important factor of the competitiveness on the Mexican manufacturing industry is that it counts with a cheap labor as it can be observed in chart 2, where it is stated that the cost per hour of the Mexican labor is cheaper than the one from Korea, Japan and Canada. The case of Canada is especially important because of the Free Trade Agreement signed by Mexico with this country and the United States of North America. In the mentioned chart it is also appraised the fall of the wages in 1995 due the financial crisis that the country underwent through, and despite of its slow recovery it has not reached the 1993 levels yet.

Chart 2  
Competitiveness ratings  
Remuneration in the manufacturing industry in different countries  
By year  
(Dollars per hour-man)

Year	México	Korea	Japan	Canada
1993	4.5	4.7	18.8	12.2
1994	4.7	5.5	20.9	11.6
1995	2.9	6.3	23.2	11.8
1996	3.0	6.7	20.5	12.2
1997	3.4	6.0	18.7	12.2
1998/p	3.5	3.9	17.2	11.6
1999	3.9	5.3	19.9	11.6

P/Preliminary figures from the indicated date

From: INEGI: Monthly industrial survey.

On the other hand, the productivity of the Mexican labor has been increasing from 1993 to 1999 in higher levels than the ones registered in the United States, Canada, Japan and the United Kingdom (see chart 3) although that the steel industry in these countries is more developed in technology and automatization of its plants.

Chart 3  
Competitiveness ratings  
Productivity of labor in the manufacturing industry



Year	By year (Base 1993=100)							
	Mexico a/	United States	Canada a/	Japan a/	Germany a/	Korea b/	United Kingdom b/	Colombia a/
1993	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1994	109.9	103.2	104.5	103.3	117.4	110.1	104.1	106.1
1995	115.3	108.5	107.9	108.0	123.3	121.2	103.2	113.9
1996	125.7	114.0	107.6	112.2	136.5	134.3	102.1	113.9
1997	130.9	120.3	108.3	117.5	151.4	146.9	102.6	124.5
1998	136.4	125.4	110.0	112.6	152.2	157.7	102.4	127.0
1999	138.9	133.2	113.9	116.3	158.2	191.6	105.7	

a/ Worked hours-man index

b/ Mobil average of six months

P/Preliminary figures from the indicated date

From: INEGI: Monthly industrial survey.

#### The sub hiring (out sourcing)

It is argued that the sub hiring allows the reduction of costs to the contractor and, for the sub contractor it means a raise of his sales, a plenty use of his installed production capacity and, to receive technological consultancy. But it does not happen in the steel industry located in Lazaro Cardenas. Certainly, SICARTSA and IMEXA do not subcontract manufacturing processes; the only thing that they subcontract is labor for cleaning, maintenance and construction work.

SICARTSA makes this sub hiring through filial companies –which are the ones who make the sub hiring-, one of these filial companies is GAMA. With this sub hiring the labor contingences are avoided because the workers hired in this way are not part of SICARTSA's or its filial companies' staff but their subcontractors' staff, perceiving, these subcontracted workers, lower wages and benefits than the ones perceived by the workers of SICARTSA and IMEXA.

Except from the iron mineral, the electricity, the gas and the water, the other consumables that the plant requires are not acquired in Lazaro Cardenas, they are brought from Monterrey or

other places, which has meant that the local companies –as well as the dismissed workers- have no opportunity to make business with the steel industries This brought as a consequence the disappearance of many local companies, with the consequent unemployment and insecurity, due to the increase of the criminality.

### Training and labor conditions

One of the interviewed subcontractors that provides SICARTSA and IMEXA with personnel with tools and security equipment for the works in the wharf and cranes, floor mechanics, electricians and engineers, hiring workers in a temporary way. This industrialist informed that he does not give training to the workers, using people who already have experience, hiring his workers temporary even though they work constantly. He also said that this is made in order to avoid labor contingencies and to stop paying the Mexican Social Security Institute (IMSS) employer's contribution.

The same industrialist also pointed out that the union dues are directly paid by his company to the union without discounting it to the workers, this has the only purpose of avoiding future labor lawsuits in which the union might enter to defend the worker's interests. The only employees that he has enrolled in the IMSS are 8 administrative ones, and these are the only ones hired for an indefinite time.

Another interviewed industrialist that buys rods mentioned that all his workers were temporary, they do not have a special training and their academic level is very poor, reason why the minimum wage is paid to them and, he only has one employee registered in the IMSS.

The representative of a huge construction company that remains in Lazaro Cardenas and which participated in the construction of SICARTSA pointed out that he pays the same salaries to his workers than the ones paid by SICARTSA, but, talking about the fringe benefits, these are lower than the ones given by the steel companies. He gives training to the workers he hires so he can be able to have specialized labor. He also said that one of the problems to give training is that in Lazaro Cardenas there are no institutions giving training. He also pointed out that the main problem faced by the industrialists is the unions, which are very corrupt.

Another company, that was SICARTSA's supplier and now it supplies IMEXA, dedicated to the assembly of plants, informed to us that it has the same tabulator than the steel companies but, the fringe benefits are lower, since the productive bonds paid by SICARTSA and IMEXA are quite high.

From the interviews made to the industrialists in Lazaro Cardenas, as well as the visit made to that place, we can point out that among the methods used by the companies –those working for both steel companies- for being competitive we can find the payment of low salaries, the cut of personnel, the implementation of the versatility of the workers, the beating against the unions, the equipment renovation, the sub hiring of workers and the relaxation of the labor relations through the negotiation of the collective contracts.

On the other hand, due to the union abuses and to the high cost of the welfare system (IMSS, Retirement Saving System “SAR” and INFONAVIT), the simulation in labor matter has increased, mainly among the small industrialists since some of them have their personnel hired on a temporary basis and, some others have them hired under a fee system in order to avoid the employer’s contributions to the welfare institutions; besides that, the wages paid by this industrialists are lower than the ones of the steel industry and, referring to the social benefits, those who give them do it in smaller amounts than the steel companies.

#### **FINAL REFLECTIONS**

Due to the economic crisis given at the eighties and the unemployment that was originated at a world wide level as a consequence of the technological innovations, the competence and the commerce globalization, the labor relaxation began to be implemented, using as a reason the labor rigidities like the wage fixation, the promotion ladder, the work stability, the cost of the welfare and other benefits that increased the production costs. In order to reduce the costs, the companies –even when the government made it first in the steel companies- reduced their staff and, because of the market requirements and the new technologies, specialized workers were hired but these workers at the same time could make different functions in the plants, which is called labor versatility.

The transformation of the relations between the companies and the labor unions begin in the eighties, starting with the rationalization and reorganization of the labor policies through the relaxation, eliminating the limits of the work categories, the raising of the mobility barriers and the suppression of the seniority principle, all that without the need of changing the labor law.

The Mexican labor unions, that during years defended the work stability, the category system through the description of places for each function and the minimum participation of temporary workers, have done little in defending these rights of the workers. But the unions have not only allowed this labor changes, they also have allowed the labor sub hiring, which what has allowed to the employers to avoid the labor contingencies, with the consequent reduction of the permanent staff of workers. Besides that, the figure of multipurpose workers has been included in the contracts, eliminating in

this way the trades, categories and tasks established by the positions, and allowing the mobility of the workers within the company according to its needs.

With the labor relaxation neither the workers nor the unions have influence in the production process, there are no restrictions in the number of temporary workers and there is no promotion of temporary worker to permanent worker, the extra time is unlimited and there is a wide power of the management of the company to manage the production, with an almost unrestricted control by the management of the hiring and the ascents, the use of temporary workers, the determination of working rhythms, the rates of production and the movement of the employees within the different departments. In this way, the collective contract is highly favorable to the company's interests.

In reference to the steel companies located in Lazaro Cardenas, the negotiation of the collective labor contract for the 1989-1991 biennium is the one that prepares the way for the privatization of those companies, making them more profitable with the reduction of the staff and the labor meekness. In this period, 1 599 workers are fired and here in after the labor relaxation and the labor sub hiring is implemented.

It is also established the possibility of the company to manage freely its resources and to acquire equipment, machinery and technologies or modernizing the existing ones; it is agreed that the permanent and temporary vacancies can be covered when the company considers it necessary and the participation of the labor union in the production decisions is limited. From this moment the union only keeps the title of the collective job contract, becoming a simple collector of union dues. On the other hand, in the contractual revision for the 1991-1993 biennium, another 1 775 posts were eliminated and the labor mobility is agreed.

Due to the labor flexibility and the companies' policies, the employment in Lazaro Cardenas has diminished, at least the one directly hired by the steel companies, the sub hiring has increased, originating an inequality on the incomes and the benefits among the workers of the industry, it is said, among the ones directly hired by the steel companies and those who make works through the sub hiring to make labors of maintenance, cleaning and construction.

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## **AUDIT FIRM ROTATION IN MALAYSIA: PROSPECTS AND PROBLEMS**

J. Nahariah

Multimedia University

A. Norazlan

Universiti Kebangsaan Malaysia

## **ABSTRACT**

The study aims to identify some benefits and problems perceived by partners of audit firms and CFOs of listed companies of KLSE on the issue of audit firm rotation within the Malaysian context. The Likert Scale was used on various statements of benefits and problems mentioned in the mailed questionnaires. The independent t-test was carried out on problems perceived by partners and companies. Linear regression is used to see the relationship between companies' decision to agree with audit firm rotation with company's size, profitability and company's auditor.

## **Introduction**

In Malaysia, Section 169(4) Companies Act 1965 requires every company incorporated under the Act to have its financial statements audited annually. The Securities Commission (SC) of Malaysia also imposes condition that all public companies listed on the Kuala Lumpur Stock Exchange (KLSE) should audit their annual reports. However, neither the Act nor the SC and the approved auditing standards mention about rotation of auditors, in particular audit firm rotation. This means that the company can engage with the same audit firm as long as they wish. The issue arises from the fact that having a long relationship with the same audit firm may affect the auditor independence, objectivity and quality of audit. Even though the Malaysian Approved Standards on Auditing (AI 220), Quality Control for Audit Work, requires an audit firm to establish quality control policies and procedures but the existence of bias in the engagement is still arguable. One may suggest to rotate the auditor within the same audit firm but an independence issue is still of concern. This paper focuses on the rotation of the audit firm not the rotation of the audit firm's personnel.

## **Literature Review**

Some studies concentrated on the issue of rotating the partner in accounting firm (John, Wendell P. et.al (1998)) while others discussed on rotating the auditing firm itself. A few studies refer to "rotation of auditor", in which it is unclear whether it focused on rotating the audit firm or the audit firm personnel (Winter, Allan J. 1976; Anonymous, 1998). Some of the researchers for example Mautz, Robert K. 1974; Winter, Allan J. 1976; Hoyle, J. 1978; Bates, Homer L. et.al 1982; Kunitake, W. 1983; Brody, Richard G. & Moscovice, Stephen A., 1998 agree that these issues as viewed by the proponents lies in the concept of auditor independence.

Mautz, Robert K. (1974), Hoyle, J. (1978) and Brody, Richard G. & Moscovice, Stephen A. (1998) suggested that the proponents believe that rotation of audit firm would: assure bringing a fresh point of view to the audit every few years; make auditors more alert to any possible improprieties, propensity to investigate thoroughly and obligation to be skeptical; increase auditors' ability to inform and protect the public; increase the quality of service (i.e. would enable CPA firms to check each other's work) and; avoid auditors' objectivity from being threatened by close relationship with client.

Meanwhile, they suggested that the disadvantages of audit firm rotation are said to be: new auditors will face difficulties to follow up on the recommendation made by the previous auditor (for example on the client's internal control system); new auditors lack the intimate knowledge of client operations; lack of familiarity with client financial statements and company; costs are increased because each new auditor needs to develop background audit data; first audit will consume more auditors time; interference to the client's staffs' work in the first engagement and; reduce the quality of audits.

This paper attempts to extend the literature by examining the perceptions of Malaysian companies and the partners of audit firms towards audit firm rotation, particularly from the scope of its benefits and problems.

## **Research Methodology**

Two different sets of questionnaire were sent to two different categories of respondents i.e. KLSE public listed companies' financial controllers and partners of audit firms. Each set contains four sections and with the exception of Section A and B, the other sections request the respondents to indicate their opinion based on Likert Scale of 1 to 5. Some of the attributes used in the Section C and Section D of both sets of questionnaire are replicated from the attributes of proponent and opposition discussed by Mautz, Robert K. (1974), Hoyle, J. (1978) and Brody, Richard G. & Moscovice, Stephen A. (1998). In addition, some audit quality attributes discussed by Craswell et. al (1995) and Behn, Bruce K. et al, (Mar 1997) are also used and amended to suit the purpose of this study.

A response rate of 34% is received from the partners while from the chief financial officer is 34.5%. Sekaran (2000) indicated that a 30 percent response rate is considered acceptable. An analysis of reliability of measurement scale using the Cronbach Alpha Model was carried out to Section C and Section D of the questionnaires and the results greater than 0.6 indicating acceptable internal consistency of measure of scale reliability used in this study. (Sekaran 2000)

## Data Analysis for Partners

### Demographic background

Due to the random selection of sample, all respondents are from the non-big 5 audit firms. The study found that the longest period of engagement ranges from 5 years to 25 years and in fact some of the audit firms are still continue to engage with the same clients. The analysis indicated that only 35 % of the partners agreed on audit firm rotation with the majority (54.17 %) of them suggested 3 years engagement periods.

### Benefits in audit firm rotation

Table 1 reveals that most partners who agree with audit firm rotation were either strongly agree or agree that statements number 5 and 8 are the greatest benefits from rotating the audit firm. Whereas, they were less agree that the rotation can force the auditor from becoming stale.

**Table 1: Benefits in audit firm rotation (As perceived by partners who agreed over audit firm rotation); (n=24)**

	Mean	Range
<b>Benefits in audit firm rotation</b>		
1. It can improve the audit quality	4.0417	1-5
2. It can force the auditor to follow the professional standard	4.0833	2-1
3. It can avoid auditor from becoming stale	3.8333	1-5
4. It can reduce dependence on one / few client / s only	3.9167	1-5
5. It can maintain independence and objectivity	4.2500	2-5
6. The audit firm may gather a reputable image since the investors' confidence towards the objectivity of financial information have increase	3.9167	2-5
7. The audit firm may obtain fresh evaluation of the company's internal control system	4.0000	2-5
8. It may provide an opportunity for small sized audit firm to grow	4.2500	2-5

### Problems in audit firm rotation



All partners were requested to give their opinion about the potential problems they perceived from audit firm rotation. Table 2 reveals that most of them at least agreed that statement number 6 as the main problem to practice audit firm rotation whereas statement number 5 as the least problem.

**Table 2: Problems in audit firm rotation (As perceived by partners); (n=69)**

	<b>Mean</b>	<b>Range</b>
<b>Problems in audit firm rotation:</b>		
1. Time constraints – more time is needed in order to study the clients company's history and business	3.9130	1 – 5
2. It will create greater competition	3.4493	1 – 5
3. The audit firm does not have branches in some areas	3.7101	1 – 5
4. The new client may be uncertain about the quality of services provided by the new audit firm	3.5797	1 – 5
5. The new clients may ask for a discounted fees since they are uncertain with the new audit firm service quality	3.1014	1 – 5
6. It is not required by the law	4.0000	1 – 5
7. It may create conflict between the audit firm and the new client because new client may predict to get special attention in the initial years of services	3.1449	1 – 5
8. It may cause problem when there is accrued amount from previous auditor	3.5797	1 - 5

An independent sample *t*-test was performed to determine whether the agreed partners and disagreed partners opinions on the problems of audit firm rotation are significantly different or otherwise. The means different for statement number 1, 4, 5, 7 and 8 are found to be significant with *t*: -4.3470, -3.9040, -2.455, -3.5510 and -2.2780 respectively (i.e. at 5 % confidence level)

### **Data Analysis for CFOs**

## Demographic background

The study aims to look into the different in opinion between companies audited by the Big-5 and non Big-5 audit firm. The participation of company are: those audited by Big 5 firm (n = 43, % = 63.2 %) and by non-Big 5 firm (n = 25, % = 36.8 %). Chi-square tests were made to analyze any significant relationship between companies audited by different type of auditor and the demographic background. The result shows that there is no significant relationship exists between the two variables.

The study found that majority of the respondents (46 or 67.6 %) disagrees with audit firm rotation. 30 or 69.8 % are from companies audited by the Big-5 firms while 16 or 64 % from companies audited by the non Big-5 firms. This result is likely to agree with Mautz (1974) who stated that both CPAs and most members of management generally opposing any regular rotation of CPAs firm. Since there is only a slight difference, 5.8 %, this may indicate that companies are satisfied with the services provided by their auditor no matter it is a Big-5 or non Big-5 firm. Further, an independent sample *t*-test was made and the result shows that there is no significant difference in opinion between the two types of company on the agreement over audit firm rotation.

## Benefits in audit firm rotation

Table 3 reports that CFOs who agree with audit firm rotation either strongly agree or agree that statements number 2 and 6 are the greatest benefits from rotation of audit firm. For statement number 2, the CFOs' responses support Craswell et al. (1995) who suggested that on new audit engagements "there is a strong incentive for the audit firm to emphasize superior client service in the initial years after acquiring a new client. New clients may receive special attention, and they may enjoy the different perspective and insights provided by the new audit firm." Meanwhile for statement number 6, the CFOs response seems to agree with Brody & Moscové, (1998) who stated that "If auditor rotation were required for public accounting firms, more assurance would exist of fresh evaluations of companies' general and application control." Whereas, they were less agree on that as a

**Table 3: Benefits in audit firm rotation (As perceived by CFOs who agreed over audit firm rotation); (n = 22)**

	Mean	Range
<b>Benefits in audit firm rotation:</b>		
1. It can improve the audit quality	3.9091	3 – 5
2. The company can gather different perspective and insights provided by the new audit firm	4.2727	4 – 5
3. It can reduce dependence on one / few audit firm / s	4.0000	2 – 5
4. It can provide reliable financial information since independency of auditor may avoid bias	4.1818	3 – 5
5. It can increase the confidence of the investor in audit objectivity	3.8636	2 – 5

6. The new audit firm may conduct fresh evaluation of the company's internal control system	4.2727	3 – 5
7. As a new client may receive special attention since the audit firm might emphasize superior client service in the initial years after acquiring a new client	4.0455	3 – 5
8. As a new client may receive discounted audit fees in the initial years	3.0455	1 – 5

new client they may receive discounted audit fees in the initial years.

Result of the independent sample *t*-test shows that the overall opinions of the CFOs, whose companies were audited by the Big-5 firm and those audited by non Big-5 firm, are not significantly different about the benefits of audit firm rotation.

#### **Problems in audit firm rotation**

All CFOs were also requested to indicate their opinion regarding the problems with regards to audit firm rotation. From Table 4, it is apparent that majority of them either agree or strongly agree that time constraint is the greatest problem in audit firm rotation whereas, they were less agree that not many audit firms available in the company business operation area as a problem in audit firm rotation.

An independent sample *t*-test was performed to determine whether the agreed CFOs and disagreed CFOs opinions on problems of audit firm rotation are significantly different or otherwise. It is suggested that the means difference for statement problems number 1, 3, 4, 5 and 6 are found to be significant with *t*: -5.3170, -1.9010, -4.1240, -4.6640 and -2.2620 respectively.

Another independent sample *t*-test was made to assess whether the opinion of the CFOs whose companies were audited by the Big-5 firm and those audited by non Big-5 firm are significantly different or not. The result shows that their overall opinions are not significantly different about the problems of audit firm rotation except for problem number 5 with *t* = -0.928.

**Table 4: Problems in Audit Firm Rotation (As perceived by CFOs); (n = 68)**

<b>Mean</b>	<b>Range</b>
<b>Problems in audit firm rotation:</b>	
1. The new audit firm may not familiar with the company's industry, background and system	3.8529 1 – 5
2. The company may not get attractive discounted	

fees as compared to the previous auditor with whom the company have a good rapport with	3.2500	1 – 5
3. Not many audit firms available in the company business operation area	2.6029	1 – 5
4. The company is uncertain about the quality of services to be provided by the new audit firm	3.7353	2 – 5
5. Time constraint – company having to train new audit team for each engagement	3.8676	2 – 5
6. Investors may view company having problems from the action of changing to new auditor	3.4412	1 – 5
7. It is not required by the law	3.6471	2 – 5
8. It may increase paper works since appointment and termination of company's auditor should pass through the annual general meeting	3.3971	1 – 5

### **The relationship between audit firm rotation and firm's size, profitability and company's auditor**

Using the linear regression test the study further suggested that there exist no linear relationship between companies' decision whether to agree with audit firm rotation with the companies' size, profitability of the companies and whether they are audited by Big 5 firm or non Big 5 firm.

### **Conclusion**

This study aims to identify some important benefits and problems perceived by partners of audit firms and KLSE listed companies in the issue of audit firm rotation within Malaysia's context. The limitations of the study are due to the fact that it was based on samples, therefore the results may not represent the opinion of the populations as a whole. Furthermore the opinion of the Big-5 firms had also not been solicited. Future areas of research may be conducted to view the opinion of other parties; i.e. bankers, concerning the issue of audit firm rotation, which particularly affect the auditor independence.

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## ENTREPRENEURIAL APPROACH TO ENTERPRISE DEVELOPMENT IN MEXICO

Gary Noreiko

University of Southern Colorado

### INTRODUCTION

Entrepreneurship of adversity develops with focus on Mexico as the economy demonstrates ambivalence between crisis and growth. For instance, consider the change from credit crisis due to bad bank loans of the 1990s to the current increase in the price of oil with the potential to inject liquidity into Mexico's banking system. The extremes that challenge this environment confront both enterprise development and the reforms advocated by Vicente Fox, President of Mexico, that focus on entrepreneurial incentives with support of the United States and World Bank.

The contemporary focus on the entrepreneurial approach is the impetus for this research along with the continued difficulty to establish viable entrepreneurial enterprises in Mexico as reflected by the substantial number of problem loans. This reflects an immature credit culture where two elements have potential to resolve this situation. First, an evaluation of Mexico's credit culture (current business practices and challenges) and second, the application of entrepreneurship (contemporary and innovative approaches) as reflected in the literature of small business development are essential elements to generate synergy for enhancing the frail credit system to promote enterprise development.

### APPRAISAL OF THE CREDIT SITUATION

The immature credit culture is adroitly reviewed in the literature by both authors from and beyond Mexico. For example, consider the credit culture spectrum illustrated by the Cabal corruption through the difficulty of charging interest as presented by authors that follow: Commercial loan problems for the failed conglomerate of Carlos Cabal Peniche by Kandell (1995), collection difficulties by Rial (1995), challenges of credit

card processing by Kotnik (1995), treasury management intricacies of the presentation day, payment day system by Fernandez (1998), real estate loan problems by Fernandez and Anderson (1996), and the legal controversy over charging compound interest under review by the Supreme Court of Mexico by Goveia (1998). These perspectives indicate the complexity and challenges of the credit situation in Mexico that confronts the entrepreneur.

For the development of entrepreneurship in Mexico, an investigation into the details of the credit culture shows the unique complexity and need for future change. Corruption exemplifies the dazzling career of Carlos Cabal Peniche based on a grupo (a conglomerate focused on banking, real estate, along with real and shell corporations) that was broken (after losses of several hundred million) during the beginning of the Zedillo administration, 1994 to 2000. To resolve collection problems creditors have invested in new debt collection technology at the expense of relationship banking with debtors. Resources have been invested into credit card processing, but more resources need to be focused on improving the credit information reporting system. Due to poor mail service, treasury management based on the lockbox system is impractical and larger organizations are moving toward electronic funds transfer. Recovery from real estate problems in Mexico is more challenging than the Resolution Trust Corporation solution for problem real estate loans in the United States. The question over the legality of charging compound interest is due to a contradiction between the Commercial Code and Civil Code. The previously described business situations imply a need for improved evaluation of information on the development of new enterprises, proper application of technology, complexity of real estate finance, and intricacies of the legal system.

#### ENTERPRISE DEVELOPMENT

The previous discussion of business practices and problems in Mexico illustrates the challenge to viable enterprise development in Mexico. In addition, the unique elements of Mexico's small business institutional structure needs investigation with the advent of trade liberalization (reduction of import restrictions and NAFTA), privatization, and deregulated foreign investment. A 1941 law established Camara Nacional de la Industria de Transformacion (CANACINTRA) representing the foundation for corporatism in Mexico where collaboration between business and government places constraints on small business relative to economic policy. In essence, the

accommodation policy of small business to the state is succinctly described by the following:

In the 1980s and 1990s, the organization most clearly identified with accommodation has been the Camara Nacional de la Industria de Transformacion (CANACINTRA), which has monopolized official representation of small industry to the state. CANACINTRA'S accommodationist response allowed the Mexican government to implement extensive economic reforms with only tepid opposition from small businesses (Shadlen, 2000, page 73).

In contrast, large enterprise organizations have been able to maintain autonomy from the state. Dissidents, however, have rejected neoliberalism, corporatism, the economic challenges of the 1980s and 1990s, and the requirement that small business join official chambers due to the 1941 law. Moreover, opposition developed to reform and repeal the chambers law so that the 1941 law "was replaced in January 1997 by the new Ley de Camaras Empresariales y Sus Confederaciones" (Shadlen, 2000, page 85). While abolishing compulsory membership in the chambers, complying with Mexico's Supreme Court, the chambers have control over the funds generated by required business participation in a national registry maintaining state influence on small business. Thus, the dissident's explicit success to abolish forced chamber membership has been implicitly countered so corporatism remains a prominent force confronting small business.

The special arrangements for small business in Mexico related to the chambers and national registry as well as business practices along with opening of the economy (both trade and foreign investment) represents a unique environment with complex contrasting dimensions where the historical perspective for enterprise development assists the investigation. Basically, this historical approach evaluates the small enterprise growth and decline cycle with plateaus of stability and instability as a series of stages where shocks like foreign competition (increasing imports through elimination of the policy of import substitution) have a critical impact on the small enterprise. For the small enterprise, the stages of growth are characterized by chaotic shocks. This type of growth scenario is similar to the situation confronting Mexico. Insightful complications on the development of small firms, with application to Mexico, from Vinnell and Hamilton (1999, page 15) follows:



The idiosyncrasy of the process means that we should not expect to find the same universal stages of growth in all trajectories, and yet the conceptualization of such stages has been the main objective of much of the small business development literature.

In contrast to the small business development literature the interpretation of a mixing of distinct unstable forces has greater application to Mexico where growth characteristics are unstable. In this context, instability reflects small enterprise progress from growth, plateau, and decline in a very short time span. This result is consistent with the shifts between crisis and growth characteristic of Mexico's economy.

For an economy reflecting growth instability with specialized forms of business organizations (i.e., national registry and chambers) entrepreneurs need to be generated to promote enterprise development. A useful approach to increase the supply of entrepreneurs to enhance economic growth and development is the entrepreneurial development system (EDS) proposed by Lichtenstein and Lyons (2001). Rather than supplying support services to entrepreneurs (focus of previous systems) this system builds skills that transforms quality entrepreneurs to a higher functioning level. To guide this transformation skills are related to levels through the specialized functions of the EDS. As the entrepreneur progresses through the system to higher levels of enterprise development, skills are synergized. The enhancement of skills allows the proper application of technology and the development of a viable business plan. Monitoring of progress gives information on the entrepreneur's background and qualifications essential to access integrity, important to lenders providing financing to avoid corruption. This type of system needs to generate valid financial information on the entrepreneur's career, to develop different enterprises, that assists in an evaluation of entrepreneurial skills, decision-making, and integrity.

#### A NEW PARADIGM FOR ENTERPRISE DEVELOPMENT

Once new enterprises have been established they need to give benefits to the economy as well as the entrepreneur. The EDS discussed in the previous section through the generation of entrepreneurs implicitly creates wealth for entrepreneurs and the community to advance economic growth and development. A more explicit approach discussed by Adeoti (2000) based on environmental sustainability indicates the direction of innovations (new ideas) for enterprise development with application to

Mexico. For instance, strategies are formulated for economic agents (entrepreneurs) to promote the development of entrepreneurship, generation of employment, as well as practical vocational training and skills acquisition. Moreover, focus is placed on the proper use of technology to benefit sustainable development. In essence the ideal emphasis of this strategy is to “change the growth trajectory of the existing unsustainable economic behaviors of economic agents to a new paradigm of growth that is environmentally sustainable” (Adeoti, 2000, page 61). This formulation represents the direction for a formulation of a new paradigm with environmentally sustainable benefits for the community and economy through enterprise development as well as wealth for the entrepreneur. This perspective is consistent with the position of the World Bank (1992), which considers economic development and environment sustainability elements of the same agenda.

Following from the previous discussion the analysis requires focus on Mexico. Relative to the textile industry for Mexico Guilford (2000) discusses the current and future situation. Currently, there is competition between Mexico (benefiting from NAFTA and proximity to the United States) and the Caribbean (advantage of lower labor costs). Raul Garcia, representing the Camara Nacional de la Industria del Vestido de Mexico (Apparel Industry National Chamber) is confident in Mexico due to proximity (reduced response time) and raw material flexibility (production materials both from the United States and Mexico). The competitive advantage remains with Mexico as Raul Garcia states, “Mexico offers a more engaging option for Manufacturers looking for full-package services” (Guilford, 2000, page 36). This engaging option with full-package services needs to incorporate the EDS (discussed in the previous section) and environmental sustainability. An illustration of this type of development is the apparel production park by NuStart emphasizing full services for smaller apparel enterprises (especially from the United States and Canada, due to NAFTA) by providing production infrastructure, worker training, expedited customs clearance, and assistance with government regulations as well as licenses. Indicating the growth potential (especially to recapture textile production previously lost to Asia) Grupo Alfa is considering starting several apparel parks. This is consistent with industry expectations due to policies of Vicente Fox, president of Mexico, “proven track record in trade” and his being elected as “governor of the entrepreneurial state or Guanajuato in 1991 and re-elected in 1994” (Guilford, 2000, page 37). From this illustration the foundation for entrepreneurship and enterprise

development is clearly apparent in Mexico, however, this new thrust requires integration of environmental sustainability to formulate a new paradigm that benefits the community and economy.

Environmental sustainability as well as the EDS, which increase the supply of quality entrepreneurs, are readily apparent upon further investigation into the policies of Vicente Fox. For instance, the coordinator for foreign investment in the state of Guanajuato, Hidalgo Anaya, illustrates the progress as prior to Vicente Fox agriculture accounted for about 80% of Guanajuato's economy, and with the policies of Vicente Fox agriculture has declined to 34% with manufacturing increasing to 31% of Guanajuato's gross domestic product, (Peters, 2001, page 50). Furthermore, according to Hidalgo Anaya, the enhancement for the state's economy, benefiting the community, resulted from a program based on an investment promotion network of educators, accountants, lawyers, and government officials focusing on the outcome objectives to modernize the labor force and give assistance to foreign investors. The former element, investment promotion network, represents the EDS and the latter elements, outcome objectives, reflects aspects of environmental sustainability. Therefore, the evolving program for Mexico of Vicente Fox has induced change to meet the challenge of Mexico's ambivalent economy.

## CONCLUSION

To improve the benefits derived from Mexico's economy, the review of change and complexity in the credit culture of Mexico shows the challenge for the generation of quality entrepreneurs to increase enterprise development in Mexico as well as the significance of the chambers for industry. In addition, financing is essential for enterprise development in Mexico. A subtle dimension to enhance financing for enterprise development is the price of oil. Pemex, a state enterprise, controls the petroleum industry in Mexico, increasing oil prices, increase Pemex revenues, to strengthen the government budget, providing government guarantees for bank liquidity, to make the loans for entrepreneurial development.

The potential benefits of increased oil prices to enhance financing for enterprise development in Mexico is presented from information provided by Secretaria de Hacienda y Credito Publico for the first nine months of 2000 with oil revenue increasing 40% showing the increasing significance of oil revenue for consolidated public finances (Pearl, 2001, page 18). Thus, an increase in the price of oil has potential to indirectly enhance the financing necessary for enterprise development. To

benefit the community and economy enterprise development needs to follow the guidelines discussed in this research.

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**A COMPARATIVE STUDY OF COPYRIGHTS PROTECTION IN UNITED STATES, THE UNITED KINGDOM AND MALAYSIA**

I. Nurhayati

Multimedia University, Malaka, Malaysia

J. Nahariah

Multimedia University, Cyberjaya, Malaysia.

**ABSTRACT**

The government has enacted the copyright law to protect the physical expression of ideas such as broadcasts, music, films etc. Once copyright rights have been established, the law prohibits unauthorized copying of the protected materials. In the era of information technology, the various kinds of software available are also exposed to risk of being copied. The main concern here is whether the creators received adequate protection for their copyrights, especially in Malaysia as compare to other nations, particularly the United States and the United Kingdom. Therefore this study is being conducted to: (1) examine the adequacy of the legal protection on copyrights in Malaysia as compared to the United States and the United Kingdom; (2) investigate whether the present copyright protection curb the emerging of high technologies issues on software programs. This study is also considered as significant because the findings

of the study are expected to highlight to the regulators concerning the need to develop regulations that is broad and depth in nature on the issue of copyright protection for software programs.

### **Introduction**

This study highlights issues concerning copyright protection of computer software. Computer software is very easy to be copied and the universal terminology used to refer copying of this type of literary work is software piracy. Software developers view piracy of computer software as threat to their businesses. As reported by the International Planning Research Corporation (IPR) for the Business Software Alliance (BSA), "software is the main obstacle to the growth of the software industry, which is reflected in revenue losses, estimated at \$ 12 billion to the worldwide industry due to piracy last year." (Anonymous, 2000)

### **Copyright protection**

The principle of copyright can be seen in twofold. The first, exclusive rights given to author for creative work. Second, the enhancement of intellectual creation which is maintained by limiting copyright duration for a fixed period and the justification of defenses such as fair use which allow the work to be used without the permission of authors in certain situations.

Section 106 Copyright Act 1976 of United States vests a bundle of "exclusive rights" on authors of work. This Act was recently amended by the Digital Millennium Copyright Act 1998 (DMCA) that came into effect in October 1998. It has implemented two 1996 World Intellectual Property Organization treaties so as to harmonize the local laws with those in Europe and has included a number of provisions that affect "service providers. These "exclusive rights" are embodied in Malaysia under s.13 Copyright (Amended) Act 1997.

Pratik A. Shah (2000) states, "Since the U.S. Uniform Commercial Code ("UCC") was not designed to address licensing of such intangible goods or service contracts, the most significant transactions in the information age are currently subject to a "complex, conflicting and uncertain body of case and statutory law". To clarify this murky area of law and provide a standard set of rules to efficiently regulate transactions in the new information industry, the National Conference of Commissioners on Uniform State Laws ("NCCUSL") promulgated the Uniform Computer Information Transaction Act ("UCITA").

Hogan (1989) reported that "Since 1983, the US Congress has passed many laws to strengthen intellectual property rights, but small business usually cannot afford to take legal

action on trade disputes because legal costs in trade cases can range from \$ 54,700 to \$ 715,000. The General Accounting Office has recommended that the federal government reimburse small companies on a sliding scale for any expenses they incur in successful trade litigation.” Russel (1982) exerts that new and more ingenious forms of piracy are developing and this makes copyright no more useful and inappropriate in an information economy. He further stated “What is needed is a reform of the distribution system, so a larger portion goes to the creator, less is wasted, the manufacturing process is simplified, accounting is more honest and the cost to the consumer is lowered to make piracy unprofitable.”

Prior to the United States Supreme Court's 1991 decision in *Feist Publications, Inc. v. Rural Telephone Service Co., Inc* American courts occasionally granted copyright protection for the effort involved in finding and assembling a body of collected data. Under what came to be called the 'sweat of the brow' doctrine a long line of cases protected the industrious collection' of a compiler, regardless of whether the materials he has collected consists or not matters which are of public juries, or whether such materials show literary skill or originality, either in thought or in language.

Feist explicitly repudiated the sweat of brow doctrine. In rejecting copyright protection for a white pages telephone directory, the Court held that requiring subsequent users to duplicate the original compiler's effort, copyright law- by denying protection to isolated facts and ideas- sought to discourage it. Henceforth, copyright protection would depend upon the quality of the compiler's work: originality, not sweat of brow', is the touchstone of copyright protection in directories and other fact-based works.<sup>135</sup>

Feist has raised the originality bar. The standard may be minimal, but it is a standard nonetheless. Courts are no longer free to ignore the originality requirement, or to substitute 'sweat of the brow.' Although the Feist standard is low, it is working to eliminate or at least vitiate protection for many databases that are the product of substantial 'sweat' (and investment), but little creativity. Moreover, even when copyright protection does exist in theory, it is often nominal in application.

In the Malaysian context the justification of fair use can be seen in operation under s13 (2) Copyright (Amended) Act 1997. Countries such as Malaysia and Canada use the term “fair dealing” instead of “fair use”. In essence they mean the same thing. It is still very early to infer the ambit of its application in Malaysia, as the country is still very young in deciding online

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<sup>135</sup> Conley; Brown; Robert. Mar 2000. *Data base protection in a digital world: Why the United State should decline to follow the European model.* Information & Telecommunications Technology Law. Abingdon.

infringements. The application of this doctrine will incur difficulties in situations where the line between legal and illegal private use is becoming almost invisible. Only time will tell how far the Malaysian courts will depart from their counterpart, the United States.

In a Malaysian case, *Creative purpose Sdn Bhd & Anor v. Integrated Trans Corporation Sdn Bhd & ors.* [1997] 2CLJ Supp 107, it has been decided in this case that from numerous judicial observation, copyright protection for software programs is strongly entrenched and that the courts have shown a willingness to extend the protection to both the object as well as the source codes.

In the case of *Microsoft Corporation v. PC House (Imbi) Sdn Bhd* [1998] 5 CLJ 474, the plaintiff claims in the statement of claims that the defendant has infringed its copyright in the computer programs by:

- (a) Reproducing or causing others to reproduce copies of the said computer programs without any lawful authority; and
- (b) Distributing or causing others to distribute copies of the same without lawful authority. These reproduction rights and distribution rights fall within the ambit of s 13(1)(a)&(c) read with s. 36(1) of the copyright Act 1987.

It is alleged that the defendant had in fact and in law breached s. 36(1) by wrongfully distributing copies of the plaintiff's computer programs to the public by way of sale without license of the plaintiff.

It seems clear from the defendant's statement of defense that the defendant admits that its main business is selling PC hardware to customers and that it is only at the request of its customers that the defendant buys the Microsoft works from legitimate Microsoft software distributors and puts these works into the hard disk of the computers. Since there is distribution by way of sale without any license from the plaintiff, there would have been clear infringement under s. 36(1) read with s. 13(1)(c) of the Copyright Act 1987.

#### Economic loss

According to the report on software piracy, prepared by the International Planning Research Corporation (IPR) for the Business Software Alliance (BSA) and the Software & Information Industry Association (SIIA), that software piracy is the main obstacle to the growth of the software industry, which is reflected in revenue losses, estimated at \$12 billion to the worldwide industry due to piracy in 1999. Mike Newton, campaign relations manager, BSA UK,



stated that the UK software industry lost over GBP457 million to software piracy last year and, whilst there has been a decline in the piracy rate, there can be room for complacency.

In 1999 the rate of software piracy was 34%, that is, over one in three business software applications were illegal copies. Software piracy continues to harm software developers and European economies and to impact on jobs. When people going to understand the damaging knock-on effects of their use of illegal software on their own business and others?

In 1994, the software piracy rate in Malaysia was 82% resulting in US\$66.7 million (RM166.8 million, RM2.5: US\$1) in losses to the industry. The percentage declined over 5 years to 71% in 1999. The value of pirated software, equivalent to losses to the software industry, amounted to US\$84.2 million (RM319.96 million, RM3.8: US\$1). In 1996, the packaged software industry in Malaysia generated RM 196.3 million (RM2.50: US\$1) in a direct and indirect tax payments to the Malaysian government. A reduction in Malaysia's 1996 packaged software piracy rate to current U.S. levels would have generated more than twice the number of local IT jobs, and a further RM215 million in tax revenues to the government.

Piracy of computer software happens all over the world. As reported by the Business Software Alliance (BSA) and Software Publishers Association (SPA) (1996; 1997; 1998) United Kingdom estimated average piracy rates is below 40 % whereas the United States had a piracy rate of only 28 %. Interestingly, the United States is the largest software market but with the lowest piracy rate. IPR's 1997 report showed that the United States experienced 27 % piracy rate with almost \$ 2.8 billion financial losses whereas the United Kingdom at 31 % rate and approximately \$ 335 million losses. Meanwhile, Malaysia's piracy rate was at 70 % with about \$ 83 million financial losses.

The Business Software Alliance (BSA) and the Software Publishers Association (SPA) (1998) have estimated piracy rates for business software in more than 70 countries for 1994 – 97. Marron & Steel (2000) stated, "in some countries, essentially all new software was pirated. In other countries, less than 40% of software was pirated." Anonymous (2000) stated that a report issued by the IPR in 1999 found that the United Kingdom software industry had suffered the largest financial loss to software piracy in Europe. In 1999 it had lost over GBP457 million to software piracy.

Marron & Steel (2000) conducted a study on the determinant factors of software piracy, economic, institutional and cultural. They concluded, "Intellectual property receives greater

protection in developed economies. Countries with an individualist culture have lower piracy rates than do countries with a collectivist culture. Piracy rates are also lower in countries that have strong institutions that enforce contracts and protect property from expropriation.”

## **Discussion**

Contract protection is often infeasible, both practically and legally. For many database proprietors, it will be impossible to obtain assent to restrictive contracts, or inconsistent with their business objectives. Since the era of information technology in Malaysia is still in the infancy stage a lot of monitoring and observation should be made in order to curb the problems that are facing by the database industry. The current level of protection is still inadequate. Malaysia should analyse the problems and come out with possible solutions.

Other alternative that the US government and the Malaysian government have is to look at the European-style solution. In 1996, the European Union ('EU') enacted a Directive (the 'Database Directive') for the purpose of bringing more uniformity to the protection of databases within the EU, while ensuring that there would be a level of protection adequate to encourage their continued creation. Prior to the enactment of the Database Directive, the scope of copyright protection for databases varied significantly from country to country.<sup>136</sup> The United Kingdom and Ireland had very low originality requirements and routinely protected works with minimal creativity.<sup>137</sup> The rest of EU countries were more focused on the level of the author's original creative work, and generally did not provide copyright protection for a work, that had minimal originality.

The Database Directive rejected the approach being used in the United Kingdom and Ireland and raised the threshold for copyright protection by specifying that there would be no copyright protection unless 'by reason of the selection or arrangement of the contents of the database, the database constitutes the author's own intellectual creation.'<sup>138</sup> This standard is very similar to the post Feist standard with one additional where under the Database Directive there must intellectual creation by a human author<sup>139</sup> for copyright protection to exist, raising questions about the extent to which a database can be protected under copyright law if the selection and arrangement of data is accomplished by a computer program with little or no

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<sup>136</sup> Id.

<sup>137</sup> See Adams, J. 'Small Earthquake in Venezuela': The Database Regulations 1997, *European Intellectual Property Review*, 1998/4, 129.

<sup>138</sup> See Conley (2000)

<sup>139</sup> Database Directive, art. 4, para 1

human contribution.<sup>140</sup> As a result, copyright law in the EU will continue to provide meaningful protection for software.<sup>141</sup>

## Conclusion

Is the current law really inadequate? But the adequacy of current law cannot be judged in the abstract. It depends on what kind of database one is talking about, and how it will be used. If we do want to protect all types of databases, what form should the protection take? The form of protection has two components: the nature of what is to be protected and the conduct that is to be prohibited.<sup>142</sup> These are the issues that researchers should explore in order to the law making body area.

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Copyright Act 1987

Computer Crimes Act 1997

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United States Copyright Act

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<sup>140</sup> Id

<sup>141</sup> Id.

<sup>142</sup> See Conley (2000)

Uniform Computer Information Transaction Act

**RISK AND CHARTER VALUE IN THE BANKING SYSTEMS  
FROM THE NAFTA COUNTRIES**

Klaus P. Fischer  
Université Laval

Jean-Pierre Gueyie  
Université de Québec à Montréal

Edgar Ortiz\*  
Universidad Nacional Autónoma de México

## 1. INTRODUCTION

The reasons why banks fail are much debated in the financial literature. One of the most recent surveys attempting to compile the underlying factors for bank failures has been carried out by Benston and Kaufman (1995). They present a thorough analysis of the main arguments and empirical analysis associated to this debate in the context of the United States. According to them, the four "causes" of banking crisis in that country, as debated in the literature, are: 1) excessive expansion of bank credit preceding the crisis; 2) asymmetric information resulting in the inability of depositors to value bank

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assets accurately; 3) shocks originating outside of the banking system, independent of the financial conditions of banks that either cause depositors to change their liquidity preference or cause reduction in bank reserves; and 4) institutional and legal restrictions that weaken banks, making them unnecessarily prone to failure. In addition, in the case of the developing countries and transition economies banking crisis are strongly associated with currency crisis, leading to the so-called "twin crisis" phenomenon that are generally preceded and accompanied with poor policy making (Kaminsky and Reinhart, 1999).<sup>143</sup>

The main goal of banks' regulators and supervisors is to ensure the safety and soundness of the banking system. This goal is reached by undertaking regulatory and supervisory activities, which refrain banks from excessive risk-taking, and minimize their probability of bankruptcy. Their task will be easy if there are some self-disciplining incentives from banks' managers. Some new research suggests that there are some deeper roots behind the above factors. One of them identified by recent research is the value of the charter of banks. Also referred to as the "franchise value" (See Rojas-Suarez and Weisbrod, 1995; Demsetz, Saidenberg and Strahan, 1996), charter value is a value that would be foregone if the bank closes.

### Empirical evidence on the disciplining role of banks'

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<sup>143</sup>Kaminsky and Reinhart (1999) provide ample empirical evidence about this problem examining the case of 20 countries from 1970 to 1995. Kaufman (1999) offers a thorough framework for analyzing the twin crisis and their relationship with systematic risk and the contagion effect, and Allen and Gale (1999) develop a full model to link the role of the low banking assets and currency crisis.

charter value is available mainly on U.S.' commercial banks. Many studies have been conducted there. But, less, if not anything has been done in the other countries. The purpose of this paper is to extend this analysis to the two other countries of the North American Free Trade Agreement (NAFTA), i.e., Canada and Mexico, motivated by the fact that that beyond commercial links this partnership also implies financial integration.

In the banking system this means integration between systems, which differ in fundamentals, regulation, governance, assets and liabilities structure, economies of scale and scope, and managerial attitudes towards risk-taking.

The paper has been organized as follows. Following this introduction, Section 2 defines and quantifies the concept of charter value. Section 3 presents a review of previous studies analyzing the relationship between charter value and risk-taking. Our methodology is outlined in section 4. We present the data used in section 5 and discuss our empirical results in section 6. Section 7 presents a brief conclusion.

## 2 CHARTER VALUE: DEFINITION AND MEASURE

### 2.1 Definition

Guttentag and Herring (1983) define the charter value, as "the present value of the net income the bank would be expected to earn on new business if it were to retain only its office, employees, and customers. (...) [It] depends on the bank's authorized powers, including power to do business within specified areas, the market structure in the area, the expertise of the bank's employees, and the customer relationships it has developed". In this view, charter value is the present value of future profits that a bank is expected to earn from its access to protected markets, its reputation, economies of scale and superior information in financial markets. It is an intangible asset, which would be foregone if the bank goes bankrupt or is closed by the chartering authority.

As pointed out by Demsetz, Saldenberg and Strahan (1996), in banking, the value of charters arises from two main sources: market regulation, which by limiting competition provides a market power to banks operating in regulated markets, and bank-related sources.

#### 2.1.1 Market power

In almost all countries around the world, the banking industry is highly regulated (Benston, 1983). Entry in the banking sector is subject to obtaining a charter (i.e., a right to operate) which is granted by a chartering authority. Hence, charter value largely depends on the number of banks allowed in the system, which in turn depend on entry costs and required capital levels (Milne and Whalley, 1998). Moreover, geographic expansion is sometimes restricted. Entry and/or geographic expansion restrictions limit competition in the sector, provide a privileged market access to chartered banks, and generate monopoly rents. These rents arise either from the deposit market, through banks' ability to acquire deposits at less than competitive deposit rates, or from the loan market, through their ability to lend at rates higher than the competitive loan market rate.

### 2.1.2 Bank-related sources

Even when banks benefit from the same market protection against competition, variation in their charter value is expected. This is induced by bank-related or bank specific factors such as efficiency in management, reputation and lending relationship with customers. There is no doubt that some banks are more efficient than others. A bank with competent managers has a competitive advantage in its sector. This advantage is induced by its ability to provide financial services to its customers at a relatively cheaper cost than its competitors. It can then grow quickly than these competitors in a business sector with large growth opportunities, or grow at the expense of its poorly managed competitors in a sector with limited growth opportunities. Such growth generates scope and scale cost savings.<sup>144</sup> An intangible also arises from bank's reputation, which generates a favorable business framework with partners and from its unique lending relationships with its customers. Through long-term lending relationships with these customers banks have access to private information that are not available on financial markets. This helps them to reduce the cost of loan origination, making lending activities more profitable.

## 2.2 Measures

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<sup>144</sup> Charter value also depends on the size of growth opportunities available in a sector protected from competition by regulation. In a sector with large growth opportunities, the market power of banks is reinforced.

Two measures are widely used in the financial literature as proxies of charter value. These are the market to book value of bank assets [MVBKA], and the market to book value of equity [MVBKE]. For instance, Keeley (1990), Saunders and Wilson (1994) and Demsetz, Saindenberg and Strahan (1996) among others use MVBKA, while MVBKE is found in Saunders and Wilson (1997), Galloway, Lee and Roden (1997), Brewer, Mondschean and Strahan (1997). These measures are sometimes presented as proxies of the "Tobin's Q" ratio used by Linderberg and Ross (1981) to assess monopoly rents in non-banking industries.<sup>145</sup> Saunders and Wilson (1994) show how one can derive MVBKA as a measure of "Tobin's Q". Their model is built on two main assumptions, namely: 1) a bank's equity value reflects the present value of all expected future dividend payments to shareholders, and 2) a "clean surplus accounting" rule holds.<sup>146</sup> In the rest of this study, charter value will refer to the market to book value of assets (i.e., MVBKA).

### 3. CHARTER VALUE AND BANK RISK-TAKING: PREDICTION AND REVIEW OF PREVIOUS STUDIES

#### 3.1 Prediction

A bank's charter value is an intangible asset that it receives only if it survives. There is an incentive for banks with a large charter value to maximize their survival likelihood. Even in the presence of weak risk regulation, commercial banks do not necessarily undertake excessively risky activities to take advantage of the subsidies, which are related to the presence of implicit or explicit deposit insurance schemes. Charter value can act as a self-imposed risk-disciplining factor, preventing certain banks from moral hazard behavior. A theoretical options model of the relationship between charter value and bank risk-taking can be found in Marcus (1984). Specifically, he defines the value of a commercial bank's equity as:

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<sup>145</sup> Linderberg and Ross (1981) define the "Tobin's Q" as the ratio of market value of assets over their replacement costs. Replacement costs are usually not available. Chung and Pruitt (1994) and Perfect and Wiles (1994) find empirically that some simplified measures are highly correlated with the Linderberg and Ross estimator. Chung and Pruitt therefore propose MVBKA as an alternative measure of the "Tobin's Q".

<sup>146</sup>"Tobin's Q", approximated by either MVBKA or MVBKE is also widely used in finance as a proxy of growth opportunities. This does not contradict its use here as charter value since we consider growth opportunities as a component of charter value.



$$E = [VN(d_1) - e^{-rT} BN(d_2)] + e^{-rT} CN(d_2), \quad (1)$$

with

$$d_1 = [\log(V/B) + (r + 0.5\sigma^2 T)] / \sigma \sqrt{T},$$

$$d_2 = d_1 - \sigma \sqrt{T}.$$

$N(\cdot)$  is the cumulative standard normal density function;  $V$  and  $B$  are the value of bank's assets and liabilities respectively;  $C$  is the bank's charter value;  $r$  is the risk free interest;  $\sigma$  is the standard deviation of the rate of return on bank's assets, and  $T$  is the time to run until the next bank examination.

The first bracketed term represents the Black and Scholes (1973) call option held by equity holders on the bank's assets, and the second term is the bank's charter value ( $C$ ).

According to Marcus (1984), the change in the value of equity per unit increase in the standard deviation of assets is given by:

$$\partial E / \partial \sigma = B e^{-rT} N(d_2) \sqrt{T} - e^{-rT} C d_1 N(d_2) / \sigma. \quad (2)$$

The first term in equation (2) is positive and represents the standard positive effect of increased variance on a call option. The second term is positive if bank's assets are greater than its liabilities (i.e.,  $V > B$ ), and its subtraction represents the loss in the value of the bank charter due to the effect of increased insolvency risk. The higher the charter values ( $C$ ), the higher the reduction in equity value. Then, the model predicts that when a bank has a high charter value, risk-reducing strategy will tend to dominate, and overall bank managers will take less risk.

### 3.2 Review of previous studies

Beside Marcus (1984), many other theoretical and empirical papers have analyzed the relationship between charter value and risk-taking by commercial banks. Suarez (1994) reaches the same results using dynamic programming techniques. His dynamic setting endogenizes the charter value within an infinite horizon model and accounts for interactions between the market power, closure rules and banks' capital and assets regulation. He is able to show explicitly that bank charter value is an important component of bankruptcy

costs to bankers, implying that it may constitute an incentive for banks to adopt prudent risk-taking policies. Keeley (1990) provides evidence of a negative relationship between risk-taking and charter value, using the interest cost on large CDs (over \$100,000) as a proxy of bank's risk.<sup>147</sup> Demsetz, Saindenberg and Strahan (1996), follow, reporting that US bank holding company's charter value is negatively related either to accounting proxies or to market proxies of banks' risk. Gallowey, Lee and Roden (1997) reinforce this evidence. They argue that during the period 1983-1989 characterized by a generalized decrease in US banks' charter value and ineffective risk-control regulations, banks with high ex-ante risk-taking incentives (i.e., with low charter value) were on average more risky than banks with low ex-ante risk-taking incentives (i.e., with high charter value). The US empirical evidence on the self-disciplining role of charter value seems incontestable. The unique contradictory view comes from Park (1997) who argues that higher charter value can result in high-risk levels at commercial banks, unless completed by effective regulation. His model is built on a framework in which deposit insurance exists, and banks can take excessive risk to maximize the subsidy that it induces. They are subject to periodic examinations. A key assumption of model is that a bank cannot expect a positive put option value (deposit insurance subsidy) once it is classified as risky by regulators. In such framework, the deposit insurance subsidy is maximized at a high level of bank risk when the charter value is large. It takes a large amount of subsidy for banks to risk their valuable charter. Banks with large charters will undertake risky strategies when the regulation is ineffective, and it is difficult to assess the true level of banks' risk. Risk-taking will be a positive function of bank's charter.

#### 4. METHODOLOGY

##### 4.1 Hypothesis and test specification

One hypothesis results from the Marcus' model presented earlier. It can be stated as:

***“Banks' risk measures are negatively and significantly related to their charter value”.***

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<sup>147</sup> The use of interest cost of large CDs as proxy of risk is based on the fact that FDIC does not insure these securities. Uninsured depositors require a risk premium proportional to the level of banks' risk to hold them. Therefore observed rates paid on large CDs contain a risk premium, and can picture the banks' risk level.

In other words, the charter value is a self-disciplining factor for commercial bank managers in their risk-taking activities. This Hypothesis is tested in each of the three NAFTA countries using the following linear specification:

$$RISK_{j,t} = \lambda_0 + \lambda_1 CHARTER_{j,t} + \sum_{k=2}^K \lambda_k X_{k,j,t} + \mu_{j,t}, \quad (3)$$

where  $RISK_{j,t}$  is a proxy of bank  $j$  risk at time  $t$ ;  $CHARTER_{j,t}$  is the charter value of bank  $j$  at time  $t$ ;  $X$  is a set of control variables,  $\mu_{j,t}$  is an error term and  $\lambda_0$  to  $\lambda_K$  are the usual regression coefficients.

Our hypothesis is verified if the coefficient of  $CHARTER$  is negative and significant.

#### 4.2 Measure of banks' risk

For Canada and the United States, the standard deviation of daily stock returns is used as a proxy of banks' risk. For a given year, it is computed using all daily returns available in the year. For Mexico, only weekly returns were available. During that period strong deregulation and liberalization policies induced an explosive growth of the Mexican Stock Market (Cabello, 1999) and stock returns presented a heterokedastic behavior (Ortiz, 2000). For that reason, we approximate Mexican banks' risk by the conditional volatility derived from an exponential generalized autoregressive conditional heteroscedasticity

$$r_{j,t} = b_0 + b_1 r_{j,t-1} + b_2 h_t + \varepsilon_{j,t}$$

$$\varepsilon_{j,t} | F_{t-1} \sim N(0, h, v)$$

$$\ln(h_t) = \delta + \beta \ln(h_{t-1}) + \theta g(\varepsilon_t)$$

$$g(\varepsilon_t) = \left( \left| \frac{\varepsilon_t}{\sqrt{h_t}} \right| - \frac{\sqrt{2} \cdot \theta}{\pi} - \gamma \frac{\varepsilon_t}{\sqrt{h_t}} \right)$$

(EGARCH) model (see Nelson, 1991). The EGARCH (1,1) model is described as follows:

(4)

there,  $r_{j,t}$  is the return on bank's  $j$  equity at time  $t$ ;  $\varepsilon_{j,t}$  the error term is assumed to be conditional upon the information set  $F_{t-1}$ , and  $h_t$  represents the conditional variance at time  $t$ .

#### 4.3 Control variables

To control for liquidity risk, we use the ratio of cash plus marketable securities to total assets, LIQUID, as in Keeley (1990). A negative relation between the various measures of risk and LIQUID is expected. For leverage, we use the ratio of total debt to total assets, LEVERAGE. Since financial risk increases with leverage, a priori, a positive relation between risks and leverage is expected. The credit risk is proxied by the variable LOANQUAL, defined as the ratio of provision for loan losses to total loans. A positive relation between the various measures of risk and LOANQUAL is expected. We use LOGTA as the logarithm of total assets to control for the size effect. As a measure of diversification (see Brewer, 1989, among others), LOGTA is negatively related to risks, in particular to non-systematic risk. Finally, to control for macro-economic determinants of bank risk, we use the gross national product growth rate, GNP GROWTH. The next section describes our data.

#### 5. DATA

Our sample consists of thirty-six U.S. banks, thirteen Mexican banks and six Canadian banks. The period covered is 1985 to 1995 [1985 to 1993 in the U.S.; 1988 to 1993 in Mexico and 1985 to 1995 in Canada]. The study uses both stock market and accounting data. For the United States, market data are retrieved from CRSP, while accounting data comes from COMPUSTAT. In Mexico, market and accounting data are from the COMISION NACIONAL BANCARIA,<sup>148</sup> while in Canada, market data are from the TSE-Western Database, and accounting data from various annual reports and the Canada Gazette. Our results are examined in the next section.

#### 6. RESULTS

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<sup>148</sup> Mexico's Banking Commission. It is worth noting that financial deregulation in Mexico has led to the establishment of "universal banking," headed by either a banking institution, or else by a stock brokerage institution. For that reason, since 1995 the Banking and Stock Market Commissions merged into one agency: **Comision Nacional Bancaria y de Valores** (National Banking and Securities Commission). Due to these changes, to keep our data homogeneous and free from the evolving problems leading to the 1994 peso crisis, our study for the Mexican banking sector ends in 1993.

We present the empirical findings in two parts: first, we report the descriptive statistics on three risk variables. Then, we discuss the results concerning the test of our hypothesis.

## 6.1 Descriptive statistics

Table 1 reports descriptive statistics on risk proxies, charter value and control variables in the three NAFTA countries.

The average value of the risk proxy is 0.2015 in Canada, 0.2742 in the United States and 0.4010 in Mexico. Although they are estimated differently (standard deviation of stock returns in Canada and the United States versus EGARCH (1,1) in Mexico), these figures suggest that banks stock returns are more volatile in Mexico than in the two other NAFTA countries. The average charter value (CHARTER) is 0.9956 in Canada, 1.0224 in Mexico and 1.005 in the United States. In these three countries, banks are highly leveraged. The average leverage ratio is 0.9501 in Canada, 0.9223 in Mexico and 0.9290 in the United States. This characteristic is well known in the banking industry. Liquidity (LIQUID), which include cash and securities held by banks accounts for one fourth to one fifth of total assets (0.2535 in Canada, 0.2855 in the United States and 0.2165 in Mexico). Cash and securities are respectively primary and secondary liquidity reserve for banks. With regard to the loan quality (LOANQUAL) average annual provisions for loan losses range from 0.3% of total loans in the United States to 0.91% in Canada.

## 6.2 Hypothesis Test

For each of the three countries, Table 2 reports the estimation of equation (3), i.e., the regression of risk on charter value and control variables.

In the United States, the variable CHARTER is negatively related to the risk proxy, and is significant at 1% level. This result concurs with those previously found in the literature with US data (see Keeley, 1990; Demsetz, Saindenberg and Strahan, 1996; Gallowey, Lee and Roden, 1997 among others). In Canada and Mexico, the relation between the risk proxy and CHARTER is also negative, but not significant. Therefore, our regression test rejects the null hypothesis for Canada and Mexico. While the charter value seems to be a self-disciplining factor for U.S. banks in their risk-taking, it is less effective in Canada and Mexico.

With regard to control variables, LIQUID is generally negative and significant in Canada at 1% level. This result is similar to the one

in Gallo, Apilado and Kolari (1996) where the relation is negative for various measures of risk, and significant for interest-rate risk. In each of the three countries, the variable LEVERAGE is positively related to risk, and is significant in Canada and Mexico at 10% and 5% levels respectively. In the United States, it is not significant. A similar result is reported in Gallo, Apilado and Kolari (1996) who find no significant relationship between leverage and risk for their sample of U.S. BHC over the period 1987-1994. As expected, the variable LOANQUAL is positively related to risk, as in Hassan (1992).<sup>149</sup> But the positive relation is significant only in Canada and the United States, at 5% and 1% levels respectively. The variable LOGTA is negatively related to risk in Canada and Mexico, but is non-significant. In the United States, the relation is positive and significant at 5% level. Finally, the growth in the gross national product, GNPGRWTH is negatively related to risk in Canada and the United States, and significant in the U.S. In this country, bank risk seems to be lower in good economic conditions. The reverse is observed in Mexico, where the relationship between GNPGRWTH and risk is positive and significant at 1% level.

A natural question is why charter value doesn't act as a disciplining device for bank managers' risk-taking in Canada and Mexico. While several justifications can be pointed out to explain this result, we argue that it may be due to the implicit guarantee provided to commercial banks by governments in Canada and Mexico. It has long been recognized that Canadian banks enjoy implicit guarantee provided by the Government of Canada (See Kryzanowsky and Roberts, 1993; Saunders and Wilson, 1999). Moore (1997) argues that Mexican banks also enjoy implicit guarantee from the Mexican government, with evidence from the Mexican peso crisis in 1994. Indeed, to protect deposits and avoid bank runs and a systemic crisis the Mexican government created in 1995 a special fund, FOBAPROA, to rescue the banking sector. Costs of this rescue program were originally estimated at 5 percent of GDP. Costs have, however increased throughout the years due to further bank failures. Costs of this program to the taxpayers are currently estimated between 20-23 percent of GDP.<sup>150</sup>

Charter value is an intangible asset, which is lost if the bank is closed. Banks' managers undertake less risky activities to protect their charter only if there is a likelihood of being closed under insolvency. With implicit guarantee they have no incentive for self-discipline to protect their bank's charter value, since it [the bank] won't be closed in financial difficulties, and will receive assistance from the government through funds infusion or arranged mergers.

## 7. CONCLUSION

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<sup>149</sup> Hassan (1992), however, used the ratio of nonperforming loans to total assets as a proxy of credit risk.

<sup>150</sup> The Mexican government recently substituted FOBAPROA by a new agency for bank's deposits protection (**Instituto para la Protección del Ahorro Bancario, IPAB**), which will continue managing the acquisition and sale of underperforming loans from the banking system. For some recent evaluations of FOBAPROA and IPAB see: Lopez-Obrador, 1999, and Szekely, 1999. It must be noted that, supporting our results and interpretation, that beginning 2003 bank's deposits will be guaranteed by IPAB in Mexico up to 400,000 UDIs only (about \$100,000 dollars). An UDI is an inflation indexed peso used for liquidation of some financial contracts.

Using data on commercial banks in Canada, Mexico and the United States, we tested the well-known disciplining role of charter value hypothesis in these three NAFTA countries. Overall, we find no empirical support for the hypothesis in Canada and Mexico, and a strong empirical evidence of the self-disciplining power of charter value in U.S commercial banks. Hence, while charter value acts as a disciplining device for U.S. commercial banks in their risk-taking, it is less effective in Canada and Mexico. These results underly the need for harmonization of financial regulation norms, particularly government deposit guarantees, among the NAFTA countries to promote their financial integration. In turn, this should promote the development of a strong regional banking system supportive of regional oriented growth projects. Finally, it is important to note that while this study focuses on the relationship between charter value and risk, it is possible to analyze the relationship between charter value and other bank decision parameters such as capital, capital structure, etc.

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**Table 1****Descriptive statistics**

<b>CANADA</b>				
Variable	Mean	Std. dev.	Minimum	Maximum
RISK proxy	0.2055	0.0572	0.1289	0.5250
CHARTER	0.9956	0.0108	0.9736	1.0323
LIQUID	0.2165	0.0566	0.0901	0.3512
LEVERAGE	0.9501	0.0073	0.9292	0.9618
LOANQUAL	0.0091	0.0044	0.0024	0.0245
LOGTA	11.2792	0.0505	9.8652	12.1208
<b>MEXICO</b>				
RISK proxy	0.4010	0.6165	0.0179	4.9584
CHARTER	1.0224	0.0709	0.8436	1.2404
LIQUID	0.2535	0.0950	0.05186	0.5566
LEVERAGE	0.9223	0.0406	0.7276	0.9697
LOANQUAL	0.0074	0.0096	0.0000	0.0439
LOGTA	9.0491	1.4763	5.6835	11.8025
<b>UNITED STATES</b>				
RISK proxy	0.2742	0.0984	0.0949	0.7288
CHARTER	1.0059	0.0351	0.9059	1.2178
LIQUID	0.2855	0.0943	0.0693	0.6406
LEVERAGE	0.9290	0.0141	0.8378	0.9648
LOANQUAL	0.0033	0.0034	0.0057	0.0322
LOGTA	9.7221	1.1765	6.9269	12.3480

Note: The risk proxy is the standard deviation of daily stock returns for Canada and the United States and the conditional volatility of returns for Mexico. CHARTER is the market to book value of assets, LIQUID is the ratio of cash plus securities to total assets, LEVERAGE is the ratio of total liabilities to total assets, LOANQUAL is the ratio of provision for loan losses to total loans, LOGTA is the natural logarithm of total assets.

**Table 2**

**Regression tests for Hypothesis**

$$RISK_{j,t} = \lambda_0 + \lambda_1 CHARTER_{j,t} + \lambda_2 LIQUID_{j,t} + \lambda_3 LEVERAGE_{j,t} + \lambda_4 LOANQUAL_{j,t} + \lambda_5 LOGTA_{j,t} + \lambda_6 GNP GROWTH_t + \varepsilon_{j,t}$$

**Parameter coefficients are estimated using the pooled cross-sectionally time-series methodology. The t-value is enclosed by parentheses.**

Variable	Canada		United States	
			Mexico	
$\lambda_0$ CONSTANT	-1.3681 (-1.036)		0.5272 (0.224)	0.7483* (1.778)
$\lambda_1$ CHARTER	-0.0541 (-0.091)		-0.1793 (-0.148)	-0.7517*** (-4.538)
$\lambda_2$ LIQUID	-0.4128*** (-3.503)		-0.9619 (-1.189)	-0.0384 (-0.529)
$\lambda_3$ LEVERAGE	1.7967* <b>(1.864)</b>		0.0957** (2.446)	0.1823 (0.485)
$\lambda_4$ LOANQUAL	1.9435** (2.163)		5.2926 (0.652)	6.4823*** (4.773)
$\lambda_5$ LOGTA	-0.0007 (-0.053)		-0.0164 (-0.194)	0.0132** (2.048)
$\lambda_6$ GNP GROWTH	-0.0001 <b>(-0.157)</b>		0.8591*** (2.790)	-0.0135*** (-5.980)
R <sup>2</sup>	36.34%		16.57%	27.14%
NOBS	66		78	324

\*\*\* = Significant at 1%; \*\* = Significant at 5%; \* = Significant at 10%.

## **Design and Construction Of A Solar Energy Dehydrator Of Nutritious Products.**

**Lerma Rojas, Leonel Salvador<sup>\*(1)</sup>; Guerrero Simental, María De Lourdes<sup>(1)</sup>; Lerma Rojas, Olga Margarita<sup>(2)</sup>; Galván Ismael María Quetzalcohuatl<sup>(3)</sup>; González Lazalde Iván<sup>(3)</sup>; Domínguez Romero José Juan De Jesús<sup>(3)</sup>; . <sup>(1),(3)</sup>Departamento de Ingeniería Industrial; Maestría En Planificación De Empresas Y Desarrollo Regional. Instituto Tecnológico De Durango, Blvd. Felipe Pescador 1830 Ote., Durango, Dgo., México 34080. Tel: 18184871, Fax: 18184813. <sup>(2)</sup>Centro de Bachillerato Industrial y de Servicios (CBTIS) No. 110, Mártires de Sonora 401, Fracc. Infonavit, Durango, Dgo., México 34220, <sup>\*(1)</sup> Profesor Investigador Del ITD. <sup>(1)</sup> Profesor Del ITD. <sup>(2)</sup> Profesor CBTIS 110. <sup>(3)</sup>Exalumno de Posgrado ITD. Email: leolerma@omanet.com.mx. Proyecto CoSNET 786.98-P.**

**Describers: Drying, Fruits, Vegetables, solar Energy, Design, Construction, Dryer, Dehydrator.**

### **INTRODUCTION**

Growing tendency exists to use the solar energy to dehydrate products and to help in its conservation and for its commercialization under controlled conditions. The use of solar energy is interesting for the fact of its readiness in most of the national territory, its economy, and the quantity of heat that it can be taken advantage of. Considering the above-mentioned the present work had as objective the design and the construction of a dryer that it is usable to dehydrate vegetable products and that it takes advantage of the solar energy as source of heat and therefore the conservation of this products.

According to the above-mentioned, the description of the problem is centered in the following slopes:

1. Demand of allowances exists on the population.
2. There is not enough production of allowances at the present time for the population.
3. It is necessary to avoid the loss of the little quantity of existent food, through their conservation.

4. The use of alternating sources of energy is required, the conventional ones are draining.
5. A great quantity of proportionate energy exists for the sun, which doesn't take advantage.

The objective of this investigation was to build and to evaluate the behavior of a support of cylindrical tunnel to annul rotational, provided of layettes with meshes, which allowed to give to the food at the same time a constant movement of providing a good aereación, for the drying of fruits and vegetables trying to achieve with it bigger effectiveness with regard to the trays drying and inclusive using cylinders.

The present project was a proposal of oriented investigation to deepen in the knowledge of the processes of dehydration of fruits, vegetables, fruits, and in the use of the solar energy. The work was framed inside the area of the engineering of allowances, in particular, on the conservation of allowances for dehydration. The work sought two fundamental objectives. On one hand, to contribute to the decrease of losses of fruits that they take place in the state of Durango and in the country; such losses take place for damages and for decomposition. On the other hand, it is wanted to contribute work of team design that allows to make use of the solar energy, looking for with it to diminish the consumption of energy conventional. This last it is to avoid the alteration of the environment and to lower costs of operation of equipment of dehydration, this is, costs of fuels and electricity.

The solar dryer consists essentially of a booth provided in its interior of fans that they circulate air through a heater (solar collector), besides ducts of input and output of air which allowed the loss of humidity in the allowances and the expulsion of the dryer of the same one. The unit also had in its interior 12 provided rotational layettes with trays food containers, existing a mass of air inside 3.76m<sup>3</sup>. To allow the rotation of the layettes you design a rotor axis that allowed the revolution from the same ones to 2 rpm, approx. The advantage that it offered the rotor was to allow a feeding and a better exhibition to the drying fluid, and to give a better final appearance.

In this prototype on the experimental base one worked the same as in the preliminary

experimentation with different allowances, pumpkin sliced in slices of 3mm of thickness, potatoes in slices of 1cm of thickness and whole chilis (chili goad, green wide chili and red wide chili). The times of drying were diverse, the pumpkins 5 hours, the potatoes, the chili goad and the wide chili 19, 28 and 41 approximate hours respectively. The registered maximum temperature inside the dryer was of 45 °C, and the maximum temperature obtained in the collector it was of 65 °C, the loss of weight on the average was of 83.68%.

### **Materials, Methods and Procedures Of Calculation**

The design and construction of the prototype, you design and I build in the facilities of the Technological Institute of Durango, and with design considerations for prototype:

- I. Capacity Of Production: absorbed Heat, Quantity of heat to generate, Way to transmit the heat, Regulation of flow, Determination of losses, The area of the drying surface.
- II. Economy AND Thermal Yield: Heat stored in the walls, Heat loss, for radiation, and dragged, Difference of temperatures among the drying surface and the air, Coefficient of transfer of heat.
- III. Resistance AND Duration: Materials employees, Expansion / Compression / Resistance
- IV. Movements Of The Gases: inherent Variations to the gases
- V. Ecological preservation: Pollution, / fuel / energy / energy use.

### **Equipment Used.**

Rotational cylindrical dryer.

The cylindrical dryer was built in a first version of black sheet and black bar, this is for the cylindrical tunnel; and the panel collector of solar energy, of sheet, acrylic and black painting; the tunnel was built in such a way that the perimeter, jointly with the width and the long one, they gave the measures of a vertical tunnel of 1x1.83x1.84 m<sup>3</sup> exactly, the collector offered the enough collected heat to reach a good temperature of 55 - 60 oC inside the drying camera, two motors were used, to move the hot fluid to a speed of 4 -7 m/s and 900 rpm,

## Scales

Two scales will be used, a granataria marks OHAUS, model 1205, with capacity of 2610 gr, which can register up to tenth of gram, for the sampling in the drying and power to build the drying curves. The other one, a scale of humidity marks OHAUS, provided of a lamp of 600 wats, model 6010, with capacity for 10 gr, with the purpose of determining the dry solids of each food and the initial humidities of the same ones.

## Other laboratory equipment:

- 1 laboratory stove.
- 1 desiccators.
- 1 scale granataria.
- 1 analytic scale.
- 1 scale for determination of humidity.
- 10 laboratory thermometers, of -10 at 110oC.
- 5 bimetallic thermometers (needle and mask), of 0 at 100oC.
- 3 hygrometers of humid bulb.
- 2 anemometers.
- 2 hygrometers (with needle indication).
- 1 hicrotermograph.
- 1 apparatus for determination of texture of allowances.

## **Materials**

They were used some allowances, susceptible of being dried just as: pumpkin, wide green chili and red, potato, in the convenient cases, a manual slicer was used BORNNER model 9504, and other they dried off whole.

## **Variables Of the Process**

Not all the variables were taken into account, they make an appointment those that it stops effect of the present work as more important.

For the speed of the air, all the tests, stayed with speeds that fluctuated between 4 and 7 m/s, on the base of that said by Walker Et Al. (1973) who he affirms that in



investigation works the ranges of speeds of air should be located between 4.5 and 7.5 m/s.

All the tests will be carried out between 55 and 60 °C. The temperature didn't register as exact due to limitations of the team. At any rate, during all the processes you was monitoreando the temperature with a thermometer of mercury and with a mask thermometer, the thermometers of mercury registered the temperature of the humid bulb, for the introduction of another thermometer of mercury whose capsule wrapped up in cotton and gauze, which constantly became moist.

Three rotation speeds were rehearsed: 2, 4, and 5 rpm, to determine which the best speed was. The relative humidity, was not controlled, because it doesn't seem to have a decisive influence, this way, the tests were held to the humidity of the environment, the relative humidity was determined by means of the monitoring of the temperatures of dry bulb and humid bulb, with which the letters psychometric were consulted.

Taking into account a vegetable product as it is the wide chili,

### **Relative humidity**

It should adapt to that of the material that dries off, it is generally chosen as 7/10 of the value corresponding to the balance higroscópico of the humidity of the chili, whereas clause with temperature in the dry bulb 50 °C and the temperature in the humid bulb of 35-40 °C, according to a psicrometric chart, a relative humidity of 40-60% is obtained.

### **Initial humidity of the chili bases dry**

$wH0$  = initial Humidity of the chili bases humid = 0.94

$wS0$  = initial Humidity of the chili bases dry =  $wH0 / (1 - wH0)$

=  $0.94/0.06$  = 15.7 kg of water / Kg of chili dries off.

$wH$  = final Humidity of the chili bases humid = 0.04

$wS$  = final Humidity of the chili bases dry =  $wH/(1-wH)$  =  $0.04/0.88$  = 0.0417Kg of dry chili water/Kg.

They were wanted to obtain 0.26m<sup>3</sup> from dry chili to a density of 288Kg/m<sup>3</sup> and 4% of equivalent humidity to 0.0417Kg. of water / Kg. of chili's dry off every 14 hours, then it can be obtain 5.35Kg. / h of dry chili.  $5.35 \times 0.0417 = 0.223$ Kg. of water / h that contains the dry chili at the end. Let S the kilograms of dry chili / h, then  $S = 5.35 - 0.233 = 5.117$ Kg. of chili per hour.

The water evaporated by hour, Aw:

$$Aw S (wS_0 - wS)/Z = 5.117(15.7 - 0.0417)/14 = 5.723$$
Kg. of water exhaust / h.

### **Sensitive heat**

Necessary sensitive heat to heat the chili more the humidity that accompanies her from the ambient temperature until the temperature of the humid bulb of the drying means

$$q_1 S.C_p (T_w - T_1 + S_w.S_0(T_w - T_1))$$

$T_w$  Temperature of the humid bulb of the drying gases = 50 °C, for the conditions of 60 °C of temperature in the serpentine.

$T_1$  = ambient Temperature in the air before the collector = 25 °C

$C_p$  = specific Heat of the chili Kcal/Kg °C = 0.95 and the other defined factors previously.

$$q_1 = 5.117 \times 0.95 (35 - 25) + 5.117 \times 1.5 (35 - 25) = 125.75$$
Kcal/h

### **Latent heat**

Necessary latent heat to evaporate the water eliminated in the dryer to the temperature of the bulb humid, more sensitive heat to heat the vapor of water until the exit temperature:

$$q_2 = S(wS_0 - wS)e + S(wS_0 - wS) \times 0.45 \times (t_2 - T_w)$$

$e$  = latent Heat of vaporization of the water to 35 °C = 275Kcal/h

$t_2$  = Temperature of the exit gases = 40 °C

$$q_2 = 5.117(15.7-0.0417) \times 275 + 5.117(15.7-0.0417) \times 0.45(40 - 35) = 22,214.3$$
Kcal/h

### **Sensitive heat to heat the chili**

Sensitive heat to heat the chili more the residual water from the temperature of the humid bulb until the temperature of exit of the dry chili:

$$q_3 = S.C_p(T_2 - T_w) + S.wS(T_2 - T_w)$$

$T_2$  = Temperature of exit of the dry chili = 40 °C

$$q_3 = 5.117 \times 0.95(40 - 35) + 5.117 \times 0.0417(40 - 35) = 51.87 \text{Kcal/h}$$

### Heat to heat the air

Necessary heat to heat the air together with their humidity from the ambient temperature until the temperature of exit of the dryer:

$$q_4 = Gs(t_2 - t_1)$$

$G$  = Quantity of dry air in Kg. / h

$s$  = humid heat of the air in Kcal/kg. = 0.253Kcal/Kg. of dry air

$t_2$  = Temperature of the gas to the exit of the dryer = 40 °C

$t_1$  = Temperature of entrance of the air = 25 °C

Heats specific molar means			
Temper ature	Cpm H <sub>2</sub> O	Cpm N <sub>2</sub>	Cpm aire
100 – 0 °C	7.9	6.8	6.9
32.2 – 0 °C	7.8	6.7	6.8

Whereas clause the psicrometric chart, the securities of temperature, and the securities of the heats specific molar means, the air humidity was determined to the entrance of the dryer,  $H_1$  and the final humidity from the air to the exit of the drying  $H_2$ ; the securities are:

$$H_1 = 0.011 \text{Kg. of water / Kg. of air}$$

$$H_2 = 0.030 \text{Kg. of water / Kg. of dry air}$$

With the previous data it is the quantity of air for hour that should be introduced to the dryer, what is achieved by means of a balance of water:

$$G(H_2 - H_1) = S(wS_0 - wS)$$

$$G = S(wS_0 - wS)/(H_2 - H_1) = 5.117(15.7 - 0.0417)/(0.030 - 0.011) = 4,217 \text{ kg. of dry air / h}$$

The necessary heat to heat the air together with its humidity from the ambient temperature until the temperature of exit of the dryer is:

$$q_4 = 4,217 \times 0.253(40 - 25) = 16,003.59 \text{Kcal/h}$$

The total heat will be  $q_1 + q_2 + q_3 + q_4 + \text{Losses Kcal/h}$

$$Q_t = 125.3665 + 22,214.3 + 25.372 + 16,003.59 = 38,368.62 \text{Kcal/h}$$

### Efficiency of the dryer

The total heat to make the drying is 38,368.62Kcal/h and the efficiency is calculated for:

$E_f = S(wS_0 - wS)/Q_t$ ; 5.20kwh/m<sup>2</sup> are added - day, what provides a heat of 40,248Kcal/h

Necessary heat to make the drying = it dilutes eliminated per hour x latent heat from the water to 35 °C, and

$$E_f = 5.117(15.7 - 0.0417) \times 275 / 38368.62 = 0.5742$$

Thermal efficiency = 57.42%

The heat lost by radiation and to heat of the trays, doors and blinds:

$$40,248 - 38,368.62 = 1,879.38 \text{Kcal/h}$$

### Calculation of the longitude of the tunnel

For this calculation use of the concept of longitude of transfer units was made.

$$N_t = (t_a - t_2)/(t)m$$

$N_t$  = Number of transfer units.

$t_a$  = Temperature of the gas to the entrance of the dryer = 60 °C

$t_2$  = Temperature of the gas after the transfer of heat, 50 °C, it will be considered a temperature from the dry chili when leaving 40 °C for calculation effect.

$(t)m$  = mediates logarithmic difference of temperatures between the gas and the chili.

$$(t)m = (60 - 25) - (50 - 40) / \ln[(60 - 25)/(50 - 40)] = 20$$

The gas cools down from 60 to 25 °C. The chili warms from 25 to 40 °C

$$N_t = (60 - 25)/20 = 1.75$$

Longitude of a transfer unit:

$$L_t = 19.5(b)(G')^{0.2}$$

$b$  = spaces between drying units and the roof = 0.55ft

$G' = \text{Lb of dry air per hour for ft}^2$

$G = 4,217.02 \text{ Kg. of dry air / h} = 9,277.44 \text{ lb. dry air / h}$

Traverse area of the dryer, intends of 0.91m of high for 0.5m of wide.

$T_o = 2.9857 \times 1.6405 = 4.89 \text{ ft}^2$

$G' = 9,277.44 / 4.89 = 1,897.22 \text{ lb. dry air / ft}^2$

The overall length of the dryer will be:

$L_t = 4.89 \times 0.55 \times (1897.22)^{0.2} = 12.17 \text{ ft} = 3.7 \text{ m}$

The longitude of the tunnel was of 3.7m, for what the measures of the dryer will be: 2.0m of wide, 0.4m of radio interior and 1.165m of external radio, of the camera, to place the fan and the serpentine, an intermediate area will be used equally previously halfway the defined area, the number trays that were managed in number of 36, in total, this is 12 layettes with 3 trays each one.

### **Speed of the movement of air**

The speed of the movement of air is considered appropriate to 0.30m/seg, the operation temperature is understood in the range from 25 to 60 °C. According to the volume of dry air it is enough to obtain the wanted results.

It is sought to give a renovation of air of continuous, without investment process, that is to say, without alternative change of the rotation sense, to obtain a more uniform drying. The fan will be located at a distance of 1.0m of the collector.

### **Type Of Drying Unit**

The dryer consists essentially of a booth or isolated similar cover, it is provided inwardly of a fan that air circulates through a heater; the hot air comes out for a grill of adjustable sheets and it is directed vertically through the perforated trays and the food. The dryer will have regulator to control the speed of entrance of the atmosphere and the wanted quantity of recirculation air. In most of the cases, the tray's dryers operate for lots and

they have the disadvantage of not drying the product evenly, for uniformizar the drying, the rotation of the charolas is required.

### Size

A structure was built (prototype) of an external diameter of 2.33m. and an interior diameter of 0.80m., in the interior, 12 layettes with 3 trays each one of 0.63m<sup>2</sup> c/u. Existing a mass of air inside the dryer of 3.76m<sup>3</sup>.

It had a duct of hot-air entrance which allows that the allowances lose humidity. It also had a duct of exit of air to expel the humidity.

### Materials

The materials employees for the construction of the dryer: angle of ½ x 1/8", bar of ½", black sheet gauges 22, acrylic of 3mm, electric welding, and black painting.

### Requirements Of Solar Energy In The Prototype Of Dryer.

The supply of heat was considered by means of a solar collector, with a capacity of 900 BTU, it settled down that in the region a reception is achieved on the average of 2700 grades-day, same that can provide 5.20KWh/m<sup>2</sup> - day in an atmosphere of temperature of 30 °C, on the average. With it is sought to achieve it a temperature inside the dryer from 45 to 60 °C:

The dryer will work 1400h and the annual consumption of energy will be of 138.25KW, the cost, more indirect expenses, it is of \$0.00

### Condition Climatic Of The Region Of Work.

The chart presents a summary of the registered maximum and minimum temperatures along the experiment as well as the humidity relative maxim and minimum obtained.

<b>Chart 1 Temperature and humidity registered in experimentation</b>			
Temperature in °C	Average	Minimum	Maxim

Interior	34.39	21.00	45.00
After 4 min.	31.61	21.00	37.00
Sheet	34.89	22.00	45.00
Collector	48.63	21.00	65.00
Shade	24.23	13.00	34.00
Minimum per day	11.18	5.90	17.30
Humidity in%	22.25	11.00	43.00

The tests were carried out in days in those that the relative humidity was presented high in the mornings, however very high temperatures were reached in the collector that they favored the time of drying, the minimum temperature presented along the test it was of 11.18 °C for what one can affirm the above-mentioned.

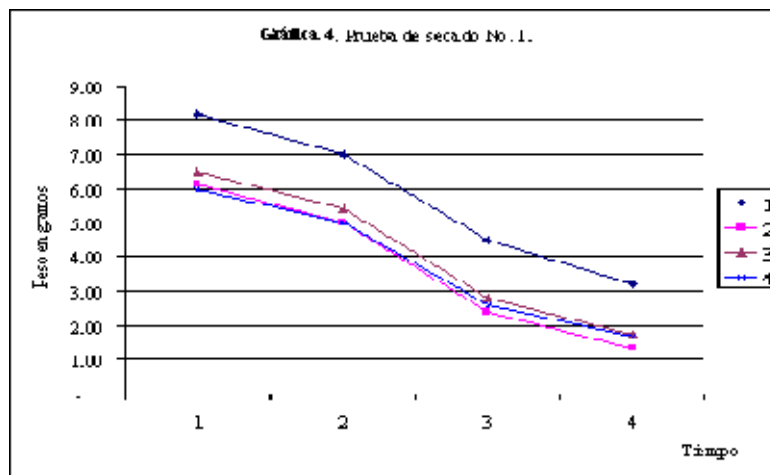
## **RESULTS AND DISCUSSION**

### **Experimentation In The Prototype Of Dryer AND it Curves Of Temperature Of Drying.**

In this prototype, on the experimental base one worked the same as in the preliminary experimentation with different allowances, pumpkin sliced in slices of 3mm of thickness, potatoes in slices of 1cm of thickness and whole chilis (chili goad, green wide chili and red wide chili). The times of drying were diverse, the pumpkins 5 hours, the potatoes, the chili goad and the wide chili 19, 28 and 41 approximate hours respectively. The registered maximum temperature inside the dryer was of 45 °C, and the maximum temperature obtained in the collector it was of 65 °C, the loss of weight on the average was of 83.68%.



It is carried out the drying test No. 1 placing in 24 trays an approximate of 25Kg of pumpkin. In approximately an hour of drying the product loses 16.56% on the average of its weight. The product after having been exposed to this test presents a loss of weight on the average of the chosen witness 71.1% (it figures 1).



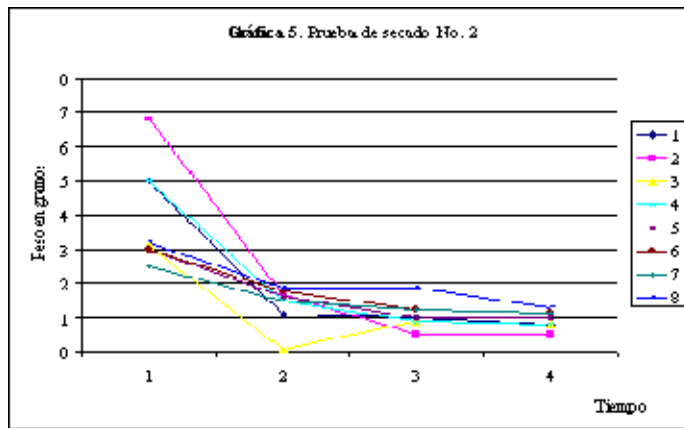
**Source: Tabulation and obtained result graficación.**

**It figures 1 Weight obtained in the drying test No. 1 (25Kg of pumpkin).**



Witness 1	60.98%
Witness 2	77.87%
Witness 3	73.00%
Witness 4	72.50%

Once finished the test the product is taken out and it is weighed, 1.7Kg, concluding that it suffered a loss of weight of 92.44%. The product once dry it presents flavor pleasant and good presentation. The figure 2 sample the variations in weight reached through the test with a temperature, which it went from 38 °C to the 15:00 hrs. Because the one sliced of the product it presents significant variation unequal grades of dehydration they exist. The thin products adhere to the trays.



Source: Tabulation and obtained result

graficación.

It figures 2 Weight registered in drying test No. 1 (25Kg of pumpkin

### Summations

The present document is an oriented investigation result to deepen in the knowledge of the processes of dehydration of fruits, vegetables, fruits, and inclusive meats, shellfish, and in the use of the solar energy. The work is framed inside the area of the engineering of allowances, in particular, on the conservation of allowances for dehydration.

With the work two fundamental objectives are sought. On one hand, to contribute to the decrease of losses of fruits that they take place in the State of Durango and in the country; such losses settle down for damages and decomposition. On the other hand, to contribute work of team design that allows to make use of the solar energy, looking for with it to diminish the consumption of energy conventional. This last it is to avoid the alteration of the environment and to lower the costs of operation of equipment of dehydration.

The design, development, construction and operation of the prototype, settle down that it is promissory, for development of a formal project to future, it notices the production potential in approximately of 60 to 250 Kg, depending on the product. One worked daily during six hours in which it took the temperature every two hours. Depending from the material type to dry off and the presentation, they occurred diverse times of drying. The pumpkins that were exposed to drying took in drying off 5 hours, losing 93.18% of their weight. The chili goad took 27 hours 50 minutes, the chili wide 41 hours 30 minutes, in weight a lost of 50% was observed, in the chili goad, and the wide chili. And the potatoes 18 hours 50 minutes, the lost weight was also of 50%. The reached maximum temperature was of 45 °C inside the dryer, as for the collector, the maximum temperature was of 65 °C. no-pollution, and it doesn't use fuel. The test is carried out in one of the months in the one that the solar radiation is low for what the obtained results are considered advantageous.

Some considerations to carry out the design of the deshidratador, depend on the quantity and material type that it must dry off for hour and the exposed surfaces of the product for the case, time of subjection to temperature, size of the products, and of the quantity of

heat that can be liberated without being used, joined to the duration of the materials that they are used they will indicate that the type and size of the deshidratador is more correct.

Fixing the weight, the exposed area and the size of the pieces that warm, you can specify the area of the deshidratador, including the longitude of the same one.

Presently work, the securities of the variables of interest, were gathered with the aid of students that like human resources they will be formed, these variables were, barometric pressure, temperature in dry and humid bulb, relative humidity, pluvial precipitation, heatstroke, solar radiation, address and speed of the wind, the obtained securities represent some irregularity, to have considered the average of the whole time of study, generated in daily, and cumulative form and averaging monthly

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## **THE GLOBAL ENTREPRENEURIAL MOVEMENT IN MEXICO**

Alejandra Salas-Porras

Universidad Nacional Autonoma de Mexico

Several scholars have advanced the thesis that in response to the economic crises of the seventies business and probusiness forces and institutions started a worldwide ideological, political and social movement in order to reduce government intervention in the economy, legitimate business activities and private property, break or weaken corporatist practices and institutions and revitalize the individualist facets of the liberal doctrine *vis à vis* the communitarian ones, the private with respect to the public rights.<sup>xxx</sup> The movement was pushed forward by public officials --as happened in the US and UK under the lead of Ronald Reagan and Margaret Thatcher, respectively-- and by

private actors, gradually incorporating an increasingly greater number of forces and institutions.

This movement has been approached from different theoretical perspectives, which in addition focus attention on specific aspects of the business response, according to the country or region in question. Thus, the focus of attention has been the programme of action, the institutions, groups and/or individuals involved in the movement, which vary greatly depending on the country and phase,<sup>xxxii</sup> the ideological components and justifications;<sup>xxxiii</sup> the agenda of the entrepreneurial movement and the forces committed to carry forward the programme of action; the attack on corporatism and the Welfare State

In particular, Álvarez Álvarez (1991) highlights entrepreneurship --that is, the economic, social and ideological potential of small enterprises and entrepreneurs-- as the most important force ("idea-force") behind the campaign to legitimate entrepreneurial interests in the eighties because it provides a democratic image of businessmen, the image they prefer to be identified with. He characterizes this business offensive as an 'entrepreneurship movement', although he admits that it is a top-down movement, i.e. one initiated not by small entrepreneurs but rather by large entrepreneurs or public officials depending on the country. He accepts, moreover, that large entrepreneurs have benefited the most from the reforms achieved in the political institutions.

Marchak (1991) offers, in turn, a comprehensive interpretation of the global entrepreneurial offensive, which in her view created the ideological conditions to be able to undertake the restructuring of the global economy. The main purpose of the political movement and, in particular, of the New Right ideological discourse embedded in it, was to discredit and undermine the arguments supporting Keynesian governments and Welfare States and, simultaneously, to underpin individualist, utilitarian and libertarian contentions that set in motion the New Right agenda, ultimately favouring global corporate interests. Economies were liberalised and deregulated, state enterprises were

privatised, collective bargaining, unions and labour confederations weakened, taxes reduced, and so forth.

This paper argues that all these forces, institutions and agents generated a social movement of global scope, which gradually engaged a larger number of business and probusiness institutions, intellectuals and other actors in many countries in a programme of action, which followed very similar guidelines.<sup>xxxiii</sup> The movement took hold and spread at different pace in different countries because, on one hand, the intensity of the economic, political and legitimacy crisis was different and, on the other hand, the strength and diversity of organizations controlled by entrepreneurs varied too. Certain lines of the programme may have become, consequently, specially relevant and urgent in one country whereas in another they may have been completely irrelevant. In Mexico and Bolivia, for example, the purpose of dignifying the image and role of entrepreneurs in society was paramount given a widespread negative image,<sup>xxxiv</sup> while in Spain and the UK not so much effort was geared in this direction (Alvarez Alvarez, 1991). Privatisation has been a top priority in the UK, France and Mexico, whereas in the US the movement has focused greater attention on public spending cuts.

Although some authors (Sztompka, 1993:274-275) discard the possibility of social movements promoted and advanced by dominant forces from above, I consider this massive offensive of the eighties a social movement for several reasons: it incorporates loosely articulated forces and actors of different degree of structuration who nevertheless share common goals and gradually agree on a basic programme of action; the programme begins in a rather spontaneous manner, evolves around its main guidelines on the basis not of a centralized planning agency but rather of growing interactions that increasingly focus collective efforts on the most urgent changes; it undergoes several stages before it matures and achieves structural reforms: collective awareness and perception of disadvantage and risk, emergence of charismatic leaders,<sup>xxxv</sup> mobilization, organisation, confrontation and negotiation; and it includes and furthers the interests of rather heterogenous groups, although in a quite hierarchical manner.

Notwithstanding its privileged position in society, the entrepreneurial class in Mexico is very heterogeneous allowing for a broad participation --often though not always induced-- of small and middle size entrepreneurs who have become disaffected with the state. Entrepreneurial actors with different levels of institutional structuration

(global, macro, meso and micro) become increasingly involved in the movement in order to expand their control over cultural, organizational and political resources; to unify entrepreneurs and entrepreneurial organizations around a common strategy that would enhance their role in society; shift policy metapreferences from protectionism to liberalism; and reverse in their favour the correlation of forces.

Additionally, entrepreneurs more or less deliberately distanced themselves from the state to contest policies and force structural reform from a more autonomous position. The liberal and libertarian demands evince a confrontation not only with subordinate classes but mainly with the state which they perceive has encroached too deeply in the economy and civic society. "Thus, on one side we have the state and on the other the longing for liberation." (Touraine, 1981:1).<sup>xxxvi</sup>

The global scope of the movement is justified in terms of: (i) the universality of the traditions of thought inspiring it: on one hand, the ethical and realist strands of liberalism which are universal, at least in the Western World. In Mexico these traditions of thought are embedded, respectively, in the Social Christian and neoliberal doctrines; (2) the multiple connections of the institutions and actors involved in the movement with their counterparts around the world which intensify the flow of information, knowledge and collective reflexivity; (3) the strategies employed to change the correlation of forces in favour of entrepreneurs and against the state and the labour movement, which have become worldwide recipes, such as liberalisation, privatisation, deregulation, state-slimming, etc.); and (4) the maturity of the institutions involved in the movement, i.e., the strategic capacity to plan, articulate, set in motion and accomplish a programme of action.

### **Business traditions of thought in Mexico**

Two global traditions of thought, deeply rooted in Mexican business and pro-business organizations inspire this movement, the neoliberal and the Social Christian doctrines, representing, respectively, the realist and ethical strands of liberalism. The principles guiding the former are free market for economic relations, pluralism and, in its most extreme forms, anti-statism for political relations and individualism for social relations. The Social Christian doctrine is structured around the principles of the social market economy (or market economy with a social content), subsidiary and solidarity, which should guide the economic, political and social relations, respectively.

There is a great deal of overlapping between these two doctrines. However, the main differences are: (1) the religious and non-religious orientation of the Social Christian and neoliberal doctrines, respectively; (2) the former advocates a market economy with social content. The neoliberal doctrine, on the other hand, defends the free market *tout court* (that is, no actor should intervene or distort the neutral character of the market, *the invisible hand*); (3) in the Social Christian doctrine society is held together by communitarian values, norms and beliefs, whereas neoliberals tend to argue that it is held together by conflict and power (even force); (4) the Social Christian doctrine is the ideology of Christian Democratic Parties, whereas the neoliberal ideology tends to be associated to New Right or conservative parties and forces within right-wing parties.

Social liberalism represents the state, secular version of ethical liberalism, a version more concerned with the principle of equality of opportunity and therefore less appealing to business interests. The Social Christian doctrine which represents a modern, entrepreneurial, religious version of ethical liberalism<sup>xxxvii</sup> is an elitist version, more concerned with the principle of solidarity, rather than equality, and with certain moral, conservative, values regarding the family and education which strengthen community ties. Given its commitment to solidarity, it supports certain social policies built on welfarist principles. Although on a rather discretionary basis, its support for welfare policies contrasts with extreme neoliberal realist positions which consider that welfare policies should disappear because they pervert market mechanisms.

While the Social Christian doctrine relies on a unified body of ideas and principles which make explicit ethical assumptions and communitarian norms, in contrast, there is a good deal of debate as to what the essence of neoliberalism is. Neoliberal pretensions of absolute neutrality with respect to the market and to different conceptions of good have elicited a wide variety of contradictory interpretations and doctrinarian expressions, as several author points out.<sup>xxxviii</sup> Furthermore, liberal practices and concepts have been internalised in a different way in different countries making it still more difficult to agree on a basic definition of neoliberalism. Consequently, while it is relatively easy to spot institutions and actors embracing Social Christian principles, it is more difficult to identify neoliberal institutions and arguments.

In general terms, neoliberalism in Mexico appears as a mix of blunt marketization strategies with extreme anti-statist positions which can paradoxically become



authoritarian when it comes to social and political stability. Libertarianism (as an extreme form of anti-statism) and New Right conservative influences are also present in the Mexican entrepreneurial movement but they usually reinforce principles, guidelines and actions derived or explicitly recommended by neoliberal or Social Christian institutions and actors.

The organizational origins of the Social Christian doctrine in Mexico can be traced to the foundation of the Social Union of Mexican Entrepreneurs (USEM, after its Spanish initials) and several academic institutions founded by the Spanish religious order, OPUS DEI: IPADE (founded in 1967) which is modelled on the Spanish Institute of High Enterprise Studies (IESE) and Universidad Panamericana.

USEM is the most important Social Christian institution which has transmitted, adapted and re-elaborated the principles of this doctrine in the light of the Mexican experience and particular problems. It was founded in 1957 to undertake a programme of entrepreneurial education, the main purposes of which consisted in reappraising and dignifying the image of entrepreneurs in society, promoting leadership and a greater commitment of entrepreneurs to social and political problems.

Contrary to neoliberal institutions that act in a more spontaneous and aggressive way, the USEM has gradually and quietly increased the scope and impact of its educational activities, generating a multiplying effect over a far-reaching network of institutions and preparing the ground for future discussions about how to conduct the reform of the state and society.<sup>xxix</sup> The structure of USEM's network (see Graph) reveals, on one hand, the key contribution of certain members (notably Lorenzo Servitje, founder, twice president and widely acknowledged as the most committed member of the association) and, on the other hand, that it literally covers all the realms of entrepreneurial social and political action. It is well connected to the corporate network (Salas-Porrás, 1997), where Lorenzo Servitje holds 4 directorships and Juan Sánchez Navarro 6; to Desem whose board is deliberately manned by members of USEM; and, indirectly, to an extensive web of universities and academic institutions that implement Desem's programmes of entrepreneurial education among the young (in ITESM, ITAM, Iberoamericana, UNAM and many secondary and primary schools). The most outstanding members of USEM have founded and presided over numerous boards of social and academic institutions.<sup>xl</sup>

Thus, even without a political arm, which in several European and Latin American countries is the Christian Democratic Party,<sup>xli</sup> the USEM has permeated by the 1990s a great variety of business interest associations, corporatist or not, probusiness NGOs, civic associations, state agencies and political parties (both the PAN and the PRI) with the Social Christian principles or with a more ethical vision of liberalism, the state and society.

In contrast, the neoliberal tradition is not as well structured, neither from the institutional nor from the doctrinarian points of views. No institution reelaborates systematically on the theory, trajectory and doctrinarian principles of neoliberalism (Whitehead, 1997). Only those principles associated to the neutral character of the market are adopted and developed. The principles of neutrality with respect to different conceptions of good and with respect to the law -basic to most strands of realist liberalism, including Hayek's neoliberalism (Bellamy, 1992:219)- are neglected mutilating and undercutting the precept on the basis of which democratic laws, institutions, arrangements, rules and regulations have been built throughout Western democracies. Property rights are, thus underscored at the expense of other civil and social rights. In addition, it is difficult to relate the neoliberal doctrine to specific institutions, because the image of 'all against all', of having 'one's own way' at whatever price is not one Mexican entrepreneurs like to be explicitly identified with. One must look therefore at the logic of arguments and struggles, which often make actors, move from neoliberal to more ethical positions. The picture is made very complex given a great feedback, cross-fertilization, flow and movement of ideas between institutions and actors committed to Social Christian and neoliberal principles.

Consequently, there is no sharp division between the two doctrines. Frequently one institution or representative holds a typically realist opinion on certain issues and an ethical one on others (for example, on state enterprises and education). Often, too, views swing from one to the other according to the situation (state spending, the opening-up of the economy). And it also happens -as has been noted by authors in other countries--<sup>xlii</sup> that ideological positions can be contradictory and inconsistent.

### **Stages of the entrepreneurial movement in Mexico**

The global entrepreneurial movement evolves with different speed and intensity according to the specific historical conditions of different regions and countries and, in particular, according to the motives prompting entrepreneurs to participate in politics and

the variety of resources which they control. In Mexico the movement has undergone two stages. In the first stage, which extended throughout the eighties, both Social Christian and neoliberal organizations and agents shared a common program of action which aimed at diminishing the role of the state in society and highlighting that of entrepreneurs. This meant privatising state enterprises, cutting public expenses, deregulating the economy, supporting business interest associations, pro-business NGOs and other autonomous pluralist interest organizations while disarticulating corporatist, state-sponsored and/or controlled labour associations.

In the seventies many business associations expressed increasing discontent about the overwhelming presence of the state in the economy. The conflictual relations with Luis Echeverría Alvarez and José López Portillo, the populist and anti-business rhetoric of these presidents and other public officials, and a decaying social image of entrepreneurs in society at large (Maxfield, 1990; Camp, 1989:39-53) urged their representatives to strengthen and diversify organizational resources. New institutions were founded, the old ones became more aggressive, connections with similar foreign institutions proliferated accelerating a revision and reappraisal of their strategies and action, and a greater specialization was promoted (Montesinos, 1992:112-113). All this occurred in the context of discussions and debates that tended to ferment feelings among entrepreneurs of common interest, discontent, resistance and reaction.

It was, however, the debt crisis which lasted from the end of 1981 to 1983 and especially the nationalization of the banks in 1982 that was responsible for the rapid spread of a sense of danger and urgency, prompting all those organizations not already in one way or another engaged in the movement to find a role to play. And since the spectrum of institutional resources controlled by entrepreneurs had become rich and diversified --as can be seen in the Graph. --, the movement acquired great momentum very fast. The challenge was not only to "push back the frontiers of the state", as in Britain and many other countries, but to change a regime which at this point most entrepreneurial forces perceived as dangerous for not being sufficiently committed to private enterprise and property rights (Alvárez Alvárez, 1991:234-236; Luna et. al. 1987; Elizondo, 1992).

A great offensive was launched covering a wide range of political and social fronts. The business interest associations concentrated their action in policy choices, reinforcing and modernizing their representation with respect to the state and labour

(Salas-Porrás, 1998). The process of privatisation, liberalisation and deregulation were negotiated with the help of new corporatist devices such as the Social Pact, commissions, new and more effective channels of communication and other mechanisms of consultation and strategic policy making think tanks.

Once the objectives of the first stage of the movement had been by and large accomplished. That is, as the state retreated considerably from the economy and the system of interest representation, leaving economic and social forces to confront one another with their own resources and much less mediation from the state --whether in the form of economic direct participation, regulation or sanctioning of interest representation--, the forces of individual liberalism, of 'having one's way', were unfettered. And as all these trends intensify, the debate between the neoliberal and Social Christian options of conceiving the social order becomes increasingly manifest, not only in events, seminars and publications promoted by the associations which espouse these doctrines, but by the business media in general. Several critical circumstances undoubtedly contributed to bring to the fore first in 1994-95 and again in 2000-2001 the problems of social welfare and the model of society, state and liberalism to promote and construct: an ethical liberalism which privileges social cohesion, solidarity and communitarian shared values as the basis and conditions of social stability (which is the liberalism characteristic of the Social Christian Doctrine); or a realist liberalism which considers that power is the only resource to guarantee stability in a society driven by competition and individual impulses (savage capitalism versus capitalism with a human face).

Stability in 1994 was very precarious: the pace of growth fell substantially, unemployment increased, an uprising started in the state of Chiapas, the presidential

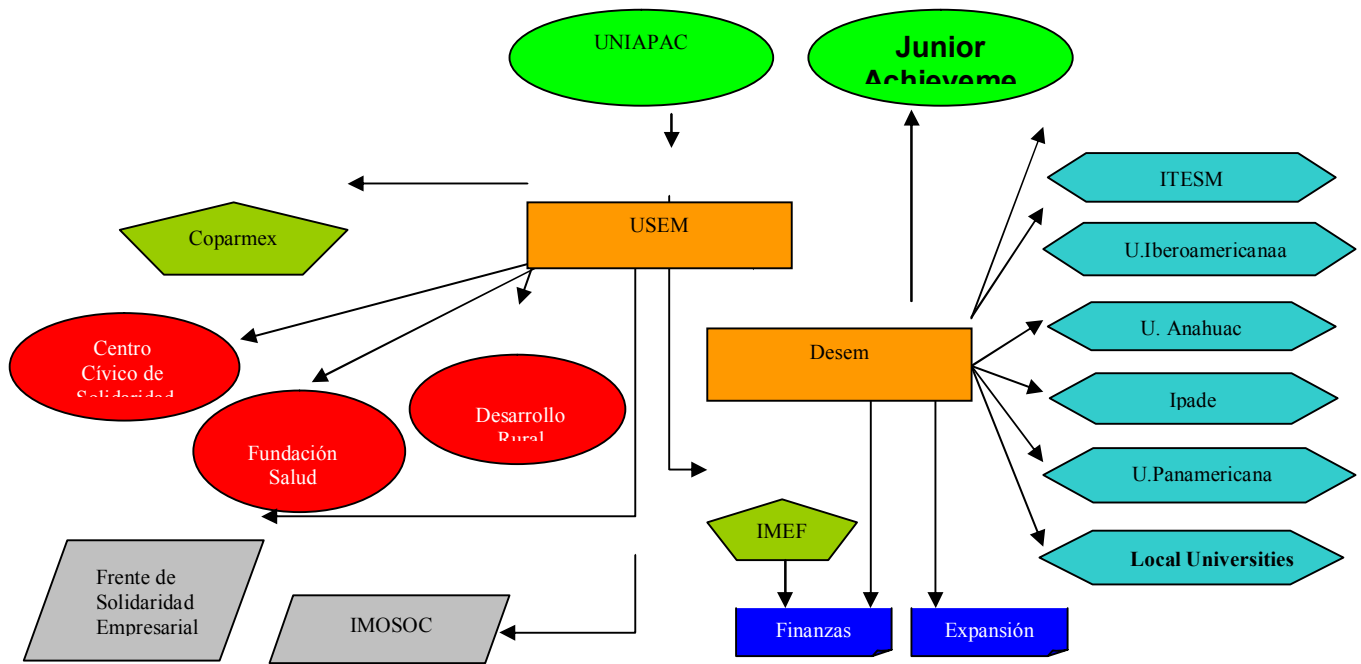
elections generated not only a bitter debate but profound contradictions within the official party which provoked two political assassinations, a wave of corruption and corporate frauds was aired throughout the year revealing irregularities and shortcomings in the process of privatisation, and the devaluation of December 1994 deepened the financial crises and triggered one of the most profound, harmful and destructive recessions in the Mexican history. Each of these events polarised discussions and positions particularly around the options and solutions offered and promoted by associations of more neoliberal or Social Christian inclination. And again between 2000 and 2001 several events revived the political debate and positions aligned around these ideological options: the electoral campaign, the breakdown of the PRI as a state party and the process of democratic transition it unleashed, including the expectations to end the conflict in Chiapas.

Specialization, division of labour and ideological preference of business institutions  
Not all the actors involved in the entrepreneurial movement advance the program of action in the same direction. Whereas some institutions put more emphasis in transforming the image and highlighting the role of entrepreneurs in society, other stress a more reduced role of the state in the economy, and in particular privatisation of state enterprises, public spending cuts across the board and privatisation of institutions governing the economy.

The Graph shows that even if you leave out the complex system of organizations which specialize in the representation of business interests, on the meso and macro level (Salas-Porrás, 1998), the network of institutions controlled by entrepreneurs is very rich, covering a wide range of activities: formal and informal education, promotion of civic and electoral participation, social welfare, cultural and charitable responsibilities. Although most of these institutions started out of an independent initiative of a group of entrepreneurs, they have become closely intertwined, particularly around certain issues, the relevance of which has varied greatly in the past two decades.

Thus, USEM, Desem, ITESM, Iberoamericana and other private universities have been founded separately and independently with quite different purposes and agendas by entrepreneurs or business representatives sharing little or no overlapping economic interests. In the past two decades, however, they tend to converge around the task of reviving the spirit of free enterprise and dignifying the image of entrepreneurs. Desem has been the key institution articulating, discovering the potential and making good use of the wide array of organizational resources of universities controlled by entrepreneurs.

## **Network of Social Christian Associations**



Business Interest Associations  
 Social NGOs  
 Political Associations

Informal Educational Associations (IEA)  
 Journals

International IEA  
 Universities

### **Network Desem-Academic Institutions**

Desarrollo Empresarial, A.C. was created in 1974 to bring the programmes of informal education developed and implemented by its parent, Junior Achievement, throughout the world.<sup>xliii</sup> The programme, which in Mexico adopted the name 'Jóvenes Emprendedores' (Young Entrepreneurs) was first implemented in secondary schools and from 1985 onwards in universities. By 1994 more than 40,000 young people had taken the programme in Mexico, conducted and supervised by one of the 9 branches of Desem.

The contribution of Desem to the development of the movement has been particularly outstanding in the area of changing the image of entrepreneurs in society, legitimising their action and developing the spirit of free enterprise. Additionally, the evolution of this institution reflects rather faithfully the changes of the movement in the content of their academic courses and other activities and even at the level of the composition of the board, the members of which have gradually become well known Social Christian entrepreneurs, such as Lorenzo Servitje and Andrés Marcelo Sada.

### **Conclusions**

The entrepreneurial political offensive represents the ideological response and justification to further and deepen the integration of regions and countries in the global economy. However, as Marchak (1991) points out, it is not merely an ideological representation of the global process in its different dimensions in the typical interpretation of Marx's concept of superstructure. Instead, and above all, it carries the global project forward by providing an ideological framework within which the neoliberal proposals can be presented as the only road to development and prosperity.

The ideological content differs greatly depending on the country because conservative and liberal forces draw on both a national and a global pool of intellectual currents, policy paradigms and historic experiences that are then reelaborated and reinterpreted in the light of specific national needs and constraints.

The task of mapping the ideological forces and institutions involved in the movement becomes particularly difficult in Mexico for several reasons: (1) actors and institutions may adhere to ethical principles on some issues and be realist on others; (2) their position with respect to the same issue may change considerably in time (public spending, is a typical case); (3) libertarianism and conservatism, though not very well structured as ideological traditions, raise moral issues that nuance or influence the general outlook of institutions and actors making still more difficult the effort of classification; and (4) the institutional framework governing the economy and the

Mexican Constitution itself are permeated by both the ethical and realist strands of liberalism with some taints of the socialist tradition.

All this notwithstanding, in general terms liberal traditions (ethical and realist) prevail over conservative ones, although we observe a rather different mix of ethical and realist values for historic and contemporary reasons. Liberal traditions emerged much later in Mexico --the XIX Century-- confronting and in response to problems of development. This fact explains the strength and appeal of the ethical strand of liberalism, whether in the secular form of social liberalism, originally fashioned by Juárez and the intellectuals participating in the movement of Reform in the second half of the Nineteenth Century and recently re-fashioned by the PRI; in the form of Mixed Economy or the Social Christian Doctrine. The latter, however, represents a considerably more elitist, confessional, version of ethical liberalism.

On the other hand, economic liberalism (as the most important interpretation of realist liberalism in Mexico) has traditionally remained a resort for both entrepreneurs and politicians, except for the Porfiriato and the 1980s when it has been placed at the core of the economic strategy. Entrepreneurs usually wield realist arguments and principles to check state participation in the economy, cut public deficit, reduce and control state regulation. Politicians used realist liberal arguments to modernize the economy, liberalise and promote foreign investment and trade.

Libertarian, anti-statist, demands have gained momentum particularly among intellectuals concerned with a state that hinders and impairs not only economic but civic, social and political participation and development. Libertarian currents have also influenced entrepreneurial organizations (Coparmex) and have strengthened the movement's programme of action, particularly with respect to the privatisation of state enterprises, the corporatist system, welfare and civic institutions, in general; highlighting the role of entrepreneurs in society and indeed legitimising small and big interests alike.

The entrepreneurial movement in Mexico undergoes two stages. In the first stage the forces of the market were liberated by a programme of action subscribed by institutions of both neoliberal and Social Christian bent. During this first stage business corporatist associations of national, regional and sectoral scope played the most important role in advancing the program of action. To push back the frontiers of the state they had to deploy a systematic offensive that would weaken and eventually withdraw resistance from representatives of the protectionist/nationalist project in the private and



public sectors. Institutions committed to the Social Christian doctrine supported this offensive on the ideological front and gradually moved from the rear- to the avant-garde. As they move into the second stage the main concern of interest associations becomes the rearticulation of a system of economic regulation with a much greater sway of private institutions, corporatist or not (depending on the policy in question) and, increasingly, the formulation of a business code of ethics.

The general objective of the second and present stage, which consists in the redefinition of the vision of state and society, engages another set of actors and institutions. Around these issues, contradictions surface once more between neoliberal and Social Christian forces and organizations. Whereas, the neoliberal project advocates the least possible intervention of the state in the economy and in the corporatist institutions, the individual as the driving force of development and a Hobbesian conception of the state to enforce law and order, the Social Christian project considers instead a market economy with a social orientation, a subsidiarian and solidarist state (that is, savage capitalism and a state of a Hobbesian type versus a social market economy and a Hegelian state).

In general terms, the Social Christian doctrine offers a much better articulated and coherent social project with educational programmes and activities to develop, inform, educate and shape politicians and entrepreneurs. Consequently, it has permeated many business and probusiness associations, corporations, civic, political and social NGOs and even traditional parties with their vision of state and society. Though very often you find contradictions and inconsistencies between discourse and business practices at all levels, it offers a project that reveals a class much less dependent on the state to look after and promote its long-term interests.

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## **NOTES**

<sup>1</sup> Among others, see: Useem, 1984 and 1993; Jackson and Schendelen, 1987; Álvarez Álvarez, 1991; Marchak, 1991; Gobeyn, 1992; Cockett, 1994; Sklair, 1997

<sup>1</sup> See: Useem (1984 and 1993) Gobeyn (1992) Jackson and Schendelen, (1987).

<sup>1</sup> Block et al (1987), Hayes (1994) Álvarez and Álvarez, (1991).

<sup>1</sup> Sklair (1997) examines the role played by different global forces and in particular the transnational capitalist class in the transformation of the global project.

<sup>1</sup> Conaghan (1995) argues that business interest groups in Bolivia promoted a campaign to expand neoliberal economic ideas and a more positive public image of businessmen. And Camp (1989:39-53) points out that in Mexico entrepreneurs have a poor image for several reasons: they are often blamed for the persistence of social inequalities;

they show a sense of inferiority with respect to foreign businessmen; intellectuals have portrayed them as "ruthless money-grubbing opportunists"; the government uses them as scapegoats of wrongful policies and profits from contradictions between the public and private sector to give credibility to its populist rhetoric.

<sup>1</sup> Manuel Clouthier is the clearest example of a representative of ethical liberalism involved in political activities. However, Lorenzo Servitje is a model among ethical liberals too.

<sup>1</sup> The autonomy and initiative of national bourgeoisies in LDCs has been greatly impaired by an oversized state which, in the first place, paradoxically promoted their growth and to a certain extent even their own existence, sponsored their organisation and guaranteed their reproduction. See: Camp (1989:34, 251) and Story (1986) for this contradictory relation between the state and the national bourgeoisie in Mexico.

<sup>1</sup> Christian Democracy emerged as an alternative to both communism and liberalism, under the auspices of the Catholic Church (González, 1995). Even though it claimed to represent an alternative to liberalism, it has defended some of its basic principles, particularly freedom and private property. On the basis of the experience of the Christian Democracy in the Rhine countries, the Social Christian doctrine representing the ideology of Christian Democratic parties, offers an alternative to the 'savage capitalism' promoted by neoliberalism, a more humane and ethical capitalism (Albert, 1993).

<sup>1</sup> See: Bellamy (1992), Marchak (1991), Block et al (1987), Hayes (1994) and Gray (1993)

<sup>1</sup> In 1993 around 1,000 entrepreneurs were affiliated to USEM (either executives or stockholders), all of whom had to take a course on 'Social Initiation' that focuses on the application of Social Christian principles to the performance of the firm. Those corporations more concerned about the human factor tend to participate more actively in the activities of USEM. Membership is individual, although in the great majority of cases the enterprises pay membership fees.

<sup>1</sup> Lorenzo Servitje, for example, a member of CMHN until recently, has been president of the Centre for Social Studies (CES, affiliate of CCE), Rural Development (Asociación Mexicana para el Desarrollo Rural, A.C.) and the National Council of Publicity (CNP). Juan Sánchez Navarro, another prominent member of USEM, presided over the CCE in 1975, Concamin (1962-64), Concanaco (1957-58) and CMHN in 1996.

<sup>1</sup> There is a strong Jacobin tradition in Mexican politics, which the state has deliberately encouraged. Although reforms have been recently introduced to return certain civic rights to the Catholic Church, it has not yet been explicitly recognized and sanctioned as a political force.

<sup>1</sup> See Hayes (1994) for the case of the UK; and Block et al (1987) for the US. See Marchak (1991:94), Gray (1993) for inconsistencies in the New Right and Libertarian ideologies, respectively.

<sup>1</sup> Junior Achievement International was created in 1919 to "introduce children and young people all over the world to economic and social activities in general, contributing in this way to a gradual integration to these activities. Presently, Junior Achievement and its affiliates implement its programs in more than 60 countries." (Sistema Desem, 1993:1)

## **NEW ACCOUNTING STANDARDS FOR SOCIAL SECURITY: SFFAS NO. 17**

**H. S. Allen Shin and Randall Bandura  
Frostburg State University, USA**

### **Introduction**

In August 1999, the Federal Accounting Standards Advisory Board (FASAB) issued the Statements of Federal Financial Accounting Standards (SFFAS) No. 17, *Accounting for Social Insurance*, as the new accounting standards for U. S. federal social insurance programs to be effective for reporting periods that begin after September 30, 1999. Therefore, for example, the 2001 Social Security Trust Report for the fiscal year that ended on September 30, 2000 should be reported under the new accounting standards.

The purpose of the SFFAS No. 17 is to establish standards for reporting information on social insurance programs that will assist users in evaluating operations and aid in assessing the government's financial conditions and the sufficiency of future budgetary resources to sustain program services and meet obligations as they come due. There are five federal social insurance programs in the U.S. that are subject to the SFFAS No. 17 standards: Old-Age, Survivors, and Disability Insurance (OASDI or "Social Security"), Hospital Insurance (HI) and Supplementary Medical Insurance (SMI), known collectively as "Medicare," Railroad Retirement benefits, Black Lung benefits, and Unemployment Insurance (UI) for the general public. The SFFAS No. 17 is applicable only to these federal social insurance programs.

SFFAS No. 17 was a very significant development in accounting for social insurance, particularly for Social Security in the United States. SFFAS No. 17 can become a protocol for accounting standards for national pension plans in many countries that feature defined benefit types of social insurance, because few countries established separate accounting standards for their national pension plans. In this paper, we discuss the important features of the SFFAS No. 17.

### **Background of the Accounting for Social Insurance**

Since the 1950s, there have been debates in the accounting community about how to apply accrual concepts in measuring costs and liabilities resulting from defined benefit type programs. Prior to the SFFAS No. 17, Social Security (Old-Age, Survivors, and Disability Insurance: OASDI) and other federal social insurance programs often

used accounting standards similar to FASB Statement of Financial Accounting Standards (SFAS) No. 87, *Employer's Accounting for Pensions*, and followed accounting standards in other FASAB statements such as SFFAS No. 5, *Accounting for Liabilities of the Federal Government*, and SFFAS No. 8, *Supplementary Stewardship Reporting*.

In adopting the SFFAS No. 17, the FASAB agreed that liabilities from federal social insurance programs should be considered as non-exchange transactions obligations, different from exchange transactions obligations that are subject to SFFAS No. 5. In an exchange transaction, a liability is recognized when one party receives goods or services in return for a promise to provide money or other resources in the future. However, for a non-exchange transaction, a liability is recognized for any unpaid amounts due and payable as of the reporting date, including estimates of claims incurred but not yet reported.

The FASAB also required the use of the open group method in estimating liabilities of federal social insurance programs, while SFAS No. 87 and Government Accounting Standards Board (GASB) No. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contributions Plans*, were based on the closed group method of estimation. In an open group method, liabilities (and surpluses) are estimated as the actuarial present values (APV) of future benefits for and future contributions and tax income from or on behalf of all current and future participants during the projection period normally used by the programs. For example, the OASDI (i.e., Social Security) program uses a 75-year projection period. Meanwhile, the closed group measure represents the actuarial net present value of (a) the future benefit payments to current participants, (b) future contributions to be made by them and their employers, and (c) the accumulated excess of cash receipts over cash disbursements within the social insurance program represented by fund balance at the valuation date.

### **Key Accounting and Reporting Standards of the SFFAS No. 17**

**Expense & Liability Recognition:** The expense recognized for the reporting period should be the benefits paid during the reporting period plus any increase (or less any decrease) in the liability from the end of the prior period to the end of the current period. The liability should be social insurance benefits due and payable to or on behalf of beneficiaries at the end of the reporting period, including claims incurred but not reported.

**Required Supplementary Stewardship Information (RSSI):** The entity responsible for the social insurance program should include in its financial report, as required supplementary stewardship information (RSSI), a clear and concise description of the program, how it is financed, how benefits are calculated, and its financial and actuarial status. The description should include a discussion of the long-term sustainability and financial condition of the program. A display should illustrate and the discussion should explain the trend revealed in the data. The entity should consider both narrative and graphic presentations. The projections and estimates used should be based on the entity's best estimates of demographic and economic assumptions, taking each factor individually and incorporating future changes mandated by current law. Significant assumptions should be disclosed.

RSSI should include the following measures and data:

**(1) Cashflow Projections** – Projections of cashflow for those persons who are participating or eventually will participate in the program as contributors (“total cash inflow”) or beneficiaries (“total cash outflow”) during a projection period sufficient to illustrate long-term sustainability. For example, traditionally the Social Security program has used a projection period of 10 years for relatively short-term and 75 years for long-term projections. The narrative accompanying the cashflow data should include identification of any year or years during the projection period when cash outflow exceeds inflow (the “cross-over points”), and an explanation of the significance of the crossover points. The actuarial estimate should also be provided as a percentage of taxable payroll and Gross Domestic Product (GDP).

Social Security Administration’s (SSA’s) Performance and Accountability Report for FY2000 (“SSA’s 2000 Report”) provides actuarial estimates of OASDI annual income, income excluding interest, and expenditures for 2000-2037 in nominal dollars. The estimates are for the open group population, all persons projected to participate in the OASDI program as covered workers or beneficiaries, or both, during that period. Thus, the estimates include payments from, and on behalf of, workers who will enter covered employment during the period as well as those already in covered employment at the beginning of that period. They also include expenditures made to, and on behalf of, such workers during that period.

SSA’s 2000 Report shows, estimated expenditures start to exceed income (including interest) in 2025. This occurs because of a variety of factors including the

retirement of the “baby boom” generation, the relatively small number of people born during the subsequent period of low birth rates, and the projected increases in life expectancy, which increase the average number of years of receiving benefits relative to the average number of years of paying taxes. Estimated expenditures start to exceed income excluding interest even earlier, in 2015. At that time, to meet all OASDI expenditures on a timely basis, the trust funds would begin to redeem assets (Treasury securities). To finance this redemption, the government would have to increase its borrowing from the public, raise taxes (other than OASDI payroll taxes), and/or reduce expenditures (other than OASDI expenditures). The government, of course, could avert this redemption by changing the law to increase OASDI taxes and/or reduce OASDI benefits.

**(2) Ratio of Contributors to Beneficiaries** – With respect to the OASDI and HI programs, the ratio of the number of contributors to the number of beneficiaries (commonly called the "dependency ratio") during the same projection period as for cashflow projections (e.g., 75 years), using the program managers' best estimate.

SSA’s 2000 Report provides the estimated number of covered workers per OASDI beneficiary using the Trustees’ intermediate assumptions. As defined by the Trustees, covered workers are persons having earnings creditable for OASDI purposes on the basis of services for wages in covered employment and/or on the basis of receipts from covered self-employment. The estimated number of workers per beneficiary will decline from 3.4 in 1999 to 2.1 in 2037.

**(3) Actuarial Present Values (APV)** – The actuarial present value of future contributions and tax income during the projection period should be subtracted from the actuarial present value of future expenditures for the projection period related to benefit payments to derive a total excess of future benefit payments over future contributions and tax income. These actuarial present values should be reported in the *Statement of Social Insurance* of the entity.

Table 1 shows the Statement of Social Insurance of OASDI for the 75-year projection period beginning January 2000. As of January 1, 2000, the Social Security Trust Fund needs

\$2.95 trillion in order to pay the current OASDI benefits until 2075.

**Table 1**

**Statement of Social Insurance  
Old Age, Survivors and Disability Insurance  
75-Year Projection as of January 1, 2000  
(In billions)**

	Estimates from Prior Years				
	2000	1999	1998	1997	1996
<b>Actuarial present value<sup>1</sup> for the 75-year projection period of estimated future income (excluding interest)<sup>2</sup> received from or on behalf of:</b>					
Current participants <sup>3</sup> who, at the start of projection period:					
Have not yet attained retirement eligibility age (Ages 15-61)	\$11,335	\$10,325	\$9,482	\$8,760	\$8,827
Have attained retirement eligibility age (Age 62 and over)	266	235	204	186	186
Those expected to become participants (Under Age 15) <sup>4</sup>	10,088	9,033	8,727	8,181	9,697
All participants	<u>21,688</u>	<u>19,593</u>	<u>18,413</u>	<u>17,127</u>	<u>18,710</u>
<b>Actuarial present value<sup>1</sup> for the 75-year projection period of estimated future expenditures<sup>5</sup> paid to or on behalf of:</b>					
Current participants <sup>3</sup> who, at the start of projection period:					
Have not yet attained retirement eligibility age (Ages 15-61)	17,217	15,676	14,605	13,405	14,346
Have attained retirement eligibility age (Age 62 and over)	4,020	3,856	3,659	3,518	3,440
Those expected to become participants (Under Age 15) <sup>4</sup>	4,297	3,758	3,719	3,539	4,350
All participants	<u>25,534</u>	<u>23,291</u>	<u>21,983</u>	<u>20,462</u>	<u>22,135</u>
<b>Actuarial present value<sup>1</sup> for the 75-year projection period of estimated future excess of income (excluding interest) over expenditures</b>	<b>-\$3,845</b>	<b>-\$3,698</b>	<b>-\$3,570</b>	<b>-\$3,335</b>	<b>-\$3,425</b>
<b>Trust Fund Assets<sup>6</sup> at Start of Period</b>	<u>896</u>	<u>763</u>	<u>656</u>	<u>567</u>	<u>496</u>
<b>Actuarial Present Value<sup>1</sup> for the 75-year Projection Period of Estimated Future Excess<sup>7</sup> of Income (excluding interest) and Trust Fund Assets at Start of Period Over Expenditures</b>	<b>-\$2,949</b>	<b>-\$2,935</b>	<b>-\$2,914</b>	<b>-\$2,768</b>	<b>-\$2,929</b>

(Source: SSA's Performance and Accountability Report for FY 2000)

**Footnotes to the Statement of Social Insurance**

<sup>1</sup> Present value are computed on the basis of the intermediate economic and demographic assumptions specified in the Report of the Board of Trustees for the year shown and over the 75-year projection period beginning January 1 of that year. Totals do not necessarily equal the sum of the rounded components.

<sup>2</sup> Income (excluding interest) consists of payroll taxes from employers, employees, and self-employed persons; revenue from Federal income-taxation of OASDI benefits; and miscellaneous reimbursements from the General Fund of the Treasury.

<sup>3</sup> Current participants are the "closed group" of individuals age 15 and over at the start of the period. To calculate the actuarial present value of the excess of future income (excluding interest) from or on behalf of these individuals over future expenditures for them or on their behalf, subtract the actuarial present value of future expenditures for them or on their behalf from the actuarial present value of future income (excluding interest) from them or on their behalf. The projection period for the closed group would theoretically include all future working and retirement years, a period which may exceed 75 years in some instances. While the estimates are limited to the 75-year projection period, the present value of future income and expenditures for the closed group participants beyond 75 years is not material.

<sup>4</sup> Includes births during the period.

<sup>5</sup> Expenditures include benefit payments, administrative expenses, net transfers with the Railroad Retirement program, and vocational rehabilitation expenses for disabled beneficiaries.



<sup>6</sup> Trust fund assets represent the accumulated excess of all past income, including interest on trust fund assets, over all past expenditures for the social insurance program. The assets are invested only in securities backed by the full faith and credit of the Federal Government.

<sup>7</sup> If this excess is positive, it represents the estimated trust fund assets (expressed in present value dollars) at the end of the 75-year projection period; if negative, the absolute value of the excess represents the magnitude of the unfunded obligation of the program over the 75-year projection period. The calculation of the actuarial balance used for analysis by the Social Security trustees differs from the calculation of the amount presented on this line. The trustees' actuarial balance is expressed as a percentage of the taxable payroll and includes the cost of attaining a target fund balance equal to the estimated next year's expenditures at the end of the period.

**(4) Sensitivity Analysis** – For all programs except UI illustrate the sensitivity of the projections and present values to changes in the most significant individual assumptions. At a minimum the OASDI and Medicare programs should analyze assumptions regarding the birth and death rates, net immigration, the real wage differential, and the real interest rate. The real-wage differential is the difference between the annual percentage increase in wages in covered employment and the inflation rate, as measured by the CPI. The Medicare program should also analyze the health care cost factors and their trend.

Table 2 shows the present value of the estimated excess of OASDI income over expenditures for the 75-year period, using various assumptions about the ultimate total fertility rate. The total fertility rate for any year is the average number of children who would be born to a woman in her lifetime if she were to experience the birth rate by age observed in, or assumed for, the selected year, and if she were to survive the entire childbearing period. These assumptions are 1.7, 1.95 and 2.2 children per woman, where 1.95 is the intermediate assumption in the 2000 Trustees Report. The total fertility rate is assumed to change gradually from its current level and to reach the selected ultimate value in 2024.

Table 2 demonstrates that, if the ultimate total fertility rate is changed from 1.95 children per woman, the Trustees' intermediate assumption, to 1.7, the shortfall for the period of estimated OASDI income relative to expenditures would increase to \$4,252 billion, from \$3,845 billion; if the ultimate rate were changed to 2.2, the shortfall would decrease to \$3,437 billion.

**Table 2**  
**Present Value of Estimated Excess of OASDI Income over Expenditures**  
**with Various Ultimate Total Fertility Rate Assumptions**  
**Valuation Period: 2000-2074**

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Ultimate Total Fertility Rate	1.7	1.95	2.2	
Excess in Present Value Dollars (In billions)	-\$4,252		-\$3,845	-
\$3,437				

(Source: SSA's Performance and Accountability Report for FY 2000)

Similarly Table 3 shows the present values of the estimated excess of OASDI income over expenditures for the 75-year period, using various assumptions about future reductions in death rates. The analysis was developed by varying the percentage decrease assumed to occur during 1999-2074 in death rates by age, sex, and cause of death. The decreases assumed for this period, summarized as changes in the age-sex-adjusted death rate, are 18, 41 and 61 percent, where 41 percent is the intermediate assumption in the 2000 Trustees Report. Note that these assumptions do not apply uniformly to all ages. Some variation by age was assumed in recognition of historical patterns and to ensure that, in terms of the financial status of the OASDI program, estimates based on the summarized 18-percent and 61-percent reduction assumptions would be more optimistic and more pessimistic, respectively, than those based on the intermediate assumption.

Table 3 demonstrates that, if the reduction in death rates is changed from 41 percent, the Trustees' intermediate assumption, to 18 percent, meaning that people die younger, the shortfall for the period of estimated OASDI income relative to expenditures would decrease to \$2,701 billion, from \$3,845 billion; if the reduction were changed to 61 percent, meaning that people live longer, the shortfall would increase to \$5,146 billion.

**Table 3**  
**Present Value of Estimated Excess of OASDI Income over Expenditures**  
**with Various Death Rate Assumptions**

*Valuation Period: 2000-2074*

Reduction in Death Rates (from 1999 to 2074)	18 Percent	41 Percent	61 Percent
Excess in Present Value Dollars (In billions)	-\$2,701	-\$3,845	-\$5,146

(Source: SSA's Performance and Accountability Report for FY 2000)

**(5) Social Security Assumptions** –The estimates used in the RSSI are based on the assumption that the programs will continue as presently constructed. They are also based on various economic and demographic assumptions. Table 4 shows Social Security assumptions and the other values on which these displays are based reflect the intermediate assumptions of the 2000 Trustees Report. Estimates made in certain prior years have changed substantially because of revisions to the assumptions based on

changed conditions or experience, and to changes in actuarial methodology. It is reasonable to expect more changes for similar reasons in future reports.

*Table 4*  
*Social Security Assumptions*

	Total Annual Fertility Rate	Period Life Expectancy		Ultimate Immigration (persons per year)	Net Annual Differential (%)		Average Real-Wage Change (%)		Annual Real CPI Change Rate	
		Age-Sex-Adjusted At Birth	Female		Male	points	Wage	Wage		
2000	2.05	796.3	73.9	79.6	900,000	1.5	4.6	3.1	3.5	6.7%
2005	2.03	767.0	74.7	80.0	900,000	1.0	4.2	3.3	2.0	6.2%
2010	2.01	744.2	75.4	80.4	900,000	1.0	4.3	3.3	2.1	6.3%
2020	1.97	692.7	76.4	81.1	900,000	1.0	4.3	3.3	1.7	6.3%
2030	1.95	640.6	77.4	82.0	900,000	1.0	4.3	3.3	1.7	6.3%
2040	1.95	594.8	78.3	82.7	900,000	1.0	4.3	3.3	1.7	6.3%

(Source: SSA's Performance and Accountability Report for FY 2000)

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# Optimum Taxation Rate

W.J.M. Heijman  
J.A.C. van Ophem  
Wageningen University, The Netherlands

## Abstract

ACCORDING TO LAFFER, ECONOMIC ACTIVITIES ARE A DECREASING FUNCTION OF THE TAXATION RATE. AS A CONSEQUENCE TOTAL TAX REVENUE INCREASES WITH AN INCREASE OF THE TAXATION RATE AT ITS LOWER LEVELS AND DECREASES WITH AN INCREASE OF THE TAXATION RATE AT ITS HIGHER LEVELS. THE RESULT IS THE LAFFER CURVE. ACCORDING TO HIM, THE REASON FOR THE DIMINISHING TAX REVENUE LIES IN DECREASING ECONOMIC ACTIVITIES. AS FAR AS ACTIVITIES IN THE OFFICIAL (WHITE) SECTOR ARE CONCERNED, THIS MAY BE TRUE. HOWEVER, LAFFER DID NOT INDICATE THAT ACTIVITIES IN THE UNOFFICIAL (BLACK) SECTOR MAY INCREASE UNDER THE INFLUENCE OF AN INCREASING TAXATION RATE. PART OF THE LAFFER EFFECT MAY BE NOTHING ELSE THAN AN ACTIVITY SWITCH AWAY FROM THE WHITE TOWARDS THE BLACK SECTOR. THIS PAPER TAKES BOTH EFFECTS INTO ACCOUNT: DECREASING ACTIVITIES IN THE WHITE SECTOR COMBINED WITH INCREASING ACTIVITIES IN THE BLACK SECTOR. THE PAPER DEALS WITH THE COMPUTATION OF THE OPTIMUM TAXATION RATE FOR A NUMBER OF OECD COUNTRIES. IT SHOWS THAT WITH THE EXCEPTION OF SWEDEN THE MARGINAL TAXATION RATE IN THESE COUNTRIES IS BELOW ITS OPTIMUM, DEFINED AS THE TAXATION RATE GENERATING THE MAXIMUM TAX REVENUE FOR THE STATE.

## THE LAFFER CURVE

Supply-side economics is a reaction on the stagflation in the 1970s. It is the antipode of the Keynesian way of reasoning in which emphasis is being laid on the demand side of the economy. In the 1970s demand side policies were unable to solve the stagflation problem, high unemployment and high inflation. The relevance of Keynesian thinking was questioned about<sup>1</sup>.

Supply-side economists share the opinion that stagflation is a consequence of an excessive tax burden and over-regulation of the economic process by the government. According to them, a reduction of taxes and a deregulation of the economy will foster

economic growth<sup>2</sup>. This idea is expressed in the Laffer curve which depicts the expected relationship between tax revenue and tax rate, see Figure 1<sup>3</sup>.

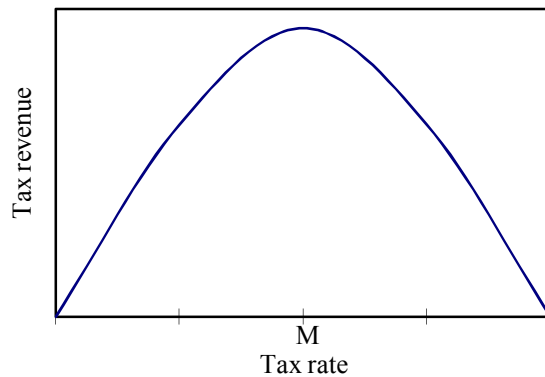


Figure 1 The Laffer curve

In the Laffer curve any tax revenue can be obtained by two tax rates, the optimum  $M$  being the exception. Laffer assumes that when the tax rate is becoming too high, economic agents will become inactive<sup>3</sup>. However, an alternative to withdrawal from the labor force is to become active, to a certain extent, in the black economy, when a higher real income can be procured in the black economy<sup>4, 5</sup>. This active switch will be further investigated in this paper. It appears from empirical research in the Netherlands that 70 per cent of the black labor suppliers do have a job in the white economy, another 20 per cent are housewives and the remaining 10 per cent are receiving a social benefit<sup>6</sup>.

In Figure 1 the maximum tax revenues is obtained at tax rate  $M$ . The level of  $M$  is unknown<sup>7</sup> Of course it holds that the maximum  $M$  is achieved when a marginal change no longer leads to a change in the tax revenue<sup>8,9</sup>. Supply-side economists are of the opinion that in most of the highly industrialized countries tax rates are to be found right of the optimum  $M$ , see note 2. This means that an increase in the tax rate will decrease tax revenue. So, a diminution of the tax rate is advocated<sup>2,7,8</sup>. However, one may doubt whether this is the case. The hypothesis that the optimal tax rate is lower than the actual tax rate needs still to be tested. In order to do so, one needs a model of optimal taxation, which will be presented in the next section.

### A model of the optimal tax rate

The model to establish the optimal tax rate is based on the idea that potential income comprises of three parts: registered income A, non-realized income B as a consequence of inactivity of a part of the population and non-registered income C, the black sector. The distribution between on the one hand B and C and on the other hand A is determined in the model by the optimal marginal tax rate. As the marginal tax rate increases, the propensity to become inactive in the sector of registered income or become active in the black sector intensifies. The optimal marginal tax rate is the tax rate for which the tax revenue is highest. This will be demonstrated formally below<sup>10</sup>.

#### Average tax rate

Assume the actual received sum of tax money  $T$  to be the result of the average tax rate  $t$  multiplied by the white income  $Y_w$ . Further, total income  $Y$  is the sum of white income  $Y_w$  and black income  $Y_b$  and we assume the ratio black income – total income  $Y_b / Y$  to be a positive function of average tax rate  $t$  with coefficient  $\varepsilon$ . So:

$$T = tY_w, T = t(Y - Y_b), \frac{Y_b}{Y} = \varepsilon t, \text{ so } : T = t(Y - \varepsilon tY) = tY - \varepsilon t^2Y.$$

When  $t = 0$ ,  $T = 0$ . It is assumed that when  $t = 1$ ,  $T = 0$ . In that case:  $Y - \varepsilon Y = 0$ , so:

$\varepsilon = 1$ . Maximum tax revenue is reached when:  $\frac{dT}{dt} = Y - 2tY = 0$ , so:  $t = 0.5$ . This means

that, in this case, the share of the black income in total income equals the average tax rate  $t$ . Further, in the optimum, where tax revenue  $T$  is maximised, tax rate  $t$  equals 50%. Then, white income  $Y_w$  is 50% of total income and total tax revenue  $T$  is 25% of total income  $Y$ .

#### Marginal tax rate

Assume the following tax function:  $T = \tau Y_w + \underline{T}$ , then:  $T = \tau(Y - Y_b) + \underline{T}$ , where

$\tau$  equals the marginal tax rate and  $\underline{T}$  equals the autonomous tax

revenue. Assume further that:  $\frac{Y_b}{Y} = \tau\beta$ , so that  $T = \tau(Y - \beta\tau Y) + \underline{T} =$

$\tau Y - \beta\tau^2 Y + \underline{T}$ . If  $\tau = 0$ ,  $T = \underline{T}$ . Assume further that if  $\tau = 1$ ,  $T = \underline{T}$ . This implies

that  $\underline{T} = Y - \beta Y + \underline{T}$ , so:  $\beta = 1$ . The first-order condition for the optimum marginal tax rate

$\tau^*$  is:  $\frac{dT}{d\tau} = Y - 2\tau Y = 0$ , so:  $\tau^* = 0,5$ . The optimum average tax rate  $\tau^*$  in this approach

$$\text{is: } \tau^* = \frac{\tau^* Y_w + \underline{T}}{Y_w} = \tau^* + \frac{\underline{T}}{Y_w} = 0,5 + \frac{\underline{T}}{Y_w}.$$

### *A more complex model*

Suppose the following model:

$$T = \tau Y_w + \underline{T}, \quad Y_w = Y - Y_b, \quad \frac{Y_b}{Y} = \beta \tau^\alpha + \gamma,$$

$$\text{then: } T = \tau(Y - Y_b) + \underline{T} \quad \text{and} \quad T = \tau(1 + \gamma)Y - \beta \tau^{\alpha+1}Y + \underline{T}.$$

It is assumed that when  $\tau = 0$ , there will be no black income. This means that in that situation  $Y_b / Y = 0$ . Therefore  $\gamma = 0$ . Total tax revenue  $T$  equals  $\underline{T}$  when  $\tau = 0$  and when

$\tau = 1$ . This means that:  $\underline{T} = Y - \beta Y + \underline{T}$ , so:  $\beta = 1$ . Now the black part of the economy and the optimum tax rate depend on the value of  $\alpha$ . The optimum rate can be determined as follows:

$$\text{follows: } \frac{dT}{d\tau} = Y - (1 + \alpha)\tau^\alpha Y = 0, \quad \text{so:}$$

$$(1 + \alpha)\tau^\alpha Y = Y \quad \text{or: } \tau^* = \left(\frac{1}{1 + \alpha}\right)^{\frac{1}{\alpha}}. \quad \text{Now it can be observed that:}$$

$$\lim_{\alpha \rightarrow \infty} \tau^* = \left(\frac{1}{1 + \alpha}\right)^{\frac{1}{\alpha}} = 1 \quad \text{and:} \quad \lim_{\alpha \rightarrow 0} \tau^* = \left(\frac{1}{1 + \alpha}\right)^{\frac{1}{\alpha}} = \frac{1}{e} = 0.36. \quad (\text{see appendix}). \quad \text{Further it is}$$

proved in the appendix that  $\left(\frac{1}{1 + \alpha}\right)^{1/\alpha}$  is an increasing function of  $\alpha$ . It can be concluded

that, under the assumptions made the optimum marginal tax rate  $\tau^*$  will never be below 36%, regardless the value of  $\alpha$ , the propensity to pay taxes.

In conclusion, as the marginal tax rate increases, the difference between gross and net payment becomes greater. This has two effects. Firstly, it leads to the inactivity Laffer predicted, as the net real wage rate is considered to be too low. Secondly, when this difference is regarded as too much, people will have an incentive to be active in the black



labour market. The resulting evasion of taxes can be beneficial for demanders and suppliers in the black labour market. The model does not make a distinction between the two effects. A high marginal tax rate leads to high differences between potential and actual income. However, it is not possible to discern the black labour from the inactivity effect. Moreover, it is also not possible to establish what parts of the population are offering black labour or withdrawing from the formal labour market or doing both.

### Operationalisation of the model and data

The calculation of potential income or production is done taking the state of technology and capital stock for granted. Potential income is calculated by multiplying the potential labour force in labour years with the average labour productivity. Both concepts are measured in men years. Potential labour force comprises the gainfully working population and the registered unemployed. The latter are willing and able to work. Non-realised income is estimated by multiplying the number of registered unemployed with the average labour productivity. Black sector is confined to household related activities. The size of the black sector may then be calculated by means of the discrepancy method, according to the following formula <sup>11, 12:</sup>

$-Y_b = Y + K - C - S$ , where

$Y_b$ : black national income

$Y$ : net disposable income of households

$K$ : consumption loans granted to households

$C$ : consumer expenditures of households

$S$ : liquid savings of households at savings institutions

Total taxes  $T$  include all income dependent taxes  $T_y$  (included VAT), plus taxes unrelated to income  $\underline{T}$ . The model to be estimated consists of three equations:

$$\tau = T_y / GDP \quad [1]; \quad \tau^* = \left( \frac{1}{1 + \alpha} \right)^{\frac{1}{\alpha}} \quad [2]; \quad T_y = \tau Y_{maxb} - \beta \tau^{\alpha+1} Y_{maxb} + \underline{T} \quad [3],$$

where  $Y_{maxb}$  equals potential registered plus unregistered income.

By means of this model, the optimal tax rate can be calculated and compared with

the actual marginal tax rate. This is done for the following countries in order of appearance in the Tables to be presented in the next section: Austria; Belgium; Switzerland; Germany; Spain; France; Italy; Ireland; Japan; the Netherlands; Sweden and the United Kingdom for the 1988-1996 period <sup>13</sup>.

Data stem from several organisations - OECD, ILO, EUROSTAT, Statistical institutes of the individual countries – and sources: national accounts, labour statistics, tax accounts. Since it appeared that statistical information on the same variable for each country differs according to the source used, as much information as possible was derived from the same source, for instance labour statistics from the ILO for labour statistics and national accounts tables from the OECD for the other variables in order to raise comparability.

Nevertheless, cross-national research is confronted with many problems and pitfalls with respect to comparability. Optimal and actual tax rates could not be established for all twelve countries in the 1988-1996 period <sup>14</sup>. Moreover, the calculation of the black sector by means of the discrepancy method proved to be impossible for most countries because of lack of data or of unreliable results <sup>15</sup>. So, a second best solution was chosen. From a sensitivity analysis for two countries – The Netherlands and Switzerland - it appeared that a doubling of the size of the black sector, hardly changed the value of the optimal tax rate <sup>16</sup>. So, the size of the black sector is fixed at 8.8 per cent of potential registered income, a result obtained for the Netherlands with full information for the application of the discrepancy method.

## Results

Unemployment and labour productivity are important variables in the calculation of potential income. In countries with a high unemployment and high labour productivity potential income differs more strongly from the actual income than in countries with low unemployment and low labour productivity, see Table 1.

As can be seen in Table 1 there is strong variation in unemployment and labour productivity. Unemployment ranges from 21.6% in Ireland to 3.5% in Japan in the year 1996. Germany has a labour productivity of 32.78 ECU per person per hour and the UK 16.48 ECU. The relative difference between potential income and GDP differs strongly across the countries, 12.6% in Japan and 31.4 % in Ireland.

Table 1 Unemployment, labour productivity and difference between potential income and actual income (GDP) for 12 OECD-countries

	A <sup>1</sup>	B	CH	D	E	F	I	IRL	J	NL	<i>s</i>	UK
Year	1996	1996	1996	1995	1995	1996	1995	1995	1996	1995	1996	1996
U <sup>2</sup>	6,2	15,5	4,4	9,6	20,3	12,3	13,6	21,6	3,5	6,8	10,3	8,1
Y/h <sup>3</sup>	24,88	32,28	29,31	32,78	18,05	26,70	20,70	18,18	29,31	28,42	26,4	16,48
											0	
Rdpai <sup>4</sup>	15,4	25,6	13,6	19,3	24,0	21,8	29,2	31,4	12,6	16,1	19,6	17,0

<sup>1</sup>Legend: A= Austria; B= Belgium; CH= Switzerland; D= Germany; E= Spain; F= France; I= Italy; IRL= Ireland; J= Japan; NL= The Netherlands; S= Sweden; UK= United Kingdom

<sup>2</sup> U: unemployment as percentage of the labour force

<sup>3</sup> Y/h: labour productivity per person per hour

<sup>4</sup> Rdpai: Relative difference between potential and actual income = [potential income- GDP]/ GDP \*100

The marginal tax rates are calculated for all countries in the 1988-1996 period as far as possible. They were moderately stable in this period. In Japan and the UK they were the lowest, 24% respectively 26%, and in Sweden the highest, 65%, see Table 2. As can be seen in Table 2, the marginal tax rates in Austria, Belgium, Germany, Italy and the Netherlands are close to each other.

The optimal marginal tax rate has been calculated for the 1988-1996 period. The values range from 53% in Ireland to 60% in Austria and The Netherlands. Compared to the marginal tax rate the difference across the countries with respect to optimal tax rates are smaller. In Sweden, the optimal tax rate is lower than the actual marginal tax rate. In all other countries the optimal tax rate is higher than the actual one. Very remarkable to see is that in Japan and the UK, the optimal tax rate is twice the actual marginal rate.

Table 2 Marginal tax rate  $\tau$ , optimal marginal tax rate  $\tau^*$  and propensity to pay taxes  $\alpha$  for 12 OECD countries

	A	B	CH	D	E	F	I	IRL	J	NL	S	UK
Year	1996	1996	1996	1995	1995	1996	1995	1995	1996	1996	1996	1996
$\tau$	0,42	0,44	0,35	0,42	0,37	0,47	0,41	0,31	0,24	0,41	0,65	0,26
$\tau^*$	0,60	0,58	0,58	0,58	0,54	0,59	0,57	0,53	0,5	0,60	0,5	0,5
$\alpha$	2,37	2,04	2,09	2,00	1,49	2,26	1,85	1,28	1,47	2,36	2,09	1,45

The coefficient  $\alpha$  denotes the propensity to pay taxes. A low value of  $\alpha$  goes along with a low value of  $\tau^*$ , the optimal tax rate<sup>17</sup>. A low optimal tax rate implies a low summit of the Laffer curve. This means that that the electorate in such a country is of the opinion that taxes are too high and rapidly is inclined to shift activities to the black sector or become inactive voluntarily. A low value of  $\alpha$  implies a low propensity to pay taxes and a high propensity to inactivity or black work.

## Conclusion

The marginal tax rates differ widely in 12 OECD countries. In Sweden, the optimal tax rate is lower than the actual marginal tax rate. In all other countries the optimal tax rate is higher than the actual one. In eleven of the twelve OECD countries there is no evidence found for the proposition or hypothesis that optimal tax rates are lower than actual marginal tax rates.

## Notes

<sup>1</sup> Duijn, J.J., van, Supply-side economics: het antwoord op de crisis? [Supply-side economics: the answer to the crises?], In: M. Sint en H. Verbruggen (red.), *Economen over crisis* [Economists on the crisis], Uitgeverij Intermediair Amsterdam/Brussel, 1982.

<sup>2</sup>erland, E.C., van (red.), W.J.M. Heijman, E.P. Kroese en E.A. Oskam, *Grondslagen van de macro-economie* [Foundations of macro-economics], Stenfert Kroese, Houten, 1994.

<sup>3</sup>Laffer, A.B., *The ellips: An explanation of the Laffer curve in a two factor model*, Rolling Hills Estates, 1980.

<sup>4</sup>The black sector is a part of the informal sector. Black labour is defined as comprising activities with a an equivalent in the formal sector, but is hidden for the state, by not or not fully complying to the relevant laws (Feijen, C.J. et al., Een verkenning van mogelijkheden voor de sectoren bouwnijverheid, horeca en recreatie, land- en tuinbouw en de ouderenzorg, in: *Werk maken van informeel werk*, [On work and informal work], COSZ, Den Haag, 1997).

<sup>5</sup> Frey en Weck in: Heertje, A., De informele economie: van analyse tot beleid [The informal economy: from analysis to policy], in: *Preadviezen van Vereniging voor de Staathuishoudkunde*, Stenfert/Kroese, Leiden, 1984.

<sup>6</sup> Zie P. Allaart, 1995. Wie doet wat in het zwarte circuit? [Who does what in the black sector?] *Economisch Statistische Berichten*, 4020, 726-728.

<sup>7</sup>Burda, M. en C. Wyplosz, *Macroeconomics: a European text*, Oxford University Press, New York, 1993.

<sup>8</sup>Sinderen, J., van, *Belastingheffing, economische groei en belastingopbrengst: een evaluatie van aanbodeconomie*, [Taxation, economic growth and tax revenue, an evaluation of the supply-side economics] Wolters-Noordhoff Groningen, 1990.

<sup>9</sup>Mulder, R. en J. van Sinderen, *De Laffer-curve en de excess burden* [The laffer curve and the excess burden], Ministerie van economische zaken discussienota 8801, Den Haag, 1989.

<sup>10</sup>Parts of this model have been published before, see Heijman, W.J.M. en J.A.C. van Ophem, The Laffer curve and the Dutch Black Labour Economy, in: G. Meijer, W.J.M. Heijman, J.A.C van Ophem en B.H.J Verstegen (eds.), *The Maastricht ISINI-papers*, volume II, Maastricht, 2000.

<sup>11</sup> See for instance Hagenaaars, A.J.M. en S.M. Wunderink-van Veen, *Soo gewonne soo verteert* [Economics of the household sector], Stenfert/Kroese, Leiden/Antwerpen, 1989.

<sup>12</sup> Koopmans C.C. *Informeel vraag, aanbod, participanten, prijzen* [Informal labour: demand, supply, participants, prices].

<sup>13</sup> For a complete discussion of methods and an overview of the results we refer to the MSc thesis written by S.M. van Deursen & A. Nauta, *De Laffer-curve herzien*, [The Laffer curve revisited], Wageningen University, 2000 and supervised by W.J.M. Heijman and J.A.C. van Ophem.

<sup>14</sup> Germany (re-unification), Sweden and Switzerland (VAT- figures not available for every year in both countries) are the exceptions.

<sup>15</sup> For instance in the UK the black sector was calculated to be only 2.7% of GDP.

<sup>16</sup> For the Netherlands the value of  $\alpha$  and  $\tau^*$  were 2.36 (1.98) and 0.60 (0.58) at a black sector size of 8.8% (17.6%) of potential registered income and in Switzerland the value of  $\alpha$  and  $\tau^*$  were 2.09 (1.68) and 0.58 (0.56) at a black sector size of 8,8% (17.6%) of potential registered income. The value of 17.6% is close to the maximum estimation of the size of the black sector in western economies, see note 5.

<sup>17</sup> It appears that  $\alpha$  is a very good predictor of the value of  $\tau^*$ , both variables are positively correlated ( $R^2$ : 0.993).

#### APPENDIX: DETERMINATION OF $\alpha$

$e = \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n \approx 2.71828$ . With  $n = \frac{1}{\alpha}$ , I can write:

$$\lim_{n \rightarrow \infty} \left( \frac{1}{1 + \frac{1}{n}} \right) = \lim_{n \rightarrow \infty} \frac{1}{\left(1 + \frac{1}{n}\right)^n} = \frac{1}{\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n} = \frac{1}{e} \approx 0.367879.$$

Now we can prove that the function  $\left(\frac{1}{1+\alpha}\right)^{1/\alpha}$  is an increasing function of  $\alpha$ .

$$\begin{aligned} \frac{d}{d\alpha} \left(\frac{1}{1+\alpha}\right)^{1/\alpha} &= \frac{d}{d\alpha} e^{\ln\left(\frac{1}{1+\alpha}\right)\frac{1}{\alpha}} \\ &= e^{\ln\left(\frac{1}{1+\alpha}\right)\frac{1}{\alpha}} \left( \ln\left(\frac{1}{1+\alpha}\right)\frac{1}{\alpha} \right) \\ &= \left(\frac{1}{1+\alpha}\right)^{1/\alpha} \left( (1+\alpha)(1+\alpha)^{-2} \frac{1}{\alpha} + \ln \frac{1}{1+\alpha} (-\alpha)^{-2} \right) \\ &= \left(\frac{1}{1+\alpha}\right)^{1/\alpha} \left( \frac{1}{\alpha(1+\alpha)} + \frac{\ln(1+\alpha)}{\alpha^2} \right) \end{aligned}$$

$e = \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n \approx 2.71828$ . With  $n = \frac{1}{\alpha}$ , we can write:

$$\lim_{n \rightarrow \infty} \left(\frac{1}{1 + 1/n}\right)^n = \lim_{n \rightarrow \infty} \frac{1}{\left(1 + \frac{1}{n}\right)^n} = \frac{1}{\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n} = \frac{1}{e} \approx 0.367879.$$

# **An Institutionalist's View on Management Accounting**

*B.H.J. Versteegen*

Open University of Amsterdam and  
Erasmus University, Rotterdam

## 1. INTRODUCTION

**In the past decades Institutionalism, among which institutional economics, has gained increasing attention. Both the old-institutional economists and the new-institutional economists studied the shaping and evolution of a great number of institutionalized rules, routines and habits that coordinate society. The system of laws, cultural norms and values, economic systems, group rules and the like all became an object of study. With it, the attention shifted from (rational) decision making by the individual or the organization to the infrastructure that facilitates the functioning of individuals and organizations.**

In institutional economics a substantial part of the attention was directed at the infrastructure that coordinates the functioning of organizations between one and another, whereas the coordination of behavior within an organization and of the behavior of individuals across organizations received less attention. Still there is an increasing reception of organizations as 'constitutional systems', as Vanberg (1992) calls them.

At an even less general or abstract level we can witness a rising interest in the functioning of institutionalized accounting rules within an organization, particularly in the last decade. Accounting principles, specifically management accounting principles, can be looked upon as rules that shape the decision room of managers and, furthermore, that coordinate the behavior of decision makers within an organization. As such management accounting principles often are seen as institutional principles. Currently, interest among other things focuses on the characteristics of management accounting research when performed in an institutionalist fashion. That is where this paper will be heading.

We will start with a description of what we mean by the concepts of management and accounting. Based on that we will go on with a point of view on the field of management accounting that emphasizes the way in which management accounting facilitates the coordination of decision making within an organization. It will appear then that we have gradually formulated an institutionalist view on management accounting. Thus it will prove possible to give some characteristics of research into the functioning of management accounting principles seen as institutional rules. Especially the multidisciplinary nature of institutionalist research will be stressed. The interdependency between management accounting principles and other coordinating mechanisms like sociological rules or laws gains interest, as does the evolutionary nature of institutional rules.

## 2. MANAGEMENT AND ACCOUNTING

Management accounting deals with the application of management accounting methods and techniques, with the functioning of these principles, and with the adaptation of them if necessary. In this paper we will limit ourselves to the way in which management accounting principles function and to the adaptation of these principles.

We will speak about management accounting principles as the means through which information is acquired, processed and provided for management. In general, management is concerned with decision-making and with planning and control. In this paper we will direct our attention to those situations where management can be seen as decision-making. Therefore, in this paper we will think of management accounting as providing information for decision-making and we will speak about the functioning of management accounting principles as a means for providing information for the purpose of decision making (Hogarth 1993, Atkinson cs 1997).

Our intention to take the point of view of management of an organization implies that we cannot choose an aspect-driven approach using the *ceteris paribus* clause. Management has to deal with all (un) expected aspects of a decision situation. Certainly, the provision of information on behalf of decision-making should never in some way or another by itself be limiting to aspects of a decision situation. Besides, as far as decision making is concerned, in the end management will not be interested in decision making in general, it will be the specific decision situation which draws the attention.<sup>151</sup>

## 3. DECISION MAKING

If we want to investigate the role and quality of management accounting principles in decision making then we must have an idea of the decision making process and of the means for coordinating the decisions that we are speaking about. If we then investigate how decisions come about, we can try to determine how accounting principles influence and facilitate decision-making.

Decision makers in organizations may be looked upon in a great number of ways. We may think of them as non-rational, quasi-rational (Russell 1997), boundedly rational, unboundedly rational, procedural rational etc. For the sake of consistency we should stylise the decision maker in one-way or another. In this paper we will take boundedly rational

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<sup>151</sup> Although for this purpose it may be worthwhile, but not satisfying, to study decision making in general.



decision making as our point of departure (Simon 1982). *Rational* decision-making means that a decision maker selects the best choice alternative from a set of possible choice alternatives (Hogarth and Reder 1986, Fusfeld 1996). So we will picture this as:

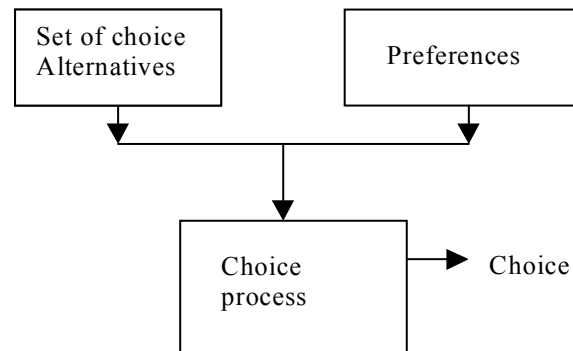


Figure 1

We may think of a rational decision maker as someone who knows it all and makes unboundedly rational decisions. That is, his decision-making is bounded only by nature's limitations. Of course this seems to be a rather unproductive notion as it cannot be a description of an existing entity, nor can it be a prescription for decision makers as no one can meet the prescription. Therefore, we will take it that a rational decision maker makes decisions, which are *bounded* by a number of other factors. Firstly, the set of choice alternatives will be bounded. Not all possible alternatives are a part of the set. Decision makers have limited information processing capacities, make mistakes, take short cuts and do not possess all the time and money in the world to investigate all possibilities (Elster 1989). Besides, decision makers know that their past decisions limit their current decision room. Laws of course are of influence on the decision space which is available to decision makers. For instance, think of the liability laws in case of pharmaceutical industries or of environmental laws. Furthermore, meso-economic conditions, the conditions on the markets, codetermine the decision space, like ethical rules and accounting principles.

Secondly, the preferences of a decision maker are of importance for the decision made. However, preferences too are not given by nature for all time. Preferences are

determined by cultural norms and values, by group values and the like. Furthermore, we can imagine that the bounds that limit the set of choice alternatives of a decision maker and the bounds that influence the preferences interact in a complex manner. For instance, smoking or non-smoking habits influencing the preferences of employees may eventually be incorporated in rules of conduct or even in law. The other way around, traffic rules may after some time be reflected in the behavioral norms of drivers (Posner 1997, Lindbeck 1997).

We can see the factors that limit the decision problem of the decision maker as rules that shape the decision problem or, in different words, rules that are used for formulating the decision problem at hand. This is depicted in figure 2 below.

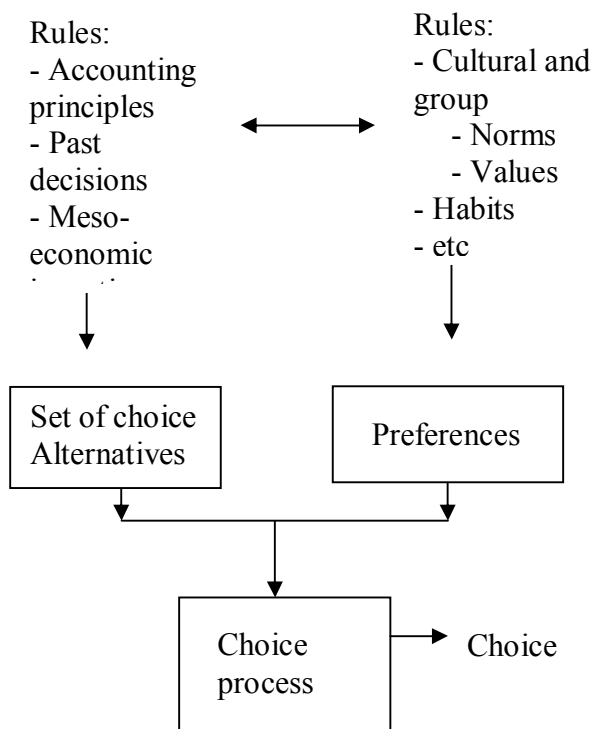


Figure 2

We view decision making as a process consisting of at least two phases. Firstly, the decision problem is shaped or formulated by rules, which result from a number of spheres. Secondly, the given decision problem is solved and a decision is reached. So, there are a number of factors that in the first phase determine the decision problem a decision maker has to solve. We want to stress that another formulation of the decision problem leads to

another decision being rational. The bounds to the decision problem determine what is rational or not. Given enough degrees of freedom in determining these bounds, we can even explain any decision as rational or, if we like, non-rational. Understanding a decision as rational then means understanding the way in which the decision problem comes about. The specific circumstance of a decision maker and the specific norms, values and habits which are used are crucial for understanding the decision that is made as being rational (Lawson 1997). This is an important reason for performing case research.

#### **4. MANGEMENT ACCOUNTING RULES AND DECISION MAKING**

Management accounting principles, in particular, shape the decision problem for a decision maker. Other accounting principles might define other concepts in terms of which there can be thought about a problem. Other accounting principles can provide other information, on another level of aggregation, about other aspects. For instance, Mouritsen and Bekke (1999) describe the importance of cost accounting for the definition of a decision space in which time management can be applied as the sole control instrument in an organization. Macintosh cs (2000) describe the way in which construed accounting concepts constitute the decision space of decision makers. In such instances accounting principles have a major role in describing the decision room for a decision maker in an organization?

In figure 2 above we have named factors that limit the decision problem of the decision maker 'rules'<sup>152</sup>. There are two kinds of rules, which bound the decision: one that determines the preferences, and one that determines the set of available alternatives. Simply to make a distinction possible we will name the first kind of rules 'preferential rules' and the last kind of rules 'infrastructural rules'.

There can be made other distinctions also. For instance we can discern rules originating from outside of the influence of the current decision makers in the organization like law, culture, the past, and rules originating from within the sphere of control of the current decision makers in the organization, like socio-organizational rules or accounting rules. In another way we can look for rules that can be adapted, rules that can only evolve and rules that cannot be changed. Depending on the time perspective rules can be adapted or not. In the long run all is variable, however not at will. For our purpose it is important to see whether rules can be designed at will or not. Designed rules have a short run dimension, evolving rules a long run dimension. The norms and values change mostly through evolution and the infrastructural rules change mostly through design.

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<sup>152</sup> See also Burns and Scapens (2000).

Now what can we say about management accounting principles which, as we saw, shape the decision problem? It seems that accounting principles initially are infrastructural. Their design can evolve through conscious adaptation (Vosselman 1996), although it may take a while before they become more or less wired in into the psychological make-up of members of an organization. Besides, in the case of accounting principles we can see an interaction between the left hand side and the right hand side of figure 2. Not only can accounting principles be of influence on norms and values, for instance when the use of an administered pricing rule or a decision algorithm is made a habit and even a norm within an organization, or when actions which are ruled out as they cannot be accounted for become negatively valued within the organization, there can be an influence the other way around too. For instance, when the norms and values with respect to the preservation of the environment are of consequence for environmental accounting.

## **5. RATIONALITY AND COORDINATION**

If we realise that there are interacting rules that determine the decision problem of decision makers and that there are a great number of decision makers, in various phases of their decision process, who interact, then we start to paint a confused picture of an organization. In fact, up to now we have given no reason why there should not result chaos. Apparently, the decisions of various decision makers must be coordinated with respect to timing, type of the decision, the specific situation etc. Therefore, we take the concept of coordination to mean, "making several decisions that are jointly optimal" (Radner 1992). As we have stated above we look at the decision process as consisting of two phases. In the first phase the decision problem is shaped and in the second phase it is solved and a choice is made. It may be noticed that if the decision problem is formulated in the first phase such that a decision can be reached then, in the second phase, a decision maker can do the deciding on his own. This means that interaction and coordination between decision makers should take place in the first phase of the decision process (Verstegen 1994, 1998). The rules, infrastructural or preferential, form the mechanism, which accounts for the coordination between decision makers. Halpern (1998) shows how the way in which persons bond their choice problem will function as a coordinating device. So we can picture the decision process for two decision makers A and B, including the coordination between them as (Verstegen, Duindam and van der Zijl 2000 p. 617):

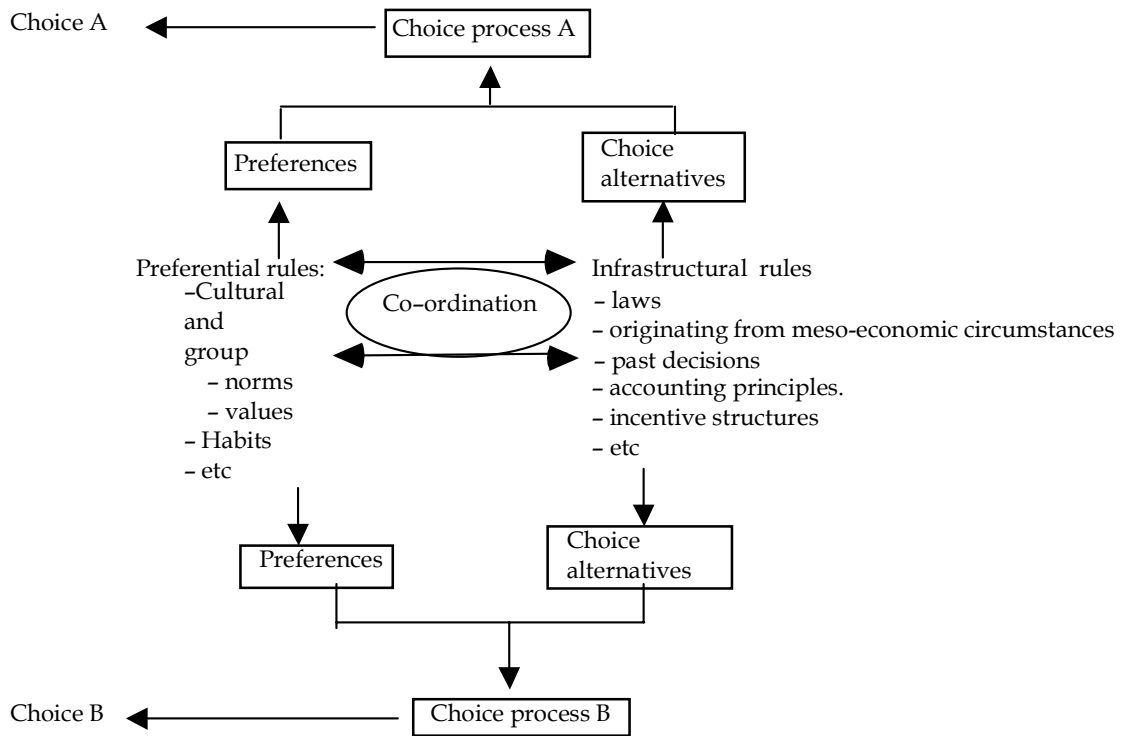


Figure 3

Coordination can happen on purpose and by accident. When a crowd or audience in a theatre applauds without being directed, after a while there will appear an ordering in the pattern of applause. This typically can be seen as a spontaneous ordering. Traffic rules can be seen as examples of coordinating principles that are designed on purpose. From this argument it appears that we can characterize the rules, preferential or infrastructural, not only by their role in determining decision situations, but also by their role and function in the coordination of decision making. We can think of technical aspects like stabilising or destabilising effects, the speed with which the coordinating mechanism transports signals, the robustness of coordinating systems etc. However, we can also take the interdependency and coherence of various systems of coordination into account (Williamson 1996 and 2000). For example, in the literature various studies can be found which emphasize the fact that the organizational design of an organization (resulting in infrastructural rules which can be used e.g. for management control) should reinforce the cultural rules that exist within an organization (Whitley 1999, Harrison and McKinnon 1999).

Also, the methods used to control employees should not interfere with the historically grown organizational values and norms.

There are a variety of rule-systems with a coordinating function. Often these are called institutions or constitutional systems<sup>153</sup>. North (1990) defines institutions as *rules* of the game (our italics). Sjöstrand (1992 p. 1011) describes institutions as "a kind of infrastructure that facilitates (or hinders) human *coordination* and (re) allocation of resources".<sup>154</sup>

## 6. THE ROLE OF ACCOUNTING IN TERMS OF COORDINATION OF DECISION MAKING

Can the previous analysis be used to characterize management accounting rules? Scapens (1994, p 301) states, "The institutional framework (...) views accounting practices as institutionalized routines which enable organizations to reproduce and legitimize behaviour and to achieve organizational cohesion". Burns and Scapens (2000, p 4 and 6) write "Our paper begins with an assumption that, in many organizations, management accounting systems and practices constitute stable rules and routines." and "As argued by Scapens (1994), rules are necessary to co-ordinate and give coherence to the actions of groups of individuals." If we consider accounting principles to constitute an institution then what characteristics can we find for these rules?

Looking at accounting rules in isolation we can say that they are more discretely than continuously evolving, more of influence on the set of decision alternatives than on norms and values, more designed on purpose than accidental. Accounting rules are of influence in the first phase of the decision process, the phase in which the decision problem is formulated (Lukka and Kasanen 1995).

However accounting principles operate in conjunction with other coordinating mechanisms, or institutions, like cultural rules, organizational-sociological rules, rules resulting from the meso-economic environment of an organization or firm, the past

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<sup>153</sup> E.g. Vanberg 1992.

<sup>154</sup> Sjöstrand mentions the infrastructural aspect of institutional rules. However, we must be aware of the fact that we have reserved a more restrictive content for this concept. We call only a part of the institutional rules 'infrastructural'.

decisions of an organization, dressing rules, rules of ethical conduct etc. For example, we know from agency theory that the incentives agents experience, in monetary terms or in terms of risk, should match the pattern of available information (Baiman 1990 and many other examples). The design of the system of performance evaluation should therefore recognise the possibilities of moral hazard. We can also mention the interdependency of accounting methods and norms and values. The operationalisation of organizational targets into performance indicators on the level of the work floor should be done in a manner that conforms the group processes that are manifest within an organization etc. This means that the functioning of accounting rules should be seen conditional on the other coordinating mechanisms (Hogarth 1993, Mangos and Lewis 1995). Hansen (1998) shows how the historically grown meso-economic conditions in Germany, among other things, were of importance for the evolution and development of tax accounting principles. Whitley (1999) shows the interdependency between cultural rules and the rules used for the purpose of management control. Sometimes accounting rules are of secondary importance for decision-making, for instance when group behavior is the key factor in determining the problem formulation. On other occasions the importance of accounting rules for decision-making is great.

#### *7. EVOLVING MANAGEMENT ACCOUNTING PRINCIPLES*

Can a specific decision situation explain the existence and the adaptation of an accounting system in conjunction with other coordinating mechanisms? It seems not. Up to now we did not give attention to the fact that accounting rules are not designed for one decision situation in isolation. Accounting rules are expensive to implement, an organization needs time to get used to them and accounting principles are to be used in decision situations to come. Therefore, we should consider from an institutionalist perspective the evolving design of accounting principles. And, if we do so, we should take notice of the changing environment, of the evolution of other coordinating systems, of decision situations to come, of uncertainties etc.

Explaining changes of coordinating rules cannot be seen as searching for an optimum solution to a rule-choice problem. There are far too many unknown variables and there is too much uncertainty to enumerate the possible choice alternatives and select the best (Burns and Scapens 2000). Besides, if we try to reach optimum rules that bound decision problems, there is an infinite regress problem lurking in the background (Verstegen

1994). Instead we have to deal with rules that are an element of an evolving combination of coordinating systems (see e.g. Hansen 1998).

Suppose that we want to analyze and perhaps even explain the evolving design of an organization's accounting system in combination with the evolution of other coordinating systems. What will be the explanatory factors or mechanisms? It seems to be a difficult task to find them, as all seems to be variable. Fortunately, there is some ground to stand on. Firstly, the coordinating systems do not evolve all at the same time and in the same pace. For instance, from the point of view of adapting accounting rules, the cultural norms and values often are relatively stable, as are laws. However, sometimes they may change in a revolutionary way. Depending on the historical circumstances there is a unique succession and timing of changes in coordinating mechanisms, among which accounting principles that determine an organization's development. Thus, in explaining the evolution in the system of accounting rules in their function of providing information for decision-making, we should give attention to the historic path preceding a change. This means that the specific situation of an organization is of great importance', as are the specific preferences of the organization (Keating 1995, Scapens 1994, Vosselman 1996). Understanding the changes of an organization's accounting system then means understanding its specific circumstances and its specific past. In agreement with our previous argument this forms an important reason for performing case research, as we should not exclude aspects of a specific situation. Secondly, within the above institutional environment the evolving design of accounting rules is the consequence of the interaction between the actions of the agents within an institutional system and the coordinating system itself. Formal accounting rules are gradually institutionalized into organizational routines that are used by agents. Such processes of institutionalization are described and can serve as, a part of, a conceptual framework for thinking about and analyzing the evolving design of institutionalized accounting rules.<sup>155</sup>

*8. AN INSTITUTIONALIST'S VIEW ON MANAGEMENT ACCOUNTING RESEARCH*  
Viewing accounting principles in this paper as part of an institutional framework we can try to pinpoint some aspects of research in management accounting that fit the old-institutionalist perspective (Duindam and Versteegen 2000). This perspective advocates an open-minded inquisitive approach, explicitly multidisciplinary of nature, which can help us in describing specific instances.

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<sup>155</sup> See for instance Bruns and Scapens (2000).



Within the limits of our points of departure, looking at management accounting principles as a means for providing information for the purpose of boundedly rational decision-making, we saw that:

- The effect of accounting rules on the behavior of individual decision makers interacts with the effects of other rules. The shaping of a decision maker's decision room and preferences can be of importance here.
- Through their influence on the decision room and preferences of decision makers, accounting principles have a function in coordinating the various decision makers, in interaction with other coordinating systems within an organization like cultural norms and values or socio-organizational rules. A number of technical characteristics of an accounting system as a coordinating device can be mentioned, for instance speed of information transport or robustness against external shocks.
- The various coordinating systems evolve in interaction with each other. The specific succession and timing of changes stipulates the historical path of an organization's development.
- The specific mechanisms through which accounting principles get institutionalized within an organization are concrete building blocks when we try to describe or even explain the specific situation of an organization.
- A case oriented nature of research is needed as a consequence of the situation bound nature of an organization's development.

## **9. CONCLUSIONS**

We can witness a rising interest in the functioning of institutionalized accounting rules within an organization, particularly in the last decade. Accounting principles, in specific management accounting principles, can be looked upon as rules that shape the decision room of managers and, furthermore, that coordinate the behavior of decision makers within an organization. As such management accounting principles on a rising number of occasions are seen as institutional principles, the functioning of which may be analyzed and evaluated using the institutionalist point of view and instruments.

We think of management accounting as a means for generating and processing information for decision making. Looking at boundedly rational decision making it appears that accounting principles have a function in formulating the decision problem, which is the first phase in the decision process. As a consequence management accounting rules perform a coordinating function between decision makers and decision

processes. There exist a variety of other coordinating mechanisms like cultural rules or socio-economic rules. When we try to research the functioning and adaptation of accounting mechanisms, we should take notice of the specific decisions for which the information is needed, of future decision-making, of the interaction with other coordinating mechanisms, of historical paths, and of the circumstances in which the decision must be reached.

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**National and World Ecological Issues: *Biodiversity and Sustainable Agriculture*  
(Ecological Case-study: *Communities of Mites (Acari) as Bioindicators in Natural-  
and Agroecological Systems in Hungary*)**

**Ildikó Szabo Komlovszky  
Julia Litkei  
Gyongyver B. Gajzer  
Bela Lauday  
Gabor Csizmarik\***

**Samuel Tessedik College, Hungary**

**ABSTRACT**

Biodiversity refers to all species of plants, animals, and microorganisms existing and interacting within an ecosystem. In agroecosystems pollinators, natural enemies, earthworms, and soil microorganisms are all key biodiversity components that play important ecological roles, thus mediating such as natural control, nutrient cycling, decomposition, etc. In general, the degree of biodiversity in Hungarian agroecosystems depends on main characteristics (the factors of environmental agricultural management) of the agroecosystems. The authors carried out an acarological case study on mite fauna of Hungary living in different ecosystems.

The **mites** (*Chelicerata: Acari*) are **special microarthropods**. They are in different food types. **The phytophagous mites** (*i.e. Tetranychidae, Tenuipalpidae, Eriophyidae*) **are important pest in plant protection practise. A lot of species of mites are predators and parasites and live in soils as decomposers. Their ecological role is important as bioindicators.** Mites and collembolans can account for 95% of total soil microarthropod numbers. The mites occur mainly in the three suborders (*Oribatida, Mesostigmata and Prostigmata*). Disturbances, predation, competitive interactions and fluctuating of the environmental conditions also play a role in the value of mite-diversity in natural ecosystems. Furthermore the following **agricultural disturbances** determine the value of the mite-diversity:

**-Soil Texture**

**-Soil Compaction;**

**-Cultivation;**

**-Fertilization;**

**-Treatment with Pesticides.**

If disturbances of the agroecosystems are common, only a few taxa, which insensitive to disruption will persist, therefore biodiversity will decrease (*i.e.* Hungarian apple-gardens

treatment with chemicals). *Eupodidae*, *Tarsonemidae*, *Tydaeidae* are among the most abundant families in cultivated agroecosystems in the soil and their numbers increase rapidly in response to disturbances such as cultivation.

The authors carried out investigations- as a case study- on dendrophylic mite fauna of *Corylaceae* (hazelnut) species living in **natural circumstances** (Hungary, Szarvas, Botanical Garden). The results of investigations: **the mite community consists of 32 species, (7 dominant family)** in different trophic levels, the **diversity values range between  $H' = 0.31-1.78$  while homogeneity values vary between  $J' = 0.36-0.99$  under natural circumstances without agricultural disturbances.**

## INTRODUCTION

The „Biodiversity Act” seems to be one of the most important documents of the World Conference „Environment and Development” organized in Rio de Janeiro in 1992. It was accepted compulsory by Hungary as well. The **main areas of conservation** of biodiversity are the **genetic** diversity protection, strategy of preservation of **species** and perhaps the most significant are the fight against the pauperisation of **biotops**, elaboration of devices of conservation and creation of action plans.

There are very few (if any) natural habitats left in Hungary. All the forests, meadows are utilized and cultivated for centuries. **The traditional agriculture and forest cultivation was sustainable, the biological diversity** (both at genetic, species, habitat and at landscape levels) **was relatively high**, and this level did not change. Many areas, that are of importance on a nature conservationist's point of view, appeared as a result of human impact. (Like for example the "original Hungarian Pusztas" vegetation is also such a secondary succession that appeared as a result of the early drainage works and changes of the water table.)

**The balance between humans and nature ended when intensive agriculture and severe environmental damage appeared.** Before transition the intensification of agriculture and forestry lead to some dangerous trends. **The basic differences of the natural and intensive agroecological systems summarized by the Table 1.**

The most of endangered and extinct species became endangered because of habitat damage. As a result of clearing the forests, ploughing the meadows and use of pesticides

and insecticides, the amount of natural habitats decreases. Population of animal and plant species are more and more fragmented and isolated from each other. The extents of these processes are not as high as in some West European countries so the **biodiversity of Hungary is relatively high. More than 42.000 animal species are living on Hungary!**

**Table 1.**

**Differences of natural and agro-ecological systems**

<b>QUESTIONS:</b>	<i>NATURAL ECOSYSTEMS</i>	<b>AGROECOSYSTEMS</b>
<b>Diversity of species</b>	High	Low (homogeneity)
<b>Gene-diversity</b>	High	Low (homogeneity)
<b>Bio-mass</b>	High	Low
<b>Bio-geo-chemical cycles</b>	In a state of equilibrium	Inhibited
<b>Adaptation</b>	Natural selection	Artificial genetical methods GMO, LMO !!!
<b>Functioning</b>	400 million year	~ 400 year
<b>Global trends</b>	Decrease	Increase
<b>Consequences for the Biosphere</b>	Sustainability GAIA !	Instability HUMAN RESPONSIBILITY !

The ecological spectrum of plant species living on different climate zone demonstrate, that **Hungary (Carpathian Hollow) has more than 3240 natural plant species (Table 2.) The 2 years lifecycle plants (HKR) are the dominants (56%) of the Hungarian flora.** However, in Hungary there are also more and more endangered plant and animal species. The number of the protected animals was more than 700 and the protected plants more than 450 in 1990 (Hungarian Red Book)

Aside from this, in Hungary, (like in most other East European countries) for many years there was the attitude that "collective property is nobody's property". As a result of this there was a lack of environmental awareness and nature protection became a topic of secondary importance. Moreover, antagonism of interests also causes problems. Apart from the basic

antagonism between short-term economic interests and nature protection, in Hungary, nature protection is of interest on a national level but not always on a local or regional level (source: <http://www.gridbp.ktm.hu>).

**Table 2**

**Ecological spectrum of plant species living on different climate zone**

Climate zone	Number of species	Ecological spectrum( %)				
		PH.	CH.	HKR.	KR. (G)	T.
<i>Subtropical zone</i>						
<b>Evergreen forest (India)</b>	361	<b>66</b>	17	2	5	10
<b>Temperate zone</b>						
<b>Carpathian Hollow (Hungary)</b>	3240	6	6	<b>56</b>	14	18
<b>Polar zone</b>						
<b>Svalbard(Spitzberg)</b>	110	1	22	<b>60</b>	15	2
<b>Desert zone</b>						
<b>Transkaspi Hollow</b>	786	11	7	27	14	<b>41</b>

**Raunkiaer's plant-categories:** Phanerophyta: Trees  
 Chamaephyta: Scrubs  
 Hemikriptophyta: 2 years lifecycle plants  
 Geophyta: roots, bulbs  
 Therophyta: 1-year lifecycle plants (weed)

(Source: in Kárász, 1990, and in Haraszty, 2000.)

**MATERIAL AND METHODS**

The **protection** of micro-arthropods, like the predator **acarus (mite)** species (Arthropoda: Chelicerata: Acari) which can limit the biotic number of individuals of phytophagous mites **can be realized only by protection and conservation of their biotops and conservation of the steady state phases.** The national parks, the natural or mostly natural ecological systems, and the dendrophyllous plant collections, which are untreated by pesticides the parks of mansions and the agricultures treatment with IPM programme (with biocontrol), are very important from this point of view.



Arthropod populations are highly dynamic and soon become a pest. For this reason, population monitoring – of both pests and beneficial – has become an essential tool for managing arthropod pests (Gliessman, 2000).

In the **present study** the elucidation of characteristics of predator acarus species having a biotic individual limiting role, was considered a main question. This **acarological case study** carried out on dendrophyl collection of **Botanical Garden** in Szarvas. The territory it is 82 hectares, is lying in the valley of the river Körös. The Arboretum was founded 120 years ago. The flora of the Arboretum is well known, however, its fauna has not been explored yet. The acarological records of these area: Bozai, 1970, Bognár et al., 1977; Szabóné Komlovszky and Markó, 1979; Szabóné Komlovszky (1982,1983,1994,1995, 1998, 1999).Mahunka and Mahunka Papp, (1999) determined that in the new habitat species associated with trees have been established.

Very interest questions are the research of the acclimatization of the microarthropods and the characterization of their secondary succession. Koehler (1999) carried out investigations on Gamasina (soil mites) in a succession of thirteen years in the vicinity of Bremen (Germany). He determined that the space-for-time studies and long-term observations are not alternatives, but complementary techniques to study succession of mite-communities.

**Collection circumstances:** the collection time of the samples was between April and November per 10 days and the sample consisted of 5 x 10 leaves/individum from the hazelnut (*Corylus avellana* L.). The correct identification of the mites is the first step was in the research work. In identifying the mites we used the basic acarological works.

**The study was directed to the following questions:**

- What kinds of predator mite species live in undisturbed areas /nature conservation territories/;
- What are the diversity and homogeneity values of mite population communities;
- What are the significant tropical relationships of dendrophilic mite families in the natural areas; and what are the species of the guilds (preda-predator);
- Which are the direct and indirect effects regulating if densities of phytophagous mite populations;

- And which are the dominant endemic predator mite species that can potentially be used in biological plant protection in the Hungarian fruit gardens.

## RESULTS

Among the most frequently used ecological indices in acarology remarkable are the results of Castagnoli et al. (1999). They used the Shannon-Wiener's and Simpson's indices in their acarological investigations on mite populations in a vineyard agroecosystem in Italy.

The term "**structural characteristics of family-individual diversity**" was introduced by the authors in order to describe the collective structure of dendrophylic mite communities Szabo-Koml6vszky, 1982). Diversity (being a primary marking phenomenon) can be used for tracing changes in markings more closely. This is why it can also be used for indicating the phenetical picture of "initial degradation" in the acarological sense of the term. It can characterize the structural relations of a population at a given time by a single number, which can be calculated by the following formula:

$$H'' = - \sum_{i=1}^s \frac{n_i}{N} \cdot \ln \cdot \frac{n_i}{N}$$

where

$H''$	= "Shannon" -diversity
$s$	= number of families in the sample
$n_i$	= number of individuals in one (the i-th) family
$n_1$	= Eriophyidae
$n_2$	= Tetranychidae
$n_3$	= Czensinskiidae
$n_4$	= Tydeidae
$n_5$	= Phytoseiidae
$n_6$	= Cheyletidae
$n_7$	= Stigmaeidae
$N$	= total number of individuals in the sample.

In the addition to diversity, homogeneity  $J''$  should also be taken into consideration. This latter value can be calculated from the following formula:

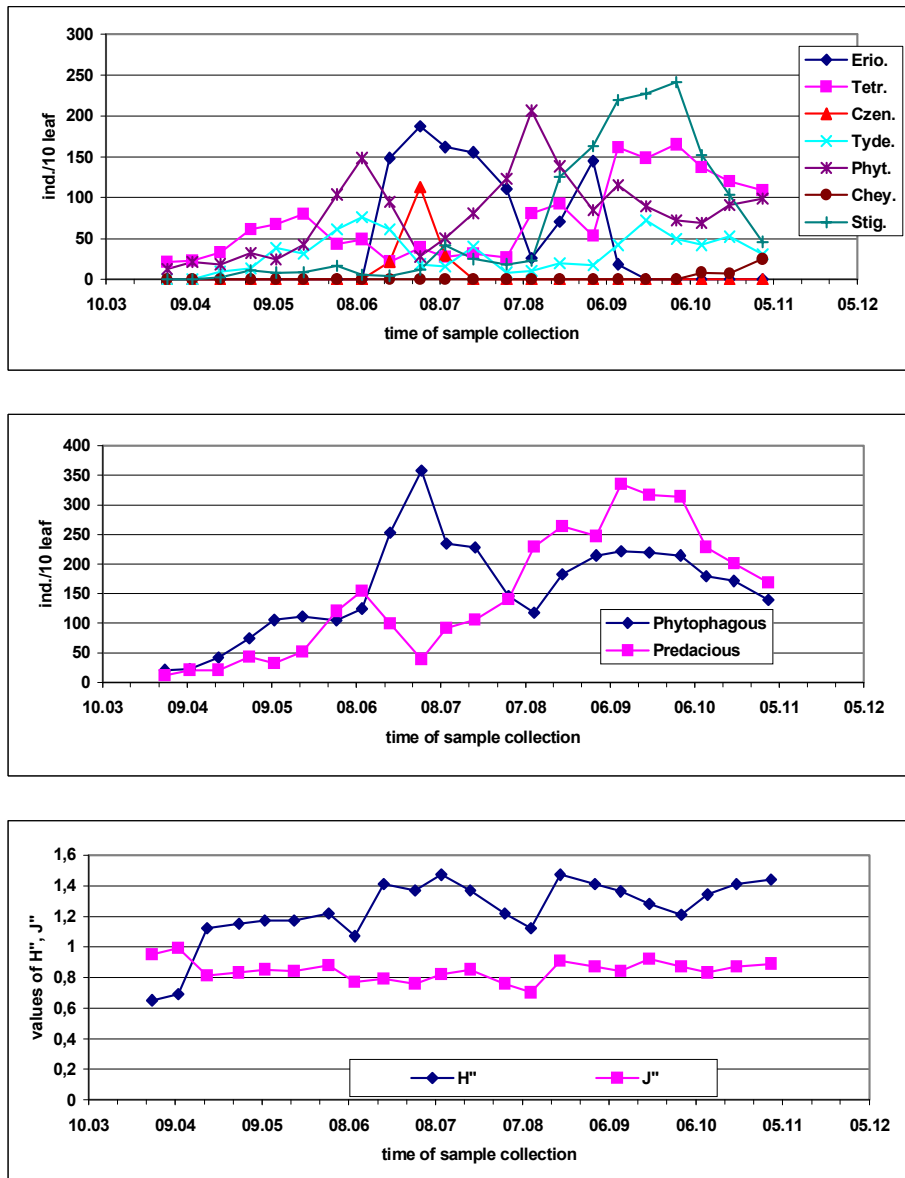
$$J'' = \frac{H''}{\ln s}$$

The abundance values of the dominant mite families (**Fig.1**) with the data of diversity indexes and values of homogeneity there are on the **Table 3 (in appendix)**.

The data of **1 year** of the research determined, that the diversity values range between **0,65 – 1.47 /H''**, the homogeneity vary between 0.70- 0.99 /J''/(**Fig. 3.**)

The phytophagous guild consist 4 dominant families and the predacious guild consist 3 dominant family (**Fig.2**) the population dynamics in space-time relation fluctuate around the “dynamic ecological equilibrium” in natural circumstances (nature protection areas). So in these areas we can study the “undisturbed steady state” of the ecosystems.

**Fig.1.,2.,3.:** Population dynamics and diversity of dominant mite families on *Corylus*



**avellana L.**

It can be ascertained on the basis of the results of the **5 years** investigation that the diversity values of dendrophilic mites living on Corylaceae species range between  $H'' = 0.31 - 1.78$  while their homogeneity values vary between  $J'' = 0.36 - 0.99$  under natural circumstances (i.e. in environments free from pesticides).

**Conclusions:** There are two aspects of population space relationships: quantitative (Density) and qualitative (Type of distribution). Density is the number of population element is a unit of space. Population density is assessed by sampling (representative sampling) in

most studies (Gallé and Charles, 1998), and expressed as a sample average with its variance or standard deviation. A well-regulated (autoregulated) natural system is stable.

The authors determined that in August are the maximum diversity values of mite communities and in April and in the end of September are the minimum diversity values of the years. It can be summarized that besides the determining role of abiotic factors, the qualitative and quantitative aspects of the food - factors as well as intra - and interspecific effects regulate the biotic potential of phytophagous mites. These relationships appear in a given habitat and at a given time only as population sizes (N).

**In mite communities forming natural dynamic systems, due to the presence and action of limiting factors such as density, competition, predation etc. and of feedback mechanisms the numbers and individual densities of both phytophagous and predatory species fluctuate around a value regarded as "optimal" in the natural circumstances.**

Authors arrived at the conclusion that **Amblyseius finlandicus Oudemans** and **Phytoseius echinus Wainstein et Arutjunjan** can potentially be used in biocontrol practice in the Hungarian fruit gardens because these are **endemic dominant predator mite of Hungarian fauna**. The results present excellent opportunities to explore new frontiers of biological control in the acarological practice. These investigations are equivalents with the results of the research in Ontario on apple trees (Amano and Chant, 1990).

**Biological control** was born and reared in the simple world of direct pair wise interactions between living species. Biological control has become today a key component of the plant protection worldwide. Concern about reliance on chemical pesticides has led to development of integrated pest management, which **depends on both the conservation of local endemic natural enemies** and their mass release as alternatives to chemicals. The nature conservation areas are reservoirs of parasite and predator microarthropods. The **phytophagous mites** /Chelicerata: Acari/ are **major pests** throughout the world. Their control is very difficult due to the development of resistance against various pesticides. The use of natural enemies Acari: **/predator mites/** is thus **essential** for any mites **biocontrol programmes** is the plant protection practice of Hungary.

## GENERAL DISCUSSION

The present acarological case study demonstrated the importance of the reservoirs of conservation of the predators and parasites.

So very important question is in view of nature protection the change of land use system in Hungary. Ángyán et al. (1998-2000) worked out of the new land use zone system for Hungary (Table 4.).

Table 4.

The distribution of arable land in the supposed land-use zone system with three categories (summary)

Land-use zone	Scenarios		
	1.	2.	3.
Protection zones (1000 ha)	111,3	111,3	111,3
Zones for extensive agricultural production (1000 ha)	981,3	1 408,90	1 860,50
Zones for intensive agricultural production (1000 ha)	3 621,40	3 193,80	2 742,20
Total:	4 714,00	4 714,00	4 714,00

The different is between the 3 scenarios so that the 3 th scenario has a “radical” conversion from the intensive agricultural systems. The main question is the combination and the “balance” of the agricultural sustainability and the environmental sensitivity (table 5). The role of the **ESA System** (Environmentally Sensitive Areas) means the protection of special flora, fauna, soil and water bases.

Table 5.

Changes in the land-use structure and in the size of their area as a result of the second scenario

Land use	area (1000 hectares)	
	present	according to 2nd scenario
<b>Arable land</b> intensive:	–	3 194
extensive:	–	<b>503</b>
total:	4 714	3 697
<b>Horticultural crops+fruits+grapes:</b>	260	260
<b>Grass</b> real data:	–	615
plan (new):	–	<b>788</b>
total:	1 148	1 403
<b>Total Agricultural Land:</b>	6 122	5 360
<b>Forests</b> actual data:	–	1 828
planned (new):	–	<b>762</b>
total:	1 828	2 590

Reeds and Fish farms	68	68
Total Agricultural Area:	8 018	8 018
Non-cultivated Land:	1 285	1 285
Total Land:	9 303	9 303

In order to realize the second scenario the following **conversions** had to be made for the development of the land-use ratio determined through the second scenario:

A conversion of 533 000 hectares of grassland **into forest**,

A conversion of 229 000 hectares of arable land **into forest**,

A conversion of 788 000 hectares of arable land **into grassland, and**

A conversion of 503 000 hectares of intensive arable land **into extensive arable land**

**This conversion would affect roughly 2 million hectares of land, which means 25 % of the total agricultural land of the country and 21 % of its total land!**

Diversity, its support and enhancement through species richness, rotations, intercropping cover crops in one of the basis principles of agroecology in sustainable agriculture system (Thrupp, 1996, in: Collins and Qualset, 1998). At the same time there are examples of agricultural practices that enhance biodiversity and one of the great challenges for the new century will be to discover additional ways for achieving complementary of food, fiber, and energy production and biodiversity conservation (Collins and Qualset, 1998).

Successful IPM (Integrated Pest Management) system should be sustainable, environmentally safe, and adaptable to the technical, institutional, economic, social, legislative, and educational needs of the farmers. The challenge in developing sustainable IPM system for the 21'st century is obtaining an adequate understanding of pests and agroecological systems, developing of effective short- and long term techniques, gaining acceptance of these practices by the institutions and community, establishing legislative control measures, and adapting techniques for various economic resources.

Our environment is we ourselves. Should our environment be ill, so are we. Healthy nature produces also healthy people. The protection of GAIA (of the Biosphere) to use of Eco-friendly techniques in the 21'st century (agricultural environmental management) is most important work of the nations all over the world. We have a moral duty to look after our planet and hand it on in a good order to future generations.

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## APPENDIX

**Table 3. Structural characteristics of mite communities on hazelnut (Corylus avellana L., Botanical Garden in Szarvas)**

Time of sample collection	Erio.	Tetr.	Czen.	Tyde.	Phytophagous ind /10 leaf	Phyt.	Chey.	Stig.	Predacios	H"	J"
01.04	0,0	21,2	0,0	0,0	21,2	12,5	0,0	0,0	12,5	0,65	0,95
10.04	0,0	23,0	0,0	0,0	23,0	21,3	0,0	0,0	21,3	0,69	0,99
20.04	0,0	32,9	0,0	9,7	42,6	18,4	0,0	2,8	21,2	1,12	0,81
01.05	0,0	61,4	0,0	13,1	74,5	32,7	0,0	10,7	43,4	1,15	0,83
10.05	0,0	67,8	0,0	38,0	105,8	24,0	0,0	8,5	32,5	1,17	0,85
20.05	0,0	80,1	0,0	31,5	111,6	42,9	0,0	9,0	51,9	1,17	0,84
01.06	0,0	43,5	0,0	60,9	104,4	103,8	0,0	16,7	120,5	1,22	0,88
10.06	0,0	49,0	0,0	76,0	125,0	148,7	0,0	5,9	154,6	1,07	0,77
20.06	148,3	21,7	21,9	61,4	253,3	95,1	0,0	4,3	99,4	1,41	0,79
01.07	187,1	38,9	112,8	18,7	357,5	28,2	0,0	11,8	40	1,37	0,76
10.07	162,0	27,6	29,5	15,8	234,9	50,6	0,0	41,7	92,3	1,47	0,82
20.07	155,7	31,5	0,0	40,1	227,3	81,1	0,0	25,1	106,2	1,37	0,85
01.08	110,8	26,8	0,0	8,3	145,9	122,8	0,0	18,2	141	1,22	0,76
10.08	26,3	81,0	0,0	10,2	117,5	206,3	0,0	22,9	229,2	1,12	0,7
20.08	70,9	92,2	0,0	19,5	182,6	138,2	0,0	125,3	263,5	1,47	0,91
01.09	144,5	53,3	0,0	17,1	214,9	84,4	0,0	162,9	247,3	1,41	0,87
10.09	18,4	161,4	0,0	42,0	221,8	115,6	0,0	219,1	334,7	1,36	0,84
20.09	0,0	148,1	0,0	71,7	219,8	89,1	0,0	227,6	316,7	1,28	0,92
01.10	0,0	164,7	0,0	49,6	214,3	72,0	0,0	241,7	313,7	1,21	0,87
10.10	0,0	137,2	0,0	41,8	179,0	68,5	8,2	152,0	228,7	1,34	0,83
20.10	0,0	119,5	0,0	52,1	171,6	91,3	6,7	103,7	201,7	1,41	0,87
01.11	0,0	109,2	0,0	30,4	139,6	98,7	24,6	45,6	168,9	1,44	0,89

## The Class Conflict Model: Theory and History

**Barrington K. Brown**  
**Barrington Associates**

### I. Introductory Background

Modern theory of class conflict was first analyzed by Karl Marx,<sup>156</sup> who defined classes in relationship to a given system of production. Focusing on two pure classes, Marx noted the historical fight between freeman and slave, dating from antiquity; patrician and plebeian, in ancient Rome; lord and serf, in feudal society; guild master and journeymen, under the handicraft system; where, generally speaking, the oppressor and the oppressed stood in constant opposition to each other. Marx concentrated upon the property relationship of the capitalist system of production, where one class, the bourgeoisie, owns the means of production, and the other class, the proletariat, works for them. The exploitation of the proletariat by the bourgeoisie leads, according to Marx, to conflict that ultimately results in the overthrow of the capitalist system.

Max Weber<sup>157</sup> expanded the concept beyond economic factors and developed a multidimensional concept of class. Weber's analyses included an economic dimension, wealth (property, income), a political dimension, power (authority), and a social dimension, prestige (honor). Weber referred to those people with common economic conditions as classes, those with common political interests as parties, and those with various degrees of prestige as status groups. While members of one of these groups may not be members of the others, where they are coincident, the systems of stratification, and class structure, is fully developed; since these various interests are joined. Class, then, according to Weber, is a group of people whose shared situation is a frequent basis for action by the group.

According to Ralf Dahrendorf<sup>158</sup>, the unequal distribution of power and authority leads to the formation of social classes, independent of economic conditions. The key element in the analyses of class conflict, then, is the authority relationships that exists between dominant and subordinate groups; where the distribution of authority may, or may not, be related to the ownership of property. When authority is distributed unequally, tension arises between such groups as management and workers, males and females, or teachers and students, such that the existence of dominance implies the possession of authority and the existence of subordination implies the exclusion from authority. These two groups have interests that are contradictory since the dominant group attempts to maintain the status quo while the subordinate group desires to change existing arrangements. Therefore, according to Dahrendorf, ownership of the means of production is but a special case of general authority relations. Dahrendorf acknowledges that authority, within limits, is empirically accompanied by relatively high income and prestige.

Gerhard Lenski<sup>159</sup> states that conflict arises over the control of the economic surplus; the surplus being the goods and services produced over and above the minimum required for society to survive. According to Lenski, the production of the surplus gives rise to stratification with regard to control over, and access, to society's resources. Lenski concludes that the distribution of the surplus is determined on the basis of the distribution of power in a society; where the inequalities in the distribution of power give rise to inequalities in the distribution of privilege and

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<sup>156</sup> Karl Marx and Frederick Engels, The Communist Manifesto (New York: International Publishers 1948).

<sup>157</sup> H.H. Gerth and C. Wright Miller, ed. Max Weber: Essays in Sociology (New York: Oxford University Press 1946) "Class, Status and Party".

<sup>158</sup> Ralf Dahrendorf, Class and Class Conflict in Industrial Society (Stanford, California: Stanford University Press 1959).

<sup>159</sup> Gerhard Lenski, Power and Privilege: A Theory of Social Stratification (New York: McGraw-Hill 1966).

prestige. This ultimately results in the unequal distributions of the economic surplus. Class, then, can be defined as an aggregate of people in a society who stand in a similar position with respect to the distribution of power, privilege, and prestige.

The present study focuses on the conflict view of social stratification from both a theoretical and historical perspective and analyzes ongoing circumstances. Social stratification, or structured inequality, refers to the unequal access, by entire categories of people, to social rewards; where social rewards include the general categories of wealth, power, and prestige. This paper will analyze, employing an interdisciplinary approach, the nature of the competition, by various groupings of people with insatiable appetites for social advantages, for scarce resources in given societies.

Some degree of status, or class, hierarchy is inevitable in any society because there are differences in the functional roles of individuals, in the power or authority they possess, or in the position they occupy. Status implies superior-inferiority relationships, and class assignments are based on a number of economic, social, political and anthropological factors. These factors include wealth and income, occupation, education, political affiliation, gender, race and ethnicity, achievement, age, ability, and family background. Since some form of social hierarchy, based on these differences, exists in all societies, social stratification is, therefore, a law of human nature.

In the presence of inequality, group or class distinctions develop which inevitably result in some degree of class feeling which, itself, leads to some degree of class tension and class friction. Class friction, or class conflict, involves activities that are directed by members of one class against the interests of another class in favor of its own interests; with all groups seeking to enhance, or at least maintain, its position relative to competing groups. While class friction, or class conflict, may be overt or covert, it always results in a certain degree of social tension, social instability, and social disorder.

Any class conflict consists of two distinct groups, standing in relationship to each other, competing for the same, scarce, resources and, thus, having opposing interests. The two class model introduced by Marx, seems appropriate since there can only be two sides to a given fight or argument. In any conflict between two opposing sides, any number of distinct classes might enter a given contest through the forming of coalitions. In any case, one party attacks, the other defends; one side seeks change, the other wants to maintain the status quo; one group seeks to improve its situation, the other desires to retain or secure its position.

Competition between opposing groups usually involve dominant versus subordinate groups, where the dominant group, of course, has the greater access to social resources, and hence, a greater amount of power.<sup>160</sup> Thus, dominant groups are able to obtain a large part of the economic surplus relative to subordinate groups.<sup>161</sup> Conversely, subordinate groups tend to be subjected to restraints, or oppression, and, through unequal exchange, exploitation. Randall Collins<sup>162</sup> notes that this exploitation, and its accompanying oppression, “need not involve conscious calculation on the part of those who gain from the situation; rather, they are merely pursuing what they perceive to be their best interests.”<sup>163</sup> Thus, given two distinct classes — standing in relationship to each other -, what is comfort to one party is oppression to the other;

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<sup>160</sup> Power, as defined by Weber, is the ability of persons or groups to obtain their will even though opposed by others.

<sup>161</sup> Social Psychologist have found that people who control resources, emotions, or finances valued by others clearly have the advantage in a relationship, whether it is commercial or personal. Erik J. Coates and Robert S. Feldman, eds. *Classic and Contemporary Readings in Social Psychology* (Upper Saddle River, N.J.: Prentice Hall, 1998 2<sup>nd</sup> ed.) p. 208.

<sup>162</sup> George Ritzer, *Sociological Theory*, (New York; McGraw-Hill 1992 3<sup>rd</sup> ed.) p. 609.

<sup>163</sup> As a form of Parkinson’s law: the use of power expands to fill the extent of its existence.

what is a fair exchange to one party is exploitation to the other; and, generally, what is justice to one party represents a threat to the other.

Social distinctions ultimately lead to inequalities, which leads to repression, which, in turn, leads to resistance. Since some degree of patterned inequality exists in all societies, it follows, then, that class conflict, whether overt or covert, is an inevitable occurrence in all human societies. Thus, it can be postulated that, from the point of view of sociology, the history of all societies is a history of class conflict; class being defined as people of like kind and circumstance. Further, each side of a conflict believes that their goal is theirs by “divine right”; which, of course, is why there is conflict.

The government, as Weber was the first to note, the apparatus of the state, is the only agency in society with a monopoly on the legal use of force and coercion; and it is the state that determines who gets what portion of the economic surplus. Thus, the object of any group is to gain control of, or otherwise influence, the government in order to enhance its position relative to competing groups. Since dominant groups have greater access to scarce resources and, hence, have more power, it can be postulated that, from the point of view of sociology, the function of the state is to maintain the position of dominant groups, i.e., to maintain the status quo. As a corollary, it can be postulated that the function of the state, operating through the government, is to provide a means whereby subordinate groups can enhance their position relative to dominant groups. The state, then, is the primary arena of conflict between classes. Competing groups seek to use the coercive powers of the state to enhance or maintain their relative position.

Over the course of human history, inequalities have been a continual source of tension and conflict, resulting in oppression and exploitation; with periodic episodes of violence. Throughout history, less powerful classes have fought more powerful classes, over perceived injustices, with some successes to their credit. Conversely, more powerful classes have fought to prevent various rights from being obtained by less powerful classes, and have attempted to undermine them even if these rights were established. These efforts have also had their share of successes. The struggles have continued; employer versus worker, rich versus poor, and, generally, haves versus have nots. The next chapter presents some examples of these struggles in order to provide a deeper insight into the class nature of society and the nature of class struggles.

#### IV. Class Conflict in the United States

##### **Business Versus Agriculture**

One of the first major conflicts between agricultural and industrial interests occurred in England in the first half of the nineteenth century. After the Napoleonic Wars, an agriculturist controlled parliament enacted heavy protective tariffs on agricultural products. Those tariffs, called the Corn Laws, enabled British landowners to obtain higher prices from the sale of their outputs, and, thus, earn higher profits. British industrialists viewed the Corn Law as a threat to the growth of manufactured exports because, unless foreigners sold their output in England, they could not pay for British manufactured products. Further, industrialists feared that tariffs on British imports might induce foreigners to retaliate with tariffs of their own.

Pressure from industrialists and merchant classes resulted in the passage, by Parliament, of the Reform Act of 1832, which set up new districts for electing members of Parliament. Prior to 1832, districts for electing members of Parliament were primarily in rural areas, and new industrial centers, such as Manchester and Sheffield, had no representation; since they grew up after older districts had been formed. The Reform Act of 1832 gave these thriving new cities representation, in Parliament, for the first time.

The Reform Act of 1832 enabled the industrialist and merchant classes to gain political power relative to landowners. As a result, Parliament repealed the Corn Laws, in 1846, and England entered upon eighty-five years of virtually tariff-free trade, a unique experiment.<sup>164</sup>

Quite the opposite situation occurred in the United States during the same period. The first significant protective tariff was enacted in 1816 in order to protect manufacturers, primarily located in the north, from British competition. Southern planters opposed the tariff because it raised the cost of goods they imported from Europe and, because, they feared, the tariff would cause other countries to retaliate with tariffs against southern products, primarily cotton.

Southern planters protested but were outvoted in Congress by manufacturing interests. In 1828, another protective tariff, called the Tariff of Abominations, imposed especially high duties on imported textiles and iron. Again, southern planters lacked the votes in Congress to counter manufacturing interests.

The question of the tariff resulted in what was termed the Nullification Crisis, in United States history. The doctrine of nullification upheld the right of a state to declare a federal law null and void and to refuse to enforce it within the state.<sup>165</sup>

### Farmers in the United States

The unique debt position of farmers results from the way in which farm production is carried out. Farmers usually receive their income, in a lump sum, when the crop is sold. In the meantime, however, farmers must borrow in order to pay for machinery, land, seed, and so forth; hoping to earn enough money from the sale of the output to repay the loans. Thus, farmers must borrow even in the best of times.

In the latter half of the nineteenth century, farmers joined together in order to bring an end to the growing power of corporations over their existence and to provide a means by which they could better appropriate the fruits of their labor. Farmers were burdened by the monopoly rates that railroads charged to transport their output to market and by the excessively high interest rates that banks charged on loans. Further, high protective tariffs on farm machinery enabled United States manufacturers to charge high prices for equipment. These, and other factors, combined to worsen the debt position of farmers.

The extension of the suffrage after the civil war to include all adult males enabled farmers to participate directly in the political process and influence government to operate in its behalf. The first national organization that promoted farm interests was the Patrons of Husbandry (the Grange). The Grange, by supporting the Greenback Party, hoped to increase the money supply in order to raise prices. As a debtor class, farmers perceived that they would benefit from an inflationary money supply at the expense of the creditor class. While farmers were not successful in expanding the money supply, they were successful in influencing federal and state legislation that benefited agricultural interests.

As the Grange faded, the Farmers' Alliances, more politically oriented than the Grange, took on a more national scope. In the election of 1890, the Farmers' Alliances took control of twelve state legislatures, elected six governors, and sent over fifty representatives to Congress. The Farmer's Alliances, and the populist movement that grew out of it, pushed for an increase in the money supply; the resulting inflation helping debtors relative to creditors. The populists advocated the creation of a bimetallic monetary system, i.e., gold and silver, rather than just a gold standard. In the election of 1896, the Populist Party supported the Democratic Party's

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<sup>164</sup> Paul Hohenberg, A Primer on the Economic History of Europe, (New York: Random House 1968) p. 97.

<sup>165</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People, Volume I (Upper Saddle River, N.J. Prentice Hall 2000), p. 280.

nomination of William Jennings Bryan, who gave his famous “Cross of Gold” speech at the Democratic convention. The Democrats lost the election primarily because urban workers in the northeast feared that the populist agenda would cause prices to rise significantly, eroding their standard of living.

### **Business Interests**

Industrial interests have had a long history of attempting to influence government to intervene in its behalf. Industrial interests have, historically, tried to combat agricultural interests, sought protection from foreign competition, attempted to impede the growth of organized labor, and have attempted, whenever possible, to maintain an environment conducive to monopoly in its own sphere of operation.

After the revolution of 1830, Louis Philippe, who was sympathetic to liberal reforms, was installed as King of France. In England, the Reform Act of 1832 gave Parliamentary representation to industrialists and enabled industrial interests to defeat agricultural interests in having the Corn Laws repealed. In other European countries, industrial interests began to gain power relative to agricultural interests. In Belgium, for example, the issue of relative political power was decided in the election of 1847 and the subsequent reforms of 1848.

In the United States, the railroads received assistance from state and local governments in the form of land grants and low interest loans. After the Civil War, the federal government made land grants and construction loans. Under the National Mineral Act of 1866, mining firms were given millions of acres of free public lands.

Although the first tariff enacted in the United States, in 1789, was intended to raise revenue, its primary function was soon to become the protection of infant industries, especially manufacturing. In 1816, in response to urging from New England manufacturers, Congress enacted its first really protective tariff, aimed against British textile manufacturers. Seaport merchants, however, opposed this tariff because it limited international free trade and, thus, eroded their profit potential. After 1865, businesses generally, were particularly favorably disposed to tariffs, which were placed upon products which were cheaper to produce in Europe; thus enabling United States firms to earn higher profits by charging higher than competitive prices. In 1909, the Payne-Aldrich Tariff, which was initially designed to lower tariffs, actually increased import duties.

The Interstate Commerce Commission was created to get the railroads to charge reasonable rates, particularly to farmers. However, when the railroads attempted to block the Commission’s rulings, particularly between 1887 and 1905, the Courts decided in favor of the railroads in 15 out of 16 cases. Under the Mann-Elkins Act of 1910, the government gained regulatory power over additional industries, including the telephone and telegraph.

As a result of corporate efforts to control and monopolize markets and, thus, obtain higher profits, Congress passed the Sherman Antitrust Act of 1890. However, due to ambiguities in the law, firms were generally successful in avoiding prosecution under this Act. In 1914, Congress passed the Clayton Antitrust Act and the Federal Trade Commission Act in order to strengthen the government’s antimonopoly efforts.

Since the Sherman Act prohibited any combination in restraint of trade, the courts interpreted the law in such a way that inhibited the growth of labor unions. Thus, labor was at a disadvantage relative to corporations. The Clayton Act exempted labor organizations from constraints under the Sherman Act and forbade federal courts to issue injunctions against strikers. Thus, corporations lost power relative to labor unions due to the Clayton Act.

After World War I, big business enjoyed considerable favor in the United States. This gain in political strength was due to the perceived contribution of big business to the war effort.

## Labor

The modern labor movement had its beginnings during the enclosure movement in Europe, primarily in England, when peasants who previously worked the land were freed to move to urban areas and form the workforce for the oncoming industrial revolution. Further, the larger, enclosed farms, with no common lands and common pastures, provided incentive for increased productivity in agriculture. The increased agricultural output resulted in the further increase in the population, which was necessary to form the labor supply for the industrial revolution.

As the industrial revolution proceeded, wealth flowed into the hands of factory owners, merchants, and shippers; people who made up the middle class. Along with the decline in their relative income share, workers worked long hours under unsafe working conditions. This exploitation of labor led workers to organize unions to press for their interests.

In England, the Combination Acts of 1799-1800 prohibited the forming of unions since the authorities were threatened, and intended to suppress them. Between 1815 and 1819, mass demonstrations and riots were common, particularly in the industrial cities, in England.

The Combination Acts were repealed in 1824 and, thereafter, unions were tolerated though not yet legal. After 1875, in England, union tactics were regarded as legal and trade union activity expanded significantly. In France, laws passed during the revolution, in 1791, and under Napoleon outlawed unions. However, these laws were repealed in 1864, whereby union activity was legalized.

The basis of workers' growing influence was the right to vote. In England, the Reform Act of 1832 gave most middle class men the right to vote. Subsequent reform acts, in 1867 and 1884, extended the franchise to all adult men. In 1871, France established universal male suffrage; the first European country to do so. By 1850, in the United States, nearly all adult white males could vote. By the end of the nineteenth century, most industrial countries had universal male suffrage. By the last decade of the nineteenth century, workers had made considerable progress and their standard of living had increased significantly.

While the early unions were made up, primarily, of skilled workers, unions later began to combine skilled and unskilled workers. The first union in the United States to do so was the National Labor Union, established in 1866. The second union of this type, the Knights of Labor was established in 1869, and reached its peak membership in 1886. The violence accompanying the Haymarket Square protest, in 1886, turned public opinion against the knights. Further, employer associations were successful in pooling their resources and impeding the growth of unionism.

After the Haymarket Square incident, the American Federation of Labor (AFL), consisting of 25 unions of skilled workers, was founded in 1886. By 1901, the AFL represented about one-third of all skilled workers.<sup>166</sup>

Meanwhile, the United States experienced a number of violent labor disputes; three of which are of particular significance. The Great Railroad Strike of 1877 was the first nationwide strike in the history of the United States. The President, fearing a national insurrection, set a precedent by sending federal troops to suppress the strike. The Homestead strike of 1892 resulted in the governor of Pennsylvania sending in troops to retake the steel plant which was under the control of strikers. In the Pullman strike of 1894, the attorney general of the United States obtained a court order, under the Sherman Act of 1890, claiming that the strike interfered with interstate commerce and impeded the movement of the mail.

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<sup>166</sup> Margaret L. King, *Western Civilization: A Social and Cultural History*, Volume 2 (Upper Saddle River, N.J. Prentice Hall 2000) p. 819.

The National Association of Manufacturers, a group of industrialists founded in 1903, launched a campaign to get rid of unions altogether. The NAM supplied strikebreakers, private guards, and labor spies to assist employers.

The Clayton Act of 1914, reflecting the growing power of the AFL, exempted unions from being viewed as illegal conspiracies in restraint of trade, as under the Sherman Act, and forbade courts to issue injunctions against strikes. Section 7a of the National Industrial Recovery Act (NIRA), of 1933, gave workers the legal right to organize and bargain collectively. When the NIRA was declared unconstitutional, in 1935, Congress passed the National Labor Relations Act, later that same year. The Wagner Act, as it was called, protected the rights of workers to bargain collectively and defined and prohibited unfair labor practices by employers. As a result of this law, union membership increased significantly. By 1947, unions represented about 40 percent of all wage earners.

In 1947, however, the balance of power shifted from labor to employers when congress passed the Labor Management Relations Act. The Taft-Hartley Act, as it was called, outlawed many labor policies approved by the Wagner Act, including the closed shop, and allowed states to pass right-to-work laws. This law made it more difficult for workers to establish unions.

The position of the labor movement was enhanced, in 1955, with the merger of the American Federation of Labor and the Congress of Industrial Organizations. The merger ended a long rivalry and the AFL-CIO made significant gains in the post World War II years.

Between 1970 and 1982, the AFL-CIO lost almost 30 percent of its membership and its political base decreased accordingly. Further, the decline in the manufacturing infrastructure has contributed to the decline in union power. By 1990, less than 15 percent of United States workers were union members, the lowest since before World War II. Currently, labor-backed measures now routinely fail in Congress.<sup>167</sup>

## Women

During the Middle Ages, in Western Europe, women held relatively little power, and their opportunities were, largely, limited to the home or the convent. In general, women were excluded from inheritance and divorce was practically unknown. When men went off to fight, as in the crusades, for example, women did, in their absence, hold some unofficial power with regard to property. Further, in some instances queens did rule, in effect, for their husbands and sons.

In colonial America, few opportunities existed for women outside the household. Men, by law, held managerial rights over property and inheritance rights for women were limited.

When the National Convention abolished the monarchy, in 1792, and declared France a republic, all adult males were given the right to vote. Women were denied this right although they had played a significant role in the revolution. However, divorce was legalized under the revolution, enabling women to leave marriages; and stronger inheritance rights were given to them.

The Napoleonic Codes, 1804, took away some of the right that women had won during the revolution. Property rights and personal freedom for women were once again restricted.

In the United States, by 1868, 27 states had granted women the right to own and administer property. In England, Parliament followed in 1882.

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<sup>167</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 919.



The women's movement in the United States officially began in 1848 in Seneca Falls, New York, at a meeting attended by about 100 women, led by Lucretia Mott, and some men who supported their cause. The meeting was concerned primarily with putting an end to women's subordination to men, in general, and was concerned with such specific items as women's right to hold property; and dealt particularly with the right to vote. Since the women's movement had roots in the abolitionist movement, women were particularly disappointed that the women's right to vote was not mentioned when the fourteenth and fifteenth amendments were passed.<sup>168</sup>

In 1869, Elizabeth Cady Stanton and Susan B. Anthony established the National Woman Suffrage Association (NWSA) to push for women's rights at the federal level. In that same year, Lucy Stone headed the American Woman Suffrage Association (AWSA) to lobby the states rather than Washington, DC. In 1890, these two organizations merged.

Farmers organizations such as the Grange (Patrons of Husbandry) and the Farmer's Alliances and labor organizations such as the Knights of Labor, included women who put forward their own set of demands. However, women were unable to gain equality within these movements. Further, they were unable to get the political parties they supported to endorse woman suffrage.

After decades of relatively peaceful efforts to obtain the vote for women, more militant organizations began to be founded, around 1900. In the United States, Carrie Chapman Catt established the North American Woman Suffrage Association (NAWSA) in 1902. In England, Emmeline Pankhurst established the Women's Social and Political Union (WSPU) in 1903.

As a result of their wartime contributions and in response to continued pressure from the suffrage movement, the Nineteenth Amendment to the Constitution was ratified in 1920, giving women the right to vote in the United States. The suffrage was also extended to women in other countries, around this time, as well. New Zealand was the first, in 1893; Australia, in 1902; Norway in 1913; Canada, in 1917; Great Britain, in 1918, to cite some instances. France did not extend the franchise to women until 1945.

After the Nineteenth Amendment was ratified, some women, such as Alice Paul, began to push for the Equal Rights Amendment, first proposed in Congress in 1923. In 1972, Congress approved the Equal Rights Amendment to the Constitution. The time limit ended in 1982; only 3 states short of the required number needed for ratification.

In the meanwhile, another hotly contested issue in the late nineteenth century and early twentieth century concerned the matter of birth control. Advocates faced opposition from the religious establishment, politicians – mostly men -, and national laws which condemned or forbade the distribution of birth control information and devices. Sexual radicals such as Margaret Sanger, in the United States, and Marie Stokes, in Great Britain, were trained in Amsterdam, the center of the birth control movement. The availability of birth control was significant in the female quest for equality and autonomy; since the ability to control their bodies is as crucial as the attainment of civil and political rights.

The politics of reproduction continue in the fight over abortion rights; which has aroused at least as much concern as the issue of contraception. The current struggle is between advocates of pro-choice (abortion rights) and pro-life (abortion rights opponents). A Supreme Court victory for the feminist movement was the 1973 case, *Roe v. Wade*, which upheld abortion during the first trimester of pregnancy. The issue rages on!

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<sup>168</sup> At the time, the idea of women suffrage was considered by Congress as being too radical. Senator Charles Sumner said that womanhood suffrage was "the great question of the future."

## Blacks

After the emancipation proclamation was issued and the Civil War had ended, southern states still attempted to keep the freedmen as near to slavery as possible by passing the Black Codes. The Black Codes seriously restricted the movement and activities of black people and attempted to return them to plantation labor.

In 1866, Congress passes the Civil Rights Act, over the President's veto, which granted full citizenship rights to black people and overturned the Black Codes. Fearing that the Act might be declared unconstitutional, Congress sent the Fourteenth Amendment to the states for ratification. Thus, black people obtained full citizenship rights under the law. In 1870, the Fifteenth Amendment, granting the vote to former slaves, was ratified.

With the end of reconstruction, the south became increasingly segregated, and this system of racial segregation was backed by state and local laws; which became known as "Jim Crow" laws. Although these laws were passed in the late 1880's, they remained in place some fifty years later. "Jim Crow" legislation in the south encouraged states outside the south to pass similar laws. Where segregation laws were not on the books, they existed in practice.

The Civil Rights Act of 1875 outlawed racial discrimination in theaters, railroads, and other public places. However, the Supreme Court overturned this law in 1883. Further, the case of Plessy v. Ferguson, in 1896, upheld a Louisiana segregation law and created the "separate but equal" doctrine. This doctrine was particularly harmful to black people when applied to education; although segregation was the norm in public school systems even in the reconstruction south.

Black voting rights were severely restricted by such tactics as literacy tests, poll taxes, and property qualification; where loopholes permitted poor whites to vote even under these conditions. In 1898, the Supreme Court ruled that these measures were proper methods of restricting the franchise to qualified voters. As a result of these efforts, only 5 percent of southern Blacks voted. In addition, blacks were barred from holding public office and serving on juries.<sup>169</sup>

White violence against blacks was common; as race riots occurred and thousands of lynchings took place. Between 1882 and the turn of the century, the number of lynching usually exceeded 100 each year.<sup>170</sup>

In 1905, W.E.B. DuBois and other black leaders met at Niagara Falls, New York, and formed an organization called the Niagara Movement. The group published a statement demanding equal opportunities for all black people. This movement led to the establishing of the National Association for the Advancement of Colored People (NAACP), in New York, in 1909.

In 1913, President Wilson ordered black and White workers in the federal government to be segregated from each other. This represented a major step backward for black people, in general.

In July of 1948, President Truman made a giant move on behalf of civil rights when he issued an executive order barring segregation in the Armed Services. Six years later, in 1954, another major step was taken when the NAACP won the landmark Supreme Court Case, Brown v. Board of Education of Topeka, Kansas. A combination of five cases, the Brown decision

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<sup>169</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 596.

<sup>170</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 596.

overturned the “separate but equal” doctrine with regard to education, established by Plessy v. Ferguson, in 1896.

The modern civil rights movement, led by Dr. Martin Luther King, began when the arrest of Rosa Parks, in December, 1955, sparked the Montgomery, Alabama, bus boycott. In late 1956, the court ruled that segregation on buses was illegal. In September, 1961, the Interstate Commerce Commission outlawed segregation in interstate buses and terminals.

The Civil Rights Act of 1964, signed by President Johnson, prohibited discrimination in employment based upon race, color, religion, sex, and national origin. The Act also created the Equal Employment Opportunity Commission.

In the late 1940’s about 10 percent of the eligible southern black people voted, most of them in urban areas in the upper south.<sup>171</sup> In 1964, the situation had not changed significantly.

The Voting Rights Act of 1965 authorized the Attorney General to investigate charges of discrimination at the polls and monitor elections and register qualified black voters in those areas. The Act also authorized federal supervision of registration in states and counties where fewer than half of the voting age residents were registered and outlawed literacy tests. Between 1964 and 1968, black registration increased from 7 percent to 59 percent, in Mississippi, and from 24 percent to 57 percent, in Alabama. In those years, the number of southern black voters increased from one million to 3.1 million.<sup>172</sup>

## Latinos

Hispanics, people of Spanish and Latin American background, have been the fastest growing group of people in the United States in recent years. The largest proportion of Hispanic Americans are people of Mexican descent; the second are Puerto Ricans.

After World War II, Latinos began serious efforts to improve their political, legal, and economic status. During the war, Mexican Americans won more medals than any other ethnic minority, and they were no longer willing to accept second-class citizenship. Latinos began to organize and stressed the importance of the vote. Dr. Hector Garcia established the G.I. Forum, in 1948, which aimed at fighting discrimination against Mexican Americans. The League of United Latin American Citizens (LULAC), founded in 1928; successfully pursued two legal cases important to Latino advancement. In *Mendez v. Westminster*, a 1947 California case, and in the 1948 *Delgado* case in Texas, the Supreme Court upheld lower court rulings that declared the segregation of Mexican Americans unconstitutional. LULAC won another important legal case in the 1954 *Hernandez* decision, in which the Supreme Court ended the exclusion of Mexican American from Texas jury lists.

Chicano nationalism of the 1960’s inspired a variety of organizations whose purpose was, not only to gain equality with whites, but also, to attain cultural and political self-determination. Corkey Gonzales’s *Crusade for Justice*, formed in 1965, campaigned for greater job opportunities throughout the southwest. In late 1967, David Sanchez formed the Brown Berets to address such issues as housing and unemployment. A new political party, *La Paza Unida* – “the united people” – (LRUP), increased Mexican-American representation in local government and established social and cultural programs. The student-led Mexican American Youth Organization (MAYO) worked closely with LRUP to help Mexican Americans take political power in Crystal City, Texas. The two organizations registered voters, ran candidates for office, and staged an extensive boycott of Anglo-owned businesses.

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<sup>171</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 853.

<sup>172</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 871.

In 1968, President Johnson signed the Bilingual Education Act, which reversed state laws that prohibited the teaching of classes in any language other than English. Meanwhile, students organized Mexican-American studies programs on various campuses.

Latino activists soon realized that economic power remained outside the community. Given the high incidence of poverty, ordinary Mexican Americans lost some confidence in the political process, and a degree of apathy set in after early hope for significant, and rapid, change.

## Asian Americans

The Chinese were the first group of Asians to arrive in the United States in significant numbers, coming initially as a result of the discovery of gold in California and in response to the need for workers to build the Central Pacific Railroad. Business leaders in California and other western states favored Chinese immigration because it provided a large supply of workers. Labor unions, however, opposed Chinese immigration, claiming that it lowered the wages of existing workers.

Anti-Chinese feeling resulted in the passage, in 1882, of the Chinese Exclusion Act, which suspended Chinese immigration, limited the rights of resident Chinese, and forbade their naturalization. Further, in 1902, pressure from the American Federation of Labor resulted in the total restriction of Chinese immigration.

In the late 1800's and early 1900's, Japanese immigrants began to arrive in significant numbers. Native-born Americans began to protest the inflow of Japanese workers and western states passed discriminatory laws against them.<sup>173</sup>

The egalitarian climate growing out of the civil rights movement resulted in the passage of the Immigration and Nationality Act of 1965, which eliminated quotas based upon national origin. In the twenty years following the 1965 Act, four times as many Asians settled in the United States than in the entire previous history of this country. As a result, the Asian Community underwent a profound change. In 1960, Japanese represented 52 percent of the Asian population, Chinese represented 27 percent, and Filipinos represented 20 percent. In 1985, however, Japanese represented 15 percent; Chinese, 21 percent; Filipinos, 21 percent; Vietnamese, 12 percent; Koreans, 11 percent; Asian Indians, 10 percent; Laotians, 4 percent; and Cambodians, 3 percent.

Inspired by the black power movement, college students of Asian ancestry began to unite in order to combat racial oppression. In 1968, students on the West Coast founded the Asian American Political Alliance (AAPA), one of the first Pan-Asian political organizations. Similar organizations spread rapidly to the East Coast and Midwest. These students began to seek alternatives to the goal of assimilation into mainstream American society; promoting instead a unique sense of Pan-Asian ethnic identity.

Older civil rights organizations, such as the Japanese American Citizens League (JACL), were prompted to bring forward the issue of internment during World War II. As a result, in 1988, Congress voted reparations of \$20,000 for each of the surviving

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<sup>173</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 874-75.

victims.

Since the late 1960's, major universities have introduced courses in Asian American studies. Currently, Asian Americans represent 4 percent of the U.S. population; and the politics of identity continue.

### Upper Income Groups

Upper income people, in the United States, benefited in the 1980's when Congress passed a huge tax decrease that lowered the tax rates for individuals and corporations. Up to that time, the richest people paid about 70 percent of their income in taxes. Their tax rate fell to 50 percent and then to 33 percent. This tax cut was financed largely by a decrease in social welfare programs. The number of people receiving food stamps declined from about 17 million to about 8 million during the first half of the 1980's.<sup>174</sup> About 1 million people were dropped from welfare and Medicaid.<sup>175</sup> Some job training programs were cancelled.

### V. Fundamentals of Class Conflict

The Concept of class implies inequalities and further implies the existence of class conflict. Classes do not exist in the absence of class conflict and, therefore, tension between classes is a constant feature of any society. As Marx states, these groups stand "in constant opposition to one another [carrying] on an uninterrupted, now hidden, now open fight...<sup>176</sup>. Whether class conflict is overt or covert, it always results in some degree of social tension, social instability, and social disorder.

Fundamental to the class nature of society are the concepts of class consciousness and false consciousness, originally introduced by Marx.<sup>177</sup> When a group develops class consciousness, it moves from being a class-in-itself, created by the structures of society, to being a class-for-itself; where the members are aware of each other and have a shared sense of their circumstances and what they can do collectively to enhance their shared position.<sup>178</sup>

As was mentioned in section one, the state determines who gets what portion of the economic surplus; and gaining political access, or otherwise gaining control of the state apparatus, is the method by which classes influence the state to intervene in their own behalf. Thus, the government, the apparatus of the state, is used by various groups to enhance their position relative to competing groups. Dahrendorf discusses the institutionalization and regulation of class conflict and notes three methods by which political change can occur. The first type involves a total (or near total) exchange of personnel in positions of domination. While this method represents the rarest type of change, an example occurred during the French revolution. In 1791, the National Assembly drew up a constitution calling for a constitutional

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<sup>174</sup> Ghomas DiBacco, Lorna Mason, and Christian Appy, History of the United States (Boston Houghton Mifflin 1991) p. 817.

<sup>175</sup> Ghomas DiBacco, Lorna Mason, and Christian Appy, History of the United States (Boston Houghton Mifflin 1991) p. 817.

<sup>176</sup> Karl Marx and Frederick Engels, The Communist Manifesto (New York: International Publishers 1948) p. 9.

<sup>177</sup> Class consciousness refers to the objective awareness by a group of their situation and shared interest and begins to challenge existing social arrangements which maintain their current position. False consciousness refers to group acceptance of ideologies that justify their relatively low status and the acceptance of current social arrangements, which maintain their current position as natural and proper.

<sup>178</sup> A unique example of the development of class consciousness was the successful middle class tax movement in California, in 1978. Proposition 13, which lowered property taxes, was approved. See section IV.

monarchy. In 1792, however, the National Convention abolished the monarchy and proclaimed France a republic.

The second mode of change involves a partial exchange of personnel in dominant positions. In this type of change, some representatives of subordinate groups penetrate the ruling class and influence the policies adopted and decisions made. In the United States, this type of change occurs when subordinate groups increase their representation in elected and appointed offices. Between 1970 and 1993, the total number of Black elected officials at the federal, state, and local levels, combined, increased by 440 percent, from 1,479 to 7,984.<sup>179</sup> From 1984 to 2000, the total number of Latino elected officials increased by nearly 65 percent, from 3,009 to 4,921, at the local level; by 80 percent, from 110 to 198, at the state level; and more than doubled, from 9 to 19, at the federal level.<sup>180</sup> From 1977 to 1999, the number of women serving as mayors increased by more than 300 percent, from 47 to 192; in state legislatures by 140 percent, from 688 to 1,652; in the U.S. House of Representatives by more than 200 percent, from 18 to 56. In the 106<sup>th</sup> Congress, in 1999, 9 women served in the U.S. Senate.<sup>181</sup>

The third type of change resulting from class conflict does not involve any exchange of personnel, and change occurs in the direction intended without any members of the subordinate group penetrating into dominant positions. This is accomplished when holders of dominant positions initiate legislation and adopt policies favorable to the subordinate group. In a representative democracy, this is accomplished by an extension of the suffrage. Legislators, in order to pursue their self-interest and remain in positions of power, will pass legislation which benefit the interests of certain groups at the expense of opposing groups. In the process of political sociology, it seems that reality lies between the extremes of type II and type III.

Institutionalization and regulation of class conflict is indicative of certain types of social machinery which provides a framework through which class struggles might be routinized and carried out in a relatively orderly manner. Examples of social machinery include the National Labor Relations Board, strengthened under the Wagner Act of 1935, and the Equal Employment Opportunity Commission, created by the Civil Rights Act of 1964.

The institutionalization and regulation of class conflict clearly decreases the violence associated with class struggles though not necessarily its intensity.<sup>182</sup> The intensity of class conflict is related to the social psychology of intergroup relations, where people develop friendly or hostile attitudes depending upon whether the functional relations between them is cooperative or competitive.<sup>183</sup> Competition for the same, scarce, resources results in prejudices and negative stereotyping and the development of an ingroup-outgroup mentality that intensifies the friction. The more people view others as competitors, the more they will compete, thereby intensifying and amplifying the competition.

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<sup>179</sup> United States Department of Commerce, Statistical Abstract of the United State. Various years.

<sup>180</sup> National Association of Latino Elected and Appointed Officials Education Fund. Los Angeles, California.

<sup>181</sup> National Women's Political Caucus. Washington, DC.

<sup>182</sup> Under authoritarian, non-democratic regimes, or even in democratic societies where class conflict is not regulated, class conflict and the attempt to gain upward mobility may be perceived as a threat by the dominant class. In pursuing their self-interest, the dominant class meets the accompanying social disorder with repression and, possibly, violence, extending, at times, to wholesale murder. For example, racial violence reached a wartime peak during the summer of 1943, when 274 conflicts occurred in about 50 cities. In Detroit, 25 blacks and nine whites were killed with more than 700 injuries. Also in 1943, the zoot suit riots occurred in Los Angeles where American Navy personnel initiated violence against Mexican-American youths. Further, during the civil rights movement of the 1960's, civil rights workers were killed, churches were bombed, and so forth.

<sup>183</sup> Muzafer Sherif, O.J. Harvey, B. Jack White, William E. Hood, and Carolyn W. Sherif, The Robber's Cave Experiment: Intergroup Conflict and Cooperation (Norman: University of Oklahoma Book Exchange 1961).

Superordinate goals, particularly with regard to the pluralist model, decreases intergroup friction. However, when the challenge is met, intergroup friction resumes. An example of a superordinate goal occurred during World War I when Samuel Gompers and most other labor leaders agreed to cooperate with business and the federal government to keep up production. For the good of the war effort, workers agreed not to strike during the War. Another example occurred during World War II when civil rights leader A. Phillip Randolph and President Roosevelt made a deal. President Roosevelt issued Executive Order 8802 -prohibiting discrimination in War industries – and Randolph cancelled a march on Washington, planned for July, 1941.

The concept of social dominance orientation, applicable to the elitist model, describes the extent to which a person wants his or her group to dominate and be superior, both socially and materially, to other groups, rather than thinking that all people should be treated equally. People having strong social dominance orientation are particularly likely to hold negative stereotypes and prejudices with regard to lower status groups because such stereotypes and prejudices help justify the existing social hierarchy. In the elitist model, from the point of view of psychology, the dominant group would rather suffer a loss than relinquish its relative position.

#### IV. New Theories of Class Conflict

Social stratification, based on certain factors, exists in all societies, and class feeling, class tensions, and thus, class friction exist, irrespective of the absolute level of the class structure. For example, if two, given, societies have identical social, political, and cultural features, and identical relative income distributions; but differ only with respect to the absolute income level of the total class structure, the intensity and the degree of class friction would be the same in both societies.<sup>184</sup> Support for their theory can be found in the history of the United States, which for the better part of its existence, has enjoyed a high national and per capita income relative to any country in the world. Yet, as has been shown, its history has revealed numerous sequences of farmers' movements, workers' movements, teachers' movements, civil rights movements, women's movements, middle class tax movements, and so forth. These types of activities were all undertaken to enhance the status and position of particular groups relative to others. In modern democracies, these groups are sometimes referred to as special interests<sup>185</sup>, and the pendulum continues to swing, in a relative sense.<sup>186</sup>

When a given society is in the process of moving to a higher level of prosperity, each contending party perceives that it is gaining and, thus, class feeling, class tension, and class friction decreases. At the new, higher, level of prosperity, each party assesses its new relative position, and class conflict continues accordingly. The party that loses relative position attacks and the party that gains relative position defends.<sup>187</sup> In the process of moving to a lower level of prosperity, each contending party perceives that it is losing and, thus, class feeling, class tension and, class friction increases.<sup>188</sup> At the new, lower, level of prosperity, the party that loses relative position attacks, the party that gains relative position defends, and class conflict continues accordingly. If all other conditions are identical at the new, higher or lower, levels of prosperity, the degree of class tension and class friction is the same at both levels.

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<sup>184</sup> This theory was initially stated as a hypothesis in a previous paper created by this author. See: Barrington K. Brown, "The Philosophical Nature of the Social Sciences and the Development of Human Technology". Prepared for presentation at the Fourth Annual Convention of the Congress of Political Economists, International, Paris, France, January 8-13, 1993. P. 14-15.

<sup>185</sup> It's always amusing to hear politicians in modern democracies accusing each other of catering to special interests. The state is always class biased and state policy is never class neutral.

<sup>186</sup> The pendulum swings because the winning party (or coalition of classes) becomes complacent and the losing party is spurred into action. Such is the nature of political sociology – political psychology.

<sup>187</sup> This point is more applicable to the pluralist model. In the elitist model, the subordinate class attacks and the dominant class defends.

<sup>188</sup> If both parties perceive that they are losing, both will be on the attack.

The following analysis holds, in concurring with Dahrendorf's inference, that there is no significant leveling of the class structure and that there is a minimum of inequality that will not be lowered by egalitarian trends. Further, the analysis holds that class conflict is prosperity neutral; maintaining consistency with the previous two analyses of this section. It can be assumed that social rewards among the members of a given society is a normal distribution with, mean,  $\mu$ , and standard deviation,  $\sigma$ . It is further assumed that the distribution is symmetrical such that the mean, median, and mode are identical. The quantification, social rewards, is some combination of wealth, power, and prestige; where the three dimensions are coincident, such that the system of stratification is fully developed, in the Weberian sense.

Fig. 1

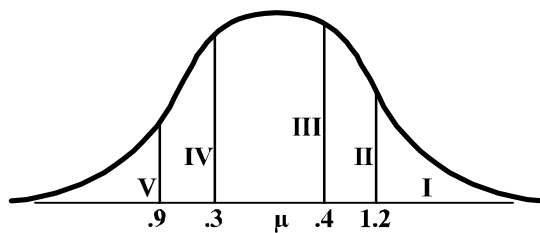


Table I<sup>189</sup>

Class	Standard Deviations from mean	Percent of Population
I	> +1.2	11.5
II	+ .4 and +1.2	23.0
III	-.3 and +.4	27.3
IV	-.9 and -.3	19.3
V	-.9 <	18.4

The graph and the table illustrates a society with five distinct classes, noted I, II, III, IV, and V. Members of Class I, the most privileged class, hold social rewards that range upward from 1.2 standard deviations above the mean and represent 11.5 percent of the population.

Members of Class V, the least privileged class, holds social rewards which range downward from .9 standard deviations below the mean and represent 18.4 percent of the population. Members of the middle most class, Class III, hold social rewards that range between .3 standard deviations below the mean to .4 standard deviations above the mean, and represent 27.3 percent of the population.

From the illustrations, Classes II or III (or both) could form a coalition with Class IV in order to enhance its position. As a result, Class IV could enhance its position; possibly by achieving an extended suffrage or through an increase in transfer payments. An example of this type of coalition occurred when British workers joined middle class reformers in agitating for the Reform Act of 1832, which extended the suffrage to nearly all middle class men. This eventually led to the repeal of the Corn Laws, in 1846, which made it easier to import grain and lowered the cost of living for the working poor. Further, this led to the Reform Acts of 1867 and 1884, which extended suffrage to all adult males and attended the legalization of labor union activity.

Another example is the successful middle class tax revolt in California in 1978, which approved Proposition 13, cutting property taxes and government revenue for social programs and education. In the above illustration, this can be represented by a coalition of Classes III and IV strengthening their position relative to Class V.

In the context of the above model, position shifting and displacement can also occur. As a result of the civil rights movement, black family income rose from 53 percent of white family income in 1954 to 60 percent in 1969, peaked at 62 percent in 1975, then fell back to 57 percent in 1977. These changes represent position shifting of blacks relative to whites. When the income of one group increases relative to that of another, position shifting occurs and the resulting displacement represents a decline in life chances for the displaced group. In the latter 1970's,

<sup>189</sup>

Data for such an analysis can be obtained from a normal distribution table.



particularly in economically hard-pressed urban areas, white voters began to resent the gains made by Blacks and Latinos and formed a powerful backlash movement.<sup>190</sup> The backlash coalition of such groups as Poles in Chicago, Irish in Boston, Italians and Jews in Brooklyn, New York, and so forth, was undertaken to consolidate political influence.

Nearly all of the movements discussed in this paper have ultimately resulted in an extension of the suffrage. The increase in voting rights allow groups to compete successfully within the hierarchical structure; i.e., along the bell shaped curve.

The final part of this section deals with people's need for consistency in action (behavior) and attitude (belief). In the process of conflict, group members may act in ways that aid members of their group and harm members of another group. This behavior, if not accompanied by changes in attitudes and belief, with regard to members of others groups, result in cognitive dissonance; where people feel uncomfortable due to contradictions. Consistency requires dissonance reduction, where attitudes and beliefs conform to behavior. Thus, when groups compete for the same, scarce, resources, prejudices, negative stereotyping, and mistrust develop.

#### V. Smith Versus Marx

The present section will show that Adam Smith's key insight, while leading to an optimum when viewed from an economic perspective, leads away from the social optimum when viewed from an interdisciplinary perspective. This section will further show that Karl Marx's dictum, while leading away from the optimum when viewed from an economic perspective, leads toward the social optimum when viewed from an interdisciplinary perspective.

Fundamental to the present analysis is the primary law of human nature; self interest. It should be noted that laws of human nature are no less fixed than laws of physical nature.

Adam Smith's key insight states that when two parties engage in voluntary, free, exchange, both parties gain otherwise, because of the law of self-interest, the exchange would not have taken place. As a result of the exchange, the whole is greater than the sum of its parts, and society benefits accordingly. This insight forms the basis of a capitalist, free market, society.

Karl Marx's dictum, "from each according to his ability to each according his need", forms the basis of a socialist society. However, the law of self interest requires that the more abled decrease their productive efforts since they are not reaping the benefits of such efforts. The less abled are required by the law of self interest to increase their needs since these needs are being met by someone other than themselves. Thus, under pure socialism, productive efforts decrease while, at the same time, need is increasing, resulting in the bankruptcy of the economy.

Thus, when viewed from an economic perspective, Adam Smith's key insight leads towards the social optimum and Karl Marx's dictum leads away from the social optimum. However, the situation reverses when viewed from an interdisciplinary perspective.

Under Adam Smith's key insight, a dominant group will have power relative to a subordinate group, and unequal exchange takes place.<sup>191</sup> The result of unequal exchange between classes is exploitation and, thus, inequality. While society benefits from voluntary, free, exchange, exploitation and inequalities lead to social instability and social disorder.

The classic example of unequal exchange between classes is, of course, the relationship between business and labor. Another example is the relationship between farmers and the

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<sup>190</sup> John Faragher, Mari Jo Buhle, Daniel Czitrom, and Susan Armitage, Out of Many: A History of the American People Volume II (Upper Saddle River, N.J. Prentice Hall 2000) p. 931.

<sup>191</sup> Randall Collins notes that in situations of inequality, groups that control resources are likely to exploit groups that lack resources. See: George Ritzer, Sociology Theory (New York: McGraw-Hill 1993 3<sup>rd</sup> ed.) p. 609.

railroads during the latter part of the nineteenth century. Other examples of unequal exchange between classes include the relationship between men and women, blacks and whites and, generally, rich and poor. Women and members of minority groups tend to receive less pay for the same work even after controlling for job type, educational background, and the like.<sup>192</sup> The fact that, in the United States, the income of women is 60 percent that of men, that family income of blacks is 54 percent that of whites, and that family income of Hispanics is 61 percent that of whites is indicative of unequal exchange, exploitation, and obviously, inequality.

As has been discussed in this paper, subordinate classes have attempted to use the coercive powers of the state to alter exchange relationships. Dominant classes have attempted to use the coercive powers of the state to strengthen their position relative to subordinate classes. This paper has discussed various pieces of labor, civil rights, and other types of legislation. Further, specific laws such as minimum wages and rent controls directly affect exchange relationships.

Application of Marx's dictum has been employed to decrease tension and friction between upper and lower income groups and enhance social stability and social order. In the United States, labor unions, as well as farm organizations, began advocating the redistribution of income through progressive income taxation as early as the 1870's. In 1892, the platform of the Populist Party called for a progressive federal income tax. Congress initially passed a federal income tax in 1894 but, the following year, the Supreme Court declared it unconstitutional. The Sixteenth Amendment, ratified in 1913, provided the legal basis for a progressive income tax by the federal government.

In the United States, the ratio of the top 20 percent of income earners to the bottom 20 percent of income earners decreased from 31.2 to one before taxes and transfers to 7.48 to one after taxes and transfers.<sup>193</sup> This figure does not include income from stocks, bonds, and property.<sup>194</sup> To accomplish this, the share of income of the top 20 percent decreased from 53.1 percent of all earned income to 47.1 percent, representing a decline of only 11.3 percent in relative well being. This redistribution was accomplished without too great a loss to the top 20 percent. The percent of total income earned by the bottom 20 percent increased from 1.7 percent to 6.3 percent, an increase of 271 percent in relative wellbeing. This increase occurred primarily because the bottom 20 percent of income earners received about 40 percent of transfer payments.

Some of the programs mentioned in this section tend to be inefficient when viewed solely from an economic perspective. Minimum wages, under a net of competitive conditions, result in a decrease in employment. Rent controls, under a net of competitive conditions, result in a decrease in rental units. Progressive income taxes result in disincentives with regard to productive efforts and, generally, distort the work-leisure trade-off. These, and other policies, including other egalitarian measures, import restrictions favoring certain industries, investment incentives favoring certain industries, and so forth, result in inefficiencies in the aggregate production function. The class nature of society, manifest through universal suffrage, however, requires that these policies be implemented so as to allow some groups to gain relative to others. Their implementation results in less class tension and less class friction and, ultimately, a stable and orderly social environment. A stable and orderly social environment is essential in providing a climate favorable to savings and investment, and, hence, economic growth.

## VI. An Application of the Model: Educational Vouchers

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<sup>192</sup> Douglas T. Kendrick, Steven L. Neuberg, and Robert B. Cialdini, Social Psychology: Unraveling the Mystery (Boston: Allyn and Bacon 1999) p. 398.

<sup>193</sup> Melvin M. Tumin, Social Stratification: The Forms and Functions of Inequality (Englewood Cliffs, N.J. Prentice-Hall 1985) p. 55.

<sup>194</sup> Melvin M. Tumin, Social Stratification: The Forms and Functions of Inequality (Englewood Cliffs, N.J. Prentice-Hall 1985) p. 55.

Educational vouchers is an arrangement whereby parents receive vouchers corresponding to all or part of the amount that the state or local community committed to spend in providing public education for their children. Under this arrangement, parents, rather than the government, choose the schools their children attend. If they are not satisfied, parents can move their child from one school to another, thus, introducing competition into the schooling process. This arrangement, if applied universally, would result in the development of a private, for profit, schooling industry. Theoretically, schools would compete with each other for students; offering the highest quality education at the least possible cost. Public schools, if any were left, would be competitive. While the foregoing analysis views the situation from an economic perspective, the following analysis examines the situation from an interdisciplinary perspective.

For most of the history of mankind, education was a private affair and, for the most part, only upper income classes received an education. Prior to the nineteenth century, most children of working class families did not attend school at all and would, more likely, be apprenticed to a craftsman, do agricultural work, or work as a servant. Many people did not learn to read, write, or do arithmetic, and the idea that all children should receive even an elementary education is a fairly recent one.

With the extension of the franchise to lower income groups, people began to view public education as a step in the advancement of the working class. The realization was that, without schooling, children of working class families would be denied social and economic opportunities.

In the latter part of the nineteenth century, mass public education began to expand, with the United States and countries in Western Europe instituting mandatory, free, public schools for all children. With access to public schooling in at least the leading nations, all children, rich and poor, had an opportunity to learn skills with which to strive for upward mobility.

Thus, given the class nature of society, lower income classes, having fought so hard, over the years, to obtain public schooling for their children, fear that the opportunities for upward mobility would be severely limited by the privatization of education.<sup>195</sup> An analogous argument can be made with regard to the historically black colleges and universities.

In the nearly fifty years since the idea of educational vouchers was first proposed, no significant progress has been made in the implementation of this system. Only trial and token programs have been instituted.

Milton Friedman<sup>196</sup> has attributed the failure to adopt educational vouchers to the vested interests of the politically powerful public education establishment reinforced by the growing power of the teachers' unions. Even if this were even partially true, the school bureaucracy and the unions could not have been successful in opposing the program without the votes of lower income classes; the 60 percent of American families that earn 31 percent of total national income and tend to send their children to public schools. It follows, then, that the primary beneficiaries of a system of educational vouchers are upper income classes; the 40 percent of American families that earn 69 percent of the nation's total income, who tend to send their children to private schools, and pay twice for their children's education.

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<sup>196</sup> Milton Friedman, "Public Schools: Make them Private", The Washington Post (February 19, 1995), op. ed.

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# COMPETITION, COOPERATION AND HUMAN NATURE

ANTONIO JORGE, ELISA SHAFRAN AND RAUL MONCARZ

## Florida International University

Cooperation, in the present context, necessitates goodwill, but does not require love in the sense of radical sacrifice. It is true that sustained and effective cooperation cannot be based solely on “enlightened egoism” and a detailed profit-and-loss calculation. In the end the two cannot be coextensive. If the two were to run parallel courses *ad infinitum* they would be, to all practical effects, indistinguishable. This is contrary to what we have called the “Divergence Principle.”<sup>197</sup> Sustained and long-run, conscious cooperation, however, does not require, under our possible assumption of goodwill as a motivating power, a belief in the overall harmony of individual and group interests. This belief, in turn, is central to economic sociology and in its main outline has traditionally been upheld by economic theory.<sup>198</sup> This, of course, does not preclude the harmonizing role played by the principle of the artificial identification of interests, originally held by Hume and Bentham, nor the importance of the sympathetic fusion of interests, closely related to social structural issues basic to sociological theory. It should also be remarked that accounting for the existence of economic harmony does not require more than a mild degree of unconscious teleology.<sup>199</sup> An examination of the preceding clearly indicates the

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<sup>197</sup> The “divergence principle”-for which many applications with varying degrees of gravity could be found, ranging from divination of the strategy of Russia in entering into accommodations with the West to the same type of behavior on the part of a cunning wife-man be stated somewhat as follows: Identical courses of action or behavior modes inspired by differed motivations must eventually diverge if their respective goals are to be actualized. If their goal divergence is non-operational, one might say that from a behavioristic standpoint there are no disparities to take account of.

It can be said that John M. Clark believes in the “divergence principle.” In his *Economic Institutions and Human Welfare* (New York: Alfred A. Knopf, 1961), pp. 207-8, he writes: “...and if his [the businessman’s] enlightened self-interest is mere farsighted shrewdness, one can be sure that at some point or other the shrewdness will not be farsighted enough and trouble will result.” In order to believe that this will not be the case, one would have to assume that interpersonal conflicts arise out of the absence of proper insight into one’s true long-run interest. This would amount to a purely formal and definitional solution to the problem. On this point see Gunnar Myrdal, *The Political Element in the Development of Economic Theory* (Cambridge, Mass: Harvard University Press, 1961), Appendix and p. 240.

<sup>2</sup> As Elie Halevy remarks, “For political economy, ever since Adam Smith, has rested entirely on the thesis of the natural identity of interests” (*The Growth of Philosophic Radicalism* [Boston: The Beacon Press, 1955], p. 16).

<sup>3</sup> We could define the teleology by paraphrasing Dorothy Emmet, “Function and Purpose” in Nicholas Demerath and Richard Peterson, eds., *System, Change and Conflict* (New York: The Free Press, 1968), pp. 421-24: the unintentional contribution of an agent through his social function to the maintenance of the complex of activities we call society. ON this point see also Joseph Schumpeter, *History of Economic Analysis* (New York: Oxford

convenience of establishing a distinction between conscious cooperation and unconscious or unintended cooperation, that is, mere will. The second is an unintended result of individual action and social processes. In the long run, through, if conscious cooperation is to endure without love or personal sacrifice as a motivating power, it must be apparent that “it pays.” If there is a conviction on the part of the individual that there is basic conflict or disharmony between him and the group, active or conscious cooperation of the type envisioned for continued development becomes impossible.<sup>200</sup> Now, at a more remote level, one can believe that cooperation is desirable either (1) because society should be organized and function in a given manner (ideological element of subjective ordering) or (2) because society requires it as a necessary condition of being (*Weltanschauung* itself as an element of objective ordering). Of course, the two can go very well together without any sharp distinction in the mind of a person. For example, society needs cooperation if it’s going to survive, therefore it should be organized accordingly. Need and preference, however, may not go together. Although this should not be the case, society can keep on functioning in a conflictive fashion, according to the preferences of the subject.

From the preceding it is clear that one’s attitude toward cooperation may be one of pure ideology, or entirely of *Weltanschauung* in its origin, or a mixture of both.<sup>201</sup> In turn, it may originate exclusively at this (these) level(s) or at a deeper philosophical one. A philosophical conviction about man, society, or the universe may lead to a given *Weltanschauung* and a practical attitude (at the praxeological level) toward cooperation. Yet there need not be a unifunctional relationship here. A conviction about man’s weaknesses and imperfections does not necessarily deter those who hold it from striving mightily toward perfection, as they see it, in man and society.

A belief in the “nominal” or “fictional” theory of society does not detract from the crusading spirit of old and modern-day liberals. A belief in the perdurability of the scarcity principle does not detract from the capacity of some to dream about unbounded improvement.

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University Press, 1954), p. 58 n., and especially Friedrich A. Hayek, *Studies in Philosophy, Politics and Economics* (New York: Simon and Schuster, 1969), chap. 6. For a thorough examination of the related area of the concept of natural law and the existence of a natural social order or set of institutions see Overton H. Taylor, “Economics and the Idea of ‘Jus Naturale’”, *Economics and Liberalism* (Cambridge, Mass.: Harvard University Press, 1955), pp. 70-99.

<sup>200</sup> Economics has, since its modern inception, solved this problem through the theorem of the Maximum Doctrine of Perfect Competition. See Schumpeter, *History of Economic Analysis*, pp. 233-34. This doctrine is founded on the practicing of the competitive rational by participants, which eventuates, under the assumptions of the model, in a process of unconscious cooperation.

<sup>201</sup> By a *Weltanschauung* is meant an apprehension of the world “as is,” rather than an ideological preference for what “should be.”

Basic inclinations to regard man as aggressive or acquisitive do not impede the blueprints of utopia in their flow.

Cooperation may also be born from ultimate ethical positions or directly from philosophical explanations of man, society, and the universe or, less articulately, from more immediate *Weltanschauungen* or ideologies or, simply, at the end of the scale, from a temperamental preference. Although there are casual connections, even if frequently implicit and unconscious, from Philosophy (1) to *Weltanschauung* (2), from both to Ideology (3), and from all to Praxeology (4) and, furthermore, reverse causal chains marking for a closed system of interaction it is nonetheless true that for the purpose of immediate scientific analysis and policy manipulation (in contrast to general theories), we do well to concentrate on the proximate sources of action. That is, if we take an intermediate theoretical level (neither the general theory with its total, interrelated inclusiveness, nor a pragmatic and supposedly non-theoretical view) and a partial-analysis approach, we will be concentrating on the understanding and handling of individual situations existing at a moment in time, whose ultimate genesis and manifold ramifications are not, by far, so important as their immediate texture and cause.

Competition is the logical antithesis of cooperation, although the two may perfectly well coexist at different levels of action. Competition is a protean word that may be greatly confusing because of its utilization in a wide spectrum of different situations. In this context, the intent is solely to contrast the concept, in some respects, to that of *cooperation*. It would seem that a basic distinction could be drawn between being in competition *with* someone or *for* something on the one hand, and competition for economic and non-economic goals on the other. Analysis of non-economic competition must be altogether eschewed; of course, because the motivational assumptions it entails on the part of the economic agent in non-coercive situations are the opposite of those here utilized. Although competing *for* something always implies competing *with* someone-if there were prizes for everyone, it would not really, by definition, be any longer a competitive situation, except in the limit case of static, long-run equilibrium under pure competition-a distinction could still be made at the subjective level, which is, in this case, all-important. When the negative character of the competitive game is stressed, attention is directed to the interpersonal conflict created by competition. If such an attitude on the part of individuals becomes deeply ingrained and pervasive, coloring their *Weltanschauung* and/or idea of society, or-if one prefers to start at the opposite extreme-if their *Weltanschauung* and/or ideology were to condition their practical reason or praxeology in such a manner, it would serve to influence the tone of that society, even with marked independence of the nature of the economic institutions that characterize it at a moment in time. The inclinations and behavior of



the members of society will help to shape the community in a distinctive form, even if a wide chasm such as that existing between market and non-market organizational forms were to separate two societies or, at the other pole, these psychological factors may establish distinctions between societies possessing similar economic institutions.

If, on the other hand, attention is directed at the goal to be reached competitively (e.g. in dynamic situations characterized by market expansion or by innovation), the element of personal antagonism is mollified. Now, it is important to realize that in the same manner in which competition *with* facilitates the appearance of a similar spirit in otherwise widely divergent societies, it is equally true that competition *for* has wide applications in the very same types of antipodal societies.

The above leads to the conclusion that the nature or, if preferred, the spirit (ethos) and goals of competition, may make a great difference in the quality and tone imparted to any society, regardless of the other organizational and institutional characteristics that define it.

The implications of the basic insight are many, and they find application in diverse areas. In relation to organizational theory, let us point out, it can be remarked that models are not completely determined in all aspects of their behavior by structural or mechanical conditions.<sup>202</sup> Lack of regard for this fact gives rise by a process of logical inversion to many crude versions of economic and technological determinism. The convergence hypothesis is on in vogue at the present time.<sup>203</sup> This is not to deny the high correlation and strong association that exists *over the long run, for free and undisturbed* processes of interaction between human conduct and social institutions and organizations. But, by the same token, all kinds of short-run, culturally inconsistent developments, arising from natural or unique historical forces, often inject themselves into the workings of these processes. The subsequent dynamic between the social culture and institutions, between the individual and the environment, acquires infinite complexity and differentiates and re-differentiates itself indefinitely.<sup>204</sup>

It could be reasonably advanced that more of competition *for* is becoming increasingly necessary in contemporary market or mixed societies. As the mere size and great complexity of

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<sup>202</sup> See Peter Blau and W. Richard Scott, *Formal Organizations* (San Francisco: Chandler Publishing Co., 1962), pp. 5-6, "In every formal organization there arises informal organization." On divergences between organizational and societal values or between societal values and those of administrators, see chap. 1, the introduction by Charles Press and Alan Arian, eds., *Empathy and Ideology: Aspects of Administrative Innovation* (Chicago: Rand McNally, 1966).

<sup>203</sup> For an excellent treatment of the sociological and economic shortcomings of this position see respectively: Raymond Aron, *The Industrial Society* (New York: Simon and Schuster, 1968), chap. 3, and James Millar, "On the Merits of the Convergence Hypothesis," *Journal of Economic Issues* 2, no. 1 (March 1968): 60-68.

<sup>204</sup> For an interesting article in economics where many related ideas are touched upon, see Peter J. Wiles, "The Political and Social Prerequisites for a Soviet-Type Economy," *Economia* 34 (1967): 1-19.

modern society increases, an orientation that focuses motivationally on personal distinction and achievement based on the attainment of social goals will be highly welcome.<sup>205</sup>

Competition *for* has the great advantage in both developed and underdeveloped modern societies of underlining the existence and acceptance of social goals even if these are to be attained in competition with others. No doubt this facilitates the blend of competition and cooperation. It is easier to enter into what may be termed convergent relations once it is established that this will serve a worthwhile social purpose.

The preceding may lead us to believe that the more we have of competition *for*, the better it will be for society. In our view, nothing could be farther from the truth. Competition *with* is also a highly essential ingredient of every economically progressive society. Again, one might suppose that even if this were to be so, the only reason for it would reside in the propensities and inclinations to be found, more or less strongly in the average individual, toward gain to be realized in competition, presumably at the expense of others (although in the equilibrium of the purely competitive model the expected result by each individual competitor-gain at the expense of others-never materializes), or because of the assertive and aggressive behavior exhibited by many individuals in their societal relations. In other words, one might be tempted to believe that, assuming the existence of an oppositely motivated society, competition *with* would not be needed for continued economic progress. The reality is that—even in the extreme theoretical case of an altruistic-disinterested utopia, where people would be actively predisposed out only toward cooperation, but even toward love and sacrifice—the fundamental problem raised by Friedrich Hayke for non-individualistically organized economies, that of the impossibility of concentrating on centralizing bodies the amount and kinds of knowledge necessary to make the right economic decision at every instant for every possible situation, would remain with us.<sup>206</sup> Notice that this is inevitable insofar as the absence of competition *with* one another, they must then discharge the function in question in a purely cooperative fashion. It follows that a very high degree of consolidated and consensual behavior control and planning will eventuate from such a situation.

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<sup>205</sup> The clash between the classical and the managerial ideology at the corporate level and the emphasis on incomes policy at the macroeconomic level are signs of the changes and needs of the socioeconomic system. R. Joseph Mosen, *Modern American Capitalism* (Boston: Houghton Mifflin Co., 1963), especially chap. 2, contains a good bibliography on this matter. On the mentioned ideologies, two articles that serve to illustrate the defense of each are: Jack Hirshleifer, "Capitalist Ethics – Tough or Soft?", *The Journal of Law and Economics*, October 1959, pp. 114-19, and Gardiner Means, "The Problems and Prospects of Collective Capitalism," *Journal of Economic Issues*, March 1969, pp. 18-31.

<sup>206</sup> See "The Present State of the Debate," published in *Collectivist Economic Planning* (London: Routledge and Kegan, 1935) under his editorship. In this context, it is very interesting to consider, by way of confirmation, which would be the requirements of "perfect computation" in a command economy as described by L. Smolinsky, "What Next in Soviet Planning?", *Journal of Foreign Affairs*, July 1964, p. 607.

This holds true, of course, even assuming that the trusts or combines that would result from the agglomeration of firms in each industry would enjoy perfect freedom. Of course, if they are not going to engage in competition from economic resources against, or grow lax in the absence of internal prodding for efficiency, or if buyers (consumers and producers) will not try to maximize, there is no sense in which we can speak of a competitive (efficient) price system. On the other hand, dealing with questions of economic efficiency would be much diminished in such a society. Seeking efficiency would tend to take place in a physical-technological sense rather than in what would tend to be the alien context of purely economic considerations.

Naturally, the further that we relax the assumed condition of an altruistic-disinterested utopia, the more difficulties we will experience in trying to sustain economic progress without competition *with*. Ultimately, and at the polar opposite of our utopia, lies the nightmare of a fully collectivized and perfectly centralized economy. This is, without this type of competition, and under the possible range of actual conditions in the real world, we will end up with the worst characteristics of collectivization and centralized decision-making. Competition *with* is necessary to make for economic efficiency and to facilitate growth in resource productivity.<sup>207</sup> All of this is, of course, within the traditional province of economics. But the role of competition *with* as a fundamental building block in the field of political institutions merits equal consideration. The relationship of this concept to the institution of private property and to the question of the state powers and their degree of concentration or diffusion is a *locus classicus*. The modern group of writers who call themselves libertarians have elaborated on this matter at great length.<sup>208</sup>

The foregoing raises a fundamental question concerning the relation of the psychic forces and goals identified with the maximizing syndrome to the basic traits of the human condition. Again, as in the case of an individual's motivations, the economist *qua* economist, has to avoid direct involvement with the field of philosophical anthropology or psychology. Nonetheless, one must squarely confront, on a purely empirical and phenomenological basis, the question of the manifestation of these traits in observed human behavior. Without going into the study of ultimate causes (reductionistic approach), or without trying to pry into the actual mechanisms that would *explain* human behavior by resolving it into some kind of a model (mechanistic approach), we constantly assert our capacity to understand human beings and

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<sup>207</sup> Competition *for* without competition *with* would not be sufficient to avert inefficiency, the reason being that the absence of the latter forces society into a narrow range of possible organizational molds of the collective genus.

<sup>208</sup> Friedrich Hayek, Ludwig Von Mises, James Buchanan and Milton Friedman are among the most conspicuous representatives of this position. There are, of course, degrees and nuances. In this connection, it is interesting to note that John M. Clark restricts the often-repeated belief that political freedom is *unqualifiedly* dependent on private business.

human action in the study of the humanities and of history. Much more important, we use that knowledge in everyday social intercourse and living, and also in all spheres and levels of thought and action. Furthermore, we engage in all kinds of predictions we regard to the malleability, possible transformations, and derivations of human nature every time we plan or provoke change in the cultural, social, political, or economic fields.<sup>209</sup>

At the intermediate (*Weltanschauung*-Ideology) level at which political economy moves, we need not claim more specific or scientific knowledge of human nature than that resulting from perceiving or grasping the meaning of human actions as behaviorally observed and as interpreted within the framework of some intermediate-level, theoretical notions about man *qua* individual and *qua* social being. No social science that would not be completely sterile and that aspires to more than formal validity can, in principle, deny this. The economist can avoid many such complexities, as is generally admitted, to the extent that he deals with concrete and specific, so-called economic problems within a set of given institutions and assumed modes of behavior. Nonetheless, even in the realm of economic policy in advanced and underdeveloped countries, seldom can the economist venture out on his own with any assurance of attaining desired results.<sup>210</sup> This, of course, is not new. In economics there has always been present, although in various contexts, the preoccupation about scientific legitimacy and true extent of the claims put forth by economics.

It should be noticed in passing that the maximizing syndrome does not presuppose or in any manner imply psychological or ethical hedonism. As a matter of fact, it just assumes general rationality of conduct with a view to the attainment of given goals. Economics, in that sense, would constitute, as has often been stated, a particular application to social reality of the wider category of actions termed rational or intelligent, in the pragmatic sense of the term. It is also increasingly recognized that maximization is not a type of conduct exclusively confined to modern man. Instrumental rationality of action at a given level of technology-be it in the economic field as such or, as may be the case in many non-literate cultures, the will to maximize in a wider social context-seems to be a universal in human culture.<sup>211</sup>

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<sup>209</sup> There is, for example, an optimistic and progressionist view in the late classical and neoclassical school of economists with respect to the melioration of egoistic economic motivations in society. It can be detected in the trilogy of Alfred Marshall, John Stuart Mill, and John M. Keynes's works.

<sup>210</sup> See on this point the debate centering on Adolph Lowe's views on the relevance of contemporary economic theory in Robert Heilbroner, *Economic Means and Social Ends* (Englewood Cliffs, N.J.: Prentice-Hall, 1969).

<sup>211</sup> On this point see Melville Herskovits, *Economic Anthropology* (New York: W.W. Norton & Co., 1952), Part 1; Stanley Udy, *Organization of Work* (New Haven, Conn.: Hraf Press, 1959), especially pp. 32 and 117; and Theodore Schultz, *Transforming Traditional Agriculture* (New Haven, Conn.: Yale University Press, 1964), chaps. 1,2, and 3.

We might say that, ultimately, man is a purposeful animal. Man uses his undifferentiated psychic energy (the *libido* of Carl Jung) to attain goals. That is all that needs to be postulated for this paper's level of discussion to be meaningful.<sup>212</sup>

<sup>212</sup> Ernest Becker sees the need to explain "man as an *energy-converting and purposive organism* (that)-seeks maximization of his own being, of his own sense of self," in a survey article, "The Evaded Question: Science and Human Nature," *Commonweal* 89, no. 20 (19): 641. See also Parsons and Shils, *Toward a General Theory*, pp. 14, 18-19.

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# **Marketing Theory And Models: Constructing A Theory-based Dissertation**

By Ron Morritt, University of Phoenix  
Joseph Balloun, Nova Southeastern University

## **Abstract**

This paper was inspired by an invitation to give a presentation to a doctoral class in marketing theory at Nova Southeastern University. I was asked to use my own dissertation at NSU (Morritt, 2000) as an example. The problem involves some confusion in the marketing literature between the concept of scientific theory and marketing model. Doctoral students are required to construct theory-based dissertations. However the formal concept of theory (as a logico-deductive system) is taken from the more mature sciences. What are actually accepted as theory in the marketing literature are usually models, which reflect hypothesized causal relationships between variables of the subject phenomena. Thus doctoral business students are often confused about what it means to have a theory-based dissertation. This paper is an attempt to differentiate the formal concept of scientific theory from the practical application of causal models found in contemporary marketing literature. Three types of models found in the marketing literature are differentiated. Strategies for finding a theory-based research question are then discussed along with the critical relationship between the research question and the research hypotheses. Finally we address the question: Why be concerned about having a theory-based dissertation?

## **Preliminary definitions**

### What is a theory?

There are many versions of the concept of a theory. A formal definition is provided by Hunt:

A set of scientific hypotheses is a scientific theory if and only if it refers to a given factual subject matter and every member of the set is either an initial assumption (axiom, subsidiary assumption, or datum) or a logical consequence of one or more initial assumptions. . . . A theory is a systematically related set of statements, including some law like generalizations that is empirically testable. The purpose of theory is to increase scientific understanding through a systemized structure capable of both explaining and predicting phenomena (Hunt, 1991, 148-149).

However, marketing being a young science, there are few candidates that would fit this formal definition of theory in marketing. In practice the term “theory” is often used to designate well-corroborated hypotheses, models, and explanations in marketing.

For example, the underlying theory of my dissertation is called “disconfirmation theory.” But the term “theory” here actually refers to an attempt to integrate different models of the constructs of customer satisfaction, perceived price, perceived quality, and perceived value (Morritt, 2000).

## What is a model?

There are many different uses of the term “model” including those in mathematics and science. Models usually are graphic or mathematical representations of hypothesized relations between variables describing real world phenomena. They are often used to construct hypothesized explanations of subject phenomena, which are parsimonious, and empirically confirmable. Models are used to map the “structure” of the targeted phenomenon. Brodbeck in a classic article on the subject cites the requirement of *isomorphism* for models:

The technical term for similarity between a thing and a model of it is *isomorphism*. Isomorphism requires two conditions. First there must be a one-to-one correspondence between the elements of the model and the elements of the thing of which it is a model. ...Second, certain relations are preserved (Brodbeck, 1968, 580.)

Thus, for example, a two dimensional scale model of a house would have the same elements of the house (e.g. the same collection of rooms, decks, patios, roofs, windows, fireplaces and doors). And the relationship of these items to each other would be preserved in the model. Thus, the rooms in the model would have the same relative location in the model that they do in the house. In this sense, this model can be viewed as a “map” of the thing that it models.

Researchers in marketing often use graphic models to map or “mirror” hypothesized descriptive or causal relationships between marketing variables.

## Similarities between theories and models

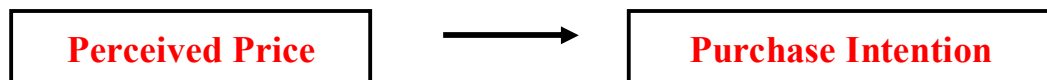
- They are both tools of scientific explanation and prediction.
- Scientific theories and models both have the requirement of operational definitions of variables required for empirical verification.
- They are both always subject to future correction and revision in the light of new information.
- Models map the elements and relationships of the theory they represent (isomorphism).
- They are both evaluated by standards of simplicity, elegance, and consistency.

## Differences

Marketing models, unlike formal theories, are usually not part of a systematic set of statements, including law-like generalizations, of a given subject matter. Marketing models are often graphic but empirically confirmable representations of speculative causal hypotheses between marketing variables. (Models without operationalized variables would qualify less as scientific theory building and more as conceptual analysis). However a scientific goal is eventually to transform models into formal theories. Thus, causal models may be viewed as precursors of law-like generalizations and theories. However, models can also be constructed of formal theories.

### **Marketing models**

I describe three basic types of marketing models used in the marketing literature. I call “type A” models those models that use only boxes and arrows to represent causal relations between variables. This simple model pictures a hypothesized direct causal relationship between the two specified variables A and B such that A influences B. This model does not specify the polarity (positive or negative), strength, or reliability of the hypothesized causal correlation (See below).

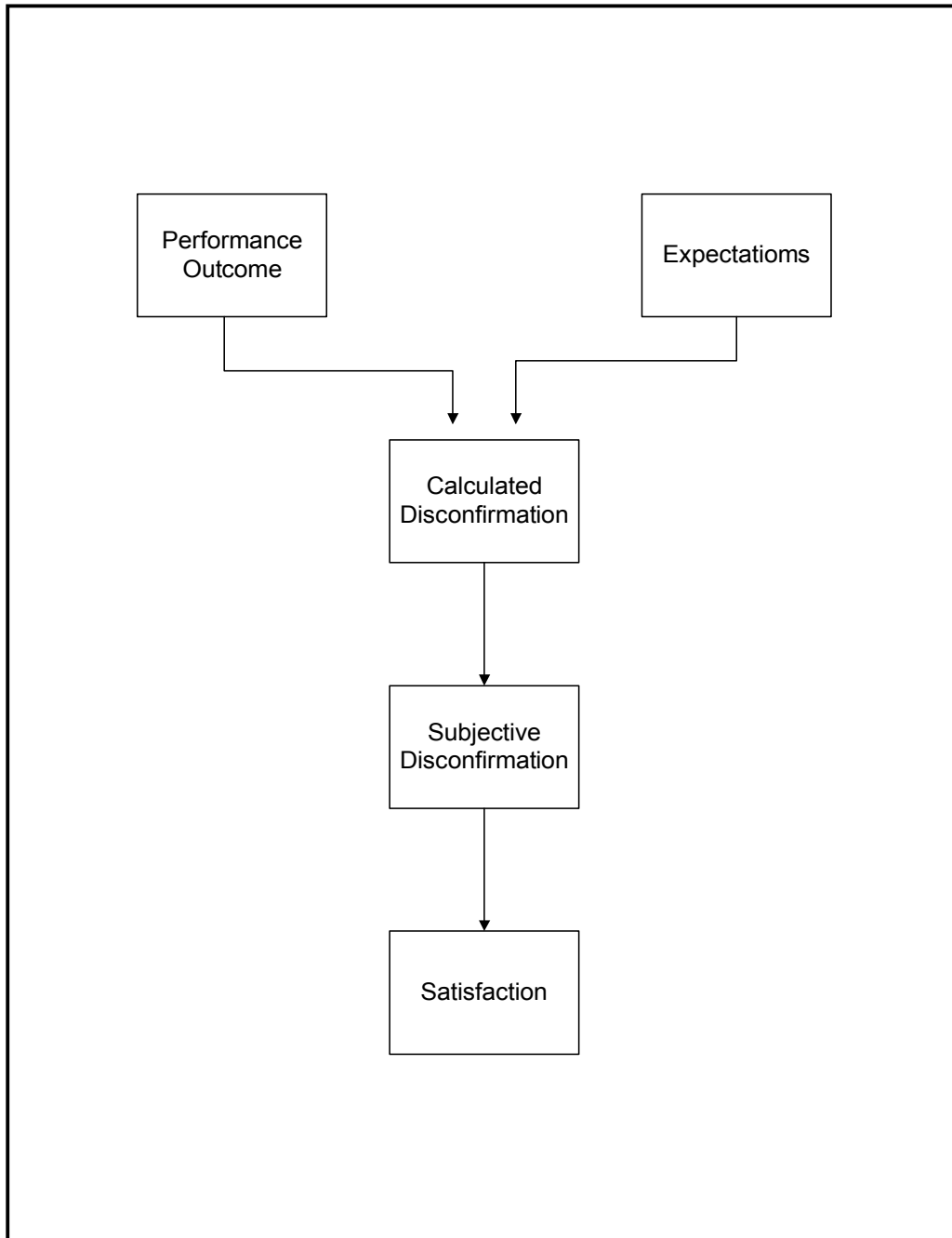


“Type B” models also describe the polarity of the correlation between the variables of the model: Thus the simplified model below represents a negative correlation between perceived price and purchase intention. Higher values of perceived price are associated with lower values of purchase intention. In ordinary language, all other things being equal, products viewed as more expensive by consumers are purchased less by those consumers.

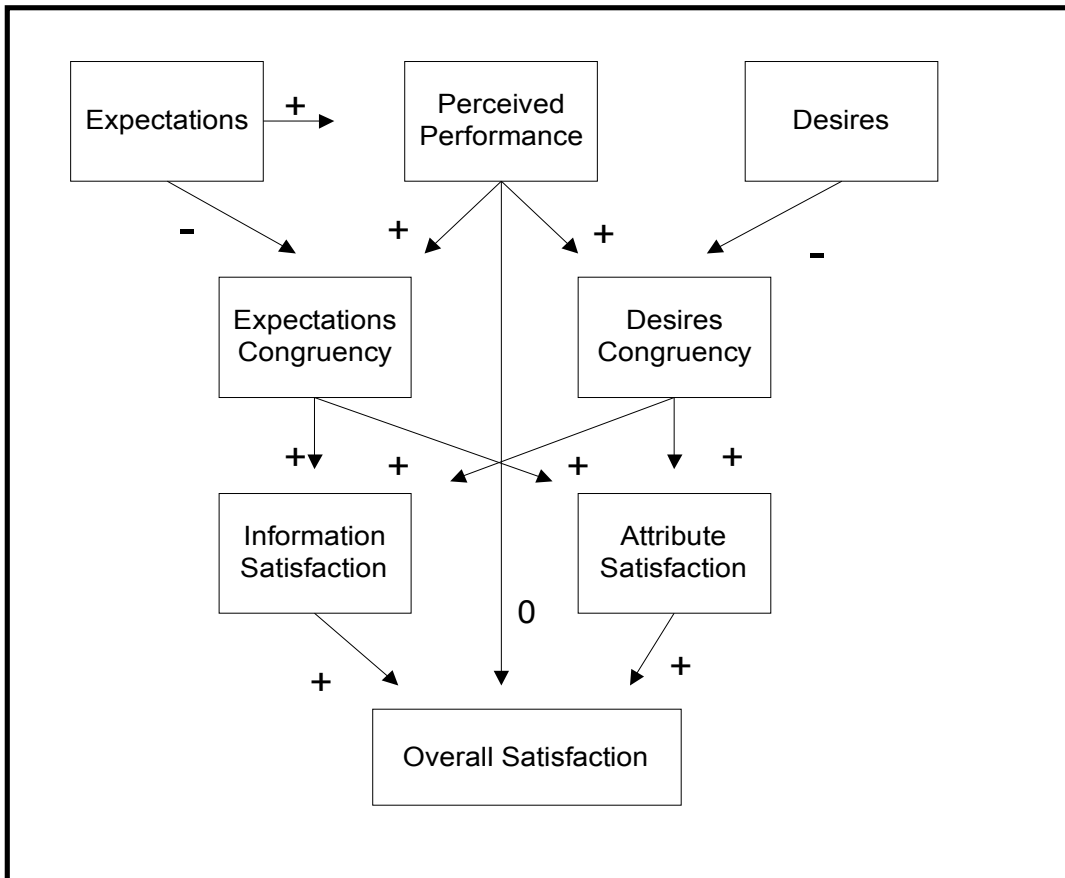




Figure 1. Type A model: Oliver's disconfirmation model of customer satisfaction (Oliver, 1993, p.73).

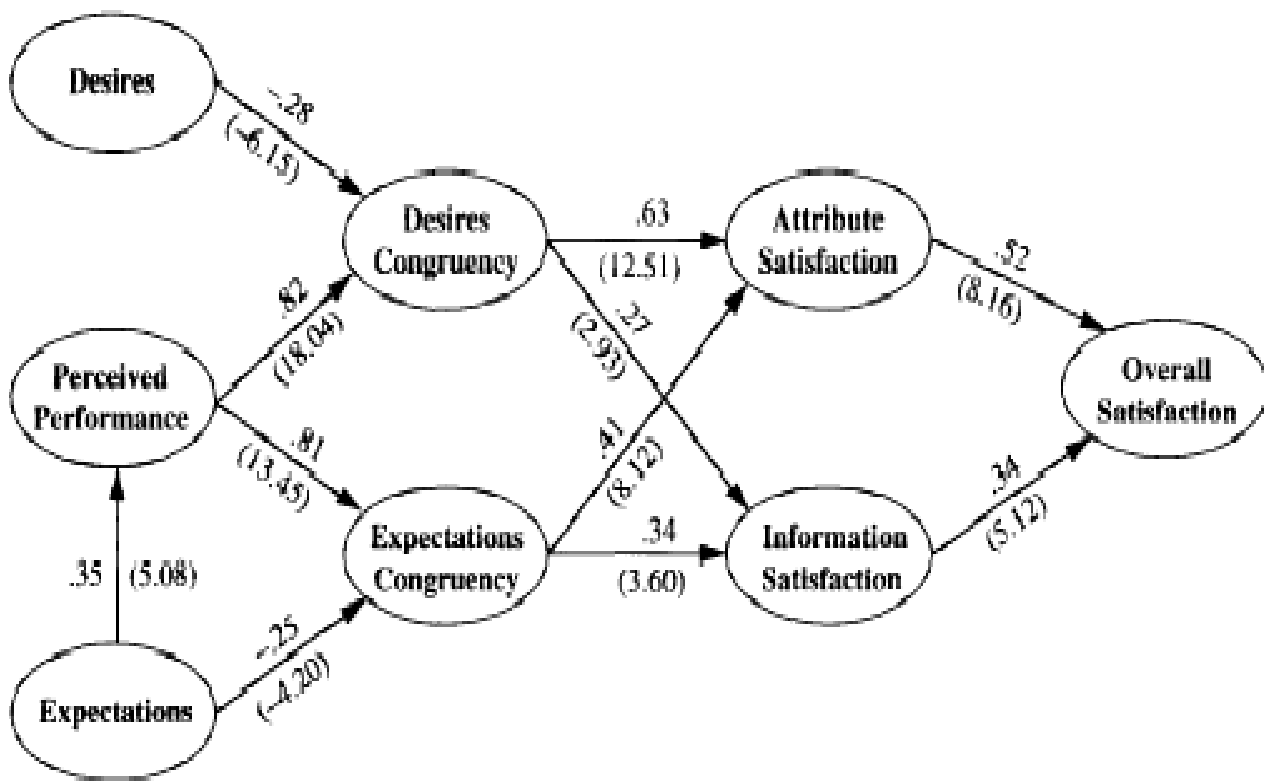


**Figure 2. Type B model of Customer Satisfaction:** (Spreng et al., 1996a, 17,25)



“Type C” models are often found in structural equation modeling (SEM) sometimes called “causal modeling”. SEM is a synthesis of factor analysis, multiple regression, path analysis, and psychological measurements into a single comprehensive system that can express and test complex theoretical formulations (models) of research problems (Kerlinger, 1986, 139). LISREL and AMOS are two popular SEM software programs. Type C models include the polarity, strength, and significance, of the regression coefficients between the variables of the designated model.

**Figure 3. Example of Type C (CFA) model:** Spreng et al., 1996b, A re-examination of the determinants of consumer satisfaction. 25. Includes estimated regression coefficients over T-values. (T-values over 2 indicate stat. sig. for large samples)(Mueller, 1996, Basic Principles of SEM, 8).



\*T-values are in parentheses.

### Examples of marketing models using disconfirmation theory

According to the expectancy-disconfirmation model suggested in CS literature (Oliver, 1980), consumers judge satisfaction with a product in comparison with their expectations about the product performance. If the performance is above the predicted expectations (positive disconfirmation), increases in satisfaction are expected. If the performance is below expectations (negative disconfirmation) increases in dissatisfaction are expected. CS is thus viewed as a function of expectations and disconfirmation, with expectations used a standard of comparison (Yi, 1990, 87)

Thus, disconfirmation theory of customer satisfaction is actually an explanatory *model* of customer satisfaction that has been corroborated by several research studies in the satisfaction literature. This “theory” has evolved with time into a more complex model. Researchers have reconstructed this model to include both disconfirmation of expectations and disconfirmation of desires (Spreng et al., 1996b).

### Strategies for identifying your research question

It is often said that there is no one right solution to a case study. However, this does not imply that there are no wrong “solutions or that some solutions are not better than others. The same might be said for identifying your research question. The research question should be within your range of competence, be manageable with existing resources (including access to data, time available, and cost), and have the potential to make an original and valued contribution to your field. Dissertation topics are chosen through different combinations of the following recommended activities:

1. Review recent empirical studies in reputable journals
2. Read what leading scholars, practitioners and researchers believe to be fruitful directions for research (especially in the “Directions for Future Research” section of research papers and books.).
3. Review older papers in reputable journals (since 1975). There may be unrealized opportunities for revision, expansion, correction, or extension.
4. Talk to your marketing professors. Some students make topic choices by selecting favorite research areas of dissertation committee chairs that are compatible with their own interests.
5. Review theories or models that describe relationships between marketing variables. Is there potential for correction, expansion, extension, or revision? Is there specification error? Are significant determinants missing? Do we know the complete set of mediating and moderating variables of this model? Is there an underlying theory/model that explains two or more other theories/models? (For

example I found that disconfirmation theories are supported by the adaptation-level theory of psychology (Helson, 1964)

6. Did you try to research an important topic in the marketing literature and found there was almost no research available in this area? Perhaps (if your search was comprehensive) this is an opportunity for exploratory research in this area?
7. It may not be wise to restrict your research to your particular literature. For example, the flight of bumblebees tells us how to build better fixed wing aircraft and studying the shape of fish tells us how to construct better boats. Marketers, like certain birds, have feathered their nests with material from several other disciplines such as psychology, sociology, economics, philosophy of science, ethics, etc. An electronic search of key words in the relevant databases of these disciplines may be fruitful.

### How I found my research topic

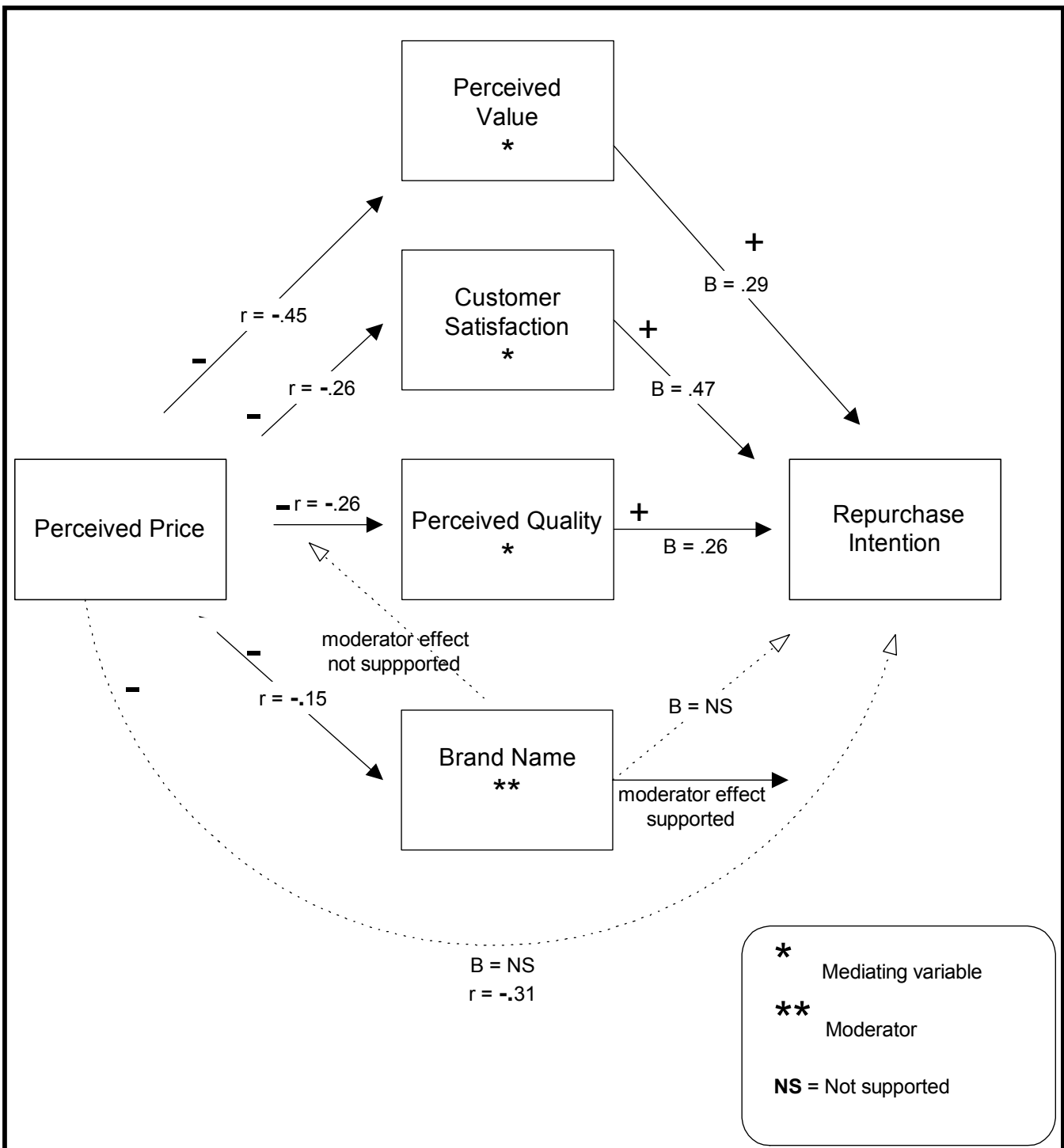
It may be helpful to explain how I arrived at the research question for my own dissertation:

During a “readings” course, I found two critical items in the literature that crystallized my dissertation topic. The first of these inspirational discoveries was a quote cited on the first page of my dissertation under Background of the Problem:

Perhaps the most intriguing issue facing service marketers today is the interplay between quality, satisfaction, and value. Specifically, which are antecedent, which are mediating, and which are consequent? To date no definitive answer exists... Value increases as quality increases and as price decreases. Yet exactly how quality and price combine to form value is not well understood (Rust & Oliver, (1994). Service Quality: New Directions in Theory and Practice, Sage Publications, 14, 7).

However, I noticed that this model of purchase intention omitted two well known determinants of purchase intention: customer satisfaction and brand name and thus left open the possibility of model under-specification error. By focusing on service repurchase intention (an important subset of purchase intention), instead of product familiarity, I was able to add the variables of Customer Satisfaction and Brand Name to the model while omitting the variable of product attribute information. Thus, the new study was able to explore the influence of Perceived Price on Service Repurchase Intention using all five of the key determinants of purchase intention (see Appendix A)!

**Figure 4.** Morrirt (2000). Direct and Indirect robust regression effects of Perceived Price on Service Repurchase Intention. Summary of findings for 5 independent variable model ( $R^2 = .83$ ) including Betas and Pearson correlation coefficients. (All p values are .000).



## **Identifying your research problem and constructing research hypotheses from your research question.**

### 1. AREA RESEARCH

This is the first stage of the process where there is usually intensive research into selected areas of interest. The area choice should be guided by your interest, subject competency, manageability of project, and availability of compatible and available doctoral chairs specializing in this area. You are looking for unresolved problems in the subject literature that are related to underlying theories, or models. Special attention is given to top journals and researchers in your field. A common error among doctoral students is choosing a topic prior to doing adequate research in the subject area. However, early choice of a problem area enables you to have the significant advantage of integrating your research with your doctoral courses and papers.

My research problem was how perceived price was related to service repurchase intention. This was within the context of a comprehensive model of service repurchase intention that included all five factors found to be determinants of purchase intention. This problem was then translated into my research questions:

RQ1: What is the role of perceived price in the formation of service repurchase intention? Specifically, how does perceived price combine with customer satisfaction, perceived quality, perceived value, and brand name to influence service repurchase intention?

RQ2: What are the relative strengths of these five factors on service repurchase intention?

RQ3: Which of these five factors are mediating and which are moderating?

### 2. PROBLEM IDENTIFICATION

Kerlinger (1986) tells us that a research problem is an interrogative sentence or statement that asks: "What is the relationship between two or more variables?" He suggests the first three criteria for a good problem statement: I expand the list of criteria (See Madsen, 1992):

1. The problem should usually express a relation between two or more variables (This may not be true with exploratory research).
2. The problem should be stated clearly and unambiguously in question form.
3. The problem should imply the possibility of empirical testing.
4. The solution or clarification of the problem would be viewed as an original and significant contribution to the subject literature.
5. The problem should be related to an underlying theory or model in the subject literature.
6. The problem should be resolvable with the resources available (time, money, difficulty level, personal competencies, chair interests).
7. It must be based on obtainable data.

### 3. HYPOTHESIS CONSTRUCTION

Kerlinger tells us that a hypothesis is a conjectural statement of the relationship between two or more variables. Criteria of a good hypothesis are:

1. Hypotheses are statements about the relations between variables.
2. Hypotheses carry clear implications for testing the stated relations (Kerlinger, 1986, 17.).

Your hypothesis should be related to your research question and generally hypothesize an empirically testable relationship between the same variables.

### Constructing the null and research (alternative) hypotheses

Here again there appears to be a difference between the traditional use of the term null Hypothesis and how it is used in the marketing research literature. The traditional use of this term refers to a statement that there is no relation between the variables of the problem. The object of this method is to rule out the possibility that the relation between the variables in question is due only to chance. The alternative hypothesis or research hypothesis (equivalent to the logical complement of the Null hypothesis) is that (since the null hypothesis is not supported) the relation between the variables in question is significant (Kerlinger, 1986, 189-190.).

The null hypothesis is the assumption about the population that is tested using sample evidence. It states that the difference between the sample statistic and the assumed population parameter is due to a chance variation in sampling. The symbol for the null hypothesis is  $H_0$ . ... The alternative hypothesis in a hypothesis test is the statement about the population that must be true if the null hypothesis is false. The symbol for the alternative hypothesis is  $H_1$  (Hanke & Reitch, 1994, 294).

This contrasts with the use of the Null hypothesis in the marketing literature which is either not used at all (The research study contains only the alternative or research hypotheses) or else used as a straw man to set the burden of proof to the alternative or research hypothesis.

Thus, Siegel tells us that the null hypothesis represents the default possibility that you will accept unless you have convincing evidence to the contrary:

In deciding which hypothesis should be the research hypothesis, ask yourself, Which one has the *burden of proof*? That is, determine which hypothesis requires the more convincing evidence before you decide to believe it. This one will be the research hypothesis (Siegal, 1990, 336-337.).

An example of one set of hypotheses used in my dissertation is:

$H_0$ 1: There is a zero or positive correlation between perceived price and service repurchase intention.

$H_A$ 1: There is a negative correlation between perceived price and service repurchase intention.



#### 4. ANALYSIS OF IMPLICATIONS FOR YOUR UNDERLYING THEORY

After a discussion the results of your study are incorporated into your model. This procedure has the function of providing a graphic representation of the results of your research including modifications to the theory or model you are using (See Figure 4.)

#### 5. DIRECTIONS FOR FUTURE RESEARCH: RELATING TO UNDERLYING THEORY

In this section, you provide guidance to your fellow marketing researchers on what you believe to be fruitful and important directions to proceed from your research. This may refer to areas omitted by your study, the application of your model to other settings or populations, or the use of additional statistical tests or measures to further refine your theory or model. Or it may refer to ways in which limitations of your study may be eliminated. For example, my study includes the following (modified) recommendation:

Finally, as indicated in the limitations section above, the use of SEM, including CFA, seems ideally suited for the construction of a causal model of service repurchase intention which includes the five key factors and six independent variables of this model (Morritt, 2000, 175).

#### Why be concerned about having a theory-based dissertation?

The short answer is that this is required for research that counts as quality scientific research. But this is not a very satisfying explanation. One rationale for having a theory is that systematically organized knowledge is more informative than unorganized knowledge (Individual bricks are less interesting than the same bricks organized into a house).

More to the point, the discipline of Marketing has enhanced its reputation in the academic community during the last 25 years by emulating the methods of more developed sciences and by adopting scientific method and scientific research methods. This includes theory-based research.

#### Deterministic assumptions of science

Science has made great strides over the last few centuries by adopting the methods of science that carry with them (unproven but very fruitful) assumptions about the causal nature of the universe. (Recent developments in cosmology, physics and systems theory have cast doubt about the validity of these assumptions. For example, the “Big Bang” theory of universe creation assumes an uncaused event.).

- It is assumed that all events E have causes (set of sufficient conditions C at time (t) such that C invariably results in E). We may not know the relevant laws or the full set of relevant antecedent conditions so that prediction of events may be based on probabilities.

- It is assumed that the universe is “governed” by some set of causal laws (L) such that any event (e) could be deduced from those causal laws and a set C of prior relevant conditions.

Thus, researchers try to build a hierarchal structure of scientific laws that explain empirical phenomena in their discipline. Low-level laws are explained by middle-level laws that are explained by high-level laws that are assumed to be finally explained by some ultimate set of laws that explain all events in the universe. Researchers in the various disciplines try to build more and more comprehensive models that explain the empirical phenomena of their area.

Middle and higher-level explanatory models that have been corroborated over time by other researchers eventually attain the status of “laws”. Of course this is a tentative status as laws are improved and revised as science evolves (Kuhn, 1962).

Thus marketing research is now viewed as a science using the same tools of empirical observation, experiment, statistical analysis, theory construction, deductive and inductive logic, and hypotheses testing, as other scientific disciplines. “Thus deterministic theory of some type is a legitimate goal of research in marketing” (Hunt, 1991, 196).

For an example and discussion of a middle-level marketing theory (model) of buyer behavior see the Howard-Sheth theory of buyer behavior (Howard & Sheth, 1969, 30). This theory explains purchase behavior using 13 variables.

#### Theory construction in my dissertation.

In my dissertation, I examined three levels of disconfirmation theory.

1. Low-level disconfirmation theory  
These were the disconfirmation models (found in the literature) of price, quality, satisfaction, and value.
2. Middle-level theory  
This included the adaptation-level theory of psychology which supported (provided an explanation) for lower level disconfirmation models.
3. Lower-middle-level theory  
This was an attempt to contribute to a comprehensive disconfirmation theory of service repurchase intention which included all five known determinants of purchase intention (price, quality, satisfaction, value, and brand name).

#### **APPENDIX A:** Abstract of dissertation (Morritt, 2000)

The major objective of this dissertation is to prepare the groundwork for a comprehensive causal model of service repurchase intention by developing the first comprehensive five factor model of repurchase intention. The focus of this study is the relationship between perceived price and service repurchase intention. The underlying theory of disconfirmation is discussed. This study builds on previous research of the last two decades which has identified the five key determinants of purchase intention as perceived price, customer satisfaction, perceived value, perceived quality, and brand name. The data set of this study was obtained from a self-

administered hotel evaluation survey of students and faculty at three business schools, two of which have a national clientele (n = 305). Analysis of this dataset confirmed the zero order correlations of these five key factors with purchase/repurchase intention. Robust regression (R square =.83) revealed that only three factors, satisfaction (B =.47), value (B =.29), and quality (B =.26), were found to be significant (alpha =.05) in the five factor model tested. The lack of significance of the factors of perceived price and brand name confirm previous studies over the past decade which indicate that consumers use the external cues of price and brand name as external cues for quality in contexts where they are unfamiliar with the quality of the offering. Regressing perceived price on the remaining four independent variables (R square =.67) resulted in one significant factor of perceived value (B = .80, p =.000). Satisfaction, value, and quality are confirmed as mediators of the perceived price-repurchase intention relationship. Additionally, brand name was supported as a moderator of this same relationship but not supported as a moderator of the perceived price-perceived quality relationship. FA revealed a two-factor solution (evaluation of service performance, and evaluation of service value) as the best fit for the five major determinants of repurchase intention. Subgroup analysis revealed major differences in the significance and sample regression weights (Betas) of twelve market segments. For example, the reported major factor of customer satisfaction (B =.47) was statistically insignificant for mature travelers and affluent travelers. Only quality and value were found to have significant sample regression weights for all twelve subgroups.

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## **The Mexican Banking System Observed Through Self-Organizing Maps**

Francisco Vargas Serrano  
Universidad de Sonora  
fvargas@guaymas.uson.mx

The purpose of this paper is to describe the performance of the Mexican banking system in the period from 1982 to 1998.

The hypothesis of this paper is that the financial liberalization process increased risk levels of Mexican banks.

The methodology used to describe the aforementioned process is that of self-organizing maps and 8 financial reasons are used as indicators of banking activity.

For analysis purposes, the period object of the study, 1982-1998, is subdivided into the following stages: Initial conditions (1982-1988); the financial liberalization period (1989-1990); the privatization of banks (1991-1993); the subscription of the North American Free Trade Agreement (1994); and the establishment of Fobaproa (Savings Protection Bank Fund – 1995-1998).

The paper's presentation is organized as follows: first, the variables used are described; then, the methodology of self-organizing maps; and thereafter, bank performance throughout the different stages of reference. Lastly, some conclusions are provided.

### **Variables Used.**

A data base comprising all national and foreign commercial banks during the period being studied – 1988 to 1998 – was prepared and a system of indicators through financial reasons was developed.

This set of indicators is grouped in a category system, which intends to link to a theoretical model regarding the financial reform and the performance of the banking system. These categories are: liquidity, risk, profitability, financial leverage, structure of the banking industry, growth, financial intermediation and administrative procedure.

### **Methodology of the Self-Organizing Maps**

The method of self-organizing maps<sup>213</sup> enables to visualize relations among the elements of a large and complex set of information.

A regression similar to that called the total of square minimums in whose curve analysis, these are classified as a non parametric regression.

In the self-organizing maps method, an intelligent curve adjustment is made, which, differently than in traditional regression, *a priori* does not assume any additional form. The form is automatically determined by the information and certain restrictions.

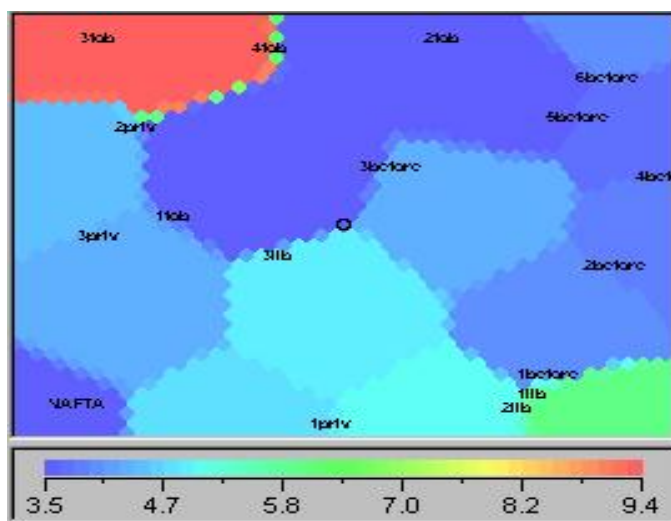
It is a regression by parts and the part of the chain that adjusts to the points of observation, is determined through a decision making process in which the closest model vector is identified.

To achieve the visualization of the space of observation, relations of closeness among model vectors are defined, as if these were along a flexible two-dimensional net.

Initial conditions.

Initial conditions prior to the financial liberalization process, in comparison to the entire period, are characterized by a low level of bank intermediation, a decrease of the banking system, low net interest margins, a high lack of capitalization, low risk levels and low operation expense levels. This is depicted in map 1 (see 1 before a 6 before).

Map No. 1  
**OPERATION EXPENSES RATIO'S BANKING SYSTEM**



<sup>213</sup> Kohonen, Teuvo, *Self-Organizing Maps (2<sup>nd</sup> Ed)* (Springer Series in Information Sciences, 30), U.S.A., 1997.

This is a poor performance stage, where shareholders have lost the control of bank capital; banks are nationalized; there are no incentives to re-capitalize it or increase profitability levels.

### The conditions before the financial liberalization

	1982	1983	1984	1985	1986	1987
Credits / Deposits	65.000	76.000	77.000	92.300	97.500	100.700
Credit risk	4.150	4.990	2.620	2.330	1.280	0.560
Net Margin	1.989	1.532	2.250	2.320	2.667	3.287
Growth	1.360	1.090	1.510	-4.920	1.730	-9.120
Equity Ratio	2.791	2.996	2.802	3.000	3.278	4.423
Market Concentration	0.656	0.666	0.680	0.692	0.720	0.759
Int. Exps / Int. Earnings	87.210	90.160	88.950	89.690	90.880	91.870
Operation Expenses	3.928	3.617	3.680	4.243	3.819	3.926

Note: Interpolation using Viscovery SOMine Program.

The existence of governmental control in the banking sector provides an implicit insurance to depositors, that does not create incentives for any monitoring activities by the latter. Furthermore, this fact causes administrators not to further the creation of reserves and they have a low disposition to risk.

The financial liberalization period.

Although 1989 is established as the year of the beginning of financial liberalization<sup>214</sup>, in fact, since 1979, the Bank of Mexico introduced the auction system to determine the interest rate that would be paid to commercial banks for deposits they make in the central bank. This process of financial liberalization would culminate in the substitution of the system based on quantitative controls to credit and interest rate regulation, by a system based on market mechanisms.

The elimination of the legal bank reserves to cover obligations and their substitution for portfolio regulations began since 1985. As of that date, the required ratio of governmental values in bank portfolios was gradually decreasing, until the liquidity coefficient was repealed in 1990.

<sup>214</sup> Araya, G. Ivan E., "De la represión financiera a la liberalización financiera en una economía en desarrollo: Una revisión de la literatura". *Inversión y Finanzas*, Mexican Stock Exchange, January-June 1994, Vol. 2, Number 1, p. 18



The elimination of the selective credit segments began since 1986, year in which it was allowed for banks to freely allot resources they obtain by acceptances. The interest rates on these and on urban development bonds were also liberalized that year.

In April 1989, time deposits were also excluded from the basis to establish credit segments and in August of that year, the same happened with checking accounts. The authorities abandoned selective credit mechanisms and as of September 11, they eliminated the requirement of the 30% mandatory liquidity.

In 1989, with the reforms to the Mexican financial system's legal framework, the participation of foreign investment in the capital of financial intermediaries was allowed.

The process of financial liberalization begins amidst a fall in the growth of the banking sector; during the second year, it recovers in an outstanding manner; margins of net interest improve, as well as the proportion of capital. A high degree of market concentration of the four large banks occurs; the system's operation expenses increase; and the risk levels do not show important changes as compared to the previous stage.

#### **Financial Liberalization**

	1988	1989	1990
Credits / Deposits	87.800	92.100	93.100
Credits Risk	1.000	1.440	2.320
Net Margin	4.916	5.834	4.845
Growth	-9.520	24.910	27.550
Equity Ratio	7.008	6.471	6.123
Market	0.781	0.746	0.691
Int. Exps / Int. Earnings	86.530	79.710	79.760
Operation Expenses	6.009	5.033	4.943

Note: Interpolation using Viscovery SOMine Program.

The process of financial liberalization begins under circumstances in which the government is the majority holder of the capital, although the private sector already holds 35% of the capital. The foregoing explains that there is no elevated disposition to risk and that, nevertheless, better market conditions enable the sector to recover its growth.

#### **Banking privatization**

The process of banking privatization occurs from June 1991 to July 1992. Nine banks are privatized during the first year, and further nine, in the second year.<sup>215</sup>

<sup>215</sup> Unal H. and Navarro, M. **The Technical Process of Bank Privatization in Mexico**. Financial Institutions Center, Wharton School, University of Pennsylvania, 1999.

The banking system's performance during this stage is characterized by the strengthening of banking operations as intermediary; an increase in the credit risk, an increase of the interest margins; a decrease of assets in the full privatization process; a slight decrease of the market power of the four large banks; an increase of income from interests as compared to expenditures for the same concept; an improvement in the operational efficiency and in capitalization.

### Privatization

	1991	1992	1993
Credits / Deposits	86.600	103.700	109.200
Credit risk	3.680	6.710	8.910
Net Margin	5.490	7.576	8.353
Growth	27.950	-1.290	4.890
Equity Ratio	5.415	6.163	6.589
Market Concentration	0.686	0.704	0.696
Int. Exps / Int. Earnings	74.880	68.450	68.290
Operation Expenses	4.731	4.379	4.220

Note: Interpolation using Viscovery SOMine Program.

The recovery of the control of the majority of banks by the shareholders modified their performance as regards their position to risk, which under the control of the public administration had been relatively conservative, and which now was more aggressive as regards credit levels and degree of risk.

The North American Free Trade Agreement (NAFTA) and the Savings Protection Bank Fund (FOBAPROA).

In 1994, with the subscription of the NAFTA, the starting point was a diagnosis of the Mexican financial system, which acknowledged that the national intermediaries were at a relative disadvantage with regard to the eventual commercial partners, due to the low level of productivity and the high degree of economic concentration of the market.

There were expectations that by posing the threat of new participants due to the subscription of the NAFTA, national intermediaries would be furthered to increase the efficiency of their operations and to improve the quality of their services. Hence, the justification of granting a six-year terms to achieve greater competitiveness in their services, in international terms.

It was expected this would bring about a decrease in the intermediation margins (active rate minus passive rate) and of the financial margin (collected interests minus paid interests on

medium assets), that would result in a greater competitiveness of the Mexican economy as a whole. By decreasing the active interest rate, financial costs of the working capital of companies would be decreased and the national productive plant would become more competitive.

The macroeconomic instability experienced as of the crisis of the end of 1994, together with the peso devaluation and the political instability at the beginning of that same year, made the decrease of financial margins very difficult. Moreover, the economic contraction increased the credit risk, the banks' cost of operation because of an increase in notes due and decreased funding possibilities in the international market, making money in the local market even more expensive.

Also, the evolution of banks with losses that increases almost fivefold from 1994 to 1998 – from 4 banks with losses at the beginning of the period, March 1994, to 19 banks in September 1998 – is noteworthy. This situation of systemic crisis has cost the country in the form of the Savings Protection Bank Fund (FOBAPROA), to which over 70 billion dollars<sup>216</sup> were allotted to purchase note dues.

#### **N.A.F.T.A. AND F.O.B.A.P.R.O.A.**

	1994	1995	1996	1997	1998
Credits / Deposits	116.800	120.900	108.600	101.900	103.300
Credit risk	9.190	8.330	7.280	12.790	13.250
Net Margin	3.261	1.980	-3.053	2.263	2.354
Growth	32.450	-14.470	-2.120	-25.110	1.910
Equity Ratio	5.455	6.776	6.010	8.460	8.407
Market Concentration	0.685	0.626	0.587	0.693	0.634
Int. Exps / Int. Earnings	69.920	85.650	85.500	80.070	79.140
Operation Expenses	3.540	3.480	3.473	9.409	9.267

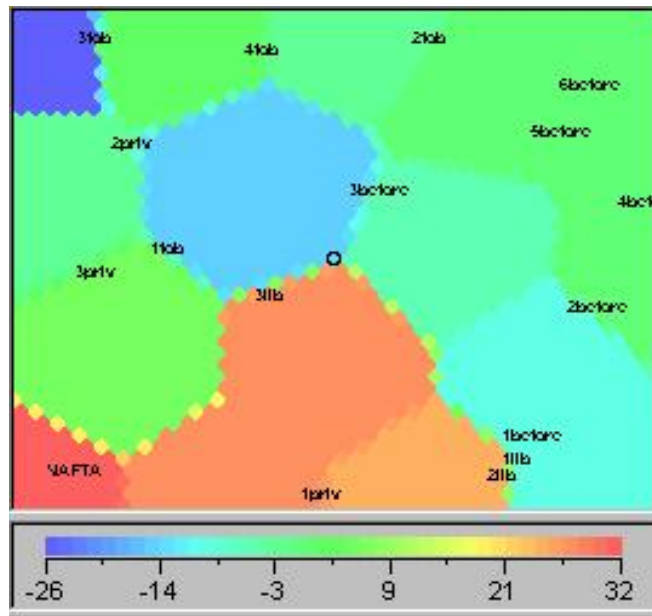
Note: Interpolation using Viscovery SOMine Program.

The approval of the NAFTA furthered the banking sector's growth; increased banking intermediation even further and new foreign subsidiaries entered the banking market. The level of growth experienced in this stage is one of the period's highest – 32 percent in 1994. Nonetheless, during this period, the banking system also experienced the greatest fall of activity in its modern history – 25 percent in 1997 – as can be clearly seen in the following map (see Nafta and 3fob).

<sup>216</sup> El Financiero, February 22, 1999. p.3.

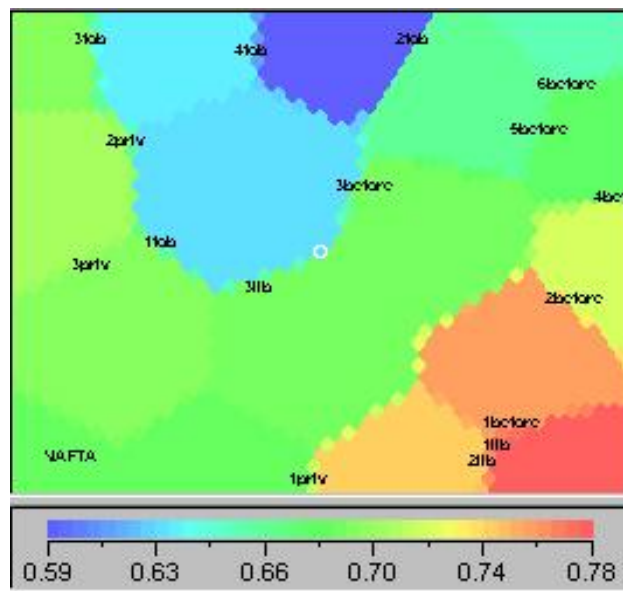
## MAP NO. 2

### Growth Banking System



The risk level increased in comparison to the prior privatization phase; the net interest margin decreased; operation expenses were more efficient; the degree of market concentration also decreased, due to a greater competition of foreign banks. The lowest level of market participation in the period being analyzed – 1982-1998 – occurred in 1996, as can be seen below (2fob in the map).

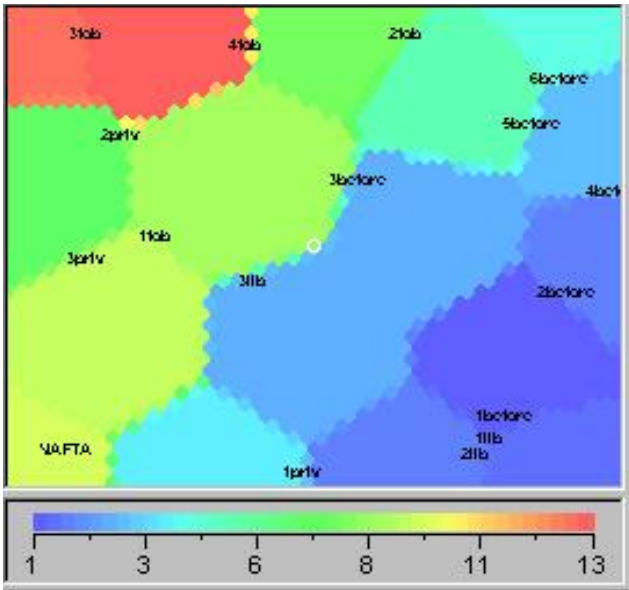
### Map No. 3 Market Concentration Banking System



An additional explanation of the high risk level in these years can be found in the incentives created by the Savings Protection Bank Fund, for banks to adopt more risky credit behaviors. Even the banks' productivity was seriously affected during the Fobaproa's last years of operation – 1997 to 1998 . Operation expenses regarding assets increased almost threefold in comparison to the two previous years.

The map below shows that the highest risk levels are reached during the last two years (3fob and 4 fob in the map) in which the Fobaproa operated.

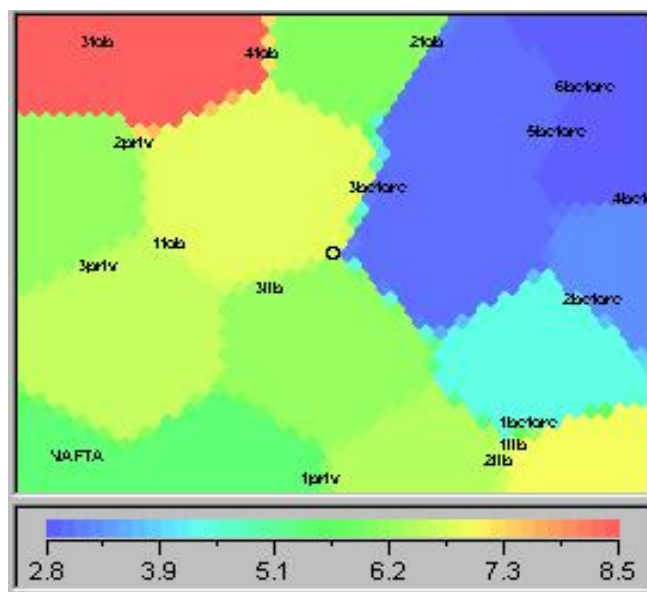
**MAP NO. 4**



**RISK BANKING SYSTEM**

Nonetheless, as can be seen in the following map, the highest levels of bank capitalization where the FOBAPROA played a determinant role, also occurred during this period.

## MAP NO. 5



## EQUITY RATIO'S BANKING SYSTEM

### CONCLUSIONS.

The initial conditions of the Mexican banking system, on which the financial liberalization process developed, were not the best. The banking system was undergoing a growth crisis, with a high degree of lack of capitalization, which made it vulnerable due to the high risk levels that would occur.

During the financial liberalization period, growth of the banking system was furthered, intermediation improved, the degree of market concentration decreased, the efficiency of operational expenditures improved, but the risk levels also increased, as well as the interest expenditure ratio for the same concept increased credit risk and bank capitalization deteriorated.

The result of the bank privatization was that the banking system increased its degree of intermediation, as well as its profitability, its degree of capitalization, and its operational efficiency, but it increased credit risk even more and it decreased its asset growth rate, although it improved its expenditures in comparison to its income from interests.

The implementation of the NAFTA, with the authorization of foreign bank subsidiaries, furthered financial intermediation even more; the growth of bank assets improved operational efficiency, decreased the market concentration, but increased credit risk; reduced the net margin; decreased the degree of capitalization and increased the ratio of expenditures over income from interests.

The government intervention to rescue banks through the purchase of notes due, increased the degree of intermediation, improved bank capitalization, but did not prevent the crash of bank assets. The fall of the net margin, which for the first time was negative, created incentives to excessively increase credit risk and the efficiency in operation expenditures that had been previously achieved was lost. The ratio of expenditures on income due to interests also deteriorated, while at the same time, market concentration decreased.

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