PRIVATIZATION AND REGULATORY REFORM:
A CASE OF MODELING LATIN AMERICAN ECONOMIES

A DISSERTATION

ALEJANDRO IBARRA YUNEZ

MONTERREY, N. L., MEXICO
APRIL 1998
PRIVATIZATION AND REGULATORY REFORM: A CASE OF MODELING

LATIN AMERICAN ECONOMIES

by

Alejandro Ibarra-Yúnez, MA, MAE

Dissertation

Presented to the Faculty of the Graduate School of Business and Leadership of the

Instituto Tecnológico y de Estudios Superiores de Monterrey

in Partial Fulfillment of the Requirements

for the Degree of

Doctor of Philosophy

Instituto Tecnológico y de Estudios Superiores de Monterrey

April, 1998
PRIVATIZATION AND REGULATORY REFORM: A CASE OF MODELING
LATIN AMERICAN ECONOMIES

APPROVED BY
THE MEMBERS OF
THE DISSERTATION COMMITTEE:

Sydney Weintraub (chair):
Chandler Stolp:
Luis E. Derbez:

DIRECTOR OF THE DOCTORAL PROGRAM

María de Lourdes Dieck:
DEDICATION

TO AURORA, MAURI, AND ALEX FERDI

who have given me encouragement in all these years of intellectual inquiry and

throughout this project
ACKNOWLEDGEMENTS

I would like to take this opportunity to thank the members of my reading and examining committee: Dr. Sidney Weintraub, Dr. Chandler Stolp, and Dr. Luis E. Derbez, for the encouragement and time spent in reading and discussing the various parts of this research project. I would like to add special thanks to my principal advisor, Dr. Weintraub, not only for his direction in accomplishing this paper effectively, but for more than ten years of intellectual contact and guidance. To Dr. Stolp, I acknowledge his careful evaluation of the report, especially of the quantitative analysis during this project; I also feel honored for the high level of discussions we have maintained on quantitative methods and economics for more than a decade. To Luis Derbez, I thank him for his friendship and encouragement to always succeed. Finally, I want to thank colleagues in the Department of Economics at Monterrey Institute of Technology (ITESM-Monterrey), and in the Graduate School of Business and Leadership, for their support.
La privatización, la reforma regulatoria y la liberalización internacional del comercio y el capital, han sido parte importante de las reformas gubernamentales de los países en desarrollo. Sin embargo, el esfuerzo teórico no ha resultado en un campo unificado del cuestionamiento intelectual, sino que cada subdisciplina ha avanzado de manera, en general, divergente. En la práctica, la privatización y la reforma regulatoria han permanecido como estrategias de gobierno difusas y no coordinadas, e incluso se les ha considerado como sustitutas, de acuerdo con líneas de acción características de los países desarrollados. La región de América Latina y el Caribe ha sido muy activa en los esfuerzos de privatización en el mundo durante los ochenta y noventa. Sin embargo, la mayoría de las privatizaciones, sobre todo de sectores y empresas con poder de mercado y externalidades --como la banca, las telecomunicaciones, la energía-- se ha llevado a cabo donde las regulaciones han
permanecido rezagadas y el desarrollo de instituciones como mecanismos de vigilancia ha estado ausente. Para la región, los tres conjuntos de políticas deben considerarse como complementos. Además, la dinámica de la secuencia de aplicación de estas políticas es de especial importancia, por lo que la presente investigación se concentra en estos aspectos. Los objetivos principales de investigación son los de (a) generar un modelo teóricamente consistente que integra privatización y reforma regulatoria con condiciones de apertura económica; (b) aplicar pruebas empíricas sobre la complementariedad o no, de tales políticas; (c) hacer uso de secuencias alternativas bajo escenarios de primero y segundo óptimo, donde la imperfección de contratos e inconsistencias temporales pueden insertarse en el modelo mediante teoría de juegos y dinámica; y (d) probar empíricamente los determinantes de las decisiones de secuencias alternativas en países de América Latina. Para ello, el análisis utiliza modelos de decisión bivariada cualitativa en un panel de siete países y para los años 1985-1995. Adicionalmente, se utiliza un modelo modificado Tobit de tipo 4 para responder a los escenarios de secuencia de políticas. Finalmente, un estudio de caso, sobre las telecomunicaciones en Chile y México, permite analizar variables de esfuerzo y compromiso de empresas privatizadas, donde existió reforma regulatoria en el primer caso, pero no en el segundo. Los hallazgos de investigación permiten aclarar el tipo de problemas de tipo agencia en la privatización y desregulación, así como determinar la importancia de la liberalización de capital en la región. Se presentan implicaciones de política económica, instituciones y negocios.
ABSTRACT OF DISSERTATION

GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP,
INSTITUTO TECNOLOGICO Y DE ESTUDIOS SUPERIORES DE
MONTERREY, CAMPUS MONTERREY

Degree: Doctor of Philosophy  Program: Doctoral Program in Administration

Name of Candidate: Alejandro Ibarra-Yúnez

Committee Chair: Sidney Weintraub

Title: PRIVATIZATION AND REGULATORY REFORM: A CASE OF
MODELING LATIN AMERICAN ECONOMIES

Privatization, regulatory reform, and trade and capital market liberalization
have traditionally constituted part of an overall government reform in developing
economies, yet they are theorized along divergent lines of intellectual inquiry.
Moreover, privatization and regulatory reform have been addressed as fuzzy
correlates, where theory assumes them as imperfect substitutes in policy making in
developed countries. Latin America and the Caribbean has been one of the most
active regions in instrumenting privatization efforts during the eighties and nineties,
both impelled by multilateral institutions but also by government strategies from
within each main country. However, most privatizations of sectors with market
power and externalities, such as banking, telecommunications, utilities and capital
goods, have been applied without regulatory reform or where institutional development of oversight mechanisms has been absent. In the region, the three sets of policies need to be considered complements. Additionally, the sequencing dynamics is key if main privatizations were implemented in a rush and with lagging or backward regulatory changes. The main objectives of the present research are to generate a theoretically consistent model of privatization with regulatory reform and under international economic opening, and to test empirically for complementarities; to make use of sequencing options under first best and second best scenarios, where time and contract imperfectness are prone to be analyzed under game theoretical dynamics; and to test empirically the choice options faced by authorities of the region. For that, the analysis follows models of qualitative bivariate choice in a panel of seven main countries for the years 1985-1995; Tobit modified type 4 models, to explain results of privatization under the various sequences and economic opening; and a case study of the telecommunication sector in Mexico and Chile, where regulatory shields existed in the first privatization but not in the second. The findings clarify the agency problems encountered in privatization and regulatory change sequences, the importance of trade and capital market liberalization in the region's privatization efforts, and the implications for businesses. The research generates policy questions for regulatory reform in Latin America and other emerging economies at the end of the century.
# TABLE OF CONTENTS

LIST OF FIGURES ................................................................................. xiii

LIST OF TABLES .................................................................................. xiv

CHAPTER

1. INTRODUCTION AND OBJECTIVES OF THE RESEARCH .......... 1
   I. Introduction and Purpose of the Dissertation ............................... 1
   II. Characteristics of Latin American Privatization and Regulatory Reform ................................................................. 5
   III. Research Focus and Objectives .................................................. 11
   IV. Plan of the Study ..................................................................... 14
   V. Main Contributions and Limitations of the Study .................... 16
   VI. Extensions and Conclusions ...................................................... 19

2. THE THEORETICAL BASIS OF PRIVATIZATION AND REGULATORY REFORM ............................................................ 21
   I. Introduction ............................................................................ 21
   II. Review of Mainstream Studies and Approaches ......................... 22
       a. Public Firms (SOEs) .......................................................... 25
       b. Private Firm .................................................................... 27
       c. Model with Deviations from Social Welfare and Agency Problems .......................................................... 28
       d. Private Firm’s Deviations and Modeling .............................. 35
       e. Trade-offs responding to Market Structures ..................... 38
       f. Extensions of Agency Conduct and Analytical Techniques 43
   III. The Relationship between Privatization and Regulatory Reform in Developing Countries .......................................... 48
       a. Regulatory Conditions in Developing Countries .................. 52
       b. A Proposed Model of Sequencing ....................................... 59
       c. Investment Related to Privatization Choice ....................... 64

   IV. The International Setting Related to Privatization and Regulatory Change .......................................................... 65
TABLE OF CONTENTS (continued)

3. EVIDENCE OF PRIVATIZATION AND REGULATORY REFORM IN LATIN AMERICAN COUNTRIES ......................... 68

I. Introduction ................................................................................................................. 68
II. The Dynamics and Scope of Privatization and Regulatory Reform in LAC .................................................................................................................. 69
   a. The Scope of Privatization in LAC ......................................................................... 71
   b. Fiscally Driven privatizations? .............................................................................. 77
   c. Privatization and Private Investment ..................................................................... 82
   d. Use of Proceeds and Government Restructuring .................................................. 85

III. Regulatory Change and Adjustment: An Evaluation .................................................. 88
   a. Timing of Oversight Mechanisms in LAC .............................................................. 90
   b. Regulations and Economic Opening ....................................................................... 94
   c. Independence and Conflicts among Oversight Agencies ......................................... 96

IV. International Capital Markets and Relationship to Privatization Measures .................. 100
V. Conclusion .................................................................................................................. 104

4. STATISTICAL MODELING AND DATA BASES FOR EMPIRICAL ANALYSIS ................. 105

I. Introduction ................................................................................................................. 105
II. Choice Models on Qualitative Dependent Variables and Switching ............................... 106
   a. Models with Panel Data and Heckman's Procedure ............................................. 107
   b. Lee's Simultaneous Equation Choice Models ...................................................... 110
   c. Multivariate Probit Models and Switching ........................................................... 112

III. Proposed Approaches to Privatization and Regulatory Reform Sequence .......................... 119
IV. Nature of the Data Set for Privatization and Regulatory Reform in LAC ......................... 123
V. Conclusion .................................................................................................................. 126
# TABLE OF CONTENTS (continued)

5. **EMPIRICAL ANALYSIS OF PRIVATIZATION AND REGULATORY REFORM IN LAC** .................................................. 128

   I. Introduction .................................................................................................................. 128
   II. Data Description ......................................................................................................... 131
       a. Analysis of Raw Data .............................................................................................. 137
       b. Evaluation of Linear Models .................................................................................. 139

   III. Multivariate Probit Models and Models of Sequence .............................................. 142
       a. Bivariate Probit Models ......................................................................................... 144
       b. The Tobit Model of Switching and Privatization Revenues .................................. 155

   IV. The Case of Telecommunications Sectors in Chile and Mexico ......................... 160
       a. Chile’s Reform ........................................................................................................ 164
       b. Mexico’s Reform ..................................................................................................... 168
       c. Empirical Evidence of Privatization and Regulatory Reform: Telecommunications ........................................................................................................ 170

   V. Implications and Conclusion ....................................................................................... 176

6. **GENERAL CONCLUSIONS, IMPLICATIONS, AND FUTURE DIRECTIONS** ................................................................. 178

   I. Introduction .................................................................................................................. 178
   II. Main Findings and Implications ................................................................................ 181
   III. Limitations and Lines for Future Research ............................................................... 190

7. **APPENDIX: DATA FOR MACRO AND MICRO MODELS** ................................................................. 195

8. **REFERENCES** .............................................................................................................. 201

BIOGRAPHICAL SKETCH ........................................................................................................ 212
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIG. No.</th>
<th>Description</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Benefits and Costs of Policy Sequence</td>
<td>51</td>
</tr>
<tr>
<td>2.</td>
<td>Game Scenarios</td>
<td>62</td>
</tr>
<tr>
<td>3.</td>
<td>Relationship between Privatization Year and Private / Public</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Investment Changes</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Options in Sequencing</td>
<td>121</td>
</tr>
<tr>
<td>5.</td>
<td>List of Variables for the Model of Sequence</td>
<td>125</td>
</tr>
<tr>
<td>6.</td>
<td>Sources of Data for the Choice Model</td>
<td>136</td>
</tr>
<tr>
<td>7.</td>
<td>Privatization Choice and Sample</td>
<td>137</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE No.</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of SOEs Privatized between 1980-91</td>
<td>72</td>
</tr>
<tr>
<td>2. Yearly Distribution of Privatization Efforts (millions of dollars)</td>
<td>74</td>
</tr>
<tr>
<td>3. Sectoral Distribution of Privatizations in ALC by Year (millions of dollars)</td>
<td>77</td>
</tr>
<tr>
<td>4. Overall Balances and Budgetary Burden of SOEs as Percentage of GDP Previous to Privatization (Selected Countries)</td>
<td>78</td>
</tr>
<tr>
<td>5. Average Overall Balance of SOEs as Percentage of GDP during Privatization Efforts (Selected LAC Countries)</td>
<td>79</td>
</tr>
<tr>
<td>6. Deficit of Central Government as Percentage of Total Expenditure plus Lending minus Repayments and Year of Privatization Beginnings (Selected LAC Countries)</td>
<td>81</td>
</tr>
<tr>
<td>7. State of Regulatory Mechanisms in LAC</td>
<td>94</td>
</tr>
<tr>
<td>8. Leading Emerging Capital Markets</td>
<td>102</td>
</tr>
<tr>
<td>9. Participation of ADR and GDR by Selected LAC Countries: 1989-95 (millions of dollars)</td>
<td>103</td>
</tr>
<tr>
<td>10. Linear Regression Results of Privatization Revenue of the Raw Data: Pooled Sample 1985-1995 of Seven LAC Countries</td>
<td>139</td>
</tr>
<tr>
<td>11. Probit Model of Privatization Choice in LAC: Entire Sample with Economic Opening ad Regulatory Variables</td>
<td>146</td>
</tr>
<tr>
<td>12. Ordered Bivariate Probit Model of Privatization Choice (lower level), and Regulatory Choice (upper level) with No Restrictions</td>
<td>147</td>
</tr>
</tbody>
</table>
LIST OF TABLES (continued)

13. Non-Restricted Ordered Bivariate Probit with Sample Selection:  
   PRIV when REGCOMP, First Best Solution ........................................... 148

14. Non-Restricted Ordered Bivariate Probit with Sample Selection:  
   REGCOMP when PRIV, Second Best Solution .......................................... 149

15. Tobit Model of Privatization Revenue: Selection Rule for  
    Priv, Reg = \{1,1\} ........................................................................... 157

16. Tobit Model of Privatization Revenue: Selection Rule for  
    Priv, Reg = \{0,0\} ........................................................................... 158

17. Comparative Analysis of Response to Privatization:  
    Telecommunications in Chile and Mexico (Lag Structure of  
    Responses by Variable) ....................................................................... 174
I. INTRODUCTION AND PURPOSE OF THE DISSERTATION

At the time that the subject matter of this dissertation was chosen, the study of liberalization, privatization, and market regulatory reform in developing countries had not been entirely developed with respect to generating a coherent, theoretically founded, yet applicable approach. There are indeed many theories about the effect and measurement of trade and investment liberalization in countries which undertook such policies in Latin America, Asia, and other latitudes of the world. Privatization literature is also abundant in its role to understand changes in property rights and impacts on welfare, as well as to lay out the ground for government political and economic motivations to sell state-owned enterprises (SOEs).

Diverse methods of sale have also been analyzed, and even World Bank economists have developed project plans and schedules for the entire process of privatization. Regarding regulatory reform, treatment has been generated to theorize around its structure or scope. Theories on regulation and deregulation determine the economic models to promote internal economic efficiency, allocative efficiency or
welfare, and dynamic efficiency or technological change. Analytical approaches extend beyond economics to political science, and even legal paradigms.

However, from the above theories and pragmatic applications it is not settled how these interplay and affect what could be called modernization of institutions, mostly applied to leading developing countries. This is the general objective of the proposed dissertation project. Developing countries and transition economies face liberalization and privatization with backward and even inconsistent regulatory frameworks, for which a study of the degree of the related depth of privatization and regulatory reform is needed. It is also unclear how middle-income developing countries, such as those in Latin America, have sequenced these policies, and how internationalization plays into changing the institutional developments or the rules of the game.

For modelers and theoreticians of international economics and policy, industrial organization, and political science, the problems of understanding, structuring, criticizing, and generating propositions for policy-making under the new set of rules seem almost insurmountable. The problems faced by scientific inquiry can be classified under theory, data, and motivation. Fortunately for theory, a new body of relevant treatments around agency problems and game theory, in stressing the dynamics of agent behavior, have given rise to growing insights of discrete processes of decision making such as opening up, privatization, and instrumentation of regulatory reform. These can be plugged into optimization models derived from
traditional theory. In developing consistent models, the researcher can then define relevant variables for empirical analysis in order to make sense of actions taken by governments committed to these policies. Moreover, the approach seems ripe for application in privatization and regulatory reform experiences in a group of developing economies in Latin America, how these policies relate to each other, how internationalization relates to the institutional change, and what are possible outcomes of these efforts in key industries.

Second, while data problems exist in every research program, the fact that privatization and regulatory reform are very recent, makes modeling a difficult task. Moreover, reforms have been achieved in various ways by different countries, for which problems of analyzing qualitative and quantitative information, at a micro- and macroeconomic level, seem even more difficult to be put together in a consistent way and be subject to statistical analyses of data in panels. It is possible that, because of the diverse implementation of opening up, privatization, and deregulation by countries and industries, most research concentrates in cases of one sector or one country. Fortunately again, econometric techniques in the area of multiple choice models, path analysis, and cumulative or learning processes have appeared in the literature in the past decade, which can be applied to the subject matter under study.

The third problem encountered by the researcher in this area seems that of motivation. As evidenced by the review of economic approaches in the body of the dissertation, privatization and regulatory reform have been analyzed under a broad
umbrella which places them as fuzzy correlates of financial and country risk assessments by private, public, and multilateral institutions. The aim of these institutions is to promote modernization in developing and transition economies, in which governments gain reputation as international partners and are more prone to develop transparent, non-discretionary economic policies, closer to the developed countries. However, it is important to separate and analyze the sequence of policies, because the impact on economic and social agents of insufficient or suboptimal dynamics in policies might lead to less than successful results, which could be subject to criticism from viewpoints not in accordance with economic reason.

The problems that this dissertation aims to solve are: to model the privatization and regulatory reform in a set of Latin American and Caribbean economies (LAC), following agency theory and the logic of sequencing; to use evidence from more than one sector and a set of countries for analysis of these reforms; to shed light on the relationships of these policies to trade and capital liberalization, as correlates in countries involved with opening up, or what could be called "open economy domestic endogenous reforms;" and to seek the relationships of the game theory approaches to new econometric methods of choice modeling. In terms of hypotheses, the following questions are relevant:
H1) LAC privatization shows second best solutions if regulatory reform is insufficient and not accomplished *ex ante*. The hypothesis needs to be tested by modeling if sequencing differences are explained by divergent variables and structural settings of countries.

H2) A second hypothesis is to test whether regulatory reform and privatization in the case of LAC, are complements rather than substitutes, opposed to traditional theory applied to developed economies.

H3) If regulatory reform is a continuum that needs upgrading and accommodating to tackle agency problems (contract imperfectness), regulatory changes may reduce agency problems even under second best. By testing this hypothesis one can come to grips with the dynamics of LAC institutional change and institutional commitment.

H4) A final hypothesis is to test the assertion that trade and investment liberalization complement and even trigger mechanisms of privatization and regulatory reform to improve outcomes of their implementation in LAC.
II. CHARACTERISTICS OF LATIN AMERICAN PRIVATIZATION AND REGULATORY REFORM

Privatization as a choice has been accompanied with deregulation in some cases, and regulation in others. Moreover, international trade and investment liberalization have been implemented in most developing economies in Latin America at different levels of depth, as indebted countries saw no alternative way to overcome macroeconomic problems in the middle of the eighties. During that decade, and extending into the nineties, developing economies have experimented with these policies within their government and social levels, but influenced by philosophies in some developed economies, mainly in the UK and the USA, international organizations such as the World Bank and GATT, and the thrust of globalization by leading economic sectors.

Reportage abounds on forms of privatization, deregulation experiences, and sectoral performance after privatization. Moreover, international financing institutions such as the World Bank have coordinated financial rescue packages to many developing countries pointing out towards more market oriented government strategies, which include liberalization, privatization, and deregulation, or what has been called the “Washington consensus.” The vision is apparent that the three sets of policies are a clear signal of commitment, that policy errors will decline in less developed countries (LDCs) and economic efficiency and allocation will grow. By
reducing the room for discretion, errors by these LDC authorities would be minimized.

Since financial institutions aim at evaluating risks for financing packages and advise, they do not spell out conditions under which LDCs could move forward in attaining economic and social improvement through distinct privatization and regulatory reforms and sequence. In the setting of a developed economy, a "first best" axiom is generally assumed that before privatization takes place, monitoring institutions and regulations are well developed and operate effectively to minimize problems of internal and allocative inefficiency (MacAvoy 1995; Vickers and Yarrow 1995). However, the choices presented to LDC authorities, and the consequences of these choices, are varied and respond to different economic, sectoral, and strategy variables, something which could be characteristic of "second best" solutions, because regulatory reform and monitoring institutions are underdeveloped (World Bank 1995). The sequencing of policies and credibility of regulatory agencies is then key.

Turning now to a description of Latin America's position, between 1983 and 1995, over 80 countries in the world have privatized part of their economies, and in the past 12 years more than 8,500 state-owned enterprises (SOEs) have seen their property structure changed. Privatizations, in general, have moved from low-value and small size SOEs to larger privatizations, that include takeover by private capital (not only divestiture through closings) both from domestic and international origins.
In the case of Latin America and the Caribbean, which represents around 12% of world privatizations but is the most active region with these policies among developing economies, the following countries have moved forward in privatization strategies: Argentina, Bolivia, Chile, Dominican Republic, Ecuador, Jamaica, Mexico, Peru, and Venezuela. Others such as Brazil, Panama, or Uruguay have postponed privatization or simply have not embarked on full blown privatization measures as part of government policy. Still others, Venezuela being the most important case, have moved back from privatization and into more traditional policies of statist sectoral control and regulation (World Bank 1995).

The key sectors subject to privatization in Latin America include: telecommunications with around 25% of the region’s total value of privatizations; banking (22%); energy (14%); and steel (11%). The first three sectors operate in monopolistic structures with externalities. As for airlines, other manufacturing SOEs, and operation of ports, they represent competitive sectors with a less pressing need of regulations. Other privatization efforts are unique to specific countries, such as mining in Chile and Mexico. Highways were privatized only in parts of Mexico. Energy at provincial level has been privatized in Brazil. And the privatization of social security is well-known in Chile, although underway in Argentina and Mexico as well.

Now, the political economy of privatization has made emphasis on the capacity of authorities to gain social support for privatization. Separating SOEs into
various activities to reduce conflicts with unions and vocal opposing groups has been tried. Speed of privatization and a favorable macroenvironment are additional considerations in the process. If domestic capital markets are shallow and underdeveloped, authorities have also tried to substitute their insufficiencies with liberalization, and by modifying rules on foreign investment limits and partnerships with domestic capital. Given different economic structures and policy options across countries, restructuring before divestiture and mode of sale have varied across countries. Preparation and form of divestiture create incentive mechanisms, which have affected not only the number of private capital interests in the process, but also the price and the regulatory shield to privatized SOEs. Sequencing of privatization and regulatory reform, while lending themselves to econometric analysis of choice, have clear effects on reputation, rules of the game, institution development, and \textit{ex post} performance of privatized SOEs, as stressed by the literature on property rights (De Alessi 1980; Sappington and Stiglitz 1987; World Bank 1995).

Sequencing shows some evidences of "second best" solutions. For example, during privatization, sectors such as banking were deregulated to be sold to private capital and regulations continue to be part of the market, aligned to international standards. However, oversight mechanisms could be insufficient to promote economic efficiency, as stressed by various discussion papers and meetings in the Private Sector Development Department of the World Bank, as well as new developments on government commitment and accountability in Europe (Moran and
Proser 1994). Banking under-performance is apparent in the case of Mexico (McComb, Gruben, and Welch 1994). In telecommunications, re-regulation of entry (but not of prices) was implemented after privatization in Mexico and Argentina, while regulatory oversight and promotion of competition existed in Chile before privatization. Still in other cases, regulation seems not to have changed after privatization. Regulatory frameworks are also varied. Chile, Colombia, Venezuela, and Argentina, seem to have modern regulatory agencies with clear regulations, as well as limits on their operation, mainly relating to competition policies and entry conditions. However, the realm of criticisms on institutions is similarly varied and even the aforementioned countries are not exempt from criticism. Other countries such as Mexico are beginning to experiment with independent agencies like these. Others such as Brazil, Bolivia, or Peru have seen little or no change in the institutional setting surrounding privatization efforts, despite international agreements such as MERCOSUR.

The same applies to liberalization policies. Chile and Mexico show the deepest and broadest liberalization, encompassing trade, investment, and institutional changes, whereas the Andean countries have followed a narrower liberalization effort, and MERCOSUR shows uneven liberalization by sectors and institutions. For the case of liberalization, countries under regional trade agreements have somewhat spelled out treatment around property rights, standards, dispute mechanisms, and capital, as is apparent in Mexico with NAFTA, Caribbean countries with CARICOM,
and Argentina with MERCOSUR. Chile has also changed the rules of the game both unilaterally and through its trade agreements with Mexico and its associate membership status with MERCOSUR. As signatories to GATT, main Latin American countries have also been influenced by international monitoring mechanisms around regulatory issues such as intellectual property, dispute settlements, and government subsidies. A key element in opening up is the access to international capital around the privatization efforts. Countries opening in the region have benefited from such an access and have promoted development of their own domestic capital and markets.

To sum up, privatization and regulatory reform are dynamic, cumulative processes; they consist of discrete decisions, either sequenced or not; are applied by different countries and to different sectors; and have been accompanied by various degrees of trade and capital liberalization. Also, these shocks are to be evaluated with respect to a set of expected performance measures in positive capitalization (both domestic and international), lower relative prices, market power reduction and entry conditions.

III. RESEARCH FOCUS AND OBJECTIVES

In deciding how to approach the modeling of privatization and regulatory reform in Latin American economies, along with the intent to integrate these sets of policies into the context of economic opening, there were several decisions to be
made. These related to the methodological approach and the theoretical approach to the subject matter.

While there is a growing body of methodological literature to treat cumulative knowledge, decision processes, or curve fitting and smoothing, under the heading of path analysis and multiple choice models in econometrics, the proposed modeling methodology is that of switching and censored data analysis, which is an econometric technique of multinomial/multivariate choice using what is known as the two-step Heckman procedure. Switching models and analyses of censored data were originally applied to labor markets and consumer choices, where observations of a decision maker deciding on, say, a type of consumer good, were conditional on the income population where the consumer was drawn in the sample. Hence, a "switch" is based on sample separation information on consumer choice and income setting; similarly for the case of labor markets, a constrained labor supply depends on previous situations of the population, where the worker could have been unemployed or not.

The technique can be extended to privatization and regulatory reform in LAC economies, where the choice of regulatory reform would be drawn conditional on privatization or not-privatization observations (Goldfeld and Quandt 1973; Greene 1980; Hensher 1986). The time variable or decision moment of policy can be plugged in such a model which uses a panel of data by country, industry, and policy in a time frame of around ten years between the eighties and beginning of the nineties. Preliminary data analysis was conducted on years for the beginning of modeling on
privatization choice, determinants of privatization in macroeconomic, fiscal, revenue, and sectoral terms, as well as the status of regulatory competence. Whereas some countries began these policy changes early in the seventies or beginning of the eighties (Chile), others moved forward during the entire past decade (Argentina and Mexico); still other countries have more recently moved to privatize and apply regulatory reforms in the nineties, (Bolivia, Brazil). The time variable is thus dependent upon the moment a country moved forward with reform.

The panel of data for the model is treated using various cuts or clusters, by country, and by case of sequencing and depth of reforms. Then an analysis of reforms as they relate to trade and capital liberalization by country and industry is applied. The database for the panel is for around 15 years (1980-1995), for seven LAC countries. In order to make the analysis manageable, it concentrates on main privatized sectors of their economies and where regulatory reform is necessary, both directed to specific sectors, and overall monitoring. Examples are telecommunications, energy, and banking. Then the analysis concentrates on two main cases of overall reforms around telecommunications as a sector with monopoly power, in order to explore more deeply the effects of different sequencing of policies and breadth of regulatory reform and international liberalization: Chile and Mexico.

The theoretical approach taken was to not exclude from the model considerations that have not been tested because there is not enough theoretical evidence in the privatization and regulation literature. Various theories exist on how
property rights are affected by privatization policies, with apparently contradictory results when it comes to economic welfare. On adjustment and new rules of the game between public and private sectors, political economy approaches theorize about the effects of these power changes but do not, in general, address the incentive mechanisms for both privatization and regulatory reform *ex ante* and *ex post*. Hence, emphasis is placed on new developments in agency theory within the new body of research on economic opening, privatization, and regulation.

By following the proposed approach the researcher is able to make sense of the relationships between the microanalysis and the modeling processes, in order to generate consistent parameters to be extended to other cases.

**IV. PLAN OF THE STUDY**

This dissertation presents the development of privatizations and regulatory reform in a group of Latin American countries that have internalized these sets of policies, and analyzes their coherence. As logically sequential decision choices in possibly "second-best" solutions, the dissertation will provoke the comprehension and evaluation of policy choices and outcomes, and how they are taken in an increasingly open economic system by middle income developing economies. The analysis is valuable since no former treatment has been assigned to inter-country, inter-industry situations using both theoretical and econometric methods which have recently been developed in the economics literature. Chapter 2 examines the various theoretical
approaches to privatization and regulatory reform, and then integrates the agency methods which are state-of-the-art in the framework of analysis to be followed in the rest of the dissertation. A treatment is presented on the logic of policy sequencing and its evaluation to the subject matter in a mathematical model.

Chapter 3 follows a historical and country / industry path of liberalization, privatization, and regulatory reform, and locates the various "rounds" of privatization in a selected group of Latin American countries which have internalized these policies. The analysis in this chapter comes to grips with implementation problems and typifies them as inputs to the quantitative analysis. Chapter 4 reviews the econometric literature on choice models, defines the two step Heckman procedure to be followed, and examines its strengths and weaknesses. The proposed model of privatization and regulatory reform is specified. Additionally, key international variables enter into the proposed model.

Chapter 5 is divided into two main parts. In the first section, data pretests are run and the panel of data is then analyzed under the specification of choice models. Then, results of the estimation are presented and analyzed under various clusters by country and sequence. Finally, an interpretation of results and directions for model improvement are presented. In the second part of the chapter, an extension of the analysis is applied to telecommunications privatization and regulatory reform in Chile and Mexico, in order to make sense of qualitative policy changes in a setting much considered as a "best practice" in Chile, and a less evident case in Mexico. Agency
problems will show that institutional change needs to consider problems of imperfection of contracts, even in a case of aduced “best practice.” Chapter 6 presents conclusions on the theoretical, modeling, and information aspects, and lines for further research in the area.

V. MAIN CONTRIBUTIONS AND LIMITATIONS OF THE STUDY

The study of privatization as a choice linked to regulatory reform, and trade and investment liberalization offers the following contributions. A first one is to elucidate analyses of these sets of polices in a coherent manner, as they are distinct, yet interrelated strategies. International and multilateral institutions have been interested in finding clearer market conditions which represent governments’ commitment to marketize economic relations in their societies, as preconditions for country risk assessment and financing of projects. However, these evaluations do not give specific weights to each of these sets of policies and their potential outcomes. By specifying the differences in policy making and sequencing, one will be able to come to grips with the different paths and outcomes in Latin American economies even under “second best” argumentations.

A second contribution of the present analysis is the use of agency theory, which has been applied in industrial organization research but little or not used in liberalization, privatization and regulatory reform. A related contribution is to use the proposed theoretical approach across countries and industries, by finding common
denominators of these policies as applied to a select group of Latin American economies which have experimented with them. Since Latin America as a region has lagged in modernization strategies, but at the same time has experienced some of the most profound policy changes in the world, a fourth contribution of the proposed analysis is to clarify the extent of success or implementation problems of these policies, in order then to find applications in further rounds of privatization and regulatory reform in the region and in other parts of the world.

A fifth contribution is to discuss the applicability of strategies of international trade and capital liberalization within the context of these institutional reforms, and whether there are similarities and convergences which would ease the path towards deepening regional liberalizations and policy coordination and relatedness in the future of the region.

A sixth contribution of the dissertation is the use of a new body of econometric treatments to models of accumulated knowledge, thresholds, censored data analysis, multivariate and multinomial choice, as they apply to the subject matter. Given the panel of data and experiences of a group of countries with these policies, the two step Heckman procedure and a modified Tobit type 4 model are used for application in the subject matter, something not experimented before in this area of economics research.

Finally, the entire study will contribute to the understanding of some of the main implementation problems encountered in the experiences of the selected group
of Latin American countries, and how regulatory lag or underdevelopment could be substituted by economic opening to generate internal and allocative efficiency results in privatized SOEs.

On the side of limitations, adding to the fact that information is disperse, much is not quantifiable, and there is much diversity in implementation of these sets of policies in Latin America, the study concentrates only on the dynamics of privatizations which comprehend private control results, rather than liquidations, since the latter imply closings of former SOEs and present little interest for the subject matter. Moreover, salient privatizations are emphasized which mainly encompass key national sectors. A limitation exists in that the evaluation of why liquidations were decided by many countries also gives evidence of modernization or reputation moves by governments. Hence such a relationship is not entirely pursued in the dissertation.

Another limitation of the study is that the analysis is mostly directed towards privatizations at the national level, rather than subnational policy strategies so often found in economies such as the US. This is a minor limitation, however, since main privatizations in Latin America have been directed towards key national sectors and SOEs.

Still another element that deserves mention is that a conclusion on how governments should generally operationalize modernization policies is not possible. One can, however, see how sequencing and scope of privatization and regulatory
reform have fared for the selected group of countries which have initiated these policies. In other words, it is difficult in the analysis to present a final normative theory of privatization and regulatory reform, as has been discussed in Crampes and Estache (1997). However, lessons from the empirical findings and analysis are clearly derived for other cases. Still another limitation is the framework of regulatory reform aimed at entry conditions and marketization of sectors which were privatized. No direct treatment is presented on other regulatory changes such as consumer protection mechanisms, dispute resolution, or intellectual property. As in many studies, a boundary is generally determined to the scope of the research. Finally, even if the proposed econometric approach results from a broad evaluation of new data analyses and techniques, the present development of these methods is far from settled.

VI. EXTENSIONS AND CONCLUSIONS

With the awareness of limitations notwithstanding, the dissertation sheds light on an issue of much current and, most importantly, future relevance as middle sized developing economies try to move forward towards modernization and participation in the global concert of countries through liberalization, privatization and regulatory reform.

In countries such as in LAC, a problem exists that regulations to the market are rampant at the same time that they are often outdated or myopic by globalized standards. Then reform is a long process that has been accelerated by privatization
and economic opening, as governments try to gain reputation as they signal commitments to modernize and move their economies towards more market forces. The analysis accomplished in this dissertation sheds light on key issues faced by main Latin American economies which could then be possibly applied to efforts in other parts of the world. Agency problems and the theoretical framework for analysis is operationalized by new econometric methods of multivariate choice or the so called two-step Heckman procedure, which in itself is a main contribution to the literature and could extend itself to research by the analyst in other areas of knowledge for years to come.

Finally, freedom of governments or incentives to privatize and deregulate are conditioned by political preference, degree of economic development, structure of institutions, and capacity to internalize agency oversight and restructuring in order to foster so called modern rules of the game. A study such as the present one clarifies the structure of reforms applied to cases of the sample used, even assuming second best situations, in which dynamic adjustments and opening up could serve in the dynamics of change. The experiences of main Latin American economies with these reforms will shed light on the challenge ahead for this region and aide in the design of policy making by governments and international institutions.
I. INTRODUCTION

The present chapter will present a consistent model of privatization, regulatory reform, and how economic opening is viable to be plugged into a proposed model.

According to the theoretical literature, most models of privatization present a first best solution such that regulatory bodies and laws are well set in a country embarking with privatization, where the so-called framer aims only at setting the adequate price limits to monopoly conduct. In the following models, however, the framer faces problems of sequencing, as well as has to define regulatory frameworks which not only encompass price or rate of return standards but also entry conditions and rent seeking.

This is more in line with privatization phenomena in developing countries.

The chapter also inserts agency problems in the relationship between privatized firms and the framer or authority, often present in government changes in Latin American and Caribbean (LAC) economies. Finally, the chapter makes capital market

21
development a domain in the objective function of governments, which affects the results. With this exercise, the theoretical basis is possible for further empirical analyses in other chapters of the research project.

II. REVIEW OF MAINSTREAM STUDIES AND APPROACHES

According to Hartley and Ott (1991), economic inquiry on privatization became a fashionable response to economic problems faced by governments and state-owned enterprises (SOEs) during the eighties. Indeed, the UK experience is mentioned as a benchmark in most studies on privatization and deregulation, for its depth and scope, and also for the underlying political philosophy of the Thatcher administration. Privatization and deregulation experiences in other parts of the world, e.g. the USA, were also increasingly studied. The recent privatization spree in Latin American economies, began with Chile around 1973 but became a noticeable case in the early eighties. Mexico, Argentina, and more recently other economies in the region, have seen experiences of privatization, regulatory reform, and trade and investment liberalization of various degrees. Moreover, privatization has become a key topic not only for governments and academics but also for advising and financial institutions which fund structural changes in these economies and the development of the private sector as a dynamo for economic growth and development (WB 1992).

The subject matter has also been debated, given the events in Central and Eastern European economies in transition, where privatization is but one of the
multifaceted problems of governance under new economic rules (Bös 1991). As these economic phenomena are inserted into an environment of rapid change, into a redefinition of what governments should take as their objectives, and under globalized capital markets and internal and external liberalization, economics has changed the focus mainly to the normative aspects (welfare impacts of alternatives), and mostly in the dynamics of privatization and deregulation.

However, equilibrium theory and its traditional- constrained optimization method has remained a key part in the analysis. Moreover, the theoretical discussion about public and private enterprise dates back to the forties with analyses of public firms such as the Heyworth Reports in the UK by industries (around prices and demand serviced). During the seventies, seminal work was done by Klevorick (1971, 1973) in a partial equilibrium model of optimal rate of return, and then on regulatory review on utilities. Niskanen (1971), in a now classical work on bureaucratic objectives of government, demonstrates how representative bureaucrats generate inferior welfare results in SOEs. Stigler’s public choice method and market for regulations is in the same line of argument, showing a critical eye for government regulation (Stigler 1971). The main thrust of inquiry was to produce a generalizable principle of private enterprise, or what could be called the basic axiom of private firms on economic efficiency:
Put succinctly, assume a firm that faces a demand function as

\[ z = z(p) \quad z_p < 0 \quad (1) \]

where market clearing implies that \( z \) is also quantity supplied. The production of a single output implies a cost function which depends on volume demanded and a level of effort by management:

\[ c = c(z, e) \quad c_z > 0 \text{ and } c_e < 0; \quad c_{ee} > 0 \quad (2) \]

Now, the manager has a utility function positively related to income \( I \), and negatively related to effort \( e \). Say that \( I \) is fixed and independent of \( e \). Moreover, the manager is willing to work if his utility is higher than a reservation utility \( V_{BAR} \) that will make him quit the job

\[ V(I, e) \geq V_{BAR} \quad V(I, e) - V_{BAR} \geq 0, \quad V_I > 0, \quad V_e < 0 \quad (3) \]

With the above equations, it is straightforward to compare the static equilibria between a public firm denoted state–owned enterprise (SOE), and a private firm.
a. Public Firms (SOEs)

Following Sappington and Stiglitz (1987), a framer is the regulator of an agent defined as an SOE. The framer acts as a principal, and the SOE acts as an agent, for which agency problems will be generated when the SOE conceals information or actions. In the simplest case, the framer maximizes social welfare, measured as the sum of the consumer’s and producer’s surplus, exerting the objective upon the SOE:

\[ S = S(p) \quad s_p = -z(p) \]  
\[ \Pi = p z(p) - C(z,e) - I \]

Maximizing with respect to the principal’s instruments \((p, I, e)\) and subject to the agent’s constraint in (3), then welfare is shown in the following Lagrangean:

\[ L = S(p) + pz(p) - C(z,e) - I - \beta [ V(I,e) - VBAR] \]

where \(\beta\) stands for a shadow price of the agent on its participation constraint.

Differentiating with respect to \(p\) gives the following price-cost margins for allocative efficiency (Bös 1991):
The first order condition in an SOE shows that price equals marginal cost for optimal allocative efficiency. Now differentiating with respect to \( I \) and \( e \), gives:

\[-z(p) + z(p) + p z_p - C_z z_p = 0 \]
\[(p - C_z) z_p = 0 \]  \hspace{1cm} (7)

which implies that the marginal rate of substitution (MRS) between effort and income, which is increasing in effort, will equal the cost of effort, for internal or \( X \)-efficiency. Following Stigler (1971), internal efficiency operates on costs, to give some internal efficiency equilibrium where relative effort (MRS) is equal to relative cost \( C_e / C_i \) or MRT. If MRS < MRT, then effort is too low and internal inefficiency occurs. The above is exacerbated not only by taking e as an input in the above simplified model, but when it becomes an element of the game of agency.
b. Private Firm

Now take shareholders as the principals whose objective is to maximize the firm’s value through profit. Then the term $S(p)$ will vanish in the lagrangean, which is again differentiated with respect to the instruments $p$, $I$, and $e$:

$$z(p) + p z_p - C_z z_p = 0$$

$$1 + (p - C_z) = 0$$

arranging

$$\frac{p - C_z}{p} = \frac{-1}{\varepsilon}$$

which shows an equilibrium through monopoly prices related to the price elasticity of demand, hence not showing allocative efficiency. Unless a regulation is already established to move monopoly behavior towards allocative efficiency as in SOEs, the price would not adjust accordingly. This is precisely the argument of Caves (1980), where a perfectly regulated private SOE is equivalent to a regulated SOE, or where he expresses concern about the policy insufficiency of privatization without former regulatory reform and oversight.

To complete the Lagrangean, it is straightforward to show that under private firm, internal efficiency is similar to the simplified case of SOEs:

$$\frac{V_e}{V_t} = C_e$$

(10)
Now, what makes the aforementioned axiom that favors private firm to SOEs has at least two conditions. First, if indeed social welfare maximization is attainable costlessly with respect to regulation-led private monopoly, then no reason for privatization would exist. However, the cost of attaining welfare maximization is taken to be higher than regulating private monopoly. For this reason, it is argued that any economic activity that is equally attainable by the state or private capital should be transferred to private capital. A second argument in favor of the private firm has to do with the implicit different costs in the agency relationships, between public principals (framer) and the agent (SOEs), as opposed to the relationship between public and private principals (framers and the market), and the agent (private or privatized SOEs). The nature of incentives is then crucial in determining the pro-privatization axiom.

c. A Model with Deviations from Social Welfare and Agency Problems

The basic model does not account for various possible and observed deviations from the social welfare specification of the objective function. These deviations form key variables to observe in an empirical analysis of SOEs that makes privatization justifiable. A first deviation arises from the governments’ assigning extra weight to maximizing consumer surplus, or when distributional objectives emerge for political, rather than pure economic reasons. Another deviation exists
when the government is not indifferent to transfer payments to the SOEs, or generating public funds for the subsidy. The two elements create distortions of economic decisions not only in the objective function of the framer / government but in other markets as well (Following Vickers and Yarrow, 1995, in individuals supplying work, or consumers burdened by extra taxes). Adjusting the basic equation (6) to a fraction $\alpha$ of distributional objectives, and on taxes, then the Lagrangean is modified as:

$$L = S(p) + \alpha[pz(p) - C(z, e) - I] - \beta[V(I, e) - \bar{V}] - \lambda T$$  

(11)

where $0 < \alpha < 1$, showing the strength of distributional objectives. Also, $\lambda T$ represents the cost of extra distortions on the economy by raising of public funds, which here is presented as additive in the maximization. The first order condition for allocative efficiency is

$$(1 - \alpha)z(p) - (1 - \alpha)[p - C_z]z_p = 0$$  

(12)

which shows politically driven underpricing, resulting from two elements: (i) the strength of distributional objectives, which is a direct function of the price/ cost
margin, such that the higher is \( \alpha \), the lower is the margin; and (ii) the position of demand, a deviation from allocative efficiency. Now with respect to the instruments income and effort (I, e), the first order condition shows that

\[
\begin{align*}
-\alpha I - \beta V_i &= 0 \\
-\alpha C_e - \beta V_e &= 0 \\
V_e / V_i &= C_e / I
\end{align*}
\]

which differs from (8) in that the MRS of effort has to equal the cost of effort adjusted by the level of I. Even if \( \lambda T \) is taken in this simplified version as a lump-sum, income is inversely related to net effort, for which internal efficiency is not granted in SOEs. So, given distributional objectives and transfer needs, the solution moves SOEs to a less than optimal equilibrium under economic efficiency grounds, which coincides with Bös (1991) and with Vickers and Yarrow (1995). Moreover, even under salutary objectives of distribution, the need to raise funds and at the same time not discipline the market through cost reduction, innovation, and similar strategies, would originate one of the main reasons for privatization. The problem is a subsidy to SOEs which is high and growing, along with the underlying needs of the government to generate funds through debt and other instruments that adversely affect macroeconomic budget constraints to society. Such a problem could be named myopic planning.
The determination of the balance between the cost of distribution objectives directly provided by SOEs, and regulation of private firms' growth to service an increasing market, is a complex one. If the cost expressed as $\text{\lambda T}$ is lower than monopoly conduct or deadweight loss of privatized SOEs, then SOEs would still be preferable to private monopolies, at least on allocative efficiency grounds. However, empirical cases in developing countries could show that the monopoly deadweight loss of, say 2% of GDP is lower than subsidies needed in SOEs before privatization.

Now, it is explicit in the above model that social welfare is well defined in SOEs, an assumption only useful for the basic comparison of equilibria but which is far from realistic. A second deviation is the existence of agency problems, that become the basis for the axiomatic preference towards private firms. The question is whether the mechanisms of monitoring and asymmetries in information generate deviations from optimal welfare of SOEs, both in a static and a dynamic manner. It is here that the theoretical and empirical discussion have concentrated, extending from developed countries to privatization efforts in developing economies. In order to summarize agency problems in a simplified model consistent with the basic one, assume the following phenomena that dramatically affect the results.

First, if the costs of monitoring privatized SOEs are overall high, then the tendency is to underprivatize because of the costs of monitoring rather than the foregone benefits of promoting private competition. This could happen if no regulatory bodies exist, or are less than independent or professional, or if the
economic base is such that privatized SOEs are prone to become national champions and exert their influence as agents upon the government principal. With such institutional problems, rather frequent in developing countries, regulatory lag or institutional lag affects the speed and scope of privatization. Second, on the benefits of not monitoring, arguments on agency theory show that if the framer observes promotion or reelection depending on who benefits from a monitoring effort, then it might deviate from objectives of economic efficiency. If internal efficiency of a SOEs is reached at the expense of a reduction in welfare of unions or workers in the industry, then the framer/monitor will not act in grievance to workers’ salaries or employment but will accept a higher fiscal burden of raising funds to sustain this compensation, since the public will be imperfectly informed on the burden at the same time that general voters will not determine the framer’s promotion or reelection (Stigler 1971, Niskanen 1975, Shapiro and Willig 1990).

Third, information gathering by the framer and on the firm’s decisions might be difficult. Information gathering is entrusted in a single body under the SOEs model (with a private agenda as shown). In contrast, many individuals participate in financial information, competition and operational performance, degree of leverage, and other information factors in the case of a privatized SOEs or a private firm. This is the argument of Vickers and Yarrow (1995), where preference for private firms results from control by shareholders, or other firms seeking to take over the enterprise under study. Also, control by creditors through risk of bankruptcy, is an element of
effective monitoring with respect to a single non-informed, but self-interested principal. Hence, even under public interest theories of SOEs, private monitoring might render a more effective means of control. Whereas monitoring costs need to be modeled in addition to the basic set of equations, the mentioned factors affect both the cost function and effort in the above model.

Continuing with the basic model, if demand is stochastic or costs have a stochastic variability element, not observable by the framer, then the profit function could be redefined from (5), with elements \( \theta \) representing such phenomena:

\[
\Pi = p z(p, \theta) - C[z(p, \theta), e] \quad \text{if demand is volatile} \tag{14}
\]

\[
\Pi = p z(p) - C[z(p), e, \theta] \quad \text{if costs are volatile} \tag{15}
\]

Since in SOEs salaries are bound to be established 
\textit{ex ante} such that \( \theta \) is not internalized because it is not observable (non-contractible), then effort will be too low, giving rise to a deviation from internal efficiency. If it is assumed that in a privatized SOE, salaries are prone not to be determined \textit{ex ante}, but will depend on \textit{ex post} performance of profits, sales, or net income, then income would be modeled in the following way, without the need to model agency dynamics explicitly:

\[
l = k + a D(p, e, \theta) \tag{16}
\]
where D is the difference between revenues and costs; 0 < a < 1 is a fraction of net income of the firm; and the manager maximizes his utility. Following Bös (1991) the shareholder principal maximizes

\[ L = (1-a) \mathbb{E}D(p, e, \theta) - k - \beta \left[ \mathbb{E}V(k + aD(.), e(.)) - V_{\text{BAR}} \right] \]  

(17)

which is similar to (6) except that given \( \theta \), an expectation generator is now inserted to establish income flows and net utility. Given \( \theta \) and risk aversion in \( e(.) \), salaries will be higher than in SOEs but the risk taking will be accrued to the manager, leaving shareholders unaffected. In the case of SOEs, salaries are predetermined and higher than effort by definition. Differentiating \( L \) with respect to \( I, e \), one obtains too low an effort, since

\[ V_e / V_t = a C_e \]  

(18)

Only if \( a = 1 \), the firm will attain internal efficiency. It is further argued, however, that \( a=1 \) can be attained through final product competition, even if \( \theta \) persists.

In countries where regulatory frameworks and competition are reduced by political or institutional backwardness or insufficient economic opening, equilibrium
would move away from efficiency. The same phenomenon would be apparent with
distributional and political deviations from optimal SOEs, along with agency
problems in monitoring managers, workers' effort, and the existence of asymmetrical
information. Net costs of each alternative will generate the result. Under the former
constraints, however, the privatization axiom is taken to be salutary. Moreover,
marketization of the economies coincides with the typical case (Vickers and Yarrow
1995). However, it is assumed that privatized SOEs work under competitive markets,
with effective controls, in dynamic markets, and where a regulatory framework is
already in place, something far from reality. The above analysis centers upon the
problems faced by SOEs in a stylized way, but does not take account of necessary and
sufficient conditions for privatized SOEs to clearly improve allocative and internal
economic efficiency. Let us turn now to considerations of privatized SOEs and
deviations.

d. Private Firm's Deviations and Modeling

So far the case of a monopoly SOE and a privatized monopoly SOE have been
presented. It is argued that agency problems subsist in a private setting, but as
opposed to the case of SOEs, incentives persist for less than political reasons, mainly
through: shareholders' monitoring; risk of takeover by other firms or aspiring firms;
and risk of bankruptcy exerted by creditors of the privatized SOEs. Michael Spence
(1975) presented a study on conditions under which monopoly regulatory shields can
give rise to innovative behavior in privatized SOEs. Baumol's contestability theory (1982), and its impact on allocative efficiency, is also an important contribution because it was subject to much debate and then to criticism on the assumptions, which then helped to generate a new wave of recent approaches on private competitive incentives. Another seminal work was done by Averch and Johnson (1962), where the well known A-J effect of overcapitalization in a regulated SOE deviates from optimal allocative and internal efficiency. More recently, Caves and Christensen (1980) raised the question that privatized monopolies, without adjustment in the regulatory framework established to check for monopoly rents, would render privatization ineffective with respect to allocative efficiency.

De Alessi (1980) reviewed some of the basic assumptions on property rights as conditions for allocative and internal efficiency in both SOEs and private firms. Taking Alchian and Kessel's work, as well as Demsetz, Coase, Stigler, or Pelzman, De Alessi concludes that property rights are a necessary condition for the establishment of credible incentives to economic conduct and welfare. Moreover, as common and usufruct rights are weaker incentives than private rights, De Alessi concludes that private firms generate higher internal efficiency than public ones. The key is the nature of incentives to "owners" of a typical firm (public or private). For Shapiro and Willig (1995), the difference is in the location of private information between public and private enterprises. In all, modeling of the objective of the
privatized SOEs and the framer are needed and show the mechanism of incentives in a game.

Take the simplified model in (1) through (3) and (9), (10). The private agent or manager and the principal face the demand schedule and the cost structure, now denoted as

\[ C = (k - \delta d - e)z + t + h(d) \]  \hspace{1cm} (19)

where costs depend on some fixed pay \( k \) to the agent, reduced by the principal in some amount \( d \) and the agent's effort. Following Bös (1991), the principal can exert control up to an efficiency parameter \( \delta \). This parameter is randomly distributed between a worst and a best level \( \delta \) and \( \delta' \). The variable \( t \) is remuneration for effort, and \( h(d) \) represents the cost of control. Since the principal does know the actual value of \( \delta \), as opposed to the principal of an SOE, the principal and the agent get involved in the following contract, considering the manager's participation constraint expressed in \( U(t, e) \geq \bar{U} > U(0,0) \)

\[ T = \begin{cases} t & \text{if } e = e^* \\ 0 & \text{otherwise} \end{cases} \]  \hspace{1cm} (20)
The result is monopoly prices, efficient control by the principal, efficient effort. In the case of imperfect information, the agent does not disclose $\delta$, which is private information. However, then a game cannot be simply a weighted determination of allocative and internal efficiency factors such as in the SOEs, and the result will depend on the degree of truth-telling by the agent. If the incentive mechanisms on costs and effort are efficient, then efficiency will be unequivocally superior under private than under public ownership. Here the role of external versus internal regulation is important.

e. Trade-offs Responding to Market Structures

Total privatization and refinements have been presented in a simplified, static model. However, privatization implies proceeds from the sale, and also privatization is performed not only in monopoly structures, but also in competitive and oligopoly settings. Whereas main privatization in LAC --called the second round-- entails large, legal or natural monopoly SOEs, such as telecommunications, gas, or electricity, other government divestitures have touched upon less than monopolistic enterprises. Such is the case of airlines, banks, or steel and other manufacturing. The following model takes account of the different structures and also the strike price of a sale.

Take an extension of the models already presented as the objective function of government, with $\Delta$ representing absolute change:
\[ \Delta W = \sum \rho \{ \Delta S(t) + \lambda_g \Delta \Pi(t) \} - (\lambda_g - \lambda_p) (Z_p - Z) \] (21)

The summation sign now implies a time frame of the welfare function. The changes in consumer surplus \( S(t) \) and profits \( \Pi(t) \) are now discounted by \( \rho \), and a new addition to the expression considers a cost of selling the SOEs at a price difference between private willingness to pay and actual price of \( (Z_p - Z) \). Finally, \( \lambda_g - \lambda_p \) stands for the difference between a multiplier of government revenue and the multiplier of private funds, which accounts for the efficiency in the use of proceeds of privatization.

For the choice to sell, e.g., \( \Delta W > 0 \), either of the following should be present:

(a) \( \Delta S(t) > 0 \). This depends on the use of monopoly power by the privatized SOEs. If monopoly power or rent seeking by the management of the divested firm are present, then \( \Delta S(t) < 0 \). Hence this part of the expression is a decreasing function of market power. If competitive structure/behavior results, the expression is positive.

(b) \( \lambda_g \Delta \Pi(t) > 0 \). It is anticipated that internal efficiency will be unequivocally positive under private ownership rather than under public ownership, as presented above. However, as shown above, a situation characteristic of LAC is one in which control by lenders, shareholders, or
rivals is insufficient; lack of competition is frequent, and capital markets do not exert implicit control over a firm’s operation. This is compounded by the possibility of stochastic demand or cost, as shown. It is an empirical question whether these adverse factors would reverse the sign of the expression. Assume that $\Delta \Pi$ will still be positive. Moreover, regulatory lag could be assumed to exert a positive effect (if regulations are temporary and pre-announced).

(c) $\lambda_g - \lambda_p$ needs to be negative, or $Z_p - Z < 0$. The first set implies that the value assigned by the government to the use of proceeds for, say fiscal cleanup, should be less than the private weighted value to increase internal efficiency. If the government’s valuation of money arising from the sale is needed only to reduce the fiscal deficit (what is called a fiscally driven privatization), then the sign will be positive and larger than private valuation, and will reduce welfare, ceteris paribus. The same result will be apparent if $\lambda_p$ is small, reflecting a suboptimal level of investment effort after privatization, as presented by Jones, Tandon, and Vogelsang (1990).

In sum, a frequent situation in LAC is $\lambda_g > \lambda_p$.

(d) As for $Z_p - Z < 0$, this term explicitly measures the maximum price the private enterprise or group is willing to pay for the SOEs, relative to the actual price. In the case of risk aversion or economies of scale, as shown...
above, the buyer’s willingness to pay will be smaller than government’s willingness to sell. As a result, a regulatory shield or restructuring before privatization will be pressed by potential buyers onto the government. Assume willingness to sell, denoted by \( Z_g = Z \) under government’s neutrality. However, evidence on expected returns on privatized SOEs could imply that the expression is positive rather than negative. It would be positive also if selling draws many bidders.

Since the terms in the second part of the expression are prone to be positive, then a general necessary condition for the choice to successfully sell (\( \Delta W > 0 \)), needs that:

\[
\Sigma \rho^t \{ \Delta S(t) + \lambda_g \Delta \Pi(t) \} > (\lambda_g - \lambda_p) (Z_p - Z),
\]

if the sale weighted price is the only element that matters and a less than monopoly structure is assumed; but if a natural or legal monopoly SOEs is divested, then choice to successfully sell will imply:

\[
\Sigma \rho^t \{ \lambda_g \Delta \Pi(t) \} > \Sigma \rho^t \{ \Delta S(t) \} - (\lambda_g - \lambda_p) (Z_p - Z).
\]

If regulation *ex post* privatization on monopoly prices reverses the sign of \( \Delta S \) (t), or entry conditions are eased, a return to the first condition will occur. Now, in
case privatization implies no internal control by shareholders, rivals, or lenders, or capital markets are undeveloped, then lack of discipline may change the sign of $\Delta \Pi(t)$. Then a condition for the choice to sell will imply the existence of price regulation or selling only competitive industries:

$$\sum \rho^t \{ \Delta S(t) \} > \sum \rho^t \{ \lambda_g \Delta \Pi(t) \} - (\lambda_g - \lambda_p) (Z_p - Z).$$

Finally, assume a probable scenario of privatization in LAC. Invoke a case where important privatizations have occurred in monopolies or privatized SOEs that have been shielded from deregulation. Also invoke a case where privatization has somewhat coincided with trade and capital liberalization to substitute for undeveloped domestic capital markets, but where governments sought privatizations mainly for fiscal reasons. Imagine also that privatizations have generated rapid internal change within firms and internal efficiency subject to discount factors larger for governments than for firms. Finally, invoke a probable case where willingness to pay has been higher than realized price, subject however to previous costs of restructuring. In such a stylized but realistic case the signs would be clearly positive on internal efficiency $\lambda_g \Delta \Pi(t)$, negative for allocative efficiency $\Delta S(t)$, positive for $Z_p - Z$, and possibly positive for $\lambda_g - \lambda_p$. Hence a condition for privatization choice is
\[ \sum p' \{ \lambda g \Delta \Pi (t) \} > \sum p' \{ \Delta S (t) \} + (\lambda g - \lambda p) (Z_p - Z) \]

Using this expression and the simple equations (1)-(6) with no risk, private information and agency problems leads to the following general privatization choice equation at the microanalytic level:

\[ \sum p' \lambda g \{ p \Delta z(p) - \Delta c(z, e) - \Delta I \} + \sum p' \{ \Delta S_t(p) \} - (\lambda g - \lambda p) (Z_p - Z) = \Delta W \]

(22)

f. Extensions of Agency Conduct and Analytical Techniques

So far, full privatization and full SOEs show the extreme cases. However, for Sappington and Stiglitz, even if subcontracting were possible short of privatization, in which the bidding aspiring contractor makes a commitment to produce or sell by truth-telling its true costs to the SOEs or the framer, the result would generate inefficiency under risk aversion or in a less than contestable market. The favoring of privatization is then not so much a problem of property rights but on how the incentive mechanism works on economic performance. This approach frees itself from static equilibrium models, as well as it makes sense of empirical evidence encountered where privatized SOEs unexpectedly did not show welfare improvements. Traditional theories could not make complete sense of the findings.
Moreover, in cases of repeated games (say, privatization, external regulatory change, internal regulation through market competition, predation, to name important research aspects), separating domains of decision variables for modeling is then possible because sequential games use backward induction.

Under the agency approach, if the government decides to foster true information on costs, then commitment and the dynamics under alternative incentives need to be accounted for. Vickers and Yarrow also ascertain that in a privatization process, the shift from welfare to profit maximization of a privatized SOE is a complex phenomenon. If the non-informed principal observes only the outcome (e.g. output, investment, or productivity of the agent), then such principal makes decisions on the incentive scheme, which is subject to two constraints. First, the agent will behave rationally and attending to self-interest. Second, the incentive scheme must be attractive enough for the agent to participate. If the agent is risk averse, the principal must offer a premium in case of bad states of the world. This viewpoint lends itself to empirical methods on the dynamics of privatization and incentives.

Vickers and Yarrow (1995) go on by emphasizing the following key points to check as elements of a successful privatization, already mentioned in the above section: (a) the structure of shareholder rights and how they are formed; (b) the structure of competition as a check for rent seeking, e.g. risk of takeover and sectoral differences; (c) the firm’s creditors pressing the firm for bankruptcy risk, which promotes at least internal efficiency.
As far as techniques are concerned, the above point (a) lends itself to empirical analysis in the field of mergers and acquisitions (M&A), as well as on capital efficiency. For example, in the not too many dissertations on privatization in recent years, Uhlenbruck (1996) approached privatization resorting to a M&A approach and technique on a modified capital asset pricing model, and then on predicting systemic risk of privatized SOEs for East-Central Europe. Point (a) also lends itself to studies on productivity before, during, and after privatization, where most of the studies in this area use TFP productivity measures by standard methods in econometrics on lags in sectors or firms. Point (b) lends itself to analyses of industrial organization structure and performance. As privatization has touched upon SOEs operating in competitive, monopolistic, and monopoly markets, the new methods around agency problems can be applied to sectors. Also, agency models can be applied to comparative performance between a privatized SOEs and other firms in international markets in time series of prices, output growth, or capitalization, among other variables. It is much less frequent to tie in regulatory oversight and its effectiveness on privatization models, although much discussion on privatization/deregulation is taking place in WB forums (Guasch and Spiller 1994; Holden and Rajapatirana 1995). On point (c), game theory analyses of signals have been developed, although the empirical content has not been habitual in models of performance.
Thobani (1994) uses a flow constraint on government fiscal changes brought about by privatizations in Latin America to measure the real fiscal effect of this policy. Afterwards, observations of effects of the use of proceeds of privatization for debt reduction, social projects, or tax relief are addressed, and control capabilities of proceeds’ use are calculated, using traditional econometric methods and simulation.

Martin and Parker (1997) separate privatization in the UK between public and privatized SOEs, under monopolistic versus competitive market environments. They argue that the separation is normally done assuming public choice and methodologies on property rights, but that privatization is more a continuum than a discrete identifiable choice. Public and private firms could show similarities in behavior and performance. However, they use data from eleven privatized SOEs to derive performance measures using relative efficiency (on profitability, productivity, employment) under the heading of data envelopment analysis or DEA. They then use the DEA method as a complement to descriptive and accounting analyses at the firm level.

Power allocation in privatization measures has also touched upon the speed of privatization and congressional agency problems. Galal et.al. (1994), Holden and Rajapatirana (1990), and IFC (1995) make emphasis on systems methods to determine schedules and plans for privatization, or the practice of privatization. Some of these works even show checklists for the privatization process. Given restrictions or implicit strong and soft links to determine probability of accomplishment, these
studies come up with the sequence of privatization (although not of regulatory relationship and design). The above models somewhat explicitly show conditions for changes in signs of the elements of the equations, as well as assume different discount factors between government and privatized SOEs. Equation (22) is then made operational in a way similar to Galal et. al. (1994).

Other new methods are more in the realm of organizational theory, where internal motivation and cooperative behavior have rendered analyses on working culture in privatized SOEs. On their part, disequilibrium models are considered by the new methods of data analysis and inferential techniques as part of a long history, beginning with partial adjustment models. However, the difference with disequilibrium models is that partial equilibrium does not include a breach adjustment in dependent variables. As for self-selection models, they began with labor market decisions as examples in which an individual chooses a type of work, given his or her comparative advantages. The application to the privatization choice is then equivalent to finding the conditions under which the variables of demand, cost, and utility in equations (1)- (3) work their way into the benchmark of SOEs and private enterprise such that, if net welfare is positive, then privatization is a choice as in equations (21) and (22).

In another strand of research, studies with discrete parameter changes make use of econometric models of the so called switching and discrete choice analysis. Moreover, structural analysis of discrete data has received much interest from
researchers, as the theory has been refined and computational methods have appeared to permit applications. An example is Manski and McFadden (1986) who show a collection of formerly unpublished contributions. Even if the discrete choice literature has become important, most studies have been applied to other areas of economics and biosciences, but not to governmental decisions, to privatization or to regulatory change. The technique lends itself to privatization choice, as it can integrate agency dynamics as well as other qualitative measures and continuous variables. It is possible that the subject matter is so complex and data are not easily available, that no study has been done on privatization choice models.

III. THE RELATIONSHIP BETWEEN PRIVATIZATION AND REGULATORY REFORM IN DEVELOPING COUNTRIES

The above analyses, even if relevant in scientific discussion, concentrate on theoretical models (typical cases and scenarios), of static nature, where constrained optimization and first order conditions assume that regulations to monitor rent seeking behavior of privatized SOEs are well developed at the time of privatization.

However, even as privatization and deregulation are interlinked in some argumentation, they remain as separate policies in the mathematical models. Regulation is either assumed *ex ante* hence not being necessary to address what happens with privatization if regulatory change is not present, or else theoretical cases are presented in which an equilibrium (say in the set of prices, quantities, profits,
taxes) is contrasted between a public firm, a regulated private firm, and an unregulated private firm (Bös 1991; Shapiro and Willig 1990). In the case of regulation, much theoretical and empirical treatment has been dedicated to rate of return vs. price-cap regulation, where a ‘framer’ or authority creates a check to potential predation by the privatized SOEs. Much less attention is dedicated to what Moran and Prosser, in studying the Eastern European experiences, call the evolving regulatory framework on entry conditions (1994), or what North addresses as “adaptive efficiency” after privatization.

For North, adaptive regulatory change is endogenous, encourages decentralized decision making, and is dependent upon institutions and rules of entry, governance structures, and organizational flexibility. North raises institutional questions not traditionally considered. Moreover, the structure of agencies as framers is part of the domain of the performance of adaptive regulations, not circumscribed to price or rate of return aspects or solely property rights. Framers affect property rights which then affect price, investment, and capacity utilization behavior. Moreover, they change the contractual costs and vertical conditions and degree of hold-up. The separation between regulations on prices or rate of return, and those on entry conditions, is an apparent advance in potential research, such that it is possible to model sequencing, depth and scope, and endogeneity of decisions to privatize and change regulations (not only to deregulate).
Whereas prices or rate of return regulation is plugged into the models described above as a new constraint, say that $p \leq p_{\text{min}}$, showing its effects on both internal and allocative efficiency, regulations on entry conditions enter a different model into either the sequence or a simultaneous equation structure. A summary figure clarifies the re-count of main benefits and costs of privatization—regulation pairs in a closed economy:
### Figure #1
Benefits and Costs of the Policy Sequence

<table>
<thead>
<tr>
<th>SITUATION</th>
<th>BENEFITS</th>
<th>COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulated SOEs</td>
<td>*welfare improvement possible *net fiscal flows can be positive</td>
<td>*undercapitalization (aside from A-J effects) *unclear incentives (agency problems) *fiscal drain and non-market prices</td>
</tr>
<tr>
<td>Regulation (no privatization)</td>
<td>*ROR vs. RPI-X incentivate allocative and X-efficiency *regulatory lag can incentivate innovation</td>
<td>*X Inefficiency depends on clarity of incentives (principals not maximizing) *Suboptimal service *Suboptimal profitability and inverse A-J effects possible</td>
</tr>
<tr>
<td>Privatization-regulation (internal incentives plus entry shield)</td>
<td>*internal or X efficiency *property rights matter *incentives of reg. shield can promote innovation *entry conditional games can discipline market</td>
<td>*rent seeking *asymmetric information generates reg. to favor privatized SOEs (co-optation and reneging games) *Reg. adjustments needed through imperfect contracts sometimes impossible</td>
</tr>
<tr>
<td>Deregulation-privatization</td>
<td>*contestability if natural monopolies partitioned ex ante *vertical (contracts) restraint eased *traditional theory first best solution</td>
<td>*agency problems persist through asymmetrical information, risk aversion, sunk costs *institutional change sometimes impossible (country and sector dependent)</td>
</tr>
</tbody>
</table>

As one can notice, inserting regulatory changes into privatization measures affects both the allocation of the instruments (p, I, e), and also the incentive mechanisms of agency types, such as status of information, contracts, cost sunkness and entry conditions, and institutional change. These enter the model of privatization.
as sequential choices of regulatory frameworks as well as their impacts under second best situations, as presented by WB (1992, 1995). Moreover, one can note that regulatory shields may result in high or low effort, depending on the time inconsistency (imperfect contracts). Hence the breadth of reneging and co-optation represent such contract imperfection. Finally, the first best is shown not to be exempt from costs under the agency approach, since asymmetrical information and difficult institutional change are shown as transactions costs of regulatory change and privatization (Martimort 1996).

a. Regulatory Conditions in Developing Countries

Most of the literature on regulatory reform has centered upon developed countries and mainly assumes that regulations are clear and present when privatization happened, or that regulations are put into place costlessly as a performance check to monopolization. Regulatory reform encompasses frank deregulation to promote competition through market forces (internal regulation through rivalry and market discipline), and also change in institutional settings to check monopoly power and conduct (external regulation and dispute settlement). In some countries, regulatory reform amounts to direct deregulation so the two terms are synonyms. In other economies, such as in LAC, regulatory reform amounts to generating clearer rules of the game through the reform of constitutions, statutes,
creation of institutions and oversight agencies, as well as the rules that reduce 
transaction costs of doing business.

In the analyses and discussion for developed economies, regulations are 
assumed as a substitute for privatization. One such discussion is the preference in the 
US for regulations against rent seeking of economic agents, and in the UK the 
preference has been towards privatization in the eighties, for the same reason. In 
developing countries such as LAC, privatization and regulatory reform seem rather 
complements, so analyses on whether regulatory reform hinders or fosters benefits 
from privatization seem necessary. Moreover, given apparent insufficient or 
awkward regulations, political discussion in LAC has criticized entire privatization 
packages as unsuccessful or even as a fraud. WB economists and WB institutions 
(such as MIGA) have cautioned against the risk of impairing private sector 
development as the result of such political criticisms.

Now, studies on deregulation in the US and mainly in the UK show that 
privatization was accomplished because SOEs (mainly utilities) could easily change 
to limited liability interests administered by the State Ministry before floating shares 
in the privatization process in a well developed stock market. Also important in the 

case of the UK was that valuation and underwriting could be accomplished easily by 
independent institutions, domestic banks, and law firms. Moreover, allocation of 
property rights (determination, aside from valuation, of land and physical capital 
rights) was well established and almost no subject to conflict. The capital market
permitted the British government to adopt other selling techniques such as partial
tendering or maintaining veto rights on privatized companies.

After privatizations, regulatory reforms --including constitutional and
statutory changes-- were marginal and easily done in the case of UK, only subject to
conflict with respect to convergence towards EC regulations (Moran and Prosser,
1994). It seems clear that regulatory change extends from before privatization to after
privatization, but the type of regulatory change could have a different flavor: *ex ante*,
consisting of preparation for sale and prevention of predatory conduct; and *ex post*,
consisting of the adjustment of regulatory frameworks and cure of predation or rent
seeking. In other words, as regulatory changes extend over a long period, there seems
not to be a general rule, and discussion on regulations has been separated from
privatization.

As a contrast, in developing countries such as in LAC (Eastern Europe could
be considered a different and more integral phenomenon), regulatory agencies have
not been clearly present at the time of privatizations, so they need to be restructured
and even created from scratch before, during, or after privatization. Some property
rights are not well defined before the time of privatization for which an agency or
ministry must assign rights and determine valuation before the sale. Moreover, many
privatizations cannot use open flotations in the stock markets, and sales are
accomplished as private sales in a bidding process.
Important is the degree of trade and mainly capital market liberalization because financial and human capital is reduced in developing economies. For LAC privatization, many multinational corporations have participated in the process, mainly in sectors and SOEs such as telecommunications, mining, banking and even insurance and pension funds. Since constitutional law could have prohibited foreign interests in some of the sectors before privatization, preparation needed includes modifying statutes and other constitutional changes.

Now, preparation in LAC is generally done with independent valuation agencies and underwriters, but preventive measures against monopolization are generally not present or even are at odds with less than competitive, high priced privatizations. As WB experts have put it, the LAC case seems subject to a second best situation (Holden and Rajapatirana, 1995). There is an implicit proposition or axiom that regulatory reform should precede privatization for it to attain welfare optimization, as a first best solution. However, given the broadness of regulatory reform as mentioned above, and impossibilities of costless institution building in LAC, models of the linkage between privatization and regulatory reform seem insufficient in the literature, as evidenced in Laffont and Tirole (1993), and Spulber (1989).

Deregulation has followed theorization and applications in the US, then in the UK and Europe for past decades, basically applied to public utilities. There is a positive theory of regulation (partial equilibrium models of rational agents and
regulation impacts), and a normative theory of regulation mainly as arguments in which internal and allocative efficiency are attained. For normative theories of regulation, they have been separated into economic theories with algebraic optimizations (Bös 1991), economic theories of agency and capture theory (Phlips 1995), economic theory around the re-definition of natural monopoly, such that separation of SOEs into parts depending on fixed cost and sunkness is now possible. For example, technology has permitted telecommunications to rescue fixed costs of operation in transmission for which a natural monopoly is not granted as a definition. In this brief recount of method and theory, there are also public choice theories (Stigler 1971), administrative theories of implementation problems (Viscusi, Vernon, and Harrington Jr. 1995) and, finally, law.

From some of them, it is important to note the different treatment and emphasis of regulations depending on whether or not the privatized SOE is located in a competitive market (small manufacturing interests of government in manufacturing during the seventies is an example); in a concentrated market but where SOEs compete against private firms (say airlines, some manufacturing); and privatized SOEs as natural or legal monopolies (oil, electricity, mining, or ports in the first category; and some electricity, and telecommunications in the legal monopoly category).

Most of regulatory theory deals with regulation around prices, either of SOEs or of privatized SOEs. Ample treatment has been presented to the incentive
characteristics of rate of return against price cap regulation in natural monopolies (ROR vs. RPI-X). Without going into great detail, the theory is presented in models in which the agent (the SOE) has an objective or loss function with effort, cost, and payment, subject to the principal's oversight cost and payment. Various models exist. In general, it is unequivocally proven that ROR is inferior to RPI-X as the latter operates both on cost reduction and managerial effort, to result in price/quantity which is welfare enhancing. A straightforward modeling is then to use equation (17) for the private agent and principal, where a new constraint is imposed on \( p < p_{\text{min}} \).

Partial equilibrium models can be put together with game theoretical ones in this aspect, where it is proven that RPI-X can also be subject to deviations from optimal managerial effort and cost reduction.

On the evaluation of empirical work, one can point out that models have analyzed sectors subject to deregulation after privatization. Such is the case with studies on airline deregulation by markets or routes (using traditional econometric methods, and pooling). Another study relates regulatory reform to welfare gains by sector in the US (Guasch and Spiller 1994). Still other studies assume that regulatory reform is endogenous and needs to be continuously revised, but concentrate on arguments for re-contracting under game theoretical viewpoints. Under the aegis of imperfect contracts, there is a difference in emphasis between authors in the new industrial organization paradigm. On the one hand, there are those who consider the problem of imperfect contracts a constant characteristic of any regulatory change,
hence assuming endogeneity of regulations to mean a passive role to authorities and a very active role of the market, even if deviating from contestable situations. Smith (1996) and others in the Chicago tradition adhere to this approach. On the other hand, some theoreticians such as Börs (1991), Laffont (1994), Tirole (1994), and policy approaches at the WB, assume that some endogeneity arises by the very nature of contract imperfectness and hence pushes for an active role of governments to modify their institutional structure and rule making. Applied to LAC, the second approach calls for government upgrading and contemporaneous adjustment of variables that impinge on transactions costs at the time of privatization.

To finish the present section, it is worth noting that Edwards (1994) discusses reform in LAC and puts privatization, deregulation, and liberalization as elements of an overall change in LAC economies. He asserts that there is an urgent need to further advance in structural economic reforms, mainly in the regulatory front. Winston (1993) discusses regulatory failures by industry in the US through a static simulation of predicted versus assessed or calculated prices and service, and calls for a modern regulatory framework to reduce transactions costs of doing business. Guasch and Rajapatirana (1994) present an analytical case on the interface between trade, investment, and competition policies in LAC. They integrate considerations of the recent discussion in multilateral organizations such as commissions at the WTO that seek to harmonize capital market liberalizations, with property establishment in
order to grant insurance to private capital against re-nationalization, as well as dispute resolution, antidumping, safeguard measures, and competition policies.

b. A Proposed Model of Sequencing

How to integrate regulatory change into the privatization basic models? As argued, assume that price cap regulation is possible and enters the Lagrangeans in a simple manner. The important element is to model regulatory change around entry conditions in a game of sequence. Following Matsuyama (1990) one can assume a model of two steps between the privatized SOE and the regulator through agency behavior. The model is one that shows a set of decisions by the regulator or framer, around to protect or to deregulate a privatized SOE. As for the firm, assumed with monopoly power, it faces a set of decisions to invest or not to invest.

The game happens in a time frame which is finite. The framer could grant temporary protection to a privatized SOE, subject to the condition that the firm will invest given the shield, and knowing that deregulation will eventually happen. The question is whether the regulator can make credible commitments on the future removal of protection. The firm plays by deciding to invest or not to invest, given that investment will prepare it for future competition. However, the firm will prefer to postpone investment and have the government extend temporary protection longer than planned. Bös (1991) presents a game of capacity in a similar fashion, although he describes a step of price competition between firms after deciding on capacity. In
the present case, a simpler model is presented implying rivalry along a finite time line only, with no specification of type of rivalry.

Assume that in the regulatory game, the framer prefers deregulating given a firm's investment position. However, the framer is tempted to wait longer if by doing so it induces the firm to invest. On the firm's side, if it believes that the period 2 deregulation is inevitable, it will invest before deregulation. The interest of the firm is to not-invest if such behavior induces the framer to postpone deregulation. The game is one of timing rather than a repeated game, since actions are assumed to be irreversible.

To define the payoff functions of government and firm respectively, let the government strategy be $g = \{ g(1), g(2), ... \}$ where $g(t)$ is either Protect $P$ or Deregulate $NP$ in period $t$ if the game is not ended. Similarly for the firm a pure strategy of investment will be $f(t) = I$ or $NI$. If we define $m(g)$ as the smallest $t$ satisfying $g(t) = NP$ and also $n(f)$ as the smallest $t$ satisfying $f(t) = I$, then we have a time line when the game ends. Make $m(g) = \infty$ if $g(t) = P$ for all $t$ and make $n(f) = \infty$ if the strategy of the firm is $f(t) = NI$ for all $t$.

With this notation, then define the payoff functions of the two direct participants in the time line approach as

$$U_h (g, f) \quad \text{where } h = 1, 2$$ (23)
such that it:

$$X_h(n(f)) \text{ if } n(f) < m(g)$$

such that the firm invests before government deregulates. This is the case of privatize—then—deregulate

else

$$Y_h(m(g) - 1) \text{ if } m(g) \leq n(f)$$

such that government deregulates before the firm invests, after privatization.

Now, take into consideration the combinations in which (a) the government does not deregulate, and the firm does not invest. Call it state $M_1, M_2$, respectively as a worst case, following Matsuyama (1990), which implies a situation of prisoner’s dilemma; (b) the government deregulates before the firm invests. The firm will need to play a post-entry game with other entrants. This is the above mentioned case of the axiomatic first best. Call this state $N_1, N_2$; (c) the government does not deregulate and the firm invests, in a situation where the objective of protection works to fortify the company, but where the protection shield might cause a deviation from allocative efficiency. This is the second best case. Call this state $P_1, P_2$; (d) the government deregulates after the firm invests, where the latter will play a post entry game with first mover advantages, facing new entrants, or what is called dominant firm. Call this state $Q_1, Q_2$. If the discount rates of government and firm are $0 < d_1 < 1$ and $0 < d_2 < 1$, and cancelling the subscript $h(1,2)$ for simplicity, then we have for the $q$ period:
\[ X(q) = \left[ 1 - d^{q-1} \right] \frac{M}{(1 - d)} + d^{q-1} \left[ P + \frac{dQ}{(1 - d)} \right], \] as the discounted set for the firm moving first, and
\[ Y(q) = \left[ 1 - d^q \right] \frac{M}{(1 - d)} + d^q \frac{N}{(1 - d)}, \] as the discounted set for the government.

The following figure helps to clarify the scenarios:

\begin{center}
\text{Figure #2}

\text{GAME SCENARIOS}

\begin{tabular}{|c|c|}
\hline
& \text{firm} & \\
\hline
\text{I} & P1, P2 & M1, M2 \\
\text{NI} & N1, N2 & Q1, Q2 \\
\hline
\end{tabular}
\end{center}

As far as assumptions on ordered preferences are concerned, the firm always prefers protection and the framer always prefers deregulation, a situation which is possibly binding but also in line with governments' objectives for the sector and the overall economy (see Vickers and Yarrow, 1991 for criticisms). With these assumptions the firm faces \( M_2 > N_2 \) and \( P_2 > Q_2 \), whereas the government faces \( M_1 < \)
N_1 and P_1 < Q_1. Also, a firm does not invest if no threat of future deregulation exists, or M_2 > P_2. In case the firm invests before deregulation, first mover advantage means Q_2 > N_2. Also a government prefers the firm to have advantage over a new entrant firm, or Q_1 > N_1. Finally, the function X_1(q) in q time is decreasing in q, whereas X_2(q) and in Y_2(q) are increasing in q for a Nash equilibrium.

With all these, the solution of the game is given in Matsuyama where a Subgame-Perfect Nash equilibrium is attained given strategies, payoffs, and preferences in q time, such that there is a positive integer q* as the maximal number of periods the government will wait for the firm to invest and until deregulation, where a first proposition is that m(g) = 1, and n(f) ≥ q* + 1 which means that immediate deregulation and successful q-period protection where 1 ≤ q ≤ q* is the Nash pure strategy equilibrium. Also, the best responses are:

m(g) = 1 if n(f) ≥ q* + 1 for the government and n(f) ≥ m(g) if m(g) = 1 for the firm, or n(f) = m(g) - 1 if m(g) ≥ 2, since X_2 is increasing in q and waiting is more preferable for the firm or X_2(q) > Y_2(q), or X_2( m(g) - 1) > Y_2 ( m(g) - 1). In sum, m(g) = 2 and n(f) = 1, which is the solution Q_1, Q_2 in a two period game of investment and deregulation, of a dominant firm with first mover advantages.
c. Investment Related to Privatization Choice

It is evident that there is a difference between a firm (privatized SOEs) choosing to invest in a time game with respect to the framer, and a decision choice by the authority in a time frame, with respect to privatize – deregulate. If one considers that shareholders and management are related (agency problems are solved through internal economic discipline), then the firm definition in the sequencing game and that in the privatization optimization models are equivalent. It is only necessary to relate the instrumental variables invest, and the ones used in the privatization model of effort (e), cost (c), and income (I). Once regulatory change works its way as a first step, then effort, cost and income are determined as a second step. In a game of deregulate, private information on effort surfaces through rules of the game and external discipline. Similarly for cost. In other words, the regulatory change reduces agency problems ex ante privatization, whereas private information (effort and cost) remain private information if privatization is exerted before regulatory change, in line with the argument on the static model, as well as with the above sequential game of temporary deregulation. Indeed, temporary shields of regulation after privatization face the same problems of time inconsistency as shown above. In sum, other things being equal, regulatory change before privatization should induce better performance of a privatized SOE in (p, e, c, I), than regulatory change afterwards, because of the agency problems explained in this section.
IV. THE INTERNATIONAL SETTING RELATED TO PRIVATIZATION AND REGULATORY CHANGE.

The developed models can be refined by the strategy of opening up. If it is assumed that trade and investment liberalization work their way into increasing competition, and are elements to generate longer horizon plans of privatized SOEs and other market competitors, then the cost function in (6), (11), implicitly (17), and finally (22) would become first best if agency problems are resolved. The question is whether international trade and investment liberalization works as an alternative incentive mechanism to reduce private information effects, hence generating market discipline through shareholders, competitors, and creditors, as the basic model explains. A related question is how internationalization can be plugged into the stylized theoretical model.

Using the described structural equations, and their summary choice equation (21) then international liberalization would affect the following expected variables:

(a) $\Delta S(t) > 0$ will continue to reverse its sign, as it remains a decreasing function of market power. Privatization with foreign investment and regulatory shield does not necessarily increase competition pressure in the market but only within the firm's objectives of internal efficiency. This will be more evident in non-tradables.
(b) $\lambda_g \Delta \Pi(t) > 0$, will become always positive, as foreign participation will establish internal efficiency as a precondition, even if monopoly power exists in the shielded country. It is assumed that the foreign co-owner will internalize other global portfolios of investment to condition investment in a privatized SOE in LAC. Such an assumption could be violated in some cases, but will remain as a reasonable prediction for the analysis.

(c) $\lambda_g - \lambda_p$ will remain positive if government’s valuation of privatization proceeds is greater than private valuation of the privatized SOEs affected by international participation.

(d) $Z_p-Z > 0$ as marginal pressure to buy by extra bidders, signals a willingness to pay higher than government’s willingness to sell. Moreover, capital market liberalization will increase $Z_p-Z$, but $\lambda_g - \lambda_p$ could become negative, a first best condition now under Bös (1991).

With the above, then the simplified choice equation (22) implies:

$$\Sigma \rho^i \{ \lambda_g \Delta \Pi(t) \} - \Sigma \rho^i \{ \Delta S(t) \} + (\lambda_g - \lambda_p)(Z_p - Z) > 0 \quad \text{Sell}$$

$$\leq 0 \quad \text{do not}$$
which now includes extra internal efficiency, extra willingness to pay and implicit multipliers of the privatized SOEs. This also generates a virtuous circle if capital market development results from privatization and regulatory reform, as pointed out by McLindon (1996).

Many foreign investors of LAC privatized sectors have participated in shielded firms as they temporarily maintain monopoly power. Such is the case of sectors with legal monopoly status and external economies, as is apparent in telecommunications, energy, and banking. Other international investment could be observed in less than monopoly sectors such as airlines and manufacturing. It is assumed here that additional internal efficiency and willingness to pay are represented in the equations. With the above complete model, the next chapter will begin to present the evidence in LAC economies, and preliminary data analysis will be conducted with the theoretical foundations developed in this chapter.
CHAPTER 3

EVIDENCE OF PRIVATIZATION AND REGULATORY REFORM IN
LATIN AMERICAN COUNTRIES

I. INTRODUCTION

After laying out the ground on privatization and regulation sequence, and first and second best solutions through optimization models, the present chapter presents preliminary data and analyzes main evidences of this process in a group of selected Latin American Countries (LAC) which have experimented with privatization, regulatory reform, and linkages with the international environment. The analysis is historical and descriptive of challenges faced by central governments in their move towards the change in paradigms, if present, as well as how some of the former SOEs, mainly those sectors with monopoly power, were subject to policy change. The chapter begins with an overall assessment of the dynamics of privatization and regulatory reform in LAC, then concentrates on countries and sectors. An analysis of sequence and of depth of policy change is also a question that is addressed, and an evaluation of regulatory change helps to determine relevant variables to quantify in the empirical study of the following chapters. The reasoning is that regulatory change can be a hindrance to further liberalize and integrate economies if a second best
sequence generates privatized SOEs that establish barriers to entry, do not move
towards allocative and internal efficiency, and present agency problems as described
in Chapter 2. A related issue is how privatization links with foreign sector
liberalizations, mainly with respect to foreign participation, capital markets, and
growth of privatized SOEs.

II. THE DYNAMICS AND SCOPE OF PRIVATIZATION AND REGULATORY
REFORM IN LAC

According to WB (1992, 1994), over 80 countries have instituted privatization
efforts, and more than 8,500 SOEs have been privatized during the eighties and
nineties. Moreover, from privatizations applied to low–value and small–sized SOEs,
the value of divested firms has been increasing, and larger SOEs have been subject to
divestiture. Most privatizations of this SOE type have been applied to firms that had
not been broke. It is not very clear, however, how are both the dynamics and the
rationales for privatizations in such diverse economies and sectors. According to
Ramamurti (1996), the bases for change in ownership are the key elements fostering
efficiency in these economies, but governments pressured by fiscal problems acted in
a pragmatic manner to shed off the burden of former SOEs. Privatizations proceeded
with diverse scale and with dissimilar regulatory frameworks, for which entry
conditions after privatization plus regulatory reform, should vary across countries and
sectors. Moreover, it is possible that investment and innovation by privatized SOEs
in light of regulatory shields and different capital market developments affect the results.

Overall, privatization in LAC is taken as a general national strategy by governments, to signal modernization to the international community (country risk assessment), including partners, multilateral agencies, and relevant constituencies (Edwards 1996). Other aspects of LAC change are the institutional upgrading brought about by government reforms, and even the acceptance to condition domestic oversight mechanisms and institutions to international standards. Now, privatizations and economic opening have been fuzzy correlates in the tentative evidence derived from many developing countries since the eighties. Whereas some authors, such as Krueger (1986), Teichman (1996), or WB (1992), view liberalization, privatization, and even deregulation, as parts of an overall, systemic government set of economic and political strategies, others such as Ramamurti (1996) or Rogozinski (1997), point out that the process of privatization, regulatory reform, and international trade and investment liberalization are distinct, pragmatic policies with their own challenges.

It is argued that SOEs privatization stems from at least the main following reasons: (a) overall suboptimal performance on external and internal debt as part of public finances. In this line of reasoning, the government would reduce the fiscal burden of SOEs; (b) unsatisfactory performance of SOEs which impels governments to shed not only the dead-weight loss but also to overcome the criticism for lack of reputation, and its inability to redesign government expenses toward social projects.
and use of proceeds; (c) the need to promote competition and investment growth under new regulatory regimes; (d) the lack of a developed and active capital market, which would grow stemming from privatization efforts and other reforms; and (e) a more philosophical wave for commitment towards market oriented policies in line with liberal markets of the end of the century and coincident with globalization and modernization. The analysis will mainly concentrate on the first three arguments for privatization. The fourth reason will be addressed by analyzing the complementary policies in LAC to liberalize foreign trade and capital accounts. A salient problem in LAC is the pragmatic character of privatization where, it is argued, fiscally driven privatizations have been present, having been criticized by academics and advisory groups mainly if proceeds from privatization were used for government current expenses instead of reducing debt burdens. Moreover, Lopez-de-Silanes (1997) even contends that selling net prices of SOEs have been low in Mexico if compared to developed countries, averaging 54 cents per dollar of assets in a sample of 170 privatized SOEs. Such pragmatism implies the more myopic consideration of the above three reasons (Holden and Rajapatirana 1997, Teichman 1995, Tovar-Landa 1997)

A second problem seems to be that privatization strategies in many LAC countries have been broad and have given little or no consideration to whether regulatory institutions and rules of the game are well set as control for market conduct and structure at the sectoral level (the argumented allocative and internal efficiency),
when privatized SOEs operate under less than competitive environments. In other words, there is a conflict between the macro origin of privatization to maximize proceeds, and the sectoral or micro level of regulations that would seek to maximize allocative efficiency, through market entry opportunities and lower transaction costs provided by clear rules of the game.

a. The Scope of Privatization In LAC

Between 1980 and 1991, the most profound privatization in the world happened in the UK among developed economies, and in the former GDR in Central Europe, at least measured as proceeds and sectors covered. Apart from them, LAC accounts for around 12% of the world total privatizations, and 37% of developing economies, as shown below:

<table>
<thead>
<tr>
<th></th>
<th>Worldwide</th>
<th></th>
<th>LDC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td>%</td>
<td>number</td>
<td>%</td>
</tr>
<tr>
<td>Total</td>
<td>6,832</td>
<td></td>
<td>Total</td>
<td>2,162</td>
</tr>
<tr>
<td>Former GDR</td>
<td>4,500</td>
<td>66</td>
<td>Eastern Europe</td>
<td>805</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>805</td>
<td>12</td>
<td>LAC</td>
<td>804</td>
</tr>
<tr>
<td>LAC</td>
<td>804</td>
<td>12</td>
<td>Sub-Sahara</td>
<td>373</td>
</tr>
<tr>
<td>Other</td>
<td>453</td>
<td>8</td>
<td>Other</td>
<td>180</td>
</tr>
</tbody>
</table>

Source: WB, Country Economics Department, 1994
Among LAC, gross proceeds as percentage of 1990 GDP by country show the relative importance of privatization in value. Chile comes first with 12% or US$3.4 billion, followed by Jamaica, with 5.8% of GDP, although only US$250 m in value and sectoral concentration; thirdly comes Mexico, with 3.5% of GDP and US$8.4 b. Argentina’s proceeds amount to 1.4% of GDP and US$1.5 b in value. Brazil’s proceeds are small for its economy, but amount to around US$3 b, and Venezuela’s proceeds were US$2 b between 1980 and 1991 (WB 1994). The maximum activity of privatizations occurred in 1991 with the sale of large SOEs in Mexico (banking and steel mills), Argentina, and Venezuela (telecommunications and airlines).
Table #2
Yearly Distribution of Privatization Efforts
(millions of dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Mexico</th>
<th>Argentina</th>
<th>Brazil</th>
<th>Peru</th>
<th>Venezuela</th>
<th>Chile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>3,160</td>
<td>3,841</td>
<td>44</td>
<td>0</td>
<td>10</td>
<td>98</td>
</tr>
<tr>
<td>1991</td>
<td>11,289</td>
<td>2,091</td>
<td>1,726</td>
<td>3</td>
<td>2,278</td>
<td>364</td>
</tr>
<tr>
<td>1992</td>
<td>6,924</td>
<td>5,567</td>
<td>2,564</td>
<td>212</td>
<td>140</td>
<td>8</td>
</tr>
<tr>
<td>1993</td>
<td>2,131</td>
<td>4,732</td>
<td>2,718</td>
<td>127</td>
<td>36</td>
<td>106</td>
</tr>
<tr>
<td>1994</td>
<td>766</td>
<td>890</td>
<td>1,697</td>
<td>2,840</td>
<td>8</td>
<td>683</td>
</tr>
<tr>
<td>1995</td>
<td>n.a.</td>
<td>1,326</td>
<td>387</td>
<td>1,176</td>
<td>39</td>
<td>n.a.</td>
</tr>
<tr>
<td>Total 1990-95</td>
<td>24,271</td>
<td>18,446</td>
<td>9,136</td>
<td>4,358</td>
<td>2,510</td>
<td>1,259</td>
</tr>
<tr>
<td>Total 1982-1989</td>
<td>500</td>
<td>130</td>
<td>170</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


From Table #2, it is clear that between 1991 and 1992, privatization proceeds peaked for the countries shown. For the rest of 19 other LAC, privatization proceeds peaked in 1993 and 1994, as other economies are more recently experimenting with privatization. For example, US$ 802 m and US$772 m were generated in 1993 and 1994, respectively, for remaining cases in LAC. Holden and Rajapatirana (1997) analyze reform processes in LAC and separate the beginning of reforms from a future period of recovery, and then from stress and correction. Whereas Chile, Bolivia, and
Mexico began reforms in 1975, 1985, and 1985 respectively, others such as Argentina, Uruguay, and Venezuela began reforms more recently, in 1991, 1990, and 1989, respectively. Brazil is considered a more recent case of overall government reforms that began in 1994. Given that the period of reforms centered around 1985-1989, it is interesting to notice the peak of privatizations in 1991, at least for LAC in total, meaning that privatization reforms encompassed a period of up to six years.

According to Edwards (1996), early reformers fared better and experimented privatization deeply and more broadly. The referred studies are skeptical however, that reforms create protection against periods of stress or backlogs stemming from external shocks, from macroeconomic indiscipline, or insufficiency by regulatory institutions to generate allocative and internal efficiency. The challenge is called the second generation agenda for economic reforms, which mainly encompasses modern regulations and clear benefits on broader social groups. The early eighties are called the first wave of privatization of mainly manufacturing and small SOEs, basically from 1982 to 1988-89. In the late eighties, privatization was widely spread and large SOEs with monopoly power were the main subjects of privatization, or what is called the second wave. With the beginning of privatization of social services around 1994-95 and strategies at provincial and non-federal level, a third wave of privatizations has been salient (Torres and Mathur 1996), within the so called second generation agenda which aims at the spread of positive effects of privatization and regulatory reform to increasing sectors of the LDC communities.
With respect to sectoral distribution, there are five major sectors of privatized SOEs in LAC according to IMF (1995): telecommunications (25% of regional total); banking (22%); energy (14%); and steel (11%). As is apparent, these sectors are characterized by monopoly power. Sales in direct tranches have been the most frequently used, as flotation of shares is impeded by very thin or blockaded stock markets, although international investment in Argentina, Chile, Mexico, and Peru has been promoted by their central governments. According to the IMF, 60% of all proceeds have been generated by direct sale, and 34% of proceeds by flotations or public tender. In the wave of privatizations, only 35% was accounted for by foreign capital in 1990-93. Lately, more than 70% has been accounted for by foreign interests, showing an increasing relationship between international reforms and domestic policies. The following Table summarizes the findings:
Table #3  
Sectoral Distribution of Privatizations in LAC by year  
(millions of dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Telecom.</th>
<th>Elec./ Gas</th>
<th>Financial</th>
<th>Oil, Min., other primary</th>
<th>Steel and other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>3,514</td>
<td>0</td>
<td>25</td>
<td>1,265</td>
<td>177</td>
</tr>
<tr>
<td>1991</td>
<td>5,742</td>
<td>226</td>
<td>7,624</td>
<td>1,131</td>
<td>2,760</td>
</tr>
<tr>
<td>1992</td>
<td>2,649</td>
<td>3,259</td>
<td>4,930</td>
<td>2,231</td>
<td>2,089</td>
</tr>
<tr>
<td>1993</td>
<td>1,091</td>
<td>1,379</td>
<td>1,125</td>
<td>3,802</td>
<td>2,927</td>
</tr>
<tr>
<td>1994</td>
<td>1,950</td>
<td>1,364</td>
<td>468</td>
<td>1,814</td>
<td>1,867</td>
</tr>
<tr>
<td>1995</td>
<td>630</td>
<td>2,279</td>
<td>511</td>
<td>36</td>
<td>39</td>
</tr>
<tr>
<td>1990-95</td>
<td>15,576</td>
<td>8,506</td>
<td>14,682</td>
<td>10,283</td>
<td>9,858</td>
</tr>
<tr>
<td>1988-89*</td>
<td>537</td>
<td>2,206</td>
<td>n.a</td>
<td>0</td>
<td>409</td>
</tr>
<tr>
<td>% of Total</td>
<td>24.8%</td>
<td>13.6%</td>
<td>23.4%</td>
<td>16.4%</td>
<td>15.7%</td>
</tr>
</tbody>
</table>


b. Fiscally Driven Privatizations?

Before privatization begun, overall balances and the budgetary burden by SOEs was calculated by Floyd (1984) showing increasing budgetary burdens on GDP for most countries in LAC except for Chile, Peru and Venezuela, between the first
part and second part of the seventies. Also shown in the following Table is the calculated SOEs overall average balance as a percentage of GDP, which remained negative in all cases and affected the budget rather than net income of SOEs, mainly because deficits were transferred to central governments to salvage poor performance. This is more clearly felt by societies, as it crowds out real investment and other social projects, creating a first reason to privatize.

Table #4
Overall Balances and Budgetary Burden of SOEs as Percentage of GDP
Previous to Privatization (Selected Countries)

<table>
<thead>
<tr>
<th>Country</th>
<th>Overall SOEs Balance</th>
<th>Budgetary Burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolivia</td>
<td>-4.5</td>
<td>n.a.</td>
</tr>
<tr>
<td>Chile</td>
<td>-1.2</td>
<td>-0.7</td>
</tr>
<tr>
<td>Colombia</td>
<td>-1.2</td>
<td>-0.5</td>
</tr>
<tr>
<td>Guatemala</td>
<td>-1.9</td>
<td>-2.7</td>
</tr>
<tr>
<td>Jamaica</td>
<td>-4.5</td>
<td>-4.0</td>
</tr>
<tr>
<td>Mexico</td>
<td>-4.9</td>
<td>-4.6</td>
</tr>
<tr>
<td>Peru</td>
<td>-5.2</td>
<td>-1.8</td>
</tr>
<tr>
<td>Venezuela</td>
<td>-6.3</td>
<td>-5.9</td>
</tr>
</tbody>
</table>


As one can notice, the negative SOEs balance created impacts on governments’ budgets that ranged from zero in Colombia and Chile, to over 2 percent
of GDP in Mexico and Venezuela in the middle of the seventies, but changed to zero
or even eased to about 2.5 percent of GDP in the late seventies for Venezuela or
Chile. Moreover, Table #4 shows that five countries faced worsening of both SOEs
balance and budgetary burden before privatization efforts begun.

Table #5
Average Overall Balances of SOEs as percentage of GDP during
Privatization Efforts (Selected LAC Countries)

<table>
<thead>
<tr>
<th>Country</th>
<th>1981-85</th>
<th>1986-91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>-5.3</td>
<td>-2.6</td>
</tr>
<tr>
<td>Bolivia</td>
<td>6.6</td>
<td>6.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>-4.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Chile</td>
<td>6.9</td>
<td>9.8</td>
</tr>
<tr>
<td>Colombia</td>
<td>-1.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Ecuador</td>
<td>-0.7</td>
<td>-1.2</td>
</tr>
<tr>
<td>Guatemala</td>
<td>-4.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Jamaica</td>
<td>-4.9</td>
<td>-1.4</td>
</tr>
<tr>
<td>Mexico</td>
<td>3.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Peru</td>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Venezuela</td>
<td>9.0</td>
<td>9.7</td>
</tr>
</tbody>
</table>


Now, data for 1986-1991 (WB 1995), show some reversals of SOEs balances
with respect to 1981-1985 averages, implying an improvement of performance
immediately before or during privatization, except for Ecuador, Mexico, and Peru.
Such is the case pointed out by Estache and Martimort (1997), and Holden and
Rajapatirana (1995) where an SOE administration, anticipating privatization, will push for temporary productivity and internal restructuring. For the government principal, the anticipation of a sale might incentivize a reduction in subsidy or revision of accounting practices of the target firm or sector. However, the pre-privatization game does not necessarily ease up the budgetary burden on GDP.

In order to further show the dynamics of the government deficit and how it loosely relates to the beginnings of privatization, Table #6 shows the deficit related to the year privatizations begun. Argentina faced a clear reduction of its deficit in 1989 which showed continuous improvement afterwards. Its privatization program began in 1990. For Bolivia, after a marked reduction of the deficit as a percentage of total expenses plus lending minus repayments, the country experienced further deterioration of government finances. With respect to Bolivia’s privatization program, it only began in 1995 as a full blown strategy. The case of Chile is a landmark, because that country began to face a surplus in 1987 that has remained since then. Its privatization program of large SOEs (second round after the efforts by the Pinochet regime to sell 503 SOEs in the seventies), seems coincident in its inception in 1987 with a marked shift in government finances. Colombia turned around its deficit in 1990 and after a plunge in 1992, has been able to control it. However, apart from this country’s privatization of the paper company PapelCol in 1990 and Hidroeléctrica Betannia in 1991, it has moved slowly in the privatization effort. The case of Mexico shows a marked shift from a deficit to surplus in 1990.
As for its privatization program, it began earlier in 1988 with the first privatizations of Mexicana de Cobre, Nikko, and the airlines, but peaked in 1991 with the banking re-privatization. Venezuela faced a marked reduction of this country’s deficit in 1989, but moved back to important deficits after 1992. Venezuela’s privatization program is nowadays somewhat suspended, after 1991’s privatizations of CANTV and Viasa airlines, coincident with surpluses.

<table>
<thead>
<tr>
<th>Year</th>
<th>Argentina</th>
<th>Bolivia</th>
<th>Brazil</th>
<th>Chile</th>
<th>Colombia</th>
<th>Mexico</th>
<th>Venezuela</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>-26.1</td>
<td>n.a</td>
<td>-29.6</td>
<td>-7.5</td>
<td>-18.4</td>
<td>-33.7</td>
<td>22.9</td>
</tr>
<tr>
<td>1986</td>
<td>-11.5</td>
<td>-0.5</td>
<td>-37.1</td>
<td>-3.3</td>
<td>-6.2</td>
<td>-45.2</td>
<td>-8.4</td>
</tr>
<tr>
<td>1987</td>
<td>-17.0</td>
<td>6.0</td>
<td>-25.8</td>
<td>8.1*</td>
<td>-5.0</td>
<td>-43.2</td>
<td>-20.4</td>
</tr>
<tr>
<td>1988</td>
<td>-16.9</td>
<td>-5.2</td>
<td>-42.9</td>
<td>4.8</td>
<td>-9.4</td>
<td>-37.1*</td>
<td>-19.9*</td>
</tr>
<tr>
<td>1989</td>
<td>-3.7</td>
<td>-9.5</td>
<td>-41.8</td>
<td>7.2</td>
<td>-12.8</td>
<td>-25.1</td>
<td>-0.4</td>
</tr>
<tr>
<td>1990</td>
<td>-3.2*</td>
<td>-10.3</td>
<td>-15.6</td>
<td>4.0</td>
<td>33.0*</td>
<td>-16.0</td>
<td>3.9</td>
</tr>
<tr>
<td>1991</td>
<td>0.2</td>
<td>-0.4</td>
<td>-1.6</td>
<td>7.4</td>
<td>22.1</td>
<td>24.1</td>
<td>18.9</td>
</tr>
<tr>
<td>1992</td>
<td>4.6</td>
<td>-9.9</td>
<td>-12.3</td>
<td>11.0</td>
<td>-12.1</td>
<td>29.3</td>
<td>-16.3</td>
</tr>
<tr>
<td>1993</td>
<td>n.a</td>
<td>-8.4</td>
<td>-23.5</td>
<td>9.3</td>
<td>-3.5</td>
<td>1.2</td>
<td>-13.8</td>
</tr>
<tr>
<td>1994</td>
<td>n.a</td>
<td>-14.6*</td>
<td>n.a</td>
<td>8.1</td>
<td>n.a</td>
<td>1.8</td>
<td>-18.0</td>
</tr>
<tr>
<td>1955</td>
<td>n.a</td>
<td>-11.3</td>
<td>n.a</td>
<td>13.1</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
</tbody>
</table>

Note: an asterisk (*) shows the year privatization programs began.
No intent is made here to establish a causal relationship between privatization efforts and evidence of government financial improvement, nor that it was because of the effect on finances that all privatizations were implemented. However, the coincidence is marked and demonstrates correlated figures as evidence of reasoning to privatize along the lines of point (a) of fiscally driven strategies. For example, in order to check for structural change of the deficit figures, with respect to privatization as an instrument or dummy variable, and given few degrees of freedom, simple country regressions were run, either to account for change in the intercept or to the slope of deficit trend. The result shows significant structural change in Argentina, Chile, and Mexico at 1% of "t" tests. As for Bolivia, structural change of deficit trend occurred at less than 10% of significance. No structural change was evidenced for Brazil. Moreover, correlation coefficients of these two primary variables ranged from .430 in Brazil to .897 in Chile. In sum, even if one cannot assure fiscally driven privatizations, at least structural change is evident of fiscal deficit resulting from privatizations, as IMF (1995) and Edwards (1996) imply.

c. Privatization and Private Investment

Regarding the effect of privatizations on the freeing up of private investment, the evidence is mixed. What was calculated is how private investment as percentage of GDP as well as public investment fared one year before privatization began, on the year of privatization, and three years afterwards. WB statistics on these two figures,
which exist from 1970 to 1995, were used. As LAC implemented privatization in different years, the base year changes in each case. The results show are displayed as follows:

![Figure # 3](image)

**Relationship between Privatization Year and Private/ Public Investment changes**

- Countries in which private investment increased participation in GDP (more than 1 percentage point):
  - on the year of privatization (w.r to base year): Brazil, Mexico, Peru
  - a year after privatization: Brazil, Chile, Peru
  - three years after privatization: Chile, Colombia, Mexico

- Countries in which public investment dropped as percentage of GDP
  - on the year of privatization: Argentina, Venezuela (in 1989)
  - a year after privatization: none
  - three years after privatization: Argentina, Brazil (1990), Chile

- Ineffectual privatization on private/ public percentage: Bolivia, Colombia

*Source: World Bank (1997), series on investment in LAC online*

The tentative calculation shows that private investment as percentage of GDP increased clearly in the cases of Mexico, Chile and Peru. Moreover, the data (not shown) on yearly participations show inflection points as structural changes following
the beginning year of privatizations, implying that privatization efforts were a signal of market-oriented strategies by these countries. For the case of Argentina (a much more recent experiment of renewed privatization) increased private investment participation stands out in 1995. The gross calculation (overall investment) on public participation is less evident, since after privatization the parastatal sector might have become smaller, but not necessarily overall state investment will drop. Moreover, freeing resources by privatizations might enhance investment positions of governments. However, Venezuela stands out after this country’s crisis in 1995, since private participation drops and the public one increases in 1994-95.

The normative argument of rationalizing privatization along the lines of signaling market orientation seems to be more complex than analyzing private versus public investment. Indeed, one would need to determine effects on both allocative efficiency and internal efficiency, and this can only be done by sectors. However, suffice it to point out that the IDB generated a survey among 17 LAC economies (IMF 1995). From the questions about benefits of privatization, “internal efficiency and broadening of services” was the most mentioned success in 8 out of 17 countries, the same frequency indicated for “freeing up of financial government resources.” Also, La Porta and Lopez-de-Silanes (1997) show in a sample of around 160 Mexican privatized companies, that investment expansion at the firm level was not significantly different between privatized SOEs in the competitive and oligopolistic markets. However, they point out that privatization of firms with monopoly power is
more recent, and that investment expansion might be downward biased as restructuring and company growth might take various years to be evident.

On companies within sectors, the evidence is very mixed. For example, the Mexican privatization of Aeromexico airlines resulted in productivity gains, employment reduction of overload, increased coverage, and higher profitability of the privatized company. In contrast, Mexicana airlines showed the opposite result. It has been argued that a temporary takeover by Aeromexico of its rival was a result of regulatory lag and evidences a major conflict of privatization without deregulation (Hanson, 1993). On its part, telecommunications as a sector has shown a performance closer to international standards in Chile, Argentina, and Mexico with respect to investment growth, trend to align tariffs (long distance), and productivity gains. However, the evidence is mixed on allocative efficiency gains (coverage, basic prices, quality), mainly because of regulatory lag or insufficient rules of the game (Ramamurti, 1996).

d. Use of Proceeds and Government Restructuring

Turning now to use of proceeds, the distribution of the sale is as follows. In Argentina, the privatization program began in 1990 and proved to be effective to reduce foreign debt, by means of issuance of foreign debt bonds for the debt conversion of main SOEs. Additionally, the central government, which had to contribute to SOEs in around 40% of the total public deficit, reduced the burden to a
minimum, except for salvaging troubled banks. However, many SOEs had to be restructured and the government had to consolidate liabilities previous to the sale, hence the government's budget could not relocate proceeds for productive and social projects (Rausch 1994). In the case of Brazil, privatization of steel, petrochemicals, and part of electricity administered by subfederal states has been aimed at using proceeds to reduce and restructure public debt at the same time that capital markets are strengthened. For this, public offering of shares was implemented, and dedicated bonds or privatization certificates were used, such as Disec, the certificates of housing (CEF), and the so called Divex, which are debt-equity swaps. Critics of the Brazilian process focus on the lack of restructuring of public finances and the maintained importance of the public sector in its economy. For example, using data from government consumer expenses from ECLA (1995), they moved from 10.4% of GDP in 1987 to 16.5% in 1993 and 15.4% in 1994.

Chile stands out as a relative success story. Proceeds from a now long process of privatization, were not pressing to curb a public sector deficit that had been successfully controlled after 1982. A fraction of SOEs sales since the eighties had been used for external debt reduction, which accounted for 124% of GDP in 1985, but shifted to 35% in 1995. Government consumption was decreased, from around 14% of GDP in 1987 to 9% in 1994-95. Indeed, the capital market was strengthened through privatization by open flotation of shares, at the same time that proceeds remained marketable through pension fund activity in privatizations. On their part,
Bolivia and Peru, with more conservative results of privatization, used proceeds for emergency current account deficit financing, Peru being a salient case. For Bolivia, proceeds were used to generate extra financial resources for the privatized companies through the so called capitalization plan. By issuing rights to control, the acquiring company pays to the fund and determines its operative plans. Remaining non-controllable shares are assigned (sold) to the public through the fund, linked to private pensions. The size of the program is of low importance in the pressing need of an active state, but the capitalization plan aims directly at the public rather than at the government.

Mexico’s privatization proceeds were basically destined for amortization of public debt, through the creation of a ‘contingency fund’ in 1990 at the time of main privatizations. Subsequently, restructuring of subsidies permitted the central government to use remaining proceeds for the so called social expenses of public works such as water and electricity supply, although funds were partially funneled to other SOEs (Rogozinski 1997). Finally, for Venezuela, government deficits have not been reduced through the period of privatization, and proceeds basically canceled SOEs debt such as is the case with CANTV (Ramamurti 1996).
III. REGULATORY CHANGE AND ADJUSTMENT: AN EVALUATION

Regulatory reform in LAC has a different meaning than in developed economies. Whereas it is assumed that regulations exist and are substitutes for privatization in economies of Western Europe, the US, and even Asia, regulatory frameworks are needed complements in LAC economies in their process of privatization, where over-regulation coexists with weak institutional oversight mechanisms and agencies, and also, where regulatory reform can foster or hinder business development. Sectors such as telecommunications, banking, electricity and gas, which account for main LAC privatizations, are characterized by monopoly power and concentration, where agency problems are frequent. Governments’ pragmatism about privatizations entailed little or no development of institutional change and oversight effectiveness, which adversely affect allocative and internal efficiency, as was pointed out with models in chapter 2. It is not entirely clear how a second best result of privatization with regulatory lag and underdevelopment of regulations can work its way to regulatory modernization.

Regulations extend from before privatization to after privatization. It is apparent that ex ante regulations include breaking up SOEs monopolies when needed, changing tax and other fiscal treatments to particular SOEs, modifying the structure of labor contracts, and finally the general preparation of SOEs to be sold (valuation, method of sale, timing, and determination of bidders’ profiles). Along with focused
regulatory adjustments to SOEs, there are others, such as the ones to change the rules of foreign ownership and property rights (foreign investment laws and liberalization), empowerment and modernization of capital markets, debt restructuring and other macroeconomic policies. As for regulatory changes needed after privatizations, they entail mainly normative aspects of prices, coverage, or investment, as well as normative aspects against predatory conduct by privatized SOEs with monopoly power.

It is assumed that *ex ante* regulatory changes are preconditions for a first best solution to privatization. Another assumption is that independent and modern agencies exist to prevent predatory conduct and determine prices and/or rate of return. In developed economies regulatory adjustments are seldom necessary, and attributes of agencies are only marginally changed to cases of predation, mainly because they exist as part of government settings. However, for LAC cases, regulations and regulators have to be created from scratch or, when agencies exist before privatization, need ample restructuring and retooling of their attributes (Guasch and Spiller 1994; Holden and Rajapatirana 1995). An argument could be made that even under second best solutions, privatization can induce regulatory modernization that would have been of low priority for governments before.

In LAC countries, where fiscally driven privatizations are evidenced, high divestiture prices exert a pressure on new owners to discount expected returns rapidly and to seek regulatory protection or shields. Moreover, in cases of shielded
privatizations, the agency created *ex post* to regulate predatory conduct or entry conditions finds itself with the conflict of overseeing privatized SOEs with concession or property titles that go against the principles of the agency. For this, regulation changes must adapt to these conditions and also to eventually modify them toward standard treatment of cases. For this, regulatory reform would become endogenous in LAC, rather than exogenous as in developed economies (Guash and Spiller 1994). Regulatory reform then implies an evaluation of constitutional changes, generation of statutes, how and when oversight institutions are created and how they operate, and finally the rules applied to reduce transaction costs of doing business after privatization.

**a. Timing of Oversight Mechanisms in LAC**

According to Buscaglia (1996), most of civil law in LAC was implemented in the nineteenth century, adopting the French codified law on civil, commercial, and criminal codes (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, and Venezuela). During the present century and for those countries with more modern and ampler economic base, economic structure and behavior moved faster than legal structures, for which adjustments have been increasingly pressing. Argentina, Brazil, and Chile established courts of justice and implemented civil force to commercial contracts. More recently, harmonization of commercial law has been sought by conferences in which Panama, Mexico and Peru have joined the above
governments. Argentina, Brazil, Chile, Mexico, and Peru have the highest number of commercial amendments on codes, to align structures to modern legal dispute settlements as well as to oversight business conduct. Trade agreements were therefore important as push forces towards revision of codes, mainly NAFTA and MERCOSUR.

As privatization has been implemented with little recourse to regulatory reform, there are needed elements to modernize regulations and institutions. On problems in property rights, governments' recourse is constitutional and institutions are mainly of the federal or central level, except for Brazil, where there are many SOEs at the state or non-federal level. The main problem with this aspect has been red tape and low professionalization of government officials. For example, Holden and Rajapatirana (1997) show the massive red tape as a case of 'bad regulations.'

Buscaglia (1997) shows that amendments of commercial codes were furthered by those countries with more economic growth and a wider economic base, mainly in manufacturing. Out of a total of 1618 amendments in a sample of 9 LAC economies between 1930-1995, Brazil was first with 32% of the total. Then came Argentina and Chile, with 32% and 29%, respectively, and Peru was next with only 3.4% of the total. For the case of Mexico, commercial codes were mostly modified during the liberalization and privatization period between 1985-1995, with around 91 amendments of regulations to sectors and general activities, registered in the Official
Gazette, which if put in perspective with Buscaglia's analysis, would make Mexico the fourth most active economy in this respect.

Now, the timing of regulatory bodies and oversight mechanisms has been off in many cases (exceptions are Chile overall, Mexico and Argentina in banking). For example, competition laws exist in Argentina since 1919 (revised in 1980); Chile (1959 and revised in 1973); Colombia (1959 revised in 1992); and Mexico (1934 and revised in 1993). More recently, Peru (1991), Venezuela (1992), and Brazil (1994) passed new laws and established oversight agencies (Rowat 1995). Relating regulatory change to years when privatization begun, it can be shown that Argentina, Chile, and Peru had adjusted competition laws before privatization, although the number of cases overseen by the Argentinian authority are very limited, for which it could be argued that its role is almost non-existent. Colombia and Venezuela made the adjustments coincident with privatization, and the oversight authority is active. For Mexico, competition policies and institutions were created after the peak of its privatization, but the competition commission CFC has increased its activity fourfold since its creation in 1991 (CFC 1996, 1997).

Sectorally, Chile enacted regulatory oversight bodies for telecommunications and electricity in 1978. The framer had the task of price adjustments mainly in electricity, and bodies continue to operate under privatized SOEs and competition. Chile has an agency for oversight of telecommunications with explicit arbitration capabilities and its own financial resources since the seventies (Guasch and Spiller
1994). For Argentina, the passage of an Electricity Law to restructure the sector occurred simultaneously with announcements of privatization in 1991.

As for telecommunications, Argentina shows that regulations faced repeated changes between 1989 and 1992, at the same time that the telecommunication sector was privatized in 1991. However, codes and legislation are very detailed and specific. Mexico privatized telecommunications in 1990, when regulatory bodies depended on the respective ministry. Regulations were extensive, but the regulatory agency COFETEL was only created as an independent agency in 1995, as the sector was deregulated. Peru’s privatization of telecommunications happened in 1994 and an independent regulatory agency was formed the same year. Venezuela’s oversight mechanism for telecommunications is done by an independent agency for tariff rebalancing, but any other changes have to pass Congress approval. The mechanism exists before the 1991 privatization. Bolivia is opening to competition in electricity, beginning in 1994. However, its Electricity Code dated from 1968 precedes privatization but has not been updated to generate oversight agencies or empowering ministries. The following table summarizes the state of regulations and timing in LAC.
Table #7
State of Regulatory Mechanisms in LAC

<table>
<thead>
<tr>
<th>Country</th>
<th>Codified commercial law</th>
<th>Courts of justice</th>
<th>No. of amendments 1930-95</th>
<th>No. of trade-related non-agricultural sectors</th>
<th>Years of experience with comp. policy to 1997</th>
<th>Years of experience with comp. policy to privat. year</th>
<th>Sectoral agencies for telecom./energy</th>
<th>Index of property rights protection (inverted)</th>
<th>Index of red tape (inverted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>yes</td>
<td>yes</td>
<td>515</td>
<td>16</td>
<td>17</td>
<td>6</td>
<td>yes</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>Bolivia</td>
<td>yes</td>
<td>no</td>
<td>19</td>
<td>1</td>
<td>0</td>
<td>-2</td>
<td>no</td>
<td>1/3</td>
<td>1/3</td>
</tr>
<tr>
<td>Brazil</td>
<td>yes</td>
<td>yes</td>
<td>521</td>
<td>14</td>
<td>3</td>
<td>-4</td>
<td>yes</td>
<td>1/3</td>
<td>1/3</td>
</tr>
<tr>
<td>Chile</td>
<td>yes</td>
<td>yes</td>
<td>467</td>
<td>11</td>
<td>24</td>
<td>12</td>
<td>yes</td>
<td>1</td>
<td>½</td>
</tr>
<tr>
<td>Colombia</td>
<td>yes</td>
<td>no</td>
<td>9</td>
<td>0</td>
<td>5</td>
<td>-1</td>
<td>no</td>
<td>1/5e</td>
<td>1/4e</td>
</tr>
<tr>
<td>Ecuador</td>
<td>yes</td>
<td>no</td>
<td>14</td>
<td>1</td>
<td>0</td>
<td>-3</td>
<td>no</td>
<td>¼</td>
<td>¼</td>
</tr>
<tr>
<td>Mexico</td>
<td>yes</td>
<td>no</td>
<td>91</td>
<td>20</td>
<td>4</td>
<td>-5</td>
<td>yes</td>
<td>1/3</td>
<td>¼</td>
</tr>
<tr>
<td>Peru</td>
<td>yes</td>
<td>yes</td>
<td>56</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>yes</td>
<td>1/3</td>
<td>¼</td>
</tr>
<tr>
<td>Venezuela</td>
<td>yes</td>
<td>yes</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>-2</td>
<td>yes</td>
<td>1/2</td>
<td>1/2</td>
</tr>
</tbody>
</table>


b. Regulations and Economic Opening

Much change in regulatory frameworks has been the result of economic opening. Beginning with the need to restructure after economic crises in the eighties, Mexico, Chile, and Venezuela were subject to financial rescue packages and government restructuring from IMF/WB since 1983, for which clearer rules of the game implied revisions of commercial codes and practices around government
subsidies, performance of SOEs, credit growth to modern sectors, and private sector
development. In the cases of Argentina, Peru, and Brazil, foreign sector strategies
began later. Even if important, Ramamurti (1996) shows that conditioning by
international institutions was not the only determinant of institutional change and
regulatory reform. Unilateral and bilateral trade and investment liberalization moved
countries —such as Mexico, Chile, and Venezuela in the eighties— toward
modernizing laws that guaranteed non-discriminatory treatment of much needed
foreign investment. It could be argued that the demand for foreign investment is
positively related to modernization of laws governing property and intellectual rights,
contracts and vertical restraints, and competition.

On trade agreements, both NAFTA and MERCOSUR take account of rules for
foreign investment limits in SOEs, after redefinition of salvaged sectors was enacted.
Competition policy issues are addressed in Chapter XV, Art. 1501 of NAFTA
(Mexico 1992). Around 30 bilateral foreign direct investment treaties have been
signed among LAC governments, and cover all the sample analyzed here. It is
assumed that through international investment, not only technology transfer but more
competition will be generated, to also affect positively more modern regulatory
frameworks in the region.
c. Independence and Conflicts among Oversight Agencies

As SOEs are privatized, firms pass from former decrees that created legal monopolies, towards a legal setting where competition policy becomes the oversight mechanism. This occurs in most sectors, unless the privatized SOE remains a natural or legal monopoly, such as in the case of regulatory shield and regulatory lag in telecommunications, electricity, mining, banking, or activities with externalities and large economies of scale. For them, agency problems exist between the competition agency and the sectoral regulating agency. In the practice of developed countries, predation through conduct, either horizontal or vertical, is subject to overall antitrust legislation, whereas other conduct or structural characteristics are overseen by the sectoral regulator.

Conflicts in LAC are evident, if privatization preceded regulatory change and a sort of duality exists for the regulator between a shielded privatized SOE with monopoly power, and other residual private firms. The same result would occur if the privatizing entity (central government) establishes delegated power to the sectoral oversight agency instead of the general antitrust agency. This is the case of so called agency problems with multiple principals. Such literature has recently received theoretical attention for its policy implications. Agency and capture exist not only between a regulated private entity and the framer, but also between government agencies. Capture could exist at various levels that divert efficiency in favor of
agency incentives for interest groups' objectives. A question is raised whether a centralized, or imported set of regulations would reduce moral hazard problems brought about by multiple agents (Estache and Martimort 1997; Laffont and Martimort 1994; Martimort 1996).

For example, Mexico’s competition law did not make any provision for the review of privatization transactions and concessions, generating ambiguity in the treatment of sectors such as banking, airlines, telecommunications, and other infrastructure. Chile exempts from its competition law (D.L. 211/1973) all SOEs or public institutions that have been granted legal monopoly, hence conflicting with sectoral regulators. In the case of Venezuela, its new law to promote free competition, which was enacted in 1992, is broad and does not make provisions for privatized SOEs. Peru has been very active in updating its competition law enacted in 1991, that covers both private and public firms. Brazil recently created an antitrust framework in 1994, by a new law on repression against economic order (8.884), but enactment on privatized SOEs is minimal. Argentina’s amendments and update of competition law are also recent, and according to Rowat (1995) the new draft of the law does not create enough operational enactment, even if criminal prosecution is included in its law, as opposed to other LAC legislations.

Referring now to independence, not all administrative agencies in charge of investigation, prosecution, and adjudication, are independent from the executive or the ministry doing policies. Rowat (1995) and Glade (1996) point out non-
independence in Mexico, Venezuela, Peru, and Brazil in terms of budget
determination and appointment by the executive, instead of the agency being financed
by a percentage of fines collected. Most agencies implement fines but are somewhat
separated from the judiciary. For example, penal codes in Mexico apply to economic
wrongdoing basically on fiscal fraud, but not on predatory market conduct, where
fines are the instruments of the agencies. As presented above, criminal elements are
only present in the Argentinian law, as well as in Chile. However, no criminal
prosecution has been enacted in Chile (Rowat 1995). As for Venezuela, its antitrust
or competition law is implemented by an autonomous agency not dependent from the
executive, and typically sends decisions to the courts to prosecute and adjudicate.
Peru’s agency is independent to the point of integrating its own court of appeals,
separated from the judiciary.

Enforcement problems stem from the privatization-then regulatory reform
structure. However, Chile has the longest record of enforcement on conduct (mainly
discrimination problems); Mexico’s case is recent, but enforcement on
monopolization in telecommunications, tied sales in banking, and the airline merger
conditioning are salient; in Argentina, the respective commission has been quite
passive in enforcement, since only 49 out of 285 investigations led to prosecution
between 1980 and 1992, according to Rowat. Only the Mexican competition
commission has acted as advisor in privatization issues affecting competition.
What are the relationships between competition and oversight agencies and those agencies in charge of privatization and follow-up? In Argentina, the accounting court or Tribunal de Cuentas was in charge of privatization, giving the agency all powers to conduct valuations, method of sale, and follow-up. However, there is no explicit treatment of privatized SOEs in either the regulatory agency or the competition agency. This operates for telecommunications and airlines. As for YPF petroleum, gas and electric energy, the regulatory framework contemplated a special agency for oversight and tariff restructuring (Rausch 1994). For Brazil, its privatization program has concentrated in steel, petrochemicals, and some banking, where entry conditions permit the market to discipline itself rather than establishing sectoral regulatory bodies. However, the experience has been concentration of market power, lack of foreign capital and ownership, and political opposition to privatization. No sectoral oversight agency exists, except the Secretariat for Public Enterprise Control, which was established in 1979, the National Bank for Economic and Social Development (BNDES) and a special commission for privatization, with no oversight powers after privatization (Saravia 1994). Peru has moved toward market rules through government reform. However, privatized firms with market power, such as electricity, mining, and railroads, do not face a strong regulatory regime or oversight mechanisms.

As a conclusion to this section, it is apparent that regulatory frameworks are lacking in many cases of privatization, when monopoly power persists. Moreover,
competition policy and institutions are only recently moving in the direction of oversight and dispute resolution. Countries with wide economic bases and where trade and capital liberalization have occurred are more pressed to modernize regulatory frameworks. Determinants of regulatory advance would include, apart from economic pressing bases, the depth of privatizations, sectors covered, degree of international opening to serve as a precondition or push towards modernizing regulations, and finally, political settings.

IV. INTERNATIONAL CAPITAL MARKETS AND RELATIONSHIP TO PRIVATIZATION MEASURES.

Privatization has marked impacts on capital markets. A first effect of privatization is generation of financial resources that can be funneled to the financial system. Such an effect is evident when SOEs divestiture is done by floating shares in an already developed stock market, and when the financial institutions help to generate clear information on previously restructured SOEs in divestiture process. This is the case of the UK. Even when SOEs are not restructured to become listed companies, and when stock markets are undeveloped, the process of privatization through direct sale has positively affected capital markets, as funds are invested by both domestic and international capital, such as is the case in most LAC privatizations. Indeed, foreign investment (both direct and portfolio) is related to privatization income. In the case of democratizing the sale among workers or other
individuals through issuance of equity during or after privatization, the result is marked participation of otherwise passive investors, as was evidenced in Argentina in 1992 (Glade and Corona 1996).

In the case of Chile, 27.9% of the total capital handled in the stock exchange represented privatization equity. As capital market development coincided with privatization efforts, sold companies began to be internationally listed under US 144A registry from 1989 on. This phenomenon, plus high liquidity in developed economies, helped to finance growth of privatized SOEs. The case of Bolivia is worth mentioning. As a result of its lack of a large banking sector or capital market, expected income from the sale of the main telecommunications and energy companies was blockaded by the impossibility to raise funds by private groups. Potential investors then had to move to neighboring Chilean capital markets to generate the financial packages. If regulations are an impediment to either generate a financial package with foreign investors, or when clearance has to be gained from congress for international financing of the sales, then privatization cannot be entirely accomplished. For this reason, a privatization plan requires a minimal capital market development, but once acquired, a self enforcing process begins in which capitalization and investment grow as a consequence of privatization.

As an objective of privatization and regulatory reform, the development of capital markets has not been evident in all countries in LAC. For example, Table #8 displays the capitalization of financial markets before and after the peak of
privatizations. The cases of Mexico, Chile, Colombia, and Argentina show significant differences within the overall emerging market growth of 1226%. On value traded as an indicator of activity, only Chile, Colombia, and Peru show growth higher than the overall emerging markets value of 3600%. In any case, growth is substantial.

Table #8
Leading Emerging Capital Markets

<table>
<thead>
<tr>
<th>Market</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>Capitalization (US$ millions)</td>
<td>Value Traded (US$ millions)</td>
<td>Listed Companies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td>2,037</td>
<td>36,864</td>
<td>631</td>
<td>11,372</td>
<td>227</td>
<td>156</td>
</tr>
<tr>
<td>Brazil</td>
<td>42,768</td>
<td>189,281</td>
<td>21,484</td>
<td>109,498</td>
<td>541</td>
<td>544</td>
</tr>
<tr>
<td>Chile</td>
<td>2,012</td>
<td>68,195</td>
<td>57</td>
<td>5,263</td>
<td>228</td>
<td>279</td>
</tr>
<tr>
<td>Colombia</td>
<td>416</td>
<td>14,028</td>
<td>30</td>
<td>2,191</td>
<td>102</td>
<td>113</td>
</tr>
<tr>
<td>Mexico</td>
<td>3,815</td>
<td>130,246</td>
<td>2,360</td>
<td>82,964</td>
<td>157</td>
<td>206</td>
</tr>
<tr>
<td>Peru</td>
<td>760</td>
<td>8,178</td>
<td>38</td>
<td>3,080</td>
<td>159</td>
<td>218</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1,128</td>
<td>4,111</td>
<td>31</td>
<td>936</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>TOTAL EMERGING MARKET GROWTH</td>
<td>1226%</td>
<td>3632%</td>
<td>92%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


As for privatized enterprises, the possibility of launching equity financing in international markets, Table #9 shows a list of main countries participating in the
global depositary receipts (GDR) between 1989 and 1995. Such participation implies a correlation between privatization, regulatory reform, and economic opening in the financial markets, as well as a relationship between depth and date of privatization and the size of an economy.

Table #9
Participation of ADR and GDR by selected LAC countries: 1989-95 (millions of dollars)

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Issues</th>
<th>Global Index of issues/ market capitalization</th>
<th>Investible Index issues/market capitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>EARLY REFORMERS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>1,996</td>
<td>2.7</td>
<td>17.8</td>
</tr>
<tr>
<td>OTHER REFORMERS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td>3,898</td>
<td>10.3</td>
<td>17.7</td>
</tr>
<tr>
<td>Colombia</td>
<td>277</td>
<td>3.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Mexico</td>
<td>6,698</td>
<td>7.4</td>
<td>12.1</td>
</tr>
<tr>
<td>Peru</td>
<td>56</td>
<td>0.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Venezuela</td>
<td>86</td>
<td>2.3</td>
<td>3.6</td>
</tr>
<tr>
<td>RECENT REFORMERS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>1,281</td>
<td>0.9</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Note: data are corrected for changes in stock prices between date of issue and end of 1995.
Capital markets support economic development by channeling savings to long productive investment, depending on clearer market signals and risk and return, rather than government intervention. However, undeveloped capital markets hinder private sector development in industry and commerce, but also in sectors banned to private capital such as infrastructure or social security. Some countries in LAC could accomplish privatizations by selling shares of SOEs in emerging capital markets, which then would further develop. Moreover, companies that upgrade their accounting practices and information to stock market standards, could have access to lower cost of capital, both domestically and internationally through ADRs, such as Telmex from Mexico, YPF and Entel North and South from Argentina, or CPT and Entel from Peru (McLindon 1996).

V. CONCLUSION

The present chapter has reviewed main characteristics and reasons to privatize in LAC, as well as the structure and problems of regulation around entry conditions and capital markets. The argumented second best result of privatization in this region of the world, can then be tested in the sequence of policies and their impacts. Plugging international conditions and capital market liberalization and development will help to construct the relevant statistical analysis.
I. INTRODUCTION

After defining a workable optimization model of privatization and regulatory reform, and defining the overall environment in a group of LAC countries that have moved forward with privatization and regulatory reform to some sectors of their economies, the present chapter lays out the ground for econometric testing and empirical analysis of sequencing of policies, their determinants and their outcomes. Analysis of choice was first applied in econometrics by McFadden (1973), Heckman (1976, 1978, 1986), and Lee (1976, 1982). Then Maddala (1983), Manski and McFadden (1986), Greene (1993), Amemiya (1985) have been noted works around choice models, nested logit and tobit constructs where dependent variables of choice take qualitative values after a threshold. Choice models are useful to the question of probability of privatizing and probability of exerting regulatory reform in small samples such as LAC’s sectors with monopoly power, as was shown to be the case in telecommunications, banking, and energy. As the two choices are interrelated, then the so called two-step Heckman procedure of multivariate choice can be applied. Switching regression has been
applied to a myriad of problems in disequilibrium analysis (Halvorson 1984; Hensher 1986; van der Gaag and Vijverberg 1987; Boehm, Herzog, and Schottmann 1988; Douglas, Conway and Ferrier 1995). However, microanalytical subjects have mainly encompassed supply and demand, labor markets, urban choice of location, and willingness to pay for natural resources, to name the most noted cases, but not to privatization and regulatory reform. Hence a contribution of the present analysis is to apply such techniques to the subject matter. The chapter first describes the technique and its problems and modifications, in order to later present the proposed empirical model of choice applied to various sequences of government decision making on modernization.

II. CHOICE MODELS ON QUALITATIVE DEPENDENT VARIABLES AND SWITCHING

A cumulative process, say of a privatization decision $y$ on variables such as reduction over trend of SOEs underperformance, debt overhang, or social pressure (see the possible combination of quantitative and qualitative variables, as presented in chapter 3), would first be candidate for non-linear estimation. Taking the basic form followed by Greene (1993) and others of $y = f(x, \beta) + \varepsilon = \beta_1 + \beta_2 e^{\beta_3 x} + \varepsilon$ then a nonlinear case is apparent, for which least squares estimation (LSE) would not be useful due to both the optimization criterion and first order conditions for a solution. Even if Taylor series expansion and proposals such as Amemiya (1995) still give
credit to LSE, non-efficiency would result if errors are not normally distributed and the ‘true value’ of the variable is unknown. There is suspicion that the case of privatization across countries, sectors, and time frames would not qualify for ‘true value’ knowledge, for which the Gauss-Newton iterative method could not be used because of the discrete $y$ and also if assumed non-normality. Moreover, if non-normality is assumed, neither probit or logit models would work directly. So normality assumptions are key, which make maximum likelihood estimation (MLE) the basis for these types of problems, and make us restrict the analysis of privatization and regulatory reform choices assuming normality conditions, subject to data availability and sample size.

a. Models with Panel Data and Heckman’s Procedure

Now, in the case of models with panel data, a fixed effects treatment has been proposed in the literature (Greene, 1993, Heckman, 1986 in Manski and McFadden (eds.) and Maddala, 1983). The argument establishes that if an event has occurred in the past, a related event would more likely occur in the future than if no past occurrence existed. If the error term in the panel contains independent standard normal variables of the two error components, then traditional methods of estimation would work. However, when heterogeneity of data make it impossible to assume the error term containing separable independent normality distributions, then a method to specify random effects is in order, but computing joint probabilities of the error
partitions would be cumbersome. A way to overcome this problem is a limited
information approach (Avery, Hansen, and Holtz, 1981) using a generalized method
of moments or GMM.

The objective is to transform the data say, around a central tendency in order
to reduce heterogeneity, hence leaving the error term with only random effects. A
discussion exists whether a fixed effects model can work better. In the alternative
proposition the objective is to transform the data directly by some means and thereby
reduce the problem of estimation. For example, in the case of a logit model,
Chamberlain (1980) suggests to group data for say, $T$ observations, then maximize a
conditional likelihood function, on the number of ones in the set that was collapsed,
e.g. overcoming an unconditional likelihood of $nT$ observations. This within
parametric models, since others propose semi-parametric transformations (see
Amemiya, 1985) which will not be used in the present research. An example would be:

\begin{align*}
y_{i1} = 0 \text{ and } y_{i2} = 0, \text{ then } \text{Prob}(0,0|\text{sum}=0) &= 1 \\
y_{i1} = 1 \text{ and } y_{i2} = 1, \text{ then } \text{Prob}(1,1|\text{sum}=2) &= 1 \\
y_{i1} = 0 \text{ and } y_{i2} = 1, \text{ then } \frac{\text{Prob}(0,1 \text{ and sum}=1)}{\text{Prob}(\text{sum}=1)} &= \frac{\text{Prob}(0,1)}{\text{Prob}(1,0) + \text{Prob}(0,1)} \quad (1)
\end{align*}
The test for heterogeneity is the Hausman one, consisting on testing a chi-square distribution of the non-conditional ML versus the conditional one (Greene, 1993). Dynamic choice analyzed by Heckman (1986) makes use of what he calls a continuous latent random variable. His argument is as follows: the investigator draws a sample from \( I \) observations, where each observation registers the presence or absence of a characteristic in each of \( T \) time periods, and where an event occurs at time \( t \) for observation \( i \) if and only if a continuous latent random variable \( Y(i, t) \) crosses a threshold. If it is assumed to be zero, a normal probit or logit model applies. If the latent random variable is non-zero, then an array of applications are developed, such as inventory, travel modes, decision to work, adaptive expectations, willingness to pay, expectations, habit persistence, risk of fire, and in the present case, privatization. No need exists to group data from the panel, which is important in the present analysis where data sets are small. Now, the important methodological decision is how to design a model which permits the inclusion of various sequences of policy decisions, e.g. privatize—not deregulate; privatize—deregulate; deregulate—privatize; not deregulate—not privatize, and then to analyze the effects of each option. A multivariate model would then be useful, if the qualitative dependent variable to deregulate is not independent from the qualitative dependent variable of privatize. This has been addressed recently by Hensher (1986), and Greene (1993).
Continuing the discussion by Heckman, he applies structural change as related to multiple choice, in situations of agents that maximize utility at time $t$ over a remaining horizon, given disposable information at the time of the decision. Transition to a state may be uncertain, but during the remaining time, the agent incurs in more costs or integrates more relevant information for future decision. The outcome of the process then affects subsequent decisions, and structural state dependence is generated. This is exactly the case of a game between a privatized SOE and the framer, where in finite but unknown time, they play a game of investing or not, versus canceling a regulatory shield or not. However, Heckman restricts his models to uni-equational choices, and moves towards the treatment of multinomial logit models. Although the use of a latent function separates the elements that tie in event dependence, explicit choice models from simultaneous or recursive equations is not addressed. Lung-Fei Lee (1986 in Manski and McFadden) concentrates on simultaneous equations.

b. Lee’s Simultaneous Equation Choice Models

Lee covers a wide variety of models, following first Amemiya’s principle, that derives structural parameter estimates of choice models as reduced form parameters. Lee begins with a specification of a set of simultaneous equations of the following general form:
where \( i = 1, \ldots, N \), \( Y_i \) is a row vector of endogenous variables which can consist of latent variables, limited or censored, and also could contain continuous dependent variables, \( X_i \) is a \( 1 \times k \) vector of exogenous variables, \( I - B \) is a \( n \times n \) non-singular matrix, \( \Gamma \) is a \( k \times n \) matrix, and the error is i.i.d. normal. Lee considers a partition of \( Y \) to be first continuous, a second partition to be limited dependent and observable when \( Y > 0 \), a third partition is possible of latent variables that are not observed but for binary indicators \( I \) observable and dependent on some latent variable \( Y_3 \), and finally a fourth partition that consist of a set of censored dependent variables, on the third partition. As one can see, this is a very general specification to be treated generally.

Lee argues that using MLE for these simultaneous equations is too complicated, for which he proposes a method in stages, where in a first stage, a reduced form equation is used as

\[
Y_i = X_i \Pi + u_i
\]
The above model can be estimated by a single equation such as tobit, probit or logit maximum likelihood methods, depending on the nature of the dependent variable as censored or not censored. A second stage is to estimate the structural parameters by making equations again through probit, or Tobit,

\[ Y_i = \mathbf{R}_k + (\mathbf{X}_i \mathbf{est\Pi}^*)k_i + v_i \]  

(3)

Moreover, Amemiya (1977) proposes OLS or GLS estimates for (3).

c. Multivariate Probit Models and Switching

Now, for the case of privatization and regulation reform, panel data could be used, but the nature of the same heterogeneous data might be better subject to estimation using the technique called switching, or the area of multivariate probit models. Multivariate models of choice are equivalent to multiple equation models in the traditional literature. Just as in traditional equation models, disturbances could be or are correlated among equations. A test for such correlation would be Wald test or likelihood ratio test. The basic model is shown as follows:

\[
y^*_1 = \beta x_1 + \varepsilon_1 y_1 = 1 \quad \text{if } y^*_1 > 0, \ 0 \text{ otherwise}
\]

\[
y^*_2 = \beta x_2 + \varepsilon_2 y_2 = 1 \quad \text{if } y^*_2 > 0, \ 0 \text{ otherwise}
\]
An example of this is voting behavior, where a voter decides to send a child to public school, and also decides on voting in favor of a school budget. In the present application, the authority decides to privatize, and also decides on regulatory change. Now, one can see that the basic model of the bivariate probit, depends on two separated sets of \( x \) exogenous variables, which might not be the case with privatization and regulatory reform. Also, the order matters, hence making the technique of multivariate probit models, very useful for the test of sequence.

Now, an alternative which takes account of some similar explanatory variables is a modification. This is accounted for in the literature as censored models. In a censored model, \( y^* \) is not observed (e.g. deregulation), unless \( y^* \) equals one (privatization has been done), and the probability of the second bivariate equation depends on a conditional \( x_2 \). The reverse order is also possible but has to be separated as a different model. Following Greene, the model would be represented as follows:

\[
\begin{align*}
E[\epsilon_i] &= E[\epsilon_j] = 0 \\
\text{Var}[\epsilon_i] &= \text{Var}[\epsilon_j] = 1 \\
\text{Cov}[\epsilon_i, \epsilon_j] &= \rho
\end{align*}
\] (4)
\[ y_2 = 0, \text{ then } \text{Prob} (y_2 = 0) = 1 - k (\beta_2 x_2) \]

\[ y_1 = 0, y_2 = 1, \text{ then } \text{Prob} (y_1 = 0; y_2 = 1) = k_2 (-\beta_1 x_1, \beta_2 x_2, -\rho) \]

\[ y_1 = 1, y_2 = 1, \text{ then } \text{Prob} (y_1 = 1, y_2 = 1) = k_2 (\beta_1 x_1, \beta_2 x_2, \rho) \] (5)

A new area of econometrics has been developed around censored multivariate and also multiple choice models, that was unexplored and not addressed before. Decisions and expectations, such as travel modes, arbitration in unions, occupational choice, or willingness to pay, have become now important issues and research topics in the literature. Take for example journals of finance, regional economics, labor studies, law and economics to find treatment of these methods. Also, refinement of the methods has appeared in many papers in the Journal of Econometrics, or the Review of Economics and Statistics, where applications are now present.

A review of censored data is useful for application in the privatization and regulatory reform game. For example, Greene (1993) begins his description of censoring in the dependent variable with the idea of a single equation, where the equation is tested when only part of a sampled population is relevant for analysis. Censoring means bringing values of some range of \( y \) to some specified number, for example, below a threshold of income \( y \) would be zero; after the threshold, \( y \) would be one or the value of the variable \( y \). This is called a Tobit model subject to ordinary MLE. Now, since the cumulative density function (cdf) of a censored model contains
continuous and also discrete parts, the likelihood function is simplified by the
Heckman's two step procedure. Suppose that the decision to deregulate depends on a
separate but related decision to privatize. So privatization is a conditioning element
in deregulate, or vice-versa. Say that privatization is a limit variable or threshold; the
decision to deregulate could take various (or discrete decision) choices or degrees. It
is obvious that deregulation will increase its probability as privatization is
implemented, e.g. will increase its mean. A probit of privatization, and a Tobit of
deregulation, then would be applied, if the second step is produced with a censored
and possibly continuous dependent variable.

Now, a simplification of sequencing might not be possible. An accumulation
function of critical conditions might impel authorities to deregulate first, and then to
privatize, as is the case in developed countries, and where this sequence gives rise to
the so-called first best conditions of privatization. However, in other situations, the
decision to privatize does not become a limit variable to deregulate. In other words,
the probability of privatize, could work positively or negatively for the probability to
deregulate. Such situations, e.g. a function that flips or jumps instead of showing a
continuous behavior, would complicate the econometric treatment. If a function
shows discontinuity or jumps, it is possible that it can be decomposed into more than
one density function, and then treated as a switch in conditions.

Assume two dependent variables in the multivariate choice model, $y$ and $z$,
that are correlated by $\rho$. The truncation of $z$ would influence the distribution of $y$. 
Let us assume that the two variables are positively correlated. Then a positive and increasing truncation of \( z \) would move the distribution of \( y \) to the right. Or assume that privatization and regulation are substitutes in a reversed case. Take the normal distribution as:

\[
f(y, z | z > a) = f(y, z) / \text{Prob}(z > a)
\]

and

\[
E[y | z > a] = \mu y + \rho \sigma y \lambda(\alpha z)
\]

\[
\text{Var}[y | z > a] = \sigma^2 y(1 - \rho^2 \delta(\alpha z))
\]

where

\[
\alpha z = (a - \mu) / \sigma z
\]

\[
\lambda(\alpha z) = \text{pdf}(\alpha z) / [1 - \text{cdf}(\alpha z)]
\]

\[
\delta(\alpha z) = \lambda(\alpha z)(\lambda(\alpha z) - \alpha z)
\]

Since \( \rho^2 \) and \( \sigma(\alpha) \) have values between zero and one, then the variance is smaller.

Heckman (1976) applied an incidental truncation model to wage reservation prices with respect to observed wages, and then related it to desire to work. If it is
supposed that a first relation is of the form \( z = \gamma w + u \), but we observe a second relationship if \( z \) is positive, or \( y = \beta x + \varepsilon \), then a selection process is as follows:

1) Estimate the probit equation (e.g. privatization) by maximum likelihood to obtain estimates of \( \gamma \). Then for each observation in the selected sample compute

\[
\text{est} \lambda = \phi(\gamma w) / \Phi(\gamma w) \text{ or pdf over cdf}
\]

and \( \delta = \text{est} \lambda (\text{est} \lambda + \gamma w) \)

2) Then estimate \( \beta \) and \( \beta \lambda = \rho \sigma \) by least squares of \( y \) on \( x \) and \( \text{est} \lambda \).

How would a multivariate Tobit model be applied? Returning to Lee (1986), his proposal seems general to accommodate various specifications of the dependent variable, in a simultaneous equation modeling theory. Taking his general model with partitions in the dependent variable, assume the last partition or grouping is a simultaneous equation, which corresponds to censored variables \( Y_i \). Assume from his notation that \( S^* = [RX\Pi^*] \) has a complement set \( S / S^* \) and is non-empty. This is called switching, and \( Y \) is observed in \( S \) when \( Y > 0 \). What is implied here is that there is a trigger \( S \) for the existence of a limited dependent variable \( Y \) observable. The equations are proposed to be solved as follows:
\[ y_i = R_i \delta_0 + (X_i \text{est} \Pi*) \delta_i + \lambda \left( \phi (X_i \text{est} \alpha) / \Phi (X_i \text{est} \alpha) \right) + \eta_i \quad \text{for } S^* \]

\[ y_i = R_i \delta_0 + (X_i \text{est} \Pi*) \delta_i + \lambda \left( \phi (X_i \text{est} \alpha) / (1 - \Phi (X_i \text{est} \alpha)) \right) + \eta_i \quad \text{for } S / S^* \]

(6)

The objective is then to find \( \alpha, \Pi^* \) for a first step, and then to estimate \( \delta_0, \delta_1, \lambda \) as a second step. Lee cautions, however, that Amemiya’s principle is asymptotically more efficient than the two stage estimation shown here, but it is easy to follow and operational. On simultaneity, Maddala (1983) considers the possibility of assuming two populations and applying a recursive logit model (RLM). Maddala’s interpretation is that when no need exists for latent variables, then separating the problem as if two populations were observed, gives rise to such an RLM estimated as any simultaneous - recursive model. However, Heckman’s criticism (1978) is that structural association among discrete dependent variables is not clear, favoring his two step structural shift model. Maddala (1983) refines Heckman’s proposition in a different two step model which captures the time lag of the shift, and also proposes a logit two stage least squares method of structural equations as an alternative, but conditions under which the dependent variables (e.g. privatization and regulation reform) are censored makes the procedure complicated.
III. PROPOSED APPROACHES TO PRIVATIZATION AND REGULATORY REFORM SEQUENCE

The selection consequences of privatization and regulatory reform presented in Figure 2 in Chapter 2, are subject to step estimation of a tree of two qualitative choices with ordering, or what is called bivariate probit models. Such treatment will compare the differences in order and their determinants for the data panel of LAC privatization-regulatory reform cases.

Alternatively, and if after the two correlated equations of choice, work to affect a continuous variable and equation which is zero before privatization and regulatory reform were implemented, but different than zero afterwards, then a case of truncated or Tobit models, as proposed by Amemiya (1985) as a type 3, 4 or 5 Tobit model, prone to the Heckman’s two step procedure, are useful. Such is the case if privatization revenue, capital market development, or other performance variables of privatized SOEs are part of the entire model. Truncation exists because it is not known how the order of privatize-deregulate will show and the fact that performance variables switch from zero to non-zero values. Amemiya classifies Tobit models in five types, by the complexity of the steps in choices that characterize a problem subject to data analysis. Then estimation is similar in all cases.

A type 1 and type 2 Tobit work for some uni-equational decisions but are not entirely applicable to our sequencing analysis. Take as in the above section $y = y^* \iff y^* > y_0$; and $y = 0$ otherwise. This is a type 1 Tobit model, in reference to original
simple models of consumer expenditures where zero expenditures occurred below a certain level of income (censored dependent variable). In a type 2 Tobit model, assume as in the above section, two original equations, one censored and one binary in the dependent variables, respectively:

\[ y^*_1 = x_1 \beta_1 + \varepsilon_1 \]

\[ y^*_2 = x_2 \beta_2 + \varepsilon_2 \]

\[ y_2 = \begin{cases} y^*_2 & \text{if } y^*_1 > 0 \\ 0 & \text{if } y^*_1 \leq 0 \end{cases} \]  

(7)

\( y_2 \) would stand for the decision to deregulate and \( y_1 \) would stand for the choice of privatize (revenue). One can see that privatization revenue relates to—deregulate, and also to regulate, but not the remaining possibilities of our interest.

Type 3 and type 4 Tobit models are ones where sequencing is prone to be subject to direct analysis. The two models are spelled out as follows, and a tree structure is then presented, where \( y_I \) (yes, no) implies privatization choice, and \( y_2 \) and \( y_3 \) stand for regulatory reform RR in a simple (yes, no) framework:
Figure #4
Options in sequencing

<table>
<thead>
<tr>
<th>Type 3 Tobit</th>
<th>Type 4 Tobit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y'_1 = x'_1 \beta_1 + u_1 )</td>
<td>( y'_1 = x'_1 \beta_1 + u_1 )</td>
</tr>
<tr>
<td>( y'_2 = x'_2 \beta_2 + u_2 )</td>
<td>( y'_2 = x'_2 \beta_2 + u_2 )</td>
</tr>
<tr>
<td>( y_1 = \begin{cases} y'_1 &amp; \text{if } y'_1 &gt; 0 \ 0 &amp; \text{otherwise} \end{cases} )</td>
<td>( y_1 = \begin{cases} y'_1 &amp; \text{if } y'_1 &gt; 0 \ 0 &amp; \text{otherwise} \end{cases} )</td>
</tr>
<tr>
<td>( y_2 = \begin{cases} y'_2 &amp; \text{if } y'_1 &gt; 0 \ 0 &amp; \text{otherwise} \end{cases} )</td>
<td>( y_2 = \begin{cases} y'_2 &amp; \text{if } y'_1 &gt; 0 \ 0 &amp; \text{otherwise} \end{cases} )</td>
</tr>
<tr>
<td>( y_3 = \begin{cases} y'_3 &amp; \text{if } y'_1 \leq 0 \ 0 &amp; \text{if } y'_1 &gt; 0 \end{cases} )</td>
<td>No choices explicitly observed</td>
</tr>
</tbody>
</table>

The likelihood function of a standard Tobit model is presented in Amemiya (1985) as

\[
L = \Pi_0 [1 - \Phi(x'_1 \beta / \sigma)] \Pi_1 \sigma^{-1} \phi(y_i - x'_1 \beta) / \sigma
\]  

\( (8) \)
which is not efficient because only $\beta / \sigma$ is estimated but not $\beta$ or $\sigma$. Define

$$E(y_i \mid y_i > 0) = x_i' \beta + \sigma \lambda (x_i' \beta / \sigma)$$

where $\lambda(z) = \phi(z) / \Phi(z)$. Further, make $\alpha = \beta / \sigma$. Then the expression can be rewritten as

$$y_i = x_i' \beta + \sigma \lambda (x_i' \alpha) + \epsilon_i \quad \text{for } i \text{ such that } y_i > 0 \quad (8')$$

Then the two step Heckman method estimates first $\alpha$ by the probit method of MLE; and then regresses $y_i$ on $x_i$ and $\lambda (x_i' \text{ est. } \alpha)$ by LSE with positive observations of $y_i$. Independence is assumed in either type 3 or 4 Tobit, for which the equations represented in Figure #4 can be simultaneously estimated, obtaining structural parameters in the two step procedure (Amemiya 1985). In Tobit 5, a tree with two censored variables and a binary one is tried. Now, sequential modeling openly estimates structural parameters such as the trees presented in the Table for which a so-called nested tobit model has also been tried to multinomial choices by Hensher (1986).
IV. NATURE OF THE DATA SET FOR PRIVATIZATION AND REGULATORY REFORM IN LAC

Two sets of data are needed in the study. A first data set corresponds to overall country and sectoral data on SOEs before, during, and after privatization. In the vector \( x' \), the following variables represent the domains or reasons to privatize: (a) deficit and debt measures by country in a time series from before 1985 to peak of privatizations around 1990 and extending afterwards to the most recent dates (1995-96). This is to capture relevant information in an entire economic cycle of privatization. Data on some measure of SOEs and privatized SOEs performance is also included, as total assets, net income, as well as public investment and private effort are also included here, as cumulative processes. They account for theoretically founded variables from the models in Chapter 2; (b) a variable measuring economic cycle, such as GDP growth is also needed in the privatization—regulatory change sequence model, which accounts as a proxy for scale factors and level of income \( I \); (c) a variable reflecting strike price or the difference between willingness to pay by private bidders (assuming government neutrality of offer price) is used either as a dummy variable and/or as a quantifiable variable; (d) dummy variables indicating type of sectors; and (e) variables representing economic trade and capital market liberalization are inserted as explanatory variables. The entire set accounts for the result in equation (22) of Chapter 2 for the decision to privatize.
As for the regulation choice, it is assumed that regulatory changes that reduce transaction costs of doing business conform the dependent variable; the vector $x'$, is conformed by (b), (d), (e), and a set of variables reflecting independence, oversight capacity of the government framers by country and date. These are obtained by assessing scores or binary measures to regulation modernization and independence, as is evidenced from the analysis in Chapter 3 and other origins such as WB (1995). Both multivariate probit, and Tobit models are needed for the analysis, after econometric preliminary analysis of data is applied.

The second analysis is needed to test for performance measures of privatized SOEs. As the analysis of sequencing of policies does not account for sectoral effects, company performance, and the interplay between privatization, regulatory reform, and international trade and mostly capital market liberalization, then a company or sectoral data set is needed for such an empirical analysis. Many studies have been produced on post-privatization performance of enterprises (Martin and Parker 1997 for a review), so a contribution of the analysis in this research is in clustering performance under ordering regimes produced in the first model of sequence. The second study will come to grips with the argued case of regulatory shield, as it affects privatized SOEs performance.

As for the first econometric analysis, the following is a list of tentative variables that result from the theoretical analysis, and the LAC description of overall privatization and regulatory reform phenomena:
List of Variables for the Model of Sequence

Privatization choice PRIV as dependent variable

$t = 1980-1995$; subsample 1985-95

$j = $ Argentina, Brazil, Chile, Mexico, Peru, Venezuela

$n = 96$; sub.$n = 66$

Explanatory “Pressure” Variables (according to theory proposed)
- Public Deficit/ GDP
- Foreign Debt/ GDP
- SOEs Deficit/GDP for fiscal burden
- Dummy for world sectoral growth
- Capitalization of Capital Market, for capital market relationship

Explanatory “Opportunity” Variables
- Overall privatization change
- GDP growth rate
- Capitalization of Capital Market

Regulatory Reform choice or score REG as dependent variable (selection)

$t = 1980-1995$ (or subsample of 1985-95)

$j = $ Argentina, Bolivia, Brazil, Chile, Mexico, Peru, Venezuela

$n = 77$

- Before/ after privatization (1,0)
- Regulatory change:
  - congressional (3)
  - executive (2)
  - statutory (1)
  - no (0)
- FDI adjustment: yes/no (1,0)
- Corporativization of SOEs before sale: yes/ no (1,0)
- Privatization agency determined: yes/ no (1,0)
- Oversight independence
  - budgetary
  - sectoral
  - all (3)
- Oversight proactivity by cases solved (1,0)
- Regulatory shield: yes/no (1,0)
- Total Score Index or independent qualititative choice variables

Explanatory Variables
- Dummy for world growth
- Investment growth
- Degree of international opening (trade dependence)
- Capital market capitalization
- FDI/ GDP
- Privatization proceeds
- Switch privatization
As established by empirical analyses on score estimators (Douglas, Comway, and Ferrier 1995; Hensher 1986), care must be taken for additivity and equal weights for survey cases, that have been applied to modeling of consumer choice, multinomial decisions on transportation mode, voting, or labor decisions. It is even argued that in order to overcome possible selection and score bias a nested Tobit model be used, which takes account of alternative specifications of the decision trees. However, the empirical analysis pursued in the following chapter, needs to integrate an explicit treatment of policy sequence, at the same time that care is taken on the selection. For such an exercise an analysis of data is previously needed (non-random selection) as proposed by Amemiya (1985).

V. CONCLUSION

It is possible to generate a tentative model to test the results of sequencing choices to privatize and apply regulatory reform in various sequences, as discussed in previous chapters. These multivariate probit, and Tobit models, subject to the two-step Heckman procedure, elucidate main reasons to privatize and deregulate (or regulate), as normative arguments of modernization of governments in LAC economies. The evaluation of techniques is developed on the basis of the theoretical model generated for this case.

A model on sectoral effects of privatization and regulatory reform is also somewhat spelled out in the present chapter. The empirical analysis of cases such as
telecommunications in Chile and Mexico, will elucidate results of various sequences of policies on performance measures of the selected sector, where a comparison of the theoretically first best solution will be compared to a case where privatization without regulatory reform (Mexico) in the sector would result in performance under second best definitions of allocative and internal efficiency, as well as how internationalization applies.
CHAPTER 5
EMPIRICAL ANALYSIS OF PRIVATIZATION AND REGULATORY REFORM IN LAC

I. INTRODUCTION
Theoretical and empirical studies of privatization, mostly applied to developed economies, assume that regulatory reform is well-developed \textit{ex ante}, and no agency problems exist between privatized SOEs with monopoly power and regulatory authorities. For developing countries, such as those in LAC, empirical studies had concentrated on one country (Rogozinski 1997 in Mexico; Hachete and Lüders 1992 in Chile; Chisari, Estache, and Romero 1997, in Argentina), discussing drawbacks or lags in regulatory reform. However, they do not insert institutional aspects and regulations into models of privatization or performance by privatized SOEs. Moreover, trade and capital market liberalization have not been generally considered as complements to economic modernization and signaling to the rest of the world. Also, capital market development as a domain of structural change in government choices of policies, is not emphasized, as it is stressed in contrast to former chapters.

To be more precise in a criticism to these studies, legal monopoly privatizations have not provided sufficient evidence of the "privatization axiom" as
beneficial in a country, since the enterprises still fall under an unchanged or lagging regulatory framework. Moreover, changes in behavior of privatized firms cannot be measured as they are confounded with such an imperfect regulatory structure. Even if some recent literature applies to developing economies (LaPorta and Lopez-de-Silanes 1997), or on cross sections of developed and developing countries (Boubakri et. al. 1997), no account is taken of the different institutional environments. The main objective of the present chapter is not only to take into account a proposed regulatory set of variables generated for the empirical analysis, but to model the dynamics of the principals-agents game in the sequence of decisions to privatize and modify regulatory settings, in models of more than one country, and for the main period of privatizations and regulatory changes in LAC economies. No study to date has tried to measure privatization and regulatory change explicitly, under the aegis of a sequential game of timing, which is followed here using a set of bivariate probit models applied to these decisions. and models of censored qualitative choice or Tobit switching in panels of various types (following Amemiya 1985).

Even if the period of privatization and regulatory reform in LAC is very recent (as presented in Chapter 3, it extends from 1987 to 1995 with a peak in 1991), it is possible to test hypotheses of the explanatory variables in the sequence of privatization, regulatory reform, and capital market liberalization. The analysis is applied to the macroeconomic setting in the first part. It is then necessary to explore more deeply a sectoral case of two countries with opposing sequences around one of
the main sectors subject to privatization: telecommunication services. This entails a different path of inquiry and technique than empirical models applied at the firm level, or country time series of before and after privatization. Although the present analysis does not account for firm characteristics as argued, nor directly models the difference in performance brought by various privatization techniques, which is generally sought by other studies (see Yeaple and Moskowitz 1995 for a summary), it focuses on the set of policy choices directly. Additionally, in order to avoid the need to separate privatizations of competitive versus less than competitive sectors, the sample of countries concentrates on main, national, privatizations of SOEs with market power.

The chapter is organized as follows: in section II, the data are described and a preliminary quantitative evaluation of the data sets is presented. Then, linear OLS models are tested assuming independence of choices; section III applies a bivariate probit model of privatization and regulatory change sequence under different assumptions, to test the explanatory power of the time game of sequence. Then such models are used into a three level model of switching of privatization revenues, censored by the fact that the explanatory variables, as an accumulative process, gave rise to privatization as a wave in main LAC economies. Because privatization events show zeroes in the beginning of the sample (around 1985 to 1988) for most countries, and then peak around the year 1991, Tobit models with incidental truncation are in order (Amemiya 1985). After testing the sequence hypothesis, section IV analyzes
the case of telecommunications in Chile and Mexico, to investigate more deeply the effects of the game between framers and privatized SOEs with respect to opening up competition in Chile's telecommunications sector, and granting regulatory shields in Mexico to the same sector, respectively. Finally, conclusions are derived for policy options and consequences.

II. DATA DESCRIPTION

Data are generated for the choices of privatization and for regulatory change for 1985-1995 of the following countries that have experienced with these policy choices: Argentina, Bolivia, Brazil, Chile, Mexico, Peru, and Venezuela. These countries account for the main privatizations in the time frame, excluding Jamaica. Jamaica was excluded for two reasons: first, because it follows oversight mechanisms derived from the UK and represents legal dependence, the Jamaican regulatory framework presents a different characteristic than the rest of the sample. Secondly, data for Jamaica were not readily available for the entire period under study. The remaining countries in the sample were designated for its relative importance in the process of privatization-regulatory change, and account for 95.5% of total LAC privatizations proceeds between 1990-95. Additionally, these cases show regulatory reforms regarding amendments to their constitutions, changes in the structure of their courts, and regulations towards monopoly market conduct and structure during the time frame.
Data for each economy are annual observations at the country level in the first part of the analysis. Selection bias is present outside the sample space, in the exclusion of smaller countries, and others more recently experimenting with privatization or where privatization and regulation changes are not fully implemented (Ecuador, Colombia, and other Central American economies are excluded). Another source of intra-sample selection bias is that data exist for total privatization and privatization revenues but no direct account is taken of cases in which the government maintains residual rights on privatized SOEs in the sample. However, it is reported that in Argentina (Chisari, Estache, and Romero 1997; Ramamurti 1996); Chile (Hachette and Lüders 1995); Mexico (Rogozinski 1997), and Venezuela (Rowat 1995, Kikeri, S., J. Nellis, and M. Shirley 1992), privatization results imply less than 10% of government residual rights in the various cases. In Peru, government rights on privatized SOEs is negligible (IMF 1995). This is not necessarily the case in Bolivia or Brazil, which are two countries with more recent privatizations.

Given the theoretical model of choices in Chapter 2, where regulatory shields exist and where first best and second best solutions are laid out, the models of choice with and without selection account for the possible outcomes of privatization and regulatory change in sequence. For the definition of explanatory variables emerging from the theoretical analysis, a set of what could be called pressure variables is a first candidate in both the privatization and also the regulatory change equations. Then, a set of variables of scale and the economic cycle form a second vector of explanatory
variables. Finally, and again, dependent on the theoretical basis where economic opening is inserted in the model definition, a set of variables that reflect trade and capital market liberalization are candidates for the privatization-regulatory change choices. Various specifications are then tried in linear models, in the bivariate choice models, and in the Tobit analysis.

As for regulatory changes, the data set was constructed on each country and year when three factors changed, and are taken as dummy variables: when courts existed or were created; when amendments to the constitution around sectoral, or privatization-related aspects were made officially public; and whether regulations on entry conditions and competition oversight agencies were empowered or created. These aspects correspond to conditions sought for oversight agencies at both World Bank forums (Guasch and Spiller 1995), and basic theories of administrative regulations (Spulber 1989). Qualitative variables to these regulatory changes directly take account of entry conditions, instead of other measures of the power of regulations around price-cap or rate of return.

The data account for what is presented as entry conditions needed to be upgraded in LAC countries, and characteristic of privatization of less than competitive industries. Moreover, it is then possible to test whether regulatory change complements rather than substitutes privatization in these economies. Regulatory reform fosters product market competition that plays a role in promoting internal efficiency and welfare of privatized SOEs. However, it works as a
politicizing or de-politicizing element in a game of time sequence if the authority
grants temporary regulatory shields to private capital, if the government’s utility
function entails fiscal reduction of former burdens and hence subjects regulatory
change to privatization revenues (Shleifer and Vishny 1994). As for privatized SOEs,
regulatory change is subject to time inconsistencies, depending on decisions to invest,
capitalize, and improving ‘effort.’ This corresponds to the theoretical model
developed before in this research.

Data on number and type of cases against monopoly conduct of privatized
firms are available for Argentina, Chile, Mexico, Peru, and partially for Brazil, and
Venezuela. However, such data were not used for the basic analysis of policy
sequence. They show, however, a basic level of oversight activity before, around, and
after privatizations in these economies. Nevertheless, the cases and their dynamics
are useful in the analysis of the telecommunication sectors in Mexico and Chile in the
last part of the present chapter.

It is assumed that the filing of cases represents a new behavior of both
dominant firms and mainly residual or entrant firms or suppliers to a privatized
market. However, type of resolutions or the legal or economic analysis of cases is not
sought in the present study. In principle, evaluation of the economics of legal cases
around market structure and conduct would account for other origins of capture in a
game of government institutions, and between them and privatized SOEs, as argued
by recent studies by Estache and Martimort (1997), Graham and Richardson (1997),
Lieberman, Nestor, and Desai (1997), Rowat, Malik, and Dakolias (1995), and Spiller (1990). These studies concentrate on either the political economy of regulatory change in emerging and transition economies, or game theory, but data cannot be produced to be subject to econometric analysis. Hence, the data set on proxies is useful, yet imperfectly so, for the present study. As presented in the theoretical part of this research, and in Figure #5, for the choice equations emanating from sequential conditional utility maximization, the sources of variables appear as follows:
### Figure #6

**Sources of Data for the Choice Model**

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEI-I</td>
<td>Share of SOEs investment in gross domestic investment (1980-91) and update from WB</td>
<td>&quot;</td>
</tr>
<tr>
<td>SBAL_GDP; SBALLAG</td>
<td>SOEs overall balances before transfers as a proportion of GDP (1980-91) used with lag</td>
<td>&quot;</td>
</tr>
<tr>
<td>SDET XD</td>
<td>Share of SOEs in total external debt (1980-91) and update</td>
<td>&quot;</td>
</tr>
<tr>
<td>FDIM</td>
<td>Foreign direct investment US millions</td>
<td>&quot;</td>
</tr>
<tr>
<td>SECR_CRG</td>
<td>Share of total loans to SOEs as percentage of total central government loans, calculated as row 12c/12a</td>
<td>&quot;</td>
</tr>
<tr>
<td>SUBS_G</td>
<td>Share of total nominal value of subsidies to non-state and provincial government as percentage of total central government expenditures and lending minus repayments</td>
<td>IMF (1996), <em>Government Finance Statistic Yearbook</em></td>
</tr>
<tr>
<td>DEF_G</td>
<td>Total central government deficit as percentage of GDP</td>
<td>&quot;</td>
</tr>
<tr>
<td>PRIV</td>
<td>Dummy for years of privatization program by country</td>
<td>Calculated from PRIVREV</td>
</tr>
<tr>
<td>PEAK</td>
<td>Statistical mode year of privatization proceeds or years if less than 5% change by year after positive proceeds</td>
<td>Calculated from PRIVREV</td>
</tr>
<tr>
<td>AMMEND</td>
<td>Dummy for years of amendments to civil and/or commercial law with effects on privatization choice, by country and year</td>
<td>From each country's official data from Supreme Court or Presidential office, online; and Rowat (1995)</td>
</tr>
<tr>
<td>COURTS</td>
<td>Dummy for existence (or not) of courts for domestic civil and commercial disputes</td>
<td>&quot;</td>
</tr>
<tr>
<td>REGCOMP</td>
<td>Dummy for yearly existence- operation of competition policy cases and agencies</td>
<td>&quot;</td>
</tr>
</tbody>
</table>
a. Analysis of Raw Data

The basic results from the pooled sample of seven countries, for 1985-1995 show the relative frequency of privatization and regulatory reform choices, as a basis for the further analysis. A first result is the counting from the entire tree as a sample of simultaneous observations, e.g., the existence or non-existence of the combined choices:

Figure #7

Privatization choice and sample

<table>
<thead>
<tr>
<th>Ref.</th>
<th>1</th>
<th>0</th>
<th>Total Obs. Reg.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23 (30)</td>
<td>14 (26)</td>
<td>37 (46)</td>
</tr>
<tr>
<td>Ref.</td>
<td>10 (5)</td>
<td>30 (26)</td>
<td>40 (31)</td>
</tr>
</tbody>
</table>

Around 30% of the total pooled sample shows privatization and regulatory change, whereas 39% shows that for the entire panel neither privatization nor regulatory reform had been implemented. Regulatory reform preceding or present without privatization is shown in 14 observations or 18%, whereas privatization without
reform is apparent in 10 cases, or 13%. In the above Figure #7, however, the joint frequency rather than the simple frequency is shown in parenthesis, i.e. values predicted by the model, given the partial correlation coefficient of all observations with no restrictions. 

In a first analysis of the panel of raw data, and assuming zero correlation between privatization, regulatory reform, and capital market liberalization, privatization revenues or proceeds are related, according to theory, with SOEs past performance, overall government fiscal conditions (deficit), as well as with SOEs scale represented by their total investment as percentage of gross domestic investment. From these pressure and size variables in the pooled data, simple regressions (with heteroskedasticity-corrected errors and covariance) are tried, even if results could be inconsistent, according to Maddala (1986). Models with regulatory change, capital market liberalization, and economic growth are shown as follows:
### Table #10
Linear Regression Results of Privatization Revenue of the Raw Data:
Pooled Sample 1985-1995 of seven LAC countries

DEPENDENT VARIABLE IS PRIV_REV
(Heteroskedasticity-consistent standard errors and covariance; t tests in parenthesis)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MODELS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>595.570</td>
<td>1151.556</td>
<td>1484.678</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.01)</td>
<td>(2.93)</td>
<td>(2.80)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>71.1321</td>
<td>55.513</td>
<td>54.8118</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.33)</td>
<td>(3.85)</td>
<td>(3.68)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-2.38)</td>
<td>(-2.68)</td>
<td>(-2.63)</td>
<td></td>
</tr>
<tr>
<td>SEI_I</td>
<td></td>
<td>-6.9153</td>
<td>-30.691</td>
<td>-29.961</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-2.43)</td>
<td>(-0.92)</td>
<td>(-0.89)</td>
<td></td>
</tr>
<tr>
<td>SBALLAG</td>
<td></td>
<td>1.0862</td>
<td>0.9979</td>
<td>0.9973</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.63)</td>
<td>(4.03)</td>
<td>(3.99)</td>
<td></td>
</tr>
<tr>
<td>FDIM</td>
<td></td>
<td>-1051.068</td>
<td>-1053.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REGCOMP</td>
<td></td>
<td>(-2.21)</td>
<td>(2.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDPG</td>
<td></td>
<td>8.434</td>
<td>(0.34)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. R²</td>
<td></td>
<td>.375</td>
<td>.696</td>
<td>.732</td>
<td>.727</td>
</tr>
<tr>
<td>F Stat.</td>
<td></td>
<td>11.795</td>
<td>31.891</td>
<td>30.534</td>
<td>24.978</td>
</tr>
<tr>
<td>DW</td>
<td></td>
<td>1.03</td>
<td>1.91</td>
<td>2.02</td>
<td>2.01</td>
</tr>
<tr>
<td>n (adjusted for endpoints)</td>
<td></td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
</tr>
</tbody>
</table>

b. Evaluation of the Linear Models

The initial linear models of the panel data show right signs for all 'pressure' variables, and are mostly significant at 1% (* shows t values at 5%; ° means not significant). As pressure increases for the overall deficit, it impels privatization efforts, expressed in monetary terms, but reduces proceeds. Its calculated elasticity for the above models ranges between -0.410 and -0.492. As for the SOEs 5-year
lagged operational balance as a variable of previous performance, the signs are as expected, the calculated elasticity is -0.103, but the variable is non-significant once capital market liberalization (FDIM) is included. As the overall government deficit is substituted for SOEs previous performance and FDIM, significance of the 5-year-lagged and accumulative SOEs’ balance SBALLAG (not shown) increases, as well as when GDPG is included.

To choose among nonnested models between SBALLAG and DEF_G in the basic model, the Cox statistic on nonnested preferred regressors (Greene 1993) is -1.43, in favor at 10% confidence of DEF_G against SBALLAG, so that the overall deficit DEF_G is the correct set of regressors. The same applies indirectly to log-likelihood ratio tests. This is in principle, not surprising, since the lagged balance of SOEs’ operations, not necessarily represented an increasing burden, as was an overall government deficit, hence proving the case of fiscally driven privatizations in the present model.

On the other hand, SOEs effort proxied by their investment share SEI_I is significant in three of the four basic models at less than 1%, as another indicator of operational performance of SOEs. The sign is also as expected in that a receding investment path of SOEs impelled authorities to privatize. Since the panel of data does not account for time effects, it cannot be tested whether or not privatization freed up resources for other non-privatized SOEs to increase investment. Additionally, nothing can be said whether in preparation for sale, SOEs showed temporal
investment increases. Such an exercise is pursued below in the analysis of telecommunications sectors between Chile and Mexico. The variable SEI_I (investment effort by SOEs), only shows a structural effect in the entire sample panel, with an elasticity of -0.492.

With respect to FDIM as a proxy for capital market liberalization, its inclusion is statistically very significant in these linear specifications, and its positive sign implies in general, larger privatization revenues for cases with economic opening (calculated elasticities ranged from .98 to 1.003). The level of non-government balance of payments assets ASSETM was not significant in the models. For regulatory change, various specifications of the variable were used, such as AMEND, and COURTS with non-significant results in the linear specification. The dummy for REGCOMP shows significant but a negative sign in the linear specification, which is an important result. However, one cannot conclude from the basic analysis that the policy choices are substitutes, as is generally presented for developed economies. What the sign implies is that privatization proceeds increased when regulatory reform, proxied by the dummy REGCOMP, was absent from the policy choices. The implication is precisely that conflicts of interest exist to postpone regulatory reform in favor of higher overall proceeds from privatization from the sample, which is the agency approach. Finally, economic growth GDPG, was not significant in this and other (not shown) linear models, implying that privatization decisions and proceeds were tried independently from the economic cycle, contrary to argumented cases in
Eastern Europe (Moran and Prosser 1994, Alexander and Skapska 1994). Other non-linear models, however, contradict the last finding.

Two other linear specifications were tried. A first one was to regress privatization proceeds in percentages with respect to each country's GDP, instead of PRIV_REV in total nominal $US. Such an exercise was performed in case the wave of privatizations made the linear specification unwarranted for the behavior of the dependent variable and changed in the structure of the error terms, because differences in proceeds showed low values in the beginning of the privatization efforts in LAC, and then revenues dramatically peaked, possibly generating a complex, non-linear equation. The other specification was to include a dummy variable for each country's peak year of privatization. The equations with percentages did not vary significantly from the models in monetary terms. For the inclusion of the peak year dummy, it was not statistically significant and even showed opposite signs, hence not representing the dynamics of privatization proceeds.

III. MULTIVARIATE PROBIT MODELS AND MODELS OF SEQUENCE

The linear models are useful in a panel data such as the one analyzed, as a starting point. However the subject matter under consideration, presents two characteristics: first, conditional probabilities of privatizing and deregulating (the term stands for regulatory change), in addition to being a sequential discrete choice program, show a censored distribution of privatization and regulatory efforts and
proceeds; secondly, such characteristics of the data make the linear model inconsistent and inefficient because the rho interaction cross-correlation, which relates the choice equations as not independent from each other, is different from zero as opposed to the linear case with independence. Moreover, a linear specification does not take account of the case here in which the error term is not likely to be independently and normally distributed (Lee 1976). In the case of combinations of privatization and deregulation, the choices would not be independent and the linear model would be downward biased with respect to estimates and prediction of the dependent variable (Heckman 1976; Lee 1976). Two alternatives exist: to use a probit model in a simultaneous multivariate analysis of the two steps of policies, and to test explicitly for models of sequential choice through switching and the Heckman two-step procedure in subsamples. The first treatment is applied in the present section.

Beyond the problem caused by the binary dependent variable, the choice of a probabilistic model poses its own challenges. The logit model is subject to potential violation of the cross-substitution between any pair of alternatives if alternatives are present or not (Hensher 1986), while the probit model is free from this problem. Sequence is tested around conditional probabilities of a ‘high level’ choice in the decision tree, subject to a ‘lower level’ one (Amemiya 1985; Maddala 1986). A problem might arise by the fact that parameter estimates of the lower level are efficient for the data subset, but the higher level estimates are consistent but not fully
efficient due to the use of estimates of estimates, as Hensher (1986) points out. However, little or no analysis exists on privatization and regulatory policy choices that use this technique. Given the theoretical specifications explaining the underlying econometric model, the utility functions to privatize and deregulate are then subject to pressure variables, proceeds, and economic opening vectors. They become logical vectors of variables in the present empirical exercises.

a. Bivariate Probit Models

Bivariate probit models to allocate explanatory power of common variables FDIM, and GDPG were first tried, a useful procedure when a two step model shares a set of explanatory variables in more than one equation (Greene 1993; Lee 1986). After the models for allocation of GDPG, and FDIM, the two step bivariate model shows a higher level PRIV variable, with explanatory variables DEF_G, and SBALLAG as the pressure vector, and FDIM, similar to the linear model and consistent with the theory developed earlier. The lower level choice REGCOMP is subject to explanatory variables of the privatization proceeds PRIVREV, PRIV_I and GDPG as scale and cycle variables, respectively, and cohorts COURTS and/or AMEND of the regulation dependent variable. The exercise is by itself important because it implies that economic opening through the variable FDIM, is a complement to privatization choice, but does not statistically affect the decision to deregulate in the panel of countries and years. This finding sheds new light on the
impact of capital market liberalization on countries' decisions to undergo structural change. For example, Moran and Prosser (1994) emphasize that by adopting an open economy view of privatization, Eastern European countries will be able to foster regulatory changes, mainly in the form of convergent capital market guarantees and modern commercial and civil law that are built from the financial market developments. From our basic results, it seems that capital market liberalization clearly affects the process of modernization in LAC countries, but its influence on the convergence towards modern legal codes found in other studies is unjustifiably optimistic. For example, Holden and Rajapatirana (1995), and WB (1997), emphasize that by opening up, economies in Eastern Europe and possibly LAC will generate a virtuous circle of privatization, capital market development, and modernization of institutions. McLindon (1996) shows a more conservative view of the impact of capital market liberalization, and concentrates on the process by which an increase in demand and supply of shares affects property rights and privatized SOEs efficiency.

Now, an ordered bivariate probit model for the entire sample is displayed in the next two Tables #11 and 12 for the choice to privatize. Then in Tables # 13 and 14 the bivariate probit models with sample selection of privatize, given regulatory change, and regulatory change, given privatize, are presented:
Table #11
Probit Model of Privatization Choice in LAC:
Entire Sample with Economic Opening and Regulatory Variables

PROBIT // Dependent Variable is PRIV
Sample: 175
Included observations: 74
Excluded observations: 1 after adjusting endpoints
Convergence achieved after 4 iterations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>T-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-1.739593</td>
<td>1.109910</td>
<td>-1.567328</td>
<td>0.1221</td>
</tr>
<tr>
<td>SBALLAG</td>
<td>0.111845</td>
<td>0.058333</td>
<td>1.917375</td>
<td>0.0598</td>
</tr>
<tr>
<td>DEF_G</td>
<td>-0.012963</td>
<td>0.020098</td>
<td>-0.644961</td>
<td>0.5213</td>
</tr>
<tr>
<td>FDIMS</td>
<td>2.46E-05</td>
<td>0.000148</td>
<td>1.655000</td>
<td>0.8691</td>
</tr>
<tr>
<td>REGCOMP</td>
<td>1.068279</td>
<td>0.611201</td>
<td>1.747835</td>
<td>0.0854</td>
</tr>
<tr>
<td>PRIVI_1</td>
<td>-0.029595</td>
<td>0.017853</td>
<td>-1.657666</td>
<td>0.1024</td>
</tr>
<tr>
<td>ASSETMS</td>
<td>-0.000109</td>
<td>9.27E-05</td>
<td>-1.176862</td>
<td>0.2437</td>
</tr>
<tr>
<td>COURTS</td>
<td>1.233247</td>
<td>0.687084</td>
<td>1.794098</td>
<td>0.0775</td>
</tr>
<tr>
<td>AMEND</td>
<td>1.043555</td>
<td>0.486250</td>
<td>2.146131</td>
<td>0.0358</td>
</tr>
<tr>
<td>PRIVREV</td>
<td>0.000808</td>
<td>0.000295</td>
<td>2.736482</td>
<td>0.0081</td>
</tr>
<tr>
<td>SECR_CRG</td>
<td>0.005280</td>
<td>0.002727</td>
<td>1.936150</td>
<td>0.0574</td>
</tr>
<tr>
<td>GDPG</td>
<td>0.100099</td>
<td>0.055634</td>
<td>1.799244</td>
<td>0.0768</td>
</tr>
</tbody>
</table>

Log likelihood: -25.17421
Obs with Dep=1: 33
Obs with Dep=0: 41

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean All</th>
<th>Mean D=1</th>
<th>Mean D=0</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>SBALLAG</td>
<td>2.700000</td>
<td>3.657576</td>
<td>1.929268</td>
</tr>
<tr>
<td>FDIMS</td>
<td>1123.745</td>
<td>1768.630</td>
<td>604.6902</td>
</tr>
<tr>
<td>REGCOMP</td>
<td>0.472973</td>
<td>0.696970</td>
<td>0.292683</td>
</tr>
<tr>
<td>PRIVI_1</td>
<td>67.78243</td>
<td>71.65455</td>
<td>64.66585</td>
</tr>
<tr>
<td>ASSETMS</td>
<td>-1290.899</td>
<td>-549.5909</td>
<td>-1887.561</td>
</tr>
<tr>
<td>COURTS</td>
<td>0.635135</td>
<td>0.878788</td>
<td>0.439024</td>
</tr>
<tr>
<td>AMEND</td>
<td>0.459459</td>
<td>0.666667</td>
<td>0.292683</td>
</tr>
<tr>
<td>PRIVREV</td>
<td>848.1486</td>
<td>1650.424</td>
<td>202.4146</td>
</tr>
<tr>
<td>SECR_CRG</td>
<td>45.80162</td>
<td>41.73455</td>
<td>49.07512</td>
</tr>
<tr>
<td>GDPG</td>
<td>3.072973</td>
<td>4.915152</td>
<td>1.590244</td>
</tr>
</tbody>
</table>
Table #12
Ordered Bivariate Probit Model of Privatization Choice (lower level) and Regulatory Choice (upper level) with No Restrictions

<table>
<thead>
<tr>
<th>VAR</th>
<th>Coefficient</th>
<th>T- Statistic (Z equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST 4 ESTIMATIONS ALLOCATED TO PRIV; NEXT 5 ESTIMATIONS ALLOCATED TO REGCOMP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PRIVATIZATION

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>T- Statistic (Z equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.4249</td>
<td>4.70</td>
</tr>
<tr>
<td>SBALLAG</td>
<td>0.5928E-02</td>
<td>0.58</td>
</tr>
<tr>
<td>DEF_G</td>
<td>0.9574E-02</td>
<td>2.81</td>
</tr>
<tr>
<td>FDIM</td>
<td>0.788E-04</td>
<td>2.51</td>
</tr>
</tbody>
</table>

### REGULATORY CHANGE

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>T- Statistic (Z equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.435</td>
<td>-2.81</td>
</tr>
<tr>
<td>PRIV_I</td>
<td>0.8749E-02</td>
<td>2.97</td>
</tr>
<tr>
<td>COURTS</td>
<td>0.5262</td>
<td>5.02</td>
</tr>
<tr>
<td>PRIVREV</td>
<td>-0.6941E-04</td>
<td>-2.54</td>
</tr>
<tr>
<td>GDPG</td>
<td>0.1399E-01</td>
<td>1.46</td>
</tr>
</tbody>
</table>

### FIML

OBS = 77; ITERATIONS = 15; Log Likelihood = -75.33

#### PRIV (lower level)

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>T- Statistic (Z equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.3133</td>
<td>-0.90</td>
</tr>
<tr>
<td>SBALLAG</td>
<td>0.2525E-01</td>
<td>0.64</td>
</tr>
<tr>
<td>DEF_G</td>
<td>0.2601E-01</td>
<td>1.98</td>
</tr>
<tr>
<td>FDIM</td>
<td>0.2825E-01</td>
<td>3.62</td>
</tr>
</tbody>
</table>

#### REGCOMP (upper level)

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>T- Statistic (Z equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-3.459</td>
<td>-4.81</td>
</tr>
<tr>
<td>PRIV_I</td>
<td>0.3412</td>
<td>3.09</td>
</tr>
<tr>
<td>COURTS</td>
<td>1.7172</td>
<td>4.17</td>
</tr>
<tr>
<td>PRIVREV</td>
<td>-0.2572E-02</td>
<td>1.64</td>
</tr>
<tr>
<td>GDPG</td>
<td>0.3432E-01</td>
<td>0.66</td>
</tr>
</tbody>
</table>

### RHO CORR

0.3298  1.24

#### PRIVATIZATION CHOICE

<table>
<thead>
<tr>
<th>PRIVATIZATION CHOICE</th>
<th>0</th>
<th>1</th>
<th>TOT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 (26)</td>
<td>10 (5)</td>
<td>40 (31)</td>
</tr>
</tbody>
</table>

#### REG. CHOICE

<table>
<thead>
<tr>
<th>REG. CHOICE</th>
<th>1</th>
<th>44 (42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14 (16)</td>
<td>23 (30)</td>
</tr>
</tbody>
</table>

TOT  33 (35)  77 (77)

147
Table #13  
Non- Restricted Ordered Bivariate Probit with Sample Selection:  
PRIV WHEN REGCOMP First Best Solution

FIML  
OBS = 75; ITERATIONS = 15; Log Likelihood = -50.589

<table>
<thead>
<tr>
<th>VAR</th>
<th>Coefficient</th>
<th>T- Statistic (Z equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-0.7872</td>
<td>1.94</td>
</tr>
<tr>
<td>FDIM</td>
<td>0.2463E-03</td>
<td>1.40</td>
</tr>
<tr>
<td>SBALLAG</td>
<td>0.5302E-02</td>
<td>0.09</td>
</tr>
<tr>
<td>GDPG</td>
<td>0.1304</td>
<td>1.97</td>
</tr>
<tr>
<td>REGCOMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-3.658</td>
<td>-5.35</td>
</tr>
<tr>
<td>PRIVI</td>
<td>0.1325E-03</td>
<td>0.53</td>
</tr>
<tr>
<td>COURTS</td>
<td>1.554</td>
<td>4.10</td>
</tr>
<tr>
<td>PRIVREV</td>
<td>-0.2913E-03</td>
<td>-1.61</td>
</tr>
<tr>
<td>RHO CORR</td>
<td>0.6843</td>
<td>1.34</td>
</tr>
</tbody>
</table>

PRIVATIZATION CHOICE

<table>
<thead>
<tr>
<th>PRIVATIZATION CHOICE</th>
<th>0</th>
<th>1</th>
<th>TOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 (6)</td>
<td>0 (0)</td>
<td>0 (6)</td>
</tr>
<tr>
<td>REG. CHOICE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12 (8)</td>
<td>23 (21)</td>
<td>35 (29)</td>
</tr>
<tr>
<td>TOT</td>
<td>12 (14)</td>
<td>23 (21)</td>
<td>35 (35)</td>
</tr>
</tbody>
</table>

148
Table #14  
Non- Restricted Ordered Bivariate Probit with Sample Selection:  
REGCOMP WHEN PRIV Second Best Solution

<table>
<thead>
<tr>
<th>VAR</th>
<th>Coefficient</th>
<th>T- Statistic (Z equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGCOMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-0.2082</td>
<td>-0.19</td>
</tr>
<tr>
<td>PRIVI_1</td>
<td>0.1494E-04</td>
<td>0.48</td>
</tr>
<tr>
<td>COURTS</td>
<td>0.7583</td>
<td>1.09</td>
</tr>
<tr>
<td>PRIVREV</td>
<td>-0.1843</td>
<td>-1.02</td>
</tr>
<tr>
<td>PRIV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-1.153</td>
<td>3.95</td>
</tr>
<tr>
<td>FDIM</td>
<td>0.4167E-03</td>
<td>4.29</td>
</tr>
<tr>
<td>SBALLAG</td>
<td>0.7582E-01</td>
<td>1.95</td>
</tr>
<tr>
<td>GDPG</td>
<td>0.1035</td>
<td>2.90</td>
</tr>
<tr>
<td>RHO CORR</td>
<td>0.1999</td>
<td>0.22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRIVATIZATION CHOICE</th>
<th>0</th>
<th>1</th>
<th>TOT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0 (4)</td>
<td>10 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REG. CHOICE</th>
<th>0 (4)</th>
<th>23 (23)</th>
<th>23 (27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOT</td>
<td>0 (8)</td>
<td>33 (25)</td>
<td>33 (33)</td>
</tr>
</tbody>
</table>
The first probit model assumes dependence of privatization choice on the choice of regulatory reform and where the theoretical argument of *ex ante* regulation change is inserted directly into the probit function. The program implies a reduced form, where each explanatory variable or vector is unique to the choice structural equations, similar to model (4) in Chapter 4. All variables are statistically significant except for DEF_G, and in this case, the variables FDIM and ASSETM which represent economic opening. The implication in the fixed effects choice to privatize is that it was implemented in LAC economies of the sample, irrespective of economic opening. For the SOEs and governments’ cumulative performance, now SBALLAG is significant at around 5% and of positive sign. The reasoning is that financial (and operational) performance of SOEs in LAC cases showed surpluses as a condition to the privatization decision, although proceeds depended more directly on the overall government deficit.

Privatization’s revenues, now as an explanatory variable in Table #11, show a significant positive sign in the decision to privatize. Hence a complex relationship among proceeds, SOEs previous performance, and overall government deficits, is explained in the probit model. As for the regulation dummy variables, all show positive signs and are significant, implying the argumented complementarity of these policies in LAC countries, in the cases and years when they appear as explanatory variables. A new variable for overall SOEs loans as percentage of government expenses was included and significant for the decision to privatize (variable
Finally, private investment efforts PRIVI_I shows a counterintuitive negative sign but is only significant at 10% in the model.

This model implies that privatization, given regulatory reform and capital market liberalization, was implemented irrespective of the change in the participation of private sector’s investment. Also, that private investment shares vary across countries and periods of privatization, hence showing large variations, as is described in Chapter 3. Some countries, like Brazil and Peru, faced an upsurge of private investment on the year of privatization and the following year, whereas others, Mexico being a case in point, faced variable private investment shares after privatization begun, and only show marked changes in PRIVI_I three or more years after privatization.

Turning to Table #12, it shows the ordered bivariate model for privatization choice and then regulatory change in the panel of data. The model not only improves the significance of the explanatory variables, but clearly shows how privatization decisions (lower level) have depended on the overall government deficit, and economic opening through the FDIM variable, whereas regulatory choice (upper level) depended significantly on the existence of COURTS and now on private investment effort.

For ordered regulatory reform, it implies that markets with high investment effort impel authorities to develop and update regulatory oversight mechanisms, ceteris paribus, or that private sector growth works as a trigger for regulatory effort, a
similar result than a proposition by Rowat (1995). Additionally, courts as a common
ground for dispute resolutions and arbitrage are a precondition of the implementation
of regulatory reforms, as presented in Chapter 3, and emphasized by Rowat (1995)
and by Spiller (1990). Argentina, Chile and Venezuela are cases in the panel where
courts exist for the entire sample, while Mexico and Brazil show courts for dispute
resolution only in recent years of the sample. It is difficult however, to extract more
information from the dummy variables of regulatory change, such as the institutional
efficiency or degree of independence of regulatory decisions. Such analysis is
presented in the telecommunications case below.

The ‘upper level’ REGCOMP variable, even if subject to the problem of
estimates of estimates, is well explained by the aforementioned variables in the game
of sequence. REGCOMP as a second step depends on variables critical for “catching
up” if the second best sequence is present. Finally, the intercorrelation coefficient \( \rho \)
shows a value of 0.33, but with little significance in the model, giving some credence
to the model with no restrictions.

Turning now to the bivariate probit models with selection, a non-random
selection is applied to the FIML estimation. Two models are produced in Tables #13
and 14. The first one is of privatization choice, once regulatory reform is present (the
first best theoretical case). The second model is of regulatory choice, once
privatization is present (the second best scenario with agency problems). The log-
likelihood of both models entails the sums of the cross probabilities of
PRIV*REGCOMP, PRIV*NOTREGCOMP, NOTPRIV in the first model, and
REGCOMP*PRIV, REGCOMP*NOTPRIV, and NOTREGCOMP, in the second.
The two specifications with selection are statistically different at close to 5%
significance, if evaluated around the test of the log-likelihood ratios. This implies
that for LAC economies of the sample, statistical differences are evidenced for cases
that followed privatization—regulatory reform, and those that followed regulatory
reform—privatization.

In the first best case, privatization choice in the LAC sample shows that
proceeds relate negatively to the decision to deregulate in the lower level, an expected
outcome for LAC economies with agency problems between authorities and
privatized SOEs, as presented in the theory. Hence, even in the first best case, there
are games of government principals seeking to maximize proceeds if fiscally driven,
against private agents seeking to maintain regulatory shields or, at least, no regulatory
change. Also, the existence of courts is a precondition for the choice deregulate.
Then privatization choice is explained significantly by GDPG and the degree of
international capital market liberalization, but not on SBALLAG. An important
outcome of the model is an increasing level of endogeneity of the cyclical variable of
economic growth, and the prevalence of non-significance from cumulative
operational performance of SOEs before privatization (but rather on overall
government fiscal deficit).
The first best case applied to the panel of countries and years, shows that economic opening is key for privatization choices, privatization decisions are implemented when economies grow, somewhat endogenizing privatization policies, and institutions such as courts positively influence decisions to deregulate *ex ante*. Table #13 also shows that regulatory reform is inversely related to privatization proceeds, which implies that even in the first best case, agency problems occur and can be modeled.

Now, Table #14 shows the second best scenario of deregulate once privatization choices have been selected. The lower level estimation is the privatization decision, which significantly depends now on the cumulative SOEs performance SBALLAG, degree of economic opening, and is endogenous with respect to economic growth. The upper level regulatory reform choice presents the correct signs but becomes little explained by the COURTS and PRIVREV variables, while the growth of the private sector’s investment is insignificant.

In contrast with the first best case, when privatization is pursued without regulatory reform, it becomes more endogenous on the economic cycle, and direct SOE performance. Arguments by policy makers and international advisors in favor of across-the-board reform, irrespective of the economic cycle, would then be questioned if no regulatory reform is implemented *ex ante*. In other words, the second best model is characterized by relatively more endogenity on the cycle, and
less structural trend in regulatory reform in the panel of main LAC economies and for
the period 1985-1995.

b. The Tobit Model of Switching and Privatization Revenues

Privatization Revenue is a censored variable with zeroes in the lower tail of its
distribution in the cumulative model of privatization-regulatory reform choices.
Hence it is subject to Tobit models of various types. If privatization and regulatory
change are two levels of a decision tree with selection, as presented above, then a
special Tobit model has been defined by Amemiya (1985) and others (Heckman
1976; Lee 1976, 1986; Lee, Maddala, and Trost 1980; Maddala 1986), as a third step,
or what Amemiya calls Tobit 2, Tobit 4, and Tobit 5 models. Invoking Equation 6 in
Chapter 4, the procedure is done in two steps, with a bivariate probit estimation first
for the binary set of variables and equations, and then the correlated censored
estimation of PRIVREV. If the bivariate choice program is taken as one step or a
reduced form, hence implying a multinomial reduced form or univariate case of
privatization-deregulation independence of explanatory variables, then the case is one
of Tobit 2, or a two step binary-censored program (Amemiya 1985). A Tobit 2 model
directly assumes only two steps: a first one is the univariate choice with the binary
dependent variable, and the second step is presented for the censored part. However,
if as was modeled above, the multivariate probit models are explicitly a sequence with
no univariate reduced form, then the case is one similar to a Tobit 4 or 5 (three levels

155
in two steps). A model of switching with the Heckman procedure is then presented.

Let the proposed model be called modified Tobit 4, because under Amemiya's
taxonomy he assumes only one binary partition in modeling, and one or more
censored partitions. Tables #15 and 16 present the results to complete the present
analysis. A selection rule is applied to how determinants of PRIVREV behave when
both PRIV and REGCOMP are present—a case denoted by \{1,1\}, and the case when
they are absent or \{0,0\}, hence making the censored part take a two-partitioned
sample (See procedures in Limdep; Econometric Software Inc. 1995).
Table #15
Tobit Model of Privatization Revenue; selection rule for priv, reg = \{1,1\}

<table>
<thead>
<tr>
<th>VAR</th>
<th>COEFFICIENT</th>
<th>T-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.2556</td>
<td>3.56</td>
</tr>
<tr>
<td>SBALLAG</td>
<td>0.1879E-01</td>
<td>1.97</td>
</tr>
<tr>
<td>FDIM</td>
<td>0.1106E-03</td>
<td>3.61</td>
</tr>
<tr>
<td>C</td>
<td>-0.3143</td>
<td>-1.61</td>
</tr>
<tr>
<td>COURTS</td>
<td>0.4815</td>
<td>4.59</td>
</tr>
<tr>
<td>PRIVI_I</td>
<td>0.7169E-02</td>
<td>2.39</td>
</tr>
</tbody>
</table>

**FIML ESTIMATES OF PRIVREV**

Observations: 77  
Iterations: 12  
Log Likelihood: -81.506

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIV (lower level)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-0.7596</td>
<td>-3.00</td>
</tr>
<tr>
<td>SBALLAG</td>
<td>0.5648E-01</td>
<td>1.83</td>
</tr>
<tr>
<td>FDIM</td>
<td>0.3872E-03</td>
<td>5.49</td>
</tr>
<tr>
<td>REGCOMP (upper level)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-2.754</td>
<td>-3.80</td>
</tr>
<tr>
<td>COURTS</td>
<td>1.395</td>
<td>3.42</td>
</tr>
<tr>
<td>PRIVI_I</td>
<td>0.2537E-01</td>
<td>2.42</td>
</tr>
<tr>
<td>RHO CORR.</td>
<td>0.371</td>
<td>1.57</td>
</tr>
</tbody>
</table>

**PRIVREV SELECTION EQUATION WITH \{1,1\}**

N = 23, df = 17  
R-squared = 0.1498  
Adj. R-squared = -0.1003  
Estimated correlation with selection equation A = 0.4701  
Estimated correlation with selection equation B = -0.3148

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>355.71</td>
<td>0.15</td>
</tr>
<tr>
<td>FDIM</td>
<td>0.2524</td>
<td>0.98</td>
</tr>
<tr>
<td>DEF_G</td>
<td>12.993</td>
<td>0.34</td>
</tr>
<tr>
<td>GDPG</td>
<td>36.172</td>
<td>0.45</td>
</tr>
<tr>
<td>LAMBDA-A</td>
<td>746.971</td>
<td>0.33</td>
</tr>
<tr>
<td>LAMBDA-B</td>
<td>-500.252</td>
<td>-0.35</td>
</tr>
</tbody>
</table>
The Tobit models are statistically consistent and in principle, efficient, as opposed to the linear specifications. The censored structure of the data panel, along with the choice of privatize and deregulate in various combinations, give rise to the above two models. Despite the fact that the censored models separate the panel into zero privatization revenues and positive ones for the Tobit specification, and cause degrees of freedom to dramatically worsen results in the present case, the coefficients of pressure DEF_G, and economic opening FDIM significantly determine privatization proceeds. It is not clear, however, if the improvement in consistency and efficient estimation is preferable to inconsistent linear models that use the entire data set of the panel (Hensher 1996; Douglas, Conway, and Ferrier 1995). Under the presence of both privatization and regulatory change, determinants of each choice make them sound estimates in the FIML first step, but do not necessarily determine
privatization proceeds if censored. As for the cases of absence of the two choice
\{0,0\}, proceeds in the censored PRIVREV depend clearly on FDIM, and with less
significance, on DEF_G, coinciding with the rest of the models.

As a conclusion to the present section, the models prove the research
hypotheses. First, privatization and regulatory reform in LAC economies of the
panel, are modeled when problems of agency exist between expected proceeds of
privatization, in turn dependent on fiscally driven policies, even under the first best
scenario. Secondly, it is also shown how privatization choices are endogenous with
respect to the economic cycle, when regulatory reform is not accomplished \textit{ex ante}
privatizations in the LAC cases. Moreover, when the Tobit censored model is applied
to the panel of data, privatization proceeds do not statistically depend on past
performance of SOEs but mainly on the degree of capital market liberalization.
Third, capital market liberalization as expressed by the flows of foreign investment, is
proven to be of key importance in both the linear and non-linear models with a
positive sign. FDIM is a statistically relevant variable in all models, as a complement
to the choices of privatization- regulatory change, but operates through the
privatization rather than regulatory reform equations. Next, the sequence of policies
is also modeled both in the bivariate probit set of results and the Tobit model, where
privatization once regulatory reform is in place, depends on pressure variables of the
overall government and is somewhat independent of the economic cycle as the
marginal elasticities in the models show. In contrast, when regulatory change is
implemented after privatization, policy choices become more endogenous, a finding with clear implications to international advisors. The hypothesis of complementarity between regulatory reform and privatization, is also proven for the panel of LAC countries, as is shown in the bivariate models with independence, as well as in the models of sequence. Finally, the results show how privatization decisions are implemented by pressure, scale, and economic liberalization variables, but when private investment efforts work to negatively affect privatization revenues or proceeds, if regulation variables are absent, as opposed to the case where they are present. This clearly proves the time inconsistency of a game of sequence of privatization and regulatory shield (non-deregulation).

IV. THE CASE OF TELECOMMUNICATIONS SECTORS IN CHILE AND MEXICO

A final research hypothesis cannot be proven with the analyses of the former section. That is the analysis of the dynamics between privatized SOEs with market power, and the regulatory agencies and their set of decisions. In order to come to grips with the case of internal and allocative efficiency results, it is necessary to evaluate the interface between the framer and the sectoral or company agent. For this exercise, a different data set, at the sectoral-company level, has been used for the telecommunications sector in two countries. Chile implemented its telecommunications privatization once capital markets were developed and regulatory
mechanisms were in place at the time of privatization, whereas Mexico followed privatization of its telecommunications sector with no adjustment in its capital market or its regulations on entry conditions. The data set is produced by the International Telecommunications Union data base, for the same period between 1985-1995 (ITU 1997).

In analyzing incentive regulations, Laffont and Tirole (1993) establish that the power of incentives of regulatory contracts affect the rent-seeking behavior of the regulated economic entities. High power incentives promote price reduction, investment and cost effort, quantity produced, and quality in the market, but also leave informational rents to the regulated firm. In contrast, low powered incentives do not favor firm’s effort but possibly will reduce informational rents accrued to the firm. A trade-off then exists between framer and regulated company as to what type of rent should be allocated.

In the case of privatized SOEs with market power, not only regulation on price or rate of return is important, but also the intertemporal treatment of entry conditions as a disciplining factor in the market. When a market is small or when it shows a dominant firm/first-mover characteristic, regulatory contracts are imperfect. Moreover, a certain regulation is insufficient to generate incentives for internal and allocative efficiency, and solve the informational rents problem, hence calling for a set of complementary regulations. In LAC economies, a problem with regulations is then not only its argued ineffectiveness, but the gaps prevalent across incentives to the
market. Even more pressing, theories of regulation assume that in establishing incentives, the government frame is a unified body of decision-making, has a clear objective function, and that it is not a source of inefficiency. Institutions are then irrelevant in theory.

However, transactions costs exist not only because markets in LAC and other emerging economies are small to exert market discipline, but also because regulators participate in contract renegotiations (with high administrative and informational costs), are subject to capture by dominant firms under regulations, and are not traditionally accountable before consumers or even the legislative powers, as it is now the case in developed countries. Moreover, institutional development to face market conduct around the wave of privatizations is uneven or lacks know-how, independence of decisions, and budgetary autonomy. Such an environment is even more complicated if one accounts for transactions costs of multiple principals, as emphasized by Spiller (1990), and Baron and Besanko (1992) within the New Regulatory Economics literature.

The present section analyzes how regulatory processes have developed in Chile and Mexico, two of the main LAC economies. They differ in that in the first case, the central government during the seventies implemented a broad institutional and regulatory reform, preceding its second privatization wave, whereas in the latter, no such strategy was planned. Then an evaluation of how transactions costs of
regulating privatized SOEs in telecommunications is done, and a model of performance variables of this sector compares the differences in regulatory approach.

As for the telecommunications sector, the process of regulation is a complex one. The main reason is that the sector has emerged as one with multi-applications and multi-technology, and where the traditional viewpoint of natural monopoly has been eroding. Indeed, regulation of telecommunications SOEs had focused on the wire-based telephony and the network providing point-to-point communications. Other segments were emerging in the eighties, and a system of multi-carrier services with no limitations on market access either for infrastructure or services has replaced the concept of natural monopoly. Regulators had then to design regulatory policies that promoted competition across technologies, some integration of the various segments, and piecing out of services and accounting methods to reduce cross subsidization by leading firms (OECD 1993, 1997).

The lessons from introducing competition in telecommunications have shown that market restructuring, redefinition, and the elimination of entry barriers is a process where regulators require a transition period to attain competitive markets. For this reason, time inconsistencies, contract renegotiation, and credible commitments of framers versus firms give rise to transactions costs and deviations from internal or allocative efficiency. Hence, the institutional and procedural setting of regulations is important, and extends beyond the existence of a regulatory agency with powers (the REGCOMP variable), to amendments to constitutional, commercial,
or civil laws (AMEND), and agencies to solve disputes and adjudicate rights (the COURTS variable). For example, courts exist in Chile for dispute resolutions, but the total budget assigned to them by the central government is less than 1%. For Mexico, it is higher but concentrated in police matters, not in economic cases (Manriquez-Reyes 1995). Regarding the so called autonomy of the respective oversight commissions, Chile distinguishes between an oversight agency or Comisión Preventiva and a resolution commission, and uses a well developed system of regional courts for adjudication. In Mexico, no such separation exists at the three levels. However, cases of illegal conduct on entry conditions in Chile’s recent history, have involved simple price discrimination or exclusive dealing, whereas in Mexico, recent cases have focused on more complex matters of predation. This only testifies to the complicated dynamics of regulatory change in Chile and Mexico, realities that cannot be accounted for by binary variables for econometric models.

a. Chile’s Reform

According to Hachette and Lüders (1992), privatization and regulatory reform in Chile faced two waves, each ending with recessions in 1975 and in 1982-83. In the beginning of the eighties many privatized SOEs became under state control when their market activity was reduced and the financial sector collapsed. Some privatized SOEs from the seventies had been sold with little or no recourse to either a transparent process and legal changes. However, Chile’s constitution was amended in
1980 to establish a ban on the Central Bank's loan positions toward the central government and SOEs. In 1978, interest subsidies and credit quotas for social priority sectors were dismantled. Even earlier in 1974, international trade tariffs had been lowered and the number of exceptional tariff rates narrowed in order to promote trade and financial competition. Foreign capital was promoted by the establishment of dollar accounts and opening up to international financial institutions.

The domestic financial market developed throughout the mid-seventies and the early eighties, mainly through the liberalization of interest rates; through permits for new local banks and international financial intermediaries, and by establishing limits on stockholding to the financial institutions. Private capital formation and private indebtedness was rising in Chile when the economic crisis of 1982 surged. Moreover, privatized banking institutions, even when they were subject to stockholder limits, had grown in their property positions in many manufacturing and service conglomerates. In other words, the oversight mechanisms to curb cross subsidization and equity control were imperfect and during the 1982 crisis, were highly criticized (Harberger 1985). Immediately after 1983, government authorities implemented new policies on the exchange rate mechanism, debt restructuring, further trade liberalization, and a promotion of the private sector as an engine for economic growth. Financial regulations were implemented on foreign funds and domestic liquidity in the financial sector (the so called Chapter 18, and 19 of the Exchange Law). In 1982, the reform on pension funds and the liberalization-
privatization of their capitalization through the stock market, was also implemented and proved important for further privatizations and regulatory reforms. Main SOEs were listed in the Chilean stock market by the mid eighties.

On the direct institutional role in privatization and deregulation in Chile, the Corporación de Fomento de la Producción or CORFO, was the state entity in charge of budgeting, oversight of operational plans, and then deciding on the privatization programs. However, Hachette and Lüders stress that during the Pinochet regime, and in order to concentrate political power in the executive at the same time that private capital growth was promoted, regulations towards public sector monopolies and private dominant firms was undertaken by general laws, hence minimizing opportunism by both discretionary regulators and regulated firms. Moreover, regulations of market conditions included revisions of take-over laws, bankruptcy regulations, and mergers and acquisitions, to generate internal market discipline, as is argued by Vickers and Yarrow (1995). Key actors are CORFO, the Pension Fund System (Sistema de Previsión Social), CORA (Corporación de Reforma Agraria) in charge of disputes and adjudication of rights on physical property, Underwriters (Comisión Clasificadora de Riesgos) for all privatizations and pension funds, the Stock Market authority (Superintendencia de Valores y Seguros), and the new Regulatory Body for telecommunications. It is not altogether clear that commitment and powers of the framer were entirely granted for the process of privatization in the eighties, although Chile’s regulatory agency has independent operation and full power.
for arbitration, although, according to Rowat (1995), no regulations have been issued under the competition law which dates from 1973. Besides the telecommunications agency, the commission for anticompetitive practices oversees predatory conduct and mergers and acquisitions. Additionally, Chile’s courts operate by regions and adjudicate all commercial and civil disputes.

Privatization of telecommunications in Chile entails CTC in local services and owner of the basic grid infrastructure, in 1987 and 1990, and of ENTEL in 1988-89, the long distance provider. CTC was acquired by Bond Corporation (53%), bought in 1990 by the Spanish Telefónica. The operation of privatization of CTC raised US$375 million. On the other hand, ENTEL raised US$121 million to CORFO, which gradually sold most of the shares. Telefónica, which had bought 20% of ENTEL, was asked to withdraw because of its CTC stake. Shares went to COINTEL of Argentina, and around 18% stake has been bought in 1995 by the Italian Stet for US$278 million. Chile’s market for telecommunications is very dynamic and open to cross-service competition since 1995, but at privatization, it showed a penetration rate of only 4.6 lines per 100 population (Ramamurti 1996, ITU 1997). The antimonopoly commissions have the power to audit market conduct of the telecommunications players, and resolutions on predation and market access supersede other laws and government agencies in charge of the sector. However, joint efforts to coordinate among oversight institutions, even if present, have given no resolutions. In addition,
regulatory commissions have been overwhelmed with irrelevant cases, as pointed out by Paredes (1995).

b. Mexico’s Reform

Privatization in Mexico was implemented later than Chile’s experience. After the 1982 debt crisis, the administration of Pres. De la Madrid began liquidation of SOEs and the government sought the development of the private domestic and foreign sector as the engine for growth. International agencies pushed for privatization and a reform of government institutions, as stressed by Ramamurti (1996), but reform of the State was broader and more profound than the international pressure. In 1987 privatization of the airlines began, but only in 1990 the Unidad de Desincorporación de Entidades Paraestatales, dependent on the Treasury was formed. It was in charge of the Mexican massive privatization program. It has been argued that regulatory institutions lagged in the process of privatization. However, some events would somewhat ease such an argument. Indeed, fiscal and budgetary reform, financial reform, and trade and foreign investment liberalization were part of the overall reforms implemented in 1985 with Mexico’s adherence to GATT, and the new industrial and trade promotion plans. Constitutional and procedural legal amendments became substantial during the Salinas administration (1988-94), when privatizations peaked. NAFTA played an important role in fostering institutional development around dispute resolution, intellectual property rights, antidumping
cases, foreign investment liberalization and 'national treatment' of enterprises, and labor, product and other administrative procedural standards. Regarding the parastatal sector, TELMEX was restructured before and during the privatization process, by application of labor laws, financial reform, and fiscal treatment to the privatizing monopoly. As in the case of Chile with CORFO, the very process of privatization preparation was centralized in the Unidad de Desincorporación. On its part, the Ministry of Communications (SCT) was in charge of the sectoral policy, whereas there were no oversight agencies before the privatization process was undertaken (The Competition Commission CFC in charge of predatory conduct and mergers and aquisitions was formed in 1993; and the Federal Telecommunications Commission COFETEL is even more recent in Mexico’s experience with oversight regulators).

As opposed to Chile, where competition was generated before and at the time of privatization of CTC and ENTEL, the Mexican TELMEX was a legal monopoly, that integrated infrastructure, local and long distance telephony, cellular services, and controlled twenty-four subsidiaries of the sector, including cable manufacturing, construction, and commercialization (Petrazzini 1994). The legal concession decree that privatized TELMEX in 1990, established as a contract, a characterized treatment to the privatized entity, including price regulations, quality and standards, interconexion measures, average investment growth, public communications, and a time frame of market competition. Such is a case of agency characteristics of

169
asymmetrical information and commitment problems presented above. TELMEX privatization raised US$ 7.8 billion between 1990 and 1994, a privatization ten times larger with respect to proceeds than the one generated in Chile. Privatization accounted for 55.1% of ownership with full private rights to the company’s administration. Shares in the international capital markets have increased private property.

When TELMEX was a state monopoly, the regulator SCT was responsible for the one company. Nowadays, multiple regulators and potential entrants have changed the market setting. A question is how do the two sectors compare regarding the regulatory and competitive structure. The antimonopoly commission CFC oversees all cases of predatory conduct and, different from Chile, depends on a very detailed law. The commission’s activities since its creation in 1993 have concentrated on complex cases, including privatized SOEs, but where evaluation and adjudication are somewhat conditioned by privatization decrees, and greatly reduce its powers. A telecommunications regulator COFETEL has been created in 1995, but limits of the breadth of regulatory competence, have not been clearly delineated for each agency.

c. Empirical Evidence of Privatization and Regulatory Reform: Telecommunications

Whereas Chile privatized its telecommunication sector in 1986-87, once the state monopoly was divested into two regional and services companies (CTC and Entel Chile), and privatization was implemented after regulatory reform, Mexico
privatized its SOE, TELMEX in 1990-91, maintaining a regulatory shield on the privatized enterprise. Regulatory reforms related to market conduct and exercise of market power were then implemented afterwards. Performance variables of the two cases can be divided into ones related to ‘effort,’ as was stressed in the theoretical treatment, and variables of ‘commitment.’ The two sets respond to agency problems in the imperfection of contracts to be applied in the Chilean an Mexican cases. A first group of variables relates to overall performance with respect to the market, or teledensity. It is argued that a regulated privatized SOE would respond by holding up the concession, hence not increasing the number of main lines per population. However, agency matters will impel the company to increase penetration if the regulatory shield will eventually end and the company sees the shift as a credible commitment by the framer. In the overall performance, another variable, waiting list reduction of mainlines, is also useful as a proxy for the so called ‘effort’ by the privatized SOE. If privatization is done once regulatory reform is well set, the time response should be comparatively shorter and more profound than in a case where the regulatory shield remains in place.

A third variable showing total investment by the privatized SOEs, would imply the hypothesis that under effective regulatory reform, the company will invest relatively higher than a legal monopoly that captures the framer, *ceteris paribus*, at the same time that would extend with little jumps after privatization. However, investment as a modernization effort and market commitment variable would show a
positive response again if the temporary shield is taken as credible (The assumption is made that the level of modernization between Chilean and Mexican SOEs was similar before and at the time of privatization).

A final variable has to do with internal efficiency. Net worth, that shows how shareholders value and perceive the privatized SOE, was not easily obtained, for which a rather gross measure of total revenue was used. If cost adjustments are assumed to take time and are directly related to investment in expansions, then revenues could be useful, even if they over-represent performance. It is assumed that if privatization is attained once regulatory reform is set and market and conduct oversight agencies are strong (clear rules and ability to settle disputes), revenues, as proxy for profitability or net worth, would decline or not increase (as rent seeking behavior would be curbed). In contrast, for the case of privatization with no regulatory reform, revenues would not reflect a decline or adjustment.

With these tentative hypotheses, a set of models with leads and lags were run, under unrestricted distributed lag econometric methods, where response functions are directly tested for structural change after privatization choice was implemented. A Vector Autorregression model (VAR), directly tests for the response in each dependent variable, to changes in its structural determinants and a time variable that takes the leads and lags. Other structural variables can also present a lead or lag structure. Then the VAR model tests for the time response of the dependent variable in each run, called impulse VAR decomposition, and also the cointegration of
variable responses under various assumptions (Greene 1993). The model pursued here only tests for the impulse response of each dependent variable in each country, under the heading of effort, and commitment.

The sample between 1985-1996 was used with data for Chile and Mexico from the International Telecommunication Union data base (ITU 1997). F- tests and the Akaike's information criterion were used to check for the time responses determined (Greene 1993). The following Table shows the $t$ values and the statistical significance of the responses for both cases, since the quantitative impact is of less importance:
Table #17
Comparative Analysis of Response to Privatization:
Telecommunications in Chile and Mexico (lag structure of responses by variable)

<table>
<thead>
<tr>
<th>PERIOD/ VARIABLE</th>
<th>t-3</th>
<th>t-2</th>
<th>t-1</th>
<th>t-0</th>
<th>t+1</th>
<th>t+2</th>
<th>t+3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFFORT VARIABLES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TELEDENSITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>2.48**</td>
<td>1.92</td>
<td>1.64</td>
<td>1.63</td>
<td>1.24</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mexico</td>
<td>2.96**</td>
<td>4.82**</td>
<td>6.07**</td>
<td>5.58**</td>
<td>4.97**</td>
<td>3.72**</td>
<td>3.10*</td>
</tr>
<tr>
<td>WAITING LINES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>-0.69</td>
<td>-0.24</td>
<td>-0.16</td>
<td>0.24</td>
<td>0.46</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mexico</td>
<td>-2.82*</td>
<td>-6.78**</td>
<td>-5.11**</td>
<td>2.78*</td>
<td>-1.86</td>
<td>-0.94</td>
<td>-0.56</td>
</tr>
<tr>
<td><strong>COMMITMENT VARIABLES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INVESTMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>1.97</td>
<td>4.28**</td>
<td>2.87**</td>
<td>2.18*</td>
<td>1.45</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.18</td>
<td>1.08</td>
<td>3.13**</td>
<td>4.41**</td>
<td>4.39**</td>
<td>3.59**</td>
<td>2.12</td>
</tr>
<tr>
<td>REVENUES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>2.17</td>
<td>2.33*</td>
<td>2.08</td>
<td>1.86</td>
<td>1.17</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mexico</td>
<td>1.96</td>
<td>3.82**</td>
<td>5.74**</td>
<td>7.42**</td>
<td>6.02**</td>
<td>3.53**</td>
<td>2.32*</td>
</tr>
</tbody>
</table>

Note: t values. * significant at 5%; ** significant at 1%

For the first two rows in the Table, teledensity in Chile as a response to privatization, once regulatory reform was in place in that case, shows a positive significant increase with a lag of three years, whereas for Mexico, teledensity increased significantly around the year of privatization, but extends in the lead variable before privatization was implemented. The significant increase could be taken as the impact of the regulatory shield for TELMEX, implying that a credible
shield might work as an effective trigger for teledensity, or that the shield effect was stronger than possible rent-seeking behavior of the legal privatized SOE with monopoly power.

As for the results of effort, represented by waiting list of mainline reduction, Chile shows no significant correlation of the variable with respect to privatization choice, whereas Mexico's behavior is markedly different, as significant values show after privatization, with one and two period lags. One rationalization is that Chile's telecommunication companies showed a low percentage level of waiting lines before, during, and after privatization, given that competition and regulatory reform were implemented before, whereas Mexico again implied the use of the regulatory shield along with compulsory concession clauses that significantly reduced waiting lines. It is however unexpected that the response is highly significant only in two years, implying tentatively that improving behavior is short lived. Now, investment response shows to be highly significant in Chile immediately after privatization (two period lags), whereas in Mexico the company significantly invested even before privatization (two period leads), at the same time that the variable was only significant in the year of privatization and the following year, again showing a short lived effort with respect to the Chilean case of market competition and regulatory oversight. Finally, the proxy for internal efficiency and performance (revenue response) shows significant in Chile with a 5-period lag (not shown), but significant at the 5% level in only the two year lag. In contrast, the Mexican sector/company
shows significant revenue increases even two years before privatization, and after
privatization, with a two year lag.

V. IMPLICATIONS AND CONCLUSION

Under second best solution where privatization in LAC economies has been
implemented with little recourse of regulatory reform, and where regulatory changes
have been applied pragmatically after privatization, problems of agency persist, at the
same time that reputation of governments with respect to liberalization commitment is
reduced. However, imperfectness of contracts generated by a reversed sequence of
policies is more complex than traditionally aduced. Indeed, it is assumed that
privatization in developing countries is similar to developed examples because
economic inquiry assumes that regulatory institutions are well set, or that agency
problems remain as if no privatization efforts were applied. For example, traditional
theory assumes that regulation changes and privatization are substitutes rather than
complements, as it is assumed that regulation is exogenous. In the present analysis,
the last model shows that agency problems and asymmetric information are part of
LAC structural reforms. However, regulatory shield and analysis of agencies seem to
make sense when applied to cases such as telecommunications in Chile and Mexico,
two economies with diverse degrees of regulatory change and sequence. Under
information asymmetries and agency problems, privatized SOEs could result in
overperformance, even under second best, but where short-lived ‘effort’ is apparent.
It is also implied, that rent seeking behavior plays against credible temporary regulatory shields, again with short-lived effort in the sectoral analysis.

Finally, the above analysis suggests that in order for governments embarking in structural change policies such as privatization, to make regulatory policies sustainable, games of overperformance and underperformance would be reduced if the first best sequence is applied to new cases. In situations already experienced of privatization-deregulation reversals, credible commitment to policy changes after a temporary regulatory shield might converge towards economic efficiency, as established by traditional theory, but where imperfection of contracts raised by less than optimal regulations towards market behavior, are an important element of the privatization dynamics. Regulatory oversight agencies in Chile and Mexico differ. In the former case, cross control between a preventive and the resolution commissions exist, but the type of cases around simple price discrimination, consumer protection, and others have overwhelmed the agencies, hence making them inactive around dominant firm problems, entry conditions, disputes on imperfect contracts that need a framer, and oversight of a disciplined market. In Mexico, the respective commission is recent and operates after privatization. CFC comprises prevention, resolution, and even adjudication. These facts shed new light on the dynamics and powers of a regulatory framer of telecommunications, as one of the key sectors subject to privatization in LAC. The last analysis takes account of the different leads and lags of economic conduct and performance of the two sectors in Chile and Mexico.
CHAPTER 6
GENERAL CONCLUSIONS, IMPLICATIONS, AND
FUTURE DIRECTIONS

I. INTRODUCTION

Privatization, regulatory reform, and trade and capital market liberalization have been at the forefront of economic discussion across countries pressed by the challenge to modernize, to shift the impetus of economic growth towards private agents, and to increase government reputation as a committed partner for growth, both in the domestic and international arenas. Political and theoretical arguments have been internalized not only by governments in the developed economies, but also in transition economies of the Central and Eastern European region, and in Latin American and Caribbean (LAC) countries. In the analysis of the present research, a first salient feature was the earlier privatization and liberalization efforts of LAC economies than those in Eastern Europe. Moreover, most of LAC experiences with privatization were generated where forward looking governments emerged in the eighties. Political pressure after the debt crises of the early eighties came from international and multilateral institutions, but was also forming internally, by an increasing dissatisfaction with the functioning of State Owned Enterprises (SOEs),
pressing internal debt burdens, and divergent competitive positions of governments in the external and domestic fronts. The wave of privatizations was generally taken as one of many ways of taking main LAC economies to an international game of modernization signals. In the theoretical arena, main developments around institutional economics, international trade and finance, multinational business, and industrial organization redefined natural monopoly, many aspects of welfare-enhancing versus welfare-reducing growth in an open economy, and the role of regulators. However, the main thrust of policy making and theoretical development in the eighties made assumptions that maintained privatization, regulatory reform, and economic opening, as interrelated yet separate sets of theories and strategies.

From the three sets of policies, regulatory reform has proven to be a relatively more backward and problematic area, from which governments in the LAC region have to deal with rushed privatizations at the same time that performances of authorities and privatized SOEs could be unsatisfactory. A challenge exists to adjust the institutional, legal, and procedural regulations in a second best scenario. Moreover, some critics of privatizations in LAC have placed the emphasis of their criticism on the privatizing procedures, government myopic strategies, or the privatized SOEs with low "effort," but have failed to account for regulatory backwardness or second best. Problems in the imperfect nature of the privatization contracts have maintained transaction costs of doing business in a liberated
environment, unexpectedly high for new economic agents in those cases where regulatory adjustments were not implemented before and along privatizations.

Main problems have to do with these imperfections in a broad sense, for which moral hazard and, in general, agency problems, have to be integrated into models of privatization, deregulation, and even international trade and capital liberalization. On its part, trade and mainly capital market liberalization have been implemented as a separate policy. However, the present research proves how important capital market liberalization is to significantly improve the results of privatization. Indeed, those countries with foreign investment liberalization showed higher privatization efforts, and even significantly higher proceeds of privatization. However, international integration was not a sufficient condition toward regulatory change.

The three sets of modernization policies need to be analyzed as an interrelated model of decisions, but where the imperfections of new contracts between economic agents give rise to time inconsistency. The present research has tried to bring the three together in a consistent theory that, at the same time, is testable in modeling. Second best scenarios require an analysis of the dynamics in which agents interrelate and how performance between a framer principal and privatized SOEs agents move toward --or away from-- improving efficiency in countries such as those in LAC. In its basic motivation, the research was intended to understand the structure and part of the dynamics of privatization and regulatory reform in LAC economies. Because
international integration is of key importance for these economies, not only at present, but will remain a factor of desired economic development in the foreseeable future, the research also emphasized the way opening up through investment and capital liberalization affects privatization and regulatory reform. Indeed, privatization, regulatory reform, and international liberalization amount to an effort to recast economic constitutions, as a redesign of the rules of the game in the strategies to bring LAC economies toward more market-oriented policies, but where governments play a new role in reducing the transactions costs of doing business. In that respect, a project such as the present is relevant because it derives lessons for domestic policy-making, for international advice, and for the dynamics of businesses and regulatory agencies. The following conclusions emerge from the research project.

II. MAIN FINDINGS AND IMPLICATIONS

Privatizations in LAC were implemented during the decade of the eighties, when governments in the region accounted for around 12% of world privatizations and for which Latin America represents a relevant research laboratory. From low-value and small-sized privatizations in the mid eighties, privatizations moved towards large-value sectors with market power and externalities. For 1990, main sectors subject to privatization in LAC economies were telecommunications, with 25% of total proceeds; banking and the financial sector, with 23%; oil, mining, and other primary sectors, with 16%; steel and related manufactures, with 16%; and electricity
and gas, with 14% of total proceeds. Total calculated proceeds were US$ 3.2 billion between 1985-1990, and reached US$59 billion between 1990 and 1995, with a peak reached as a region in 1991. Some countries, like Chile, Jamaica, Mexico, implemented privatizations broadly, that represented between 5 and 12% of their economies. Others, such as Argentina and Venezuela, also began broad privatizations that encompassed main former legal public monopolies. Still others, such as Brazil only more recently began privatizations of main SOEs and entire sectors with market power and externalities. Expected proceeds for the foreseeable years will continue to be at the lead for world standards. From the analysis of main privatizations of SOEs in less than competitive markets, the testable hypotheses resulted in the following findings.

First, data for Argentina, Bolivia, Brazil, Mexico, Peru, and Venezuela, for the years prior and posterior to the privatization peak years, comprised 77 observations in the pooled data set. Even if the data are scarce and do not exist at present for most recent years (WB 1995), in addition to the fact that not all relevant variables are available, modeling is possible and findings were sound. For regulatory change in the sample of countries and years of analysis, proxies for the existence and experience of courts, of regulatory oversight agencies, of performance and conduct of privatized SOEs, and amendments to laws related to privatization and market conduct were used. Twenty three observations of the sample showed the existence of privatization and regulatory change policies, whereas privatization without regulatory change was
present in 10 observations; in 30 observations, privatization and regulatory reform had not been accomplished. The panel of the various clusters of policy choices was thus viable for econometric testing, using linear models of the pooled data, bivariate probit analyses of the two policy choices in various combinations (models with selection), a Tobit model for the analysis of privatization revenues or proceeds, with the combinations of choices in the tree of decisions, and time series models for a special study of the telecommunications sector. For the test of the sequence of policy choices of privatization and regulatory reform, the log-likelihood ratio test of models with the two sequence possibilities shows that they are structurally different, a first finding of the analysis. Moreover, qualitative choice modeling was viable for application in the privatization-regulatory reform sequence, a technique not generally used for the subject matter of this research (Amemiya 1981; Hensher 1986). In the bivariate probit model of sequence, explanatory variables for SOEs' performance, government debt, and capital market liberalization, were very significant in the first best case (ex ante regulatory change), but were less significant in the second best sequence.

More specifically, a second finding was that second best solutions of privatization without regulatory reform give rise to decisions to privatize dependent upon the so-called pressure variables: accumulated SOEs balances before privatization, and government deficit position, i.e. privatizations in LAC economies were fiscally driven, rather than dependent upon expectations of efficiency or private
investment. In choosing between overall deficits and SOEs 5-year lagged performance, a Cox statistic was applied to these variables and resulted in the preferred deficit variable, adding to the fiscal pressure for privatizations. The finding coincides with the concern of theory (Vickers and Yarrow 1995; WB 1995; Teichman 1995; Estache and Martimort 1997) and international policy advisors, that a more myopic reason to privatize jeopardizes efforts for economic structural change in LAC countries. Moreover, privatization without ex ante regulatory reform, was endogenous with respect to the economic cycle. The bivariate model with selection applied to the pooled data indeed shows that GDP growth is significant as a determinant of privatization decisions under the second best scenario. Such dependence had not been tested in a pooled data set such as the one used for the present study.

The opposite, where regulatory reform is present ex ante (the first best scenario), privatization is not significantly determined by the economic cycle. This result is in line with policy positions of international advisors, that privatization needs to be implemented irrespectively and for efficiency reasons (Caves and Christensen 1980; Edwards 1994; Galal, Jones, Tandon, and Vogelsang 1994). In the first best scenario, regulatory explanatory variables such as the existence of courts, and expected privatization revenue are significant to explain decisions to privatize. In both sets of models, the hypothesis that for LAC economies, privatization and regulatory reform are complements rather than substitutes, in opposition to what is
argued for developed countries, is proven by the significance and positive signs in all models. Hence, the hypothesis of complementarity is sufficiently demonstrated.

A third important result is the hypothesis that trade and capital market liberalization, once included in the models, induces privatization and could even trigger regulatory reform efforts by authorities in developing countries in LAC. Whereas trade liberalization, measured by trade dependency indices, was not significant as explanatory variable in the linear and bivariate models, capital market liberalization, expressed by foreign direct investment flows, was a significant determinant in the linear, bivariate, and Tobit models. Moreover, a Cox test to determine its explanatory power both to privatization and regulatory reform, showed that the FDI variable, estimated in nonnested bivariate models of choice, applied as a preferred regressor in the privatization choice, rather than the regulatory reform choice.

The sign was positive and statistically significant at 1% confidence levels in various models of privatization. The result is that economic opening will directly relate to privatization effort and will be complementary. Nevertheless, FDI is not a statistically significant for the regulatory reform choice, around entry conditions and market conduct. This finding coincides with a proposition by Weintraub (1997) of the effect of regional trade agreements upon institutional development in Mexico. It also coincides with Moran and Prosser (1994) who emphasize that through an open economy view of privatization, Eastern European economies will be able to foster
profound regulatory changes toward capitalistic institutions. However, it extends the above propositions to imply that capital and investment liberalization complement privatization choices in the testable models, but are insufficient to generate regulatory changes in LAC economies represented in the sample. Moreover, Estache and Mortimort (1997), McLindon (1996), and Rowat (1995), focus on the inefficiency of regulations to limit anticompetitive behavior, and stress that constitutional settings misaligned with modern competitive economies, hinder a broad regional reform in the regulatory environment. The present analysis on the effect of economic opening gives credence to FDI in its direct effect of privatization efforts, but implies that the challenge to upgrade the regulatory environment as a complement of policies, requires government efforts additional to other modernizing policies, which is coincident with a pessimistic view of regulatory reform in LAC by these authors.

To test the hypothesis of the existence of agency problems (moral hazard) under second best scenarios in the sequence of policies, the analysis finds the following statistically significant evidence. In the linear models applied to privatization proceeds, with and without economic opening, existence of regulatory reform on entry conditions and market conduct (proxied by REGCOMP), shows that its sign was negative, implying that privatization revenues increased when deregulation was absent from the policy choices. Conflicts of interest existed to postpone regulatory reforms in favor of higher overall proceeds from privatization. Now, in the bivariate models with selection, privatization with *ex ante* regulatory
change demonstrates that in such a case, privatization choice is dependent on financial and operational SOEs’ performance rather than the overall government deficit, but proceeds depend on the latter. This finding means that under a first best scenario, authorities take balances of SOEs for privatization decisions, but given informational asymmetries this does not necessarily reflect itself in proceeds. Hence asymmetries are proven to exist in both the decision to generate regulatory change (shields), as well as in determining proceeds by government principals. The same finding is presented in the Tobit models.

It is important to point out that agency problems exist even in the first best case. For the second best models where the sequence is reversed, the relationship is centered on regulatory reform *ex post*, which depends on the growth of private investment. This implies that institutional oversight agencies upgrade (through the proxy for changes), given private investment effort, or that investment impels creation or upgrade of oversight mechanisms. If regulatory variables are absent, private investment even affects privatization proceeds negatively, showing how contract imperfection affects results in the game between agents. Courts exist but are active in only a subset of countries, for which concealed information or concealed actions are not controlled for after privatization is implemented.

In order to directly analyze the time inconsistencies encountered in the game between a government principal offering temporary regulatory shields after privatization, and when regulatory reform on freer entry conditions is present at
privatization, the case study of telecommunications in Mexico and Chile shows the structure and complex dynamics of regulatory change in both countries. To test firms' "effort" under the two real cases, the autoregressive model shows that in Mexico under regulatory shield, the privatized SOE implemented high penetration effort, represented by teledensity, waiting time, and investment, but that such an effort was short-lived under the shield. For Chile, where privatization was accomplished when deregulation was present, investment is significant as result of competition and is significant for a relatively longer period than its Mexican counterpart. In Mexico, authorities preparing the sale, impelled the company to invest even before privatization. Revenues, on its part, are higher and positive in the Mexican case, implying relative capture by the privatized SOE, whereas in Chile, revenues without a shield have not increased and show higher variation, given competition. Overall, a set of variables proxying "effort," show time-response differences between Chile and Mexico. For another set of variables under the heading of "commitment," more capture is shown to exist in the Mexican relative to the Chilean telecommunications sector.

In the case study, a related analysis shed light on the creation and operation of oversight agencies in both countries. Additional to the creation of courts and propitious dispute resolution mechanisms in Chile during the seventies, the Mexican regulatory institutions act in the evaluation, adjudication, and even settlement of predatory conduct. However, it is shown that an evaluation of whether regulations
are strong or weak is a complex one. An account in the analysis for Chile presents
evidence that oversight agencies are burdened by many cases of consumer protection
and price discrimination, which could be solved by other government instances. For
Mexico, the respective competition commission has concentrated on predatory
conduct of more complex cases. Independence, autonomy, and capacity to settle
disputes and policies are complex characteristics of LAC economies, which is
addressed in this research. These have important implications for future
privatizations and economic opening not only in the region but also in other parts of
the world, as is stressed by Alexander and Skapska (1994), or by Martin and Parker
(1997).

All the hypotheses of the present research were proven. Implications are
varied for policy makers at the domestic and international level, as well as for
businesses trying to enter the privatization process. They would coincide with the
quest for economic opening and capital market liberalization in developing economies
with privatization policies. However, authorities and advisors in international
agencies should be cautioned that the much needed regulatory changes are not
evidenced by the pressure of economic opening. As Estache (1997), Holden and
Rajapatirana (1995), Lopez-de-Silanes (1997), McComb, Gruben, and Welch (1994),
and Spiller (1994), point out, special efforts are needed to even generate a framework
where regulatory change will be accomplished, under problems of multiple principals,
and where constitutional problems exist in the basic theory and implementation of
market conduct mechanisms, both internal such as arbitrage and court empowerment, and external in oversight agencies. The LAC context of privatization without regulations of high power character, needs to be internalized in policy making to generate conditions for regulatory and institutional improvement.

III. LIMITATIONS AND LINES FOR FUTURE RESEARCH

The research concentrated on macroeconomic variables affecting the decisions to privatize and to implement regulatory changes in a set of seven LAC economies. Given the new light shed by the method and approach, the study concentrated on policy choices and the dynamics of second best agency problems, but was not directed to focus on operational economic or financial performance of privatized SOEs in LAC in the time frame. Other studies have concentrated at the company level before and after privatization. Their data bases at such level are not entirely compatible with the general models and data generated in this research. Other limitations of the present study derive from the fact that only national privatizations were emphasized, of sectors in less than competitive markets, and where direct sale was the main method of privatization. Hence the research excludes from the analysis many aspects of the dynamics of the process undertaken by LAC governments such as preparation, valuation, and method of sale. Moreover, no account is taken on the effects of residual property rights exerted by central governments towards privatized SOEs as a substitute for lack of oversight mechanisms.
Another limitation of the present study exists in the direct treatment of regulatory reform, mainly around entry conditions. The literature on regulations has concentrated on rate of return, its limitations, and price-cap regulation. On directly evaluating effectiveness and power of regulatory oversight under changing conditions, emphasis has been placed in the relevant literature on problems of multiprincipals, and the legal and constitutional incompatibility of antimonopoly agencies in their independence or autonomy; and finally, on the instruments of regulation of market conduct against other regulations. In the present research, the complexity and dynamics of regulatory change were addressed, but no definitive method of evaluating regulatory change related to privatizations and internationalization in LAC economies emerged as a new theory from the study. A question remains if institutional change needs to be studied in the context of economic theory, as a reflection of the impact of regulatory change, so that the researcher has to concentrate on theoretical and empirical inquiry. Even under the limitations, the analysis of main privatization experiences shows that it is possible to directly address policy sequences and agency problems as a process in main Latin American economies, and derive lessons from the accounted evaluation of regulatory reform. In general, the main limitation of this study is in scope, for which various lines of future research could be derived. Some of the most salient ones are the following.
As a first line of future research, the analyst could generate broader and more compatible data. Specifically, the theory developed for the aduced optimal privatization choice, presented price variables of willingness to pay and sell, that could not be directly proxied in the empirical analysis by price data. In the same line of reasoning, data and approaches to regulatory agencies and their scope and power should prove to generate new avenues of research.

A second line of future research should concentrate on the price dynamics of privatization and regulatory reform of SOEs in emerging economies, both before privatization (signals and institutional or procedural determinants of prices) and after privatization (price cap regulation or market discipline of prices). This was not accomplished here. Moreover, considerations of transfer prices and two or multiple part tariffs and their effects, have received attention in the economics literature (Bös 1991, Laffont and Tirole 1993), not pursued in the present research. A related aspect not emphasized here was on the financial analysis of risk before, during, and after privatization, and how stock prices and capitalization are affected not only by the various methods of privatization, but also by the development of domestic and international capital markets around privatization. Such an approach has been pursued by analyzing company level data (Lopez-de-Silanes 1997), but has not focused on time inconsistencies. A question is whether rich data bases at the company level are complementary to analyses at a more aggregated level, a problem of robustness of conclusions.
Another line of research would use the evidence derived from the analyses produced here, to strategies by private companies in LAC and elsewhere to take part in the privatization market at the end of the century. Business policy approaches to privatization, both domestically and from multinationalized enterprises, have been produced in that literature (Ernst and Young 1994, Holden and Rajapatirana 1995), but are somewhat disintegrated from economic analysis. Additional to the well known business planning and competence analyses, a research line should concentrate on the network relationship between firms and government principals, when contract imperfections are prevalent, as was stressed throughout the present research. Finally, a pressing theoretical and political inquiry has not been resolved on how to approach regulatory change in countries seeking international integration, and where extra-national rule making plays a key role. Start-up regulatory positions, contextual and procedural impediments to modernize regulations and institutions, and then whether competition policy should converge internationally because it affects transactions costs for businesses, has not been addressed and resolved in policy making, for which a broad number of studies should emerge, as is evidenced by the thrust of theory and empirical tests followed here. The present research stressed the regulatory setting and its imperfectness. Even though some recent literature is addressing regulation convergence (Graham and Richardson 1997; Phlips 1995; Spiller 1990), and has received attention in multilateral forums, more research and proposals are needed on aspects on which the present research has intended to shed new light. On its part, the
present analysis emphasized the nature of regulations before and after privatizations, and quantified proxies for three aspects of regulations. A future research program should score or even present qualifications of regulatory change in the LAC economies analyzed, and the national independence of regulatory policies around entry conditions.

Overall, the study intends to illuminate the economics and policy disciplines with theory, methods, and a new viewpoint of privatization, regulatory reform, and economic opening. The researcher, advisor, and even business decision maker, will find key variables to consider when making sense of the setting and dynamics, and even strategic moves, in privatization waves in LAC economies.
### A. Data for the Model with Panel Observations:
(Countries, Years, and Variable Code)

<table>
<thead>
<tr>
<th>country</th>
<th>year</th>
<th>priv</th>
<th>def_g</th>
<th>secr_crg</th>
<th>subs_g</th>
<th>privi_l</th>
<th>se_gdp</th>
<th>sei_l</th>
<th>sbal_gdp</th>
</tr>
</thead>
<tbody>
<tr>
<td>arg</td>
<td>1985</td>
<td>0</td>
<td>-26.8</td>
<td>4.81</td>
<td>8.5</td>
<td>73.2</td>
<td>4.7</td>
<td>10</td>
<td>-4.9</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>0</td>
<td>-11.46</td>
<td>7.2</td>
<td>21.6</td>
<td>76.7</td>
<td>5.6</td>
<td>9.2</td>
<td>-3.1</td>
</tr>
<tr>
<td></td>
<td>1987</td>
<td>0</td>
<td>-16.08</td>
<td>5.33</td>
<td>23</td>
<td>67.2</td>
<td>6.2</td>
<td>10.4</td>
<td>-4.9</td>
</tr>
<tr>
<td></td>
<td>1988</td>
<td>0</td>
<td>-16.87</td>
<td>5.9</td>
<td>37</td>
<td>71.6</td>
<td>6</td>
<td>9.1</td>
<td>-3.5</td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>0</td>
<td>-3.74</td>
<td>2.84</td>
<td>24.8</td>
<td>74.7</td>
<td>4.9</td>
<td>10.3</td>
<td>-1.9</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>1</td>
<td>-3.18</td>
<td>6.57</td>
<td>32.4</td>
<td>78.8</td>
<td>3.5</td>
<td>7.1</td>
<td>-0.7</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>1</td>
<td>0.17</td>
<td>4.51</td>
<td>22.9</td>
<td>85.6</td>
<td>2.2</td>
<td>4.8</td>
<td>-1.3</td>
</tr>
<tr>
<td></td>
<td>1992</td>
<td>1</td>
<td>4.55</td>
<td>7.45</td>
<td></td>
<td>88.7</td>
<td></td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1993</td>
<td>1</td>
<td>4.8</td>
<td>8.87</td>
<td></td>
<td>87.9</td>
<td></td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1994</td>
<td>1</td>
<td>3</td>
<td>4.62</td>
<td></td>
<td>85</td>
<td></td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>1</td>
<td>-1.2</td>
<td>3.15</td>
<td></td>
<td>86</td>
<td></td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>bol</td>
<td>1985</td>
<td>0</td>
<td>-5.4</td>
<td>31</td>
<td>31.7</td>
<td>51</td>
<td>15.3</td>
<td>14.3</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>0</td>
<td>-0.54</td>
<td>28.5</td>
<td>28.5</td>
<td>49.4</td>
<td>15.6</td>
<td>23.2</td>
<td>8.9</td>
</tr>
<tr>
<td></td>
<td>1987</td>
<td>0</td>
<td>6.01</td>
<td>24.1</td>
<td>11.7</td>
<td>39.3</td>
<td>11.4</td>
<td>31.7</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>1988</td>
<td>0</td>
<td>-5.21</td>
<td>22.2</td>
<td>27.3</td>
<td>34</td>
<td>12.5</td>
<td>28.5</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>0</td>
<td>-9.51</td>
<td>26.4</td>
<td></td>
<td>33.6</td>
<td>14.7</td>
<td>26.3</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>0</td>
<td>-10.34</td>
<td>25.93</td>
<td></td>
<td>32.5</td>
<td>14.4</td>
<td>24.7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>0</td>
<td>-0.42</td>
<td>24.3</td>
<td></td>
<td>33.7</td>
<td>15</td>
<td>25</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td>1992</td>
<td>0</td>
<td>-9.87</td>
<td>24.74</td>
<td></td>
<td>32.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1993</td>
<td>0</td>
<td>-8.36</td>
<td>17.32</td>
<td></td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1994</td>
<td>1</td>
<td>-14.56</td>
<td>17.79</td>
<td></td>
<td>38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>1</td>
<td>-11.26</td>
<td>2.6</td>
<td></td>
<td>39.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bra</td>
<td>1985</td>
<td>0</td>
<td>-29.56</td>
<td>240</td>
<td>50.4</td>
<td>71.5</td>
<td>6.1</td>
<td>24</td>
<td>-2.4</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>0</td>
<td>-37.08</td>
<td>46.68</td>
<td></td>
<td>72.2</td>
<td>7.7</td>
<td>18</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>1987</td>
<td>0</td>
<td>-25.84</td>
<td>74.77</td>
<td></td>
<td>72.6</td>
<td>9.1</td>
<td>17</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>1988</td>
<td>0</td>
<td>-42.91</td>
<td>4.39</td>
<td></td>
<td>73.6</td>
<td>9.1</td>
<td>18</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>0</td>
<td>-41.38</td>
<td></td>
<td></td>
<td>78.5</td>
<td>8.1</td>
<td>13</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>0</td>
<td>-15.59</td>
<td>11.1</td>
<td></td>
<td>76.7</td>
<td>7.7</td>
<td>14</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>0</td>
<td>-1.62</td>
<td>10.36</td>
<td></td>
<td>73.4</td>
<td>9.7</td>
<td>11</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>1992</td>
<td>0</td>
<td>-12.31</td>
<td>11.76</td>
<td></td>
<td>71.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1993</td>
<td>0</td>
<td>-23.53</td>
<td>15</td>
<td></td>
<td>76.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1994</td>
<td>1</td>
<td>-15</td>
<td>22.81</td>
<td></td>
<td>78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>1</td>
<td>-14</td>
<td>19.7</td>
<td></td>
<td>76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chi</td>
<td>1985</td>
<td>0</td>
<td>-7.47</td>
<td>4.63</td>
<td>14.9</td>
<td>83.6</td>
<td>17</td>
<td>30.6</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>0</td>
<td>-3.3</td>
<td>4.88</td>
<td>17.4</td>
<td>79.5</td>
<td>15.5</td>
<td>32.2</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td>1987</td>
<td>1</td>
<td>8.07</td>
<td>5.22</td>
<td>19.4</td>
<td>67.3</td>
<td>14.6</td>
<td>21.9</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td>1988</td>
<td>1</td>
<td>4.79</td>
<td>2.34</td>
<td>25.4</td>
<td>70.7</td>
<td>14.5</td>
<td>19.4</td>
<td>11</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.22</td>
<td>4.03</td>
<td>7.39</td>
<td>9.33</td>
<td>8.1</td>
<td>13.13</td>
<td>2.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.7</td>
<td>10.79</td>
<td>7.86</td>
<td>4.35</td>
<td>3.46</td>
<td>8.1</td>
<td>2.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16.8</td>
<td>21.3</td>
<td>20</td>
<td>5.09</td>
<td>5.09</td>
<td>80.8</td>
<td>80.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>79.1</td>
<td>83.5</td>
<td>80.6</td>
<td>80.8</td>
<td>80.8</td>
<td>80.8</td>
<td>80.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12.7</td>
<td>12</td>
<td>8</td>
<td>9.1</td>
<td>9.1</td>
<td>9.1</td>
<td>9.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12.8</td>
<td>9.4</td>
<td>9.1</td>
<td>9.6</td>
<td>9.6</td>
<td>9.6</td>
<td>9.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.9</td>
<td>10.2</td>
<td>9.6</td>
<td>9.6</td>
<td>9.6</td>
<td>9.6</td>
<td>9.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-33.72</td>
<td>-45.15</td>
<td>-43.77</td>
<td>-37.42</td>
<td>-25.06</td>
<td>-15.97</td>
<td>24.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>32.98</td>
<td>29.56</td>
<td>10.4</td>
<td>17.67</td>
<td>15.47</td>
<td>10.86</td>
<td>5.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>12.8</td>
<td>13.3</td>
<td>4.4</td>
<td>7.2</td>
<td>11.9</td>
<td>9.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65.2</td>
<td>66.4</td>
<td>73.8</td>
<td>75.1</td>
<td>73.5</td>
<td>73.8</td>
<td>76.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13.9</td>
<td>12</td>
<td>11.3</td>
<td>10.8</td>
<td>10.4</td>
<td>11.3</td>
<td>8.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19.8</td>
<td>18.2</td>
<td>12.2</td>
<td>14.3</td>
<td>13</td>
<td>12.2</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.9</td>
<td>0.8</td>
<td>3.3</td>
<td>2.4</td>
<td>2.1</td>
<td>3.3</td>
<td>3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>92.9</td>
<td>79.73</td>
<td>25.46</td>
<td>278.18</td>
<td>326.98</td>
<td>1900</td>
<td>200.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14.7</td>
<td>17.8</td>
<td>14.8</td>
<td>11.5</td>
<td>16.5</td>
<td>9.3</td>
<td>13.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>66.2</td>
<td>71.1</td>
<td>75.1</td>
<td>78.5</td>
<td>78.9</td>
<td>83</td>
<td>82.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.9</td>
<td>8</td>
<td>3.4</td>
<td>4.1</td>
<td>4.1</td>
<td>5.4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18.1</td>
<td>10.6</td>
<td>8</td>
<td>7.8</td>
<td>7.8</td>
<td>6.8</td>
<td>4.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.8</td>
<td>2.4</td>
<td>-2.5</td>
<td>-0.3</td>
<td>-0.3</td>
<td>2.6</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22.93</td>
<td>-8.4</td>
<td>-20.38</td>
<td>-19.94</td>
<td>-0.43</td>
<td>3.88</td>
<td>1.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.94</td>
<td>8.38</td>
<td>6.63</td>
<td>2.15</td>
<td>3.41</td>
<td>1.19</td>
<td>12.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24.5</td>
<td>31.1</td>
<td>30.8</td>
<td>27.7</td>
<td>15.7</td>
<td>22.3</td>
<td>27.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>61.7</td>
<td>53.4</td>
<td>57.2</td>
<td>54.1</td>
<td>46.9</td>
<td>34.7</td>
<td>45.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>17.1</td>
<td>19</td>
<td>17.7</td>
<td>26.7</td>
<td>31.1</td>
<td>26.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>33.6</td>
<td>43.4</td>
<td>32.3</td>
<td>30.3</td>
<td>76.5</td>
<td>89.3</td>
<td>49.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.1</td>
<td>2.7</td>
<td>7.2</td>
<td>5.3</td>
<td>12.2</td>
<td>17.3</td>
<td>13.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>46</td>
<td>41</td>
<td>43</td>
<td>43</td>
<td>43</td>
<td>43</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### A. DATA FOR THE MODEL WITH PANEL OBSERVATIONS:
(Countries, Years, and Variable Code cont’d)

<table>
<thead>
<tr>
<th>country</th>
<th>year</th>
<th>sdet_xd</th>
<th>fdim$</th>
<th>assetm$</th>
<th>gdpg</th>
<th>privrev</th>
<th>regcomp</th>
<th>courts</th>
<th>amend</th>
</tr>
</thead>
<tbody>
<tr>
<td>arg</td>
<td>1985</td>
<td>9.4</td>
<td>919</td>
<td>-1795</td>
<td>-4.4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>8.1</td>
<td>574</td>
<td>-66</td>
<td>5.6</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1987</td>
<td>8.1</td>
<td>-19</td>
<td>-313</td>
<td>2.5</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1988</td>
<td>4.4</td>
<td>1147</td>
<td>-514</td>
<td>-1.9</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>5.3</td>
<td>1028</td>
<td>-6145</td>
<td>-6.2</td>
<td>21</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>8</td>
<td>1836</td>
<td>661</td>
<td>0.1</td>
<td>3841</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>10.2</td>
<td>2439</td>
<td>426</td>
<td>8.9</td>
<td>2091</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1992</td>
<td>2555</td>
<td>4038</td>
<td>8.7</td>
<td>5567</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1993</td>
<td>3482</td>
<td>399</td>
<td>7.1</td>
<td>4732</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1994</td>
<td>603</td>
<td>2853</td>
<td>10.4</td>
<td>890</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>1319</td>
<td>-10458</td>
<td>-3.6</td>
<td>1326</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>bol</td>
<td>1985</td>
<td>11.7</td>
<td>10</td>
<td>-12.6</td>
<td>-0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>11</td>
<td>10</td>
<td>124.8</td>
<td>-2.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1987</td>
<td>9.9</td>
<td>36.4</td>
<td>-83.2</td>
<td>4.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1988</td>
<td>10.1</td>
<td>-12</td>
<td>-59.4</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>9.5</td>
<td>-25.4</td>
<td>-118.7</td>
<td>2.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>11</td>
<td>26.1</td>
<td>-32.1</td>
<td>4.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>11.5</td>
<td>22.8</td>
<td>-16.3</td>
<td>3.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1992</td>
<td>33.4</td>
<td>-13</td>
<td>2.7</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1993</td>
<td>27</td>
<td>-2.5</td>
<td>4</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1994</td>
<td>22.2</td>
<td>5</td>
<td>4.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>23.6</td>
<td>-3.5</td>
<td>3.7</td>
<td>615</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>bra</td>
<td>1985</td>
<td>31.4</td>
<td>1267</td>
<td>-3423</td>
<td>7.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>35.2</td>
<td>177</td>
<td>-3960</td>
<td>7.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1987</td>
<td>32.1</td>
<td>1087</td>
<td>-7499</td>
<td>3.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1988</td>
<td>27.5</td>
<td>2794</td>
<td>-8778</td>
<td>-0.1</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>11.1</td>
<td>744</td>
<td>-4210</td>
<td>3.3</td>
<td>90</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>11</td>
<td>324</td>
<td>-2864</td>
<td>-4.4</td>
<td>44</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>12.1</td>
<td>89</td>
<td>-3140</td>
<td>0.9</td>
<td>1726</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1992</td>
<td>1924</td>
<td>-99</td>
<td>-0.9</td>
<td>2564</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1993</td>
<td>801</td>
<td>-2696</td>
<td>4.2</td>
<td>2718</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1994</td>
<td>2035</td>
<td>-4368</td>
<td>5.7</td>
<td>1697</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>3475</td>
<td>-1783</td>
<td>4.3</td>
<td>387</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>chi</td>
<td>1985</td>
<td>13.7</td>
<td>114</td>
<td>-416</td>
<td>2.5</td>
<td>10.3</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1986</td>
<td>12.9</td>
<td>116</td>
<td>-360</td>
<td>5.6</td>
<td>231.7</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1987</td>
<td>11.4</td>
<td>230</td>
<td>-424</td>
<td>5.7</td>
<td>312.6</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1988</td>
<td>10.2</td>
<td>141</td>
<td>121</td>
<td>7.4</td>
<td>560</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1989</td>
<td>8.4</td>
<td>184</td>
<td>868</td>
<td>10</td>
<td>234.4</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>8.2</td>
<td>492</td>
<td>2263</td>
<td>2.1</td>
<td>98</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1991</td>
<td>7.7</td>
<td>400</td>
<td>1298</td>
<td>6.6</td>
<td>364</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1992</td>
<td>321</td>
<td>-273</td>
<td>7.2</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Year</td>
<td>Mex</td>
<td>Per</td>
<td>Ven</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>375</td>
<td>-459</td>
<td>6.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>848</td>
<td>-163</td>
<td>4.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>1008</td>
<td>-292</td>
<td>8.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>17.6</td>
<td>491</td>
<td>-13006</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>9.8</td>
<td>1160</td>
<td>-8263</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>9.6</td>
<td>1796</td>
<td>-6980</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>9</td>
<td>635</td>
<td>-4444</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>8.9</td>
<td>2684</td>
<td>-1879</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>8.8</td>
<td>2548</td>
<td>959</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>9.1</td>
<td>4742</td>
<td>-395</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>8.9</td>
<td>4393</td>
<td>-435</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>4389</td>
<td>-3038</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>10972</td>
<td>-5057</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>6963</td>
<td>-5296</td>
<td>-6.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>17.1</td>
<td>1</td>
<td>-152</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>17.6</td>
<td>22</td>
<td>-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>17.2</td>
<td>32</td>
<td>-112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>16.8</td>
<td>26</td>
<td>-319</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>15.8</td>
<td>59</td>
<td>-154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>15.1</td>
<td>41</td>
<td>-432</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>14.9</td>
<td>-7</td>
<td>-289</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>136</td>
<td>318</td>
<td>-1.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>670</td>
<td>269</td>
<td>6.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>2860</td>
<td>-263</td>
<td>13.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>1895</td>
<td>-538</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>7.7</td>
<td>55</td>
<td>-170</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>7</td>
<td>-444</td>
<td>-44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>6.7</td>
<td>-16</td>
<td>183</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>7.8</td>
<td>21</td>
<td>-962</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>8.2</td>
<td>77</td>
<td>-4166</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>10.2</td>
<td>96</td>
<td>-824</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>7.9</td>
<td>1769</td>
<td>71</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>545</td>
<td>1344</td>
<td>6.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>287</td>
<td>125</td>
<td>2.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>-2.8</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>2.2</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. DATA FOR THE AUTOREGRESSIVE TIME IMPACT MODEL OF CHILE AND MEXICO  
(Countries, Years, and Variable Code)

<table>
<thead>
<tr>
<th>obs</th>
<th>CHITELEDE</th>
<th>MEXTELEDE</th>
<th>CHIWAITING</th>
<th>MEXWAITING</th>
<th>CHIREVUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>537089.0</td>
<td>3704432.</td>
<td>180863.0</td>
<td>1317720.</td>
<td>254530.3</td>
</tr>
<tr>
<td>1986</td>
<td>557987.0</td>
<td>3899168.</td>
<td>228420.0</td>
<td>756800.0</td>
<td>271082.8</td>
</tr>
<tr>
<td>1987</td>
<td>580795.0</td>
<td>4122681.</td>
<td>232090.0</td>
<td>769972.0</td>
<td>300810.8</td>
</tr>
<tr>
<td>1988</td>
<td>625466.0</td>
<td>4387436.</td>
<td>236469.0</td>
<td>863061.0</td>
<td>368553.5</td>
</tr>
<tr>
<td>1989</td>
<td>645863.0</td>
<td>4847166.</td>
<td>283919.0</td>
<td>1058211.</td>
<td>561894.5</td>
</tr>
<tr>
<td>1990</td>
<td>860075.0</td>
<td>5354500.</td>
<td>310267.0</td>
<td>1043744.</td>
<td>573953.0</td>
</tr>
<tr>
<td>1991</td>
<td>1056027.</td>
<td>6024800.</td>
<td>240559.0</td>
<td>1036371.</td>
<td>704944.8</td>
</tr>
<tr>
<td>1992</td>
<td>1283048.</td>
<td>6753652.</td>
<td>313736.0</td>
<td>662533.0</td>
<td>918635.0</td>
</tr>
<tr>
<td>1993</td>
<td>1520291.</td>
<td>7620880.</td>
<td>198462.0</td>
<td>281274.0</td>
<td>1162869.</td>
</tr>
<tr>
<td>1994</td>
<td>1545074.</td>
<td>8492521.</td>
<td>116928.0</td>
<td>196850.0</td>
<td>1203502.</td>
</tr>
<tr>
<td>1995</td>
<td>1884762.</td>
<td>8801030.</td>
<td>52198.00</td>
<td>176500.0</td>
<td>1360453.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MEXREVUS</th>
<th>CHIUS</th>
<th>MEXIUS</th>
<th>CHITEL100</th>
<th>MEXTEL100</th>
</tr>
</thead>
<tbody>
<tr>
<td>1026899.</td>
<td>18810.40</td>
<td>485871.6</td>
<td>4.0000000</td>
<td>5.0000000</td>
</tr>
<tr>
<td>922823.6</td>
<td>71528.50</td>
<td>410323.5</td>
<td>5.0000000</td>
<td>5.0000000</td>
</tr>
<tr>
<td>1151861.</td>
<td>34502.10</td>
<td>505941.2</td>
<td>5.0000000</td>
<td>5.0000000</td>
</tr>
<tr>
<td>1499431.</td>
<td>97954.40</td>
<td>598184.8</td>
<td>5.0000000</td>
<td>6.0000000</td>
</tr>
<tr>
<td>2131610.</td>
<td>364482.2</td>
<td>792451.0</td>
<td>5.0000000</td>
<td>6.0000000</td>
</tr>
<tr>
<td>3805232.</td>
<td>402114.8</td>
<td>1397457.</td>
<td>7.0000000</td>
<td>7.0000000</td>
</tr>
<tr>
<td>4993068.</td>
<td>321674.9</td>
<td>1871966.</td>
<td>8.0000000</td>
<td>7.0000000</td>
</tr>
<tr>
<td>6184846.</td>
<td>428945.3</td>
<td>3054393.</td>
<td>9.0000000</td>
<td>8.0000000</td>
</tr>
<tr>
<td>7897772.</td>
<td>517504.5</td>
<td>2682623.</td>
<td>11.000000</td>
<td>9.0000000</td>
</tr>
<tr>
<td>8619980.</td>
<td>361823.2</td>
<td>2493912.</td>
<td>11.000000</td>
<td>9.0000000</td>
</tr>
<tr>
<td>6509111.</td>
<td>653640.8</td>
<td>1106877.</td>
<td>13.000000</td>
<td>10.000000</td>
</tr>
</tbody>
</table>
MODEL OF CHILE AND MEXICO
(continued)

<table>
<thead>
<tr>
<th>obs</th>
<th>CHITRAFFIC</th>
<th>MEXTRAFFIC</th>
<th>CHIGDP</th>
<th>MEXGDP</th>
<th>CHIPOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>13585.00</td>
<td>144000.0</td>
<td>16463.40</td>
<td>184404.7</td>
<td>12076.00</td>
</tr>
<tr>
<td>1986</td>
<td>17086.00</td>
<td>178000.0</td>
<td>17722.50</td>
<td>128741.8</td>
<td>12284.30</td>
</tr>
<tr>
<td>1987</td>
<td>22154.00</td>
<td>197000.0</td>
<td>20694.70</td>
<td>140174.2</td>
<td>12496.20</td>
</tr>
<tr>
<td>1988</td>
<td>27271.00</td>
<td>211000.0</td>
<td>24153.40</td>
<td>173220.4</td>
<td>12711.70</td>
</tr>
<tr>
<td>1989</td>
<td>36266.00</td>
<td>315000.0</td>
<td>28204.50</td>
<td>208289.3</td>
<td>12931.00</td>
</tr>
<tr>
<td>1990</td>
<td>46293.00</td>
<td>402115.0</td>
<td>30401.50</td>
<td>247284.7</td>
<td>13154.00</td>
</tr>
<tr>
<td>1991</td>
<td>58284.00</td>
<td>321675.0</td>
<td>34411.40</td>
<td>290374.2</td>
<td>13368.50</td>
</tr>
<tr>
<td>1992</td>
<td>60438.00</td>
<td>428945.0</td>
<td>42749.70</td>
<td>334864.1</td>
<td>13586.50</td>
</tr>
<tr>
<td>1993</td>
<td>61702.00</td>
<td>517505.0</td>
<td>45659.50</td>
<td>403274.5</td>
<td>13822.00</td>
</tr>
<tr>
<td>1994</td>
<td>73500.00</td>
<td>361823.0</td>
<td>52163.50</td>
<td>419994.1</td>
<td>14044.00</td>
</tr>
<tr>
<td>1995</td>
<td>136000.0</td>
<td>653641.0</td>
<td>67298.20</td>
<td>279191.7</td>
<td>14275.00</td>
</tr>
</tbody>
</table>

MEXPOP
74766.00
76178.00
77562.00
78933.00
80312.00
81724.00
83306.00
84967.00
86712.00
91858.00
91831.00
8. REFERENCES


LaPorta, R., and F. Lopez-de-Silanes (1997), "The Benefits of Privatization: Evidence from Mexico," Harvard University, mimeo

Lee, Lung-Fei (1976), Estimation of Limited Dependent Variable Models by Two-Stage Methods, unpublished PhD Dissertation, University of Rochester


207


Mexico (1992), Tratado de Libre Comercio de America del Norte [North American Free Trade Agreement], Mexico: SECOFI, Books I, II


OECD (1993), Communications Outlook: Paris


208


World Bank (1994), data set on privatization, Country Economics Department


BIOGRAPHICAL SKETCH

Alejandro Ibarra-Yúnez was born in Puebla, Mexico, in 1952. He received his Bachelor of Arts degree in Economics in 1974 and a Master of Arts in Economics with a minor in Latin American Studies in 1975, both from the University of the Americas in Puebla. In 1975 he entered the Ph.D. program in Economics at the University of Michigan in Ann Arbor, where he completed course work, and obtained a Master of Arts degree in Applied Economics, with areas in Industrial Organization and Quantitative Methods. In 1978 he became assistant professor at the Monterrey Institute of Technology (ITESM) in Monterrey, Mexico, where he has been a professor and researcher. From 1980 to 1987 he was the Economics Department Chairperson and Director of the Econometrics Research Unit (UNET) at this institution. While at ITESM, he has written more than twenty refereed articles and five books in the areas of International Economics, US-Mexico Economic Integration, Industrial Organization, and Regional Economics. Alejandro Ibarra is currently a professor of Economics and Public Policy at the Graduate School of Business and Leadership at ITESM-Monterrey.

Permanent Address: Gardenia 219, Col. Colorines, Garza García, Nuevo León 66750, Mexico

This dissertation was typed by the author