

THE POLITICAL ECONOMY OF BANKING REGULATION:  
THE CASE OF MEXICO, 1940–1978

DISSERTATION

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## ABSTRACT

This dissertation develops a model of banking regulation from a positive political economy perspective. The main characteristic of this model, based on the interrelation between regulators and incumbent banks, is that regulation is driven by public interest and political economy motives. The public interest of regulators includes the efficiency and soundness of the banking industry. The political economy motives consist of two elements. First, incumbent banks demand regulation to obtain higher than competitive profits (rent-seeking motive). Second, regulation by itself is rewarding for the regulator. In the model, the government finances the public-sector deficit with banking resources (fiscal motive).

Regulators make use of two instruments. The first is to require banks to hold minimum capital adequacy levels. Theory predicts that increasing bank capital reduces the risk of bank failure. The second instrument is the control of entry, which makes bank charters valuable, so banks follow a conservative behavior to protect their charters. Entry restrictions, however, have a negative impact on efficiency in the industry. Regulatory policy is based on a trade-off: soundness versus efficiency.

The model synthesizes the public interest and political economy motives of regulation. A main prediction is that regulation is dynamically time-inconsistent because the regulator uses its discretionary and coercive power to renege on the agreement with the incumbent banks to obtain windfall revenues.

The model empirically fits the Mexican experience. Non-public interest factors weighted more in the making of regulatory policy in the 1940-1956 period. This was

a period of easy bank entry and increasing public sector budget financing with bank resources. Public interest motives were more important for 1957–1978 and for the overall 1940–1978 period. These findings support the claim that long-run growth with financial stability of the Mexican economy was based on two elements. First, financing of the public sector deficit with bank resources avoided excessive use of the inflation tax. Second, while regulatory policy reflected political economy factors, the promotion of stability was a key factor in banking policy.

A Guillermina con todo mi amor

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## CHAPTER 1

### INTRODUCTION

#### 1.1 The Process of Banking Regulation

This dissertation undertakes a positive political economy analysis of the process of the making of banking regulation. Rather than taking regulation as given, a political economy approach attempts to explain regulation as the outcome of rational decisions on the part of both the government authorities and private interest groups. Moreover, the making of regulation is not static; it is best described as a dynamic process. The main factors that explain the dynamic nature of regulation are usually exogenous, such as financial innovations. Endogenous forces of change emerge, however, from conflicts between incumbent and potential entrant groups, given that all forms of regulation have significant distributional consequences.

More importantly, the interaction between the regulator and the incumbent banks is dynamically time-inconsistent. The discretionary and coercive power of the regulator is the factor responsible for the absence of binding commitments between the regulator and the incumbent banks. Once a set of rules is adopted for a specified period of time, the regulator may use its discretionary power to renege on its commitment to the regulatory framework.

Theoretical work in the area of banking regulation follows two main approaches. The public interest or prudential approach rests on the assumption that the regulatory

authorities design incentive-compatible mechanisms to promote the well-being of the overall banking industry and adopt policies to improve its efficiency. In this way, the regulator can curtail the moral hazard problems that characterize this industry. The second approach is the positive political economy of banking regulation based on non-public interest motivations. Under this approach, the regulator behaves so as to maximize its own objective function, which includes some kind of self-appropriated reward.

### 1.1.1 Objectives

The purposes of this dissertation are threefold. First, the dissertation develops a model of how banking regulation is implemented. This model has as its main characteristic a view of banking policy as the outcome of both public interest and political economy motives.

Second, the dissertation offers a positive political economy analysis of the development of banking regulation in Mexico. This is undertaken with the aim to show that banking regulation is not a collection of decrees and rules without connection but the outcome of complex interrelations among relevant actors. An economic history analysis is employed with this purpose.

Third, an endeavor of this dissertation is to provide an alternative view of the development of banking in Mexico. The conventional view argues that government intervention in financial markets was necessary because of the lack of interest of commercial banks to finance *productive* activities. In this respect, this dissertation argues that regulation by itself was rewarding for the government. Discretion over regulation allowed the government to finance the public sector deficit in a situation where foreign capital markets were closed to the Mexican Government.

The development of the Mexican banking industry provides an excellent opportunity to test the positive political economy approach. One reason is that the Mexican banking industry has been the object of intense intervention by the government. During the period under study, 1940–1978, the government used a gamut of instruments to influence the allocation of financial resources. In addition, the deposits mobilized by the banking system were the source of funds to finance the public sector deficit.

## 1.2 The Stages in Mexican Banking Regulation

The 1940–1978 period was chosen for the study because some historical and analytical considerations indicate that this period includes the three stages that compose a regulatory cycle: regulation-avoidance-reregulation (Kane 1977).

During the first stage (regulatory formation, 1940 to mid-1950s), entry into the banking industry was promoted by the regulatory authorities. As a consequence, the industry substantially grew in the number of banks, and deposit-asset and loan-asset ratios. While during this stage the core of the regulatory framework had already been established, enforcement by the financial authorities of the regulations and direct control was weak. Towards the end of this stage, however, the strength of both the Central Bank and the state-owned banks, mainly NAFINSA, allowed the government to more effectively intervene in the allocation of commercial bank funds. To accomplish this purpose, the government adopted most of the traditional mechanisms of state intervention in credit markets through the Central Bank, mainly via the use of compulsory reserve requirements.

The second stage of the regulatory cycle (avoidance) is dated from the mid-1950s to the late-1960s. During this stage, the regulatory authorities (Central Bank and National Banking Commission) severely restricted entry of new banks by issuing very

few new charters. Limited entry allowed the incumbent banks to earn higher profits and capture a rent on their charter. Thus, during this stage, the average spread between the deposit interest rate and the lending interest rate was the widest for the whole period.

The strongest government intervention in the allocation of commercial bank credit also characterized this second stage of the regulatory cycle. The authorities compelled the commercial banks to hold required reserves and specific amounts of deposits at the Central Bank's vaults at zero interest rates. The Central Bank used these funds mainly to finance Central Government spending. Intervention by the regulatory authorities also included administratively setting the interest rates charged to privileged borrowers (some farmers and manufacturing firms) at low subsidized levels and mandating that the banks allocate specific proportions of their loanable funds to particular economic activities.

To avoid these stringent regulations, major incumbent banks created subsidiaries in non-regulated financial markets, such as the capital market, where the most profitable business could be found. The most important type of subsidiary thus created were the *financieras* (private development banks). The regulatory authorities allowed this type of financial intermediary to set their own interest rates but also mandated the allocation of specific proportions of their loanable funds for privileged industries. As a consequence, this stage witnessed a substantial increase in the number of *financieras* and in the volume of funds loaned by them.

The main feature of the last stage of the regulatory cycle (1970s) was the development of a reregulation phase. The peak of this phase occurred by 1974, with the modification of the law that rules the operations of financial intermediaries (*Ley General de Instituciones de Crédito y Organizaciones Auxiliares*). The new law al-

lowed commercial banks to undertake business in any credit market. Consequently, the commercial banks merged with their *financieras*.

### 1.2.1 Factors explaining the shape of banking regulation in Mexico

Four factors explain the behavior of the regulatory authorities during the 1940–1978 period. The lack of stable sources of funds for the Central Government is one factor. It took at least three decades after the Mexican Revolution of 1910 for the government to be able to gain the trust of domestic and foreign investors back. Before 1940, Mexican commercial banks bought public debt only in response to government coercion.

Despite the scarcity of funds through the issuing of public debt, the fiscal authorities were unable to reform the tax system. Less than one-third of public sector funds came from income or property taxes. In addition, the authorities could not make use of the inflationary tax because this might lead to a breakdown of the public's trust in the post-revolutionary administrations. Moreover, higher inflation rates were incompatible with the government's import-substitution strategy of development. Taxes on foreign trade and on the production of cotton and silver and sales of commodities produced by state-owned enterprises, such as petroleum, were the main revenues for the government.

The dearth of government resources led policymakers to take advantage of the deposits mobilized by commercial banks. Indeed, some historical events made it easier for the government to transfer resources into its vaults. World War II brought about a significant flow of funds, mainly from Europe, to the Mexican banks, thereby reducing the cost of credit for most borrowers.

A second factor explaining the shape of the regulatory framework is the absence of a developed capital market in Mexico. Entrepreneurs looking for sources of finance

beyond their own funds established new banks. Thus, major industrial groups were frequently associated with a commercial bank. This relationship allowed the firms in the group to gain access to a stable source of funds for investment. Indeed, regulations regarding ceilings on the interest rates paid on deposits made credit cheaper for the firms within industrial groups associated with commercial banks. In this way, restrictions on interest rates paid on deposits and restrictions on entry into the banking industry allowed incumbent banks to enjoy some monopoly power, thereby earning moderately high but steady rates of profits in the long run.

A third factor that explains the regulatory environment for the banking industry is the relationship between commercial and state-owned banks. Although the commercial banks made transfers of cheap funds to the state-owned banks through the Central Bank, the commercial banks benefited from this relationship because of the self-selection of non-attractive borrowers, who applied for loans only to the state-owned banks. This situation allowed the commercial banks to either concentrate their lending on the most profitable projects (usually from the firms in their own group) or lend only to less risky borrowers, thereby reducing the costs associated with handling non-performing loans.

A fourth factor that explains the shape of the regulatory framework is the evolution of technological innovation in the financial sector. As time passed, regulations and rules became obsolete. Given the rigidity of the law, the banks preferred a faster route towards adjustment: the avoidance of regulations. Avoidance explained the rise in the importance of non-bank intermediaries (*financieras*).

This dissertation argues that the Mexican regulatory framework has been the outcome of these four factors. Both the commercial banks and the government benefited from the resulting relationships: both were able to gain access to a stable source of funds at the expense of depositors. Regulations and related rules that restricted entry permitted the commercial banks to earn a moderate but steady rate of profits. Technological innovations in the financial sector, however, contributed to making the regulatory framework obsolete. This led the commercial banks to avoid the regulations by creating financial subsidiaries, such as the *financieras*.

The symbiotic relationship between the commercial banks and the central government brought about macroeconomic stability. Use of bank reserves to finance the public sector allowed the government to avoid printing money in excess, so inflation rates were low. A stable macroeconomic environment in turn favored economic growth.

### 1.3 Organization of the Dissertation

The remainder of this dissertation is divided into five chapters. Chapter 2 reviews the literature on banking regulation. The organization of this chapter is based on the two main traditions about regulation, namely the normative or prudential and the positive political economy traditions. Several theoretical elements are extracted from the review of the specialized literature on regulation, which serve as the basis for the following chapters.

Chapter 3 undertakes an economic history analysis. The principal conclusion is that even with a strict and cumbersome regulatory framework, the incumbent banks were able to obtain economic profits by means of avoiding the regulations. Another important conclusion is that the government utilized the deposits mobilized by the commercial banks as a stable source of funds to finance the public sector deficit.

Chapter 4 claims that the main instrument of banking regulation in Mexico was the restriction of entry into the industry. To empirically evaluate this claim, the elements that determine bank entry are enumerated and a function of entry is estimated by means of a regression analysis for the Mexican case. The elements derived in this chapter are the basis for the model of the making of banking regulation developed in Chapter 5. The model has the purpose of including both public interest and political economy motives of regulation in the explanation. The model is fitted to Mexican data. Chapter 6 presents the conclusions of this dissertation. Appendix A presents the data and explanations regarding the sources of information and transformations of data. Appendix B presents a chronology of important regulatory events.

## CHAPTER 2

### THE LITERATURE ON BANKING REGULATION

#### 2.1 Introduction

The pioneering work of Shaw (1973) and McKinnon (1973) stressed the role of financial deepening in economic development. Financial deepening occurs when the pace of accumulation of financial assets is faster than the accumulation of nonfinancial wealth (Gonzalez Vega 1976). The success with which funds are mobilized by financial intermediaries and transferred to profitable activities is now widely regarded as a crucial determinant of the pace of economic development (Levine, Loayza, and Beck 1998).

In most countries, banks have been the dominant financial intermediary during the early stages of economic development. Banks have been considered critical for the accumulation and productivity of capital for several reasons. First, banks efficiently match deficit unit demands for credit (borrowers) with the availability of funds from surplus units (depositors). Through intermediation, banks allow depositors to share risk, promise savers a payoff for delaying consumption, and enhance social welfare (Gurley and Shaw 1969, Bhattacharya, Boot, and Thakor 1998).

Banks are better vehicles to collect essential information on borrowers at a lower cost than multiple lenders (depositors) can (Diamond and Dybvig 1983, Diamond and Dybvig 1986). This is the second function stressed by models of bank performance. By allowing numerous potential lenders to share the fixed costs of asset evaluation, banks

help to ameliorate the asymmetric information problems that emerge in financial transactions. In contrast to the stylized Arrow–Debreu model, economic agents make deals in an environment characterized by imperfect information.

Leland and Pyle (1977), for instance, build a formal model to show that banks significantly reduce the screening and monitoring costs of a loan portfolio that result from imperfect information because they invest their wealth only in assets about which they have special knowledge. In this sense, banks perform the role of *delegated monitors* for numerous lenders (Diamond 1984).

Banks also help to solve some information and risk–pooling problems by issuing a variety of demand deposits and loan contracts to match risk preferences and funds availability at different states of nature. Thus, banks eliminate some non–optimal outcomes derived from the potentially opportunistic behavior of participants in financial markets.

The third function of banks is their role as the main component of the payments system. Banks are efficient vehicles to process debt documents, gather information about borrowers’ ability to repay, and monitor instruments that can be easily converted into generalized purchasing power (Corrigan 1982).

Government intervention in the banking system has been often justified from a normative approach to policy analysis. Banks must be regulated in order to assure that risky assets are safely managed and the stability of the system is protected. According to this view, regulation is a *technical problem*. Once a set of regulatory procedures is enacted and the regulatory bodies strictly enforce the regulations, the stability of the financial system would be assured. This is the public interest theory of regulation, which views policies solely as responses to market failure (Dixit 1996).

The political economy theory of regulation challenges the assumptions of public interest theory and introduces elements ignored by the latter. One of these elements is the realization that regulators often do not maximize social welfare. Instead, the regulatory framework is part of the political process of economic policymaking. In this process, struggles among incumbent banks, depositors, and regulators to maximize their own objective functions can lead to inefficient aggregate welfare outcomes.

Government intervention has not been limited to mere regulatory tasks. By means of the operation of state-owned banks, by enacting rules on deposit and loan interest rates for specific economic activities, or by subsidizing loans granted to pressure groups, the government has commanded a leading role in the financial system and has distorted market allocations. This has been specially important in developing countries, where the absence of developed capital markets makes banks the principal source of external funds for enterprises.

The rest of this chapter proceeds as follows. The main arguments in favor of banking regulation are reviewed in Section 2.2. This section argues that the public interest theory of regulation implicitly assumes that optimal government intervention can cure market failure. Further, the main instruments of prudential banking regulation are scrutinized. Section 2.4 discusses the political economy theory of banking regulation. This section also includes the argument that ignoring the possibility of government failure is the principal flaw of public interest theory.

An interest group theory of regulation is developed on the principle that regulation is the outcome of the struggle of pressure groups, each one attempting to maximize its own objective function. In this framework, the government is just another player, with its own particular interests. The last section presents the perspective that regulation is a dialectic process, and it ends with a review of selected empirical applications of the interest group theory of regulation.

## 2.2 The Rationale for Banking Regulation

The existence of some kind of market failure (when competitive market outcomes differ from Pareto efficient allocations) is a usual justification for government intervention in the economy. The financial system is not an exception. This section reviews the case in favor of banking regulation. The importance of the classical sources of market failure in banking is analyzed first. Market failure derived from information-related problems is considered next. The last two decades, in particular, have produced numerous contributions where the presence of asymmetric information leads to adverse selection and moral hazard and thereby to the desirability of regulation.

### 2.2.1 Natural Monopoly in Banking

A natural monopoly emerges when the production function of a firm shows increasing returns to scale up to the point where all market demand is satisfied. The second-best optimum for a natural monopoly is found at the point where the customer pays the average cost of the good or service. The corresponding quantity is smaller than the perfectly competitive outcome.

The production function of banks may exhibit increasing returns to scale for several reasons. One reason arises from the holding of reserves by banks. As a bank

gets bigger, everything else constant, it can economize on the amount of reserves. Indeed, two or more banks can economize on their reserves by merging into a larger bank (Porter 1961).

Dowd (1992) advances two reasons why the existence of increasing returns to scale due to reserve holdings does not necessarily cause a natural monopoly. The first one is related to the opportunity cost of reserves. If bank reserves can earn a return, the incentive to accumulate reserves could be significant. The second one rests on the consideration that benefits from a merger could be compensated by the costs of corporate governance.

Diversification is a more relevant factor that may lead to increasing returns to scale in a bank's production function. A greater degree of diversification allows a bank to reduce transaction and delegation costs. Furthermore, a more diversified bank would be considered by the public to be safer. Accepting the importance of diversification for banks, the relevant question to address is if this factor will lead to a natural monopoly. A possible answer emerges from the trade-off between benefits from diversification and corporate agency problems in larger banks.

The empirical evidence is, nevertheless, the strongest argument against the existence of a natural monopoly in banking. Dowd reviews several empirical studies regarding this issue. He concludes that "there are economies of scale but not natural monopoly [and this is] supported by [an] extensive empirical literature on returns to scale in modern banking" (Dowd 1992, p. 389).

### 2.2.2 Externalities and Bank Runs

Potential negative externalities in financial markets are the main rationale in favor of regulation. One of the most feared externalities is the risk of systemic failure—or

domino effect—from the failure of one or more banks, such that the performance of the payments system may be at risk (Corrigan 1982). Bank assets are composed mainly of medium or long-term promises to pay. This “... term structure mismatch on the books of banks is one of the realities that gives rise to concerns about strains on bank liquidity and sudden drain on bank deposits” (Corrigan 1982, p. 8). The domino effect is, indeed, the topic of an intense scrutiny among scholars. Some see it as a major justification for of some form of deposit insurance.

A better evaluation of the relevance of the domino effect is addressed by contrasting it with the competition effect. The competition effect occurs when a firm that declares itself in bankruptcy conveys information about how well other firms are doing relative to each other. In fact, an industry is renewed and becomes more competitive and healthier when inefficient firms exit the market. The contagion effect occurs when a firm in trouble conveys negative information about the overall industry, and thus customers and suppliers become wary of all other firms (Lang and Stulz 1992).

According to the banking literature, the contagion effect can have critical effects on the stability of the financial system because it can lead to runs on banks.<sup>1</sup> The Great Depression of 1929 is a classical historical episode of bank runs. One lesson learned from this episode is how important and how fragile confidence in the banking system can be (Bernanke 1983). To face the threat of financial instability in the United States, deposit insurance was established by the Federal Government. Deposit insurance avoids the need for bank customers to withdraw their funds when faced with an actual or rumored bank failure (Furlong and Keeley 1989, Silverman 1995).

Several formal models attempt to explain the factors behind bank runs. In a seminal paper, Diamond and Dybvig (1983) develop a model to show that bank

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<sup>1</sup>A bank run occurs when for some reason a significant number of depositors withdraw their funds simultaneously, thereby threatening the liquidity of a bank.

demand-deposit contracts are instruments to reach a socially optimal allocation of resources even in an environment characterized by incomplete information. In this model, however, banks are vulnerable to a coordination failure.

The Diamond-Dybvig model is based on a two-period model of consumption. In the first period, a group of representative agents (savers) deposit one dollar each in a bank. Later, a fraction of those agents decide to withdraw their funds in order to consume either in period 1 with utility  $U(c_1)$  or in period 2 with utility  $U(c_2)$ . The *ex ante* probability that each event occurs is defined as  $P$  and  $(1 - P)$  respectively. A coordination failure arises in this model when the fraction of savers withdrawing funds in period 1 exceeds  $P$ , so the promised return to savers withdrawing in period 2 becomes infeasible. In this setting, a bank run is a possible equilibrium (Huo and Yu 1994).

This undesirable equilibrium occurs once a threshold of depositors who withdraw their funds is reached. Such threshold, however, is undetermined *ex ante*. In this respect, Jacklin and Bhattacharya (1988) point out that bank runs are *sunspots* phenomena that arise from completely unpredictable choices among Pareto-ordered Nash equilibria . . .” (Jacklin and Bhattacharya 1988, p. 568). Diamond and Dybvig (1983) argue that this bad equilibrium could be ruled out by means of introducing mandatory government deposit insurance.

A bank run in the Diamond-Dybvig model is a self-fulfilling prophesy. Bank runs will not be observed in equilibrium since, anticipating a run, no one would deposit (Waldo 1985). To remedy this situation, some authors have adapted the Diamond-Dybvig model to include a bank run as a deterministic equilibrium (Huo and Yu 1994, Matutes and Vives 1996, Postlewaite and Vives 1987, Waldo 1985).

Goodharth (1989) argues that bank runs are the outcome of three factors: (a) banks hold a large proportion of nonmarketable assets, (b) second-hand markets are weak and (c) the time required for production requires long-term financing. Whatever the cause that triggers a bank run, the banks' hurry in search of funds "will drive interest rates up and asset prices down to the point at which the banks are actually insolvent simply because of depositor fears that they might fail. To the extent that bank assets consist of poorly marketable commercial loans, they are even more exposed to the risk of runs" (McCulloch 1986, p. 79).

Both an absent or undeveloped second-hand market and the long maturities of projects are factors that make more critical the potential ensuing of bank runs. Borrowers are often unable to repay loans by selling their existing businesses. If a bank facing a run should call in its loans, in many cases the borrowers' only hope is to find new funds from elsewhere. This search is unfruitful because the conditions that caused concern about the value of the bank's portfolio will make it hard for the borrower to obtain additional funds elsewhere.

The competition effect in banking is incorporated in the work of Calomiris and Khan (1991) and Park (1991). These authors develop models in which bank runs are selective. In these models, bank runs are self-correcting mechanisms that improve the efficiency of the system. Informed depositors transfer deposits from banks they perceive as insolvent to those they perceive as financially sound. In contrast to the contagious-run situation, the uninformed depositors follow the actions of informed depositors.

On this issue, Saunders and Wilson (1996) find empirical evidence in favor of the historical existence of selective bank runs. Based on a broad sample of U.S. bank runs in the 1929–1933 period, these authors report that "failing-bank deposit withdrawals

[were] redeposited locally in nonfailing banks... The implication is that depositors distinguished insolvent and solvent banks” (p. 422).

### 2.2.3 Information Problems in Banking

Information problems are central issues in the performance of the financial system. Broadly speaking, adverse selection and moral hazard are causes of market failure from the perspective of constrained Pareto efficiency. Information constraints frequently are used as a strong argument in favor of regulation of the banking system. Information constraints also represent, however, limits to the efficiency of control of incumbent banks by regulatory agencies.

Information-related problems in banking have two sources. The first one is related to the asymmetric risk-sharing relationship between banks and depositors. Taking advantage of their private information, banks make depositors bear the risk of the banks’ business. On the one hand, banks pay a pre-set interest rate on deposits. On the other hand, in their search for profitability, banks are prone to increase their risk exposure (Matutes and Vives 1996). The final result is that banks capture the spread between the loan rate and the deposit rate when it is positive, while when this spread is negative banks make depositors partners of the banks’ losses.

This asymmetric relationship occurs as depositors do not monitor the actions of banks because they are “... unsophisticated, in that they are unable to understand the intrinsics of balance and off-balance sheet activities [of banks] ... [T]he thousand or hundreds of thousands of customers of a bank have little individual incentive to perform the various monitoring functions” (Dewatripont and Tirole 1994, pp. 31-32).

Although banks may mitigate the asymmetric bank-depositor relationship by diversifying their portfolio, the protection of depositors' assets has been raised as a main argument in favor of the prudential regulation of the banking system.

The protection of depositors' assets argument is challenged by some experts. Calomiris and Khan (1991) argue, for example, that small depositors follow the actions of large depositors. To protect their deposits, large depositors have incentives to be informed on bank solvency and they are readily prepared to transfer their funds from insolvent to solvent banks.

A second information-related problem in banking is found in the bank-borrower relationship. Moral hazard occurs because banks cannot determine if delinquent borrowers are unable to repay the loan or do not want to repay the loan. An old and effective solution to ameliorate this problem is for banks to request collateral from borrowers.

### 2.3 The Instruments of Banking Regulation

The main rationale for bank regulation springs from the goal of curing market failure (Noll 1989). In classical welfare economics, perfect markets and perfect governments both do an equally good job in achieving economic efficiency. The optimal solution for a benevolent dictator who maximizes an aggregate welfare function subject to the economy's availability of resources and technological constraints is the same as the solution derived from the interaction of economic agents in competitive and complete markets (Dixit and Londregan 1995).

The benevolent dictator's means of achieving an optimal solution consists of Pigovian taxes or subsidies to correct for market imperfections. In this framework, some set of appropriate instruments can correct for market failure. This is the so-called

first-best solution. Along this line of thinking, perfect information and negligible transaction costs are two essential assumptions. These assumptions, however, are clearly at odds with what is observed in the real world.

The recognition of the limitations of the perfect information and null transaction costs assumptions led Lipsey and Lancaster, Bhagwati, and others to develop a theory of the second-best or, in other words, a constrained Pareto optimum. Under this approach not only Pareto-improving government intervention exists, but also the type of the required intervention is related to observable parameters (Greenwald and Stiglitz 1986).

Regulation in the banking industry is based in part on the public interest theory of policy intervention. Some scholars and practitioners point out that regulations are designed to cope with the pernicious effects of some kind of market failure. Along this line of reasoning, the government is assumed to incur lower transaction costs and have less information limitations than private agents (Noll 1989).

There is no consensus among scholars, nevertheless, about why banks should be regulated. The stability of the payments system and the protection of small depositors are two of the main arguments often raised in favor of prudential regulation (Mussa 1986, Dewatripont and Tirole 1994).

Besides uniform accounting or auditing procedures, the regulation of banks mainly relies on the specification of minimum capital requirements. Peltzman (1970) stresses the relevance of this variable: “In banking, the most important inputs are labor and deposits. . . In this production process, bank capital has two roles: (1) it cooperates directly with the other inputs in the production of bank services, and (2) it is used to attract the deposit input by providing insurance to depositors against a decline in the value of a bank’s assets; the more capital a bank has, the more the value of its assets can fall before depositors incur losses” (Peltzman 1970, p. 1).

### 2.3.1 Capital Requirements and Bank Reserves

Regulation of capital requirements reduces the moral hazard problem that resides in the bank–depositor relationship. Because deposits are analogous to borrowed capital, bankers have incentives to increase their leverage, *i.e.* reduce their capital–deposit ratios. Other things being equal, the bank with the most leverage will earn the highest return on its equity capital.

For this reason, minimum capital requirements provide both an insurance fund for depositors against the possibility of losses due to a reduction in the value of bank assets and a limit to the banks’ degree of risk on their earning assets.

Minimum capital requirements, however, have also been considered to be an effective barrier to entry into banking. Sylla (1969), for instance, found evidence in favor of this argument for the free–banking era in the United States (1863–1913).

Long before the development of models on incentives, the role of financial regulation was seen as a mere technical issue; the purpose of regulation was to assure the liquidity of banks by means of setting an optimal level of bank reserves (Baltensperger 1980). The problem consisted in a management decision on inventory optimization

under stochastic demand for deposit balances. Apart from technical details (such as the measurement of adjustment costs or the use of probabilistic functions that attempted to capture the likelihood of simultaneous withdrawals of funds), the regulator's main issue was to find an optimal rule to match the marginal opportunity cost of holding an extra dollar of reserves to a one-dollar marginal reduction in the liquidity costs of a bank.

The definition of an optimal amount of bank reserves, however, is still a debated issue. Even some members of the academic community go as far as proposing a requirement of 100 percent of bank reserves against transaction balances (Kareken and Wallace 1978). In this framework, liabilities (deposits) would become risk-free and bank monitoring activities would not longer be necessary. Furthermore, the 100 percent reserves would make deposit insurance obsolete.

Shaw (1973) and McKinnon (1973) argue that involuntary reserve requirements reduce the efficiency of the banking industry. On the one hand, reserves are a leakage from the intermediation process, which prevents banks from efficiently intermediating between depositors and borrowers. Stringent reserve requirements prevent banks from creating liquidity, which is one of the primary functions of banks (Diamond and Dybvig 1986, Mussa 1986, Wallace 1996). Furthermore, if a 100 percent requirement is imposed on banks, alternative intermediaries would take their place in the financial intermediation process.

### 2.3.2 Deposit Insurance

Deposit insurance is at the center of the debate regarding the effectiveness of bank regulation. The models developed by Diamond (1984), Diamond and Dybvig (1983), and Leland and Pyle (1977) support the implementation of some kind of deposit

insurance. These authors argue that deposit insurance reduces or even eliminates the possibility of bank runs because depositors will fully trust the banking system even in periods of financial distress. Deposit insurance has also been extolled as an efficient risk-transfer mechanism. By transferring risk from risk-adverse depositors to risk-neutral borrowers, risky production projects are carried out (Park 1991).

The incentive side effects of deposit insurance bring concerns to the academic and practitioner communities. Although deposit insurance may eliminate the negative effects of bank runs, it represents efficiency costs for the banking industry. Moreover, deposit insurance is responsible for lessening the market's discipline over bank investments and operations. With deposit insurance, banks are observationally equivalent to depositors, shareholders, and debtholders. No practical distinction between solvent and insolvent banks exists (Klausner and White 1993).

Deposit insurance increases the incentives for bankers to take additional risks (moral hazard). In their attempt to maximize the value of their stockholders' equity, bank managers will maximize the value of the insurance subsidy by increasing leverage and asset risk. This behavior has worse consequences in situations of financial distress (Barth and Brumbaugh 1994, Diamond and Dybvig 1986, Kane 1989b, Kareken and Wallace 1978, Klausner and White 1993, Keeley 1990).

Merton (1977) offers a plausible explanation of this behavior. He argues that bank liabilities can be considered by bank owners as the strike price of a put option. A rational banker will maximize the value of this option in two ways. On the one hand, in an environment characterized by a stable rate of return on assets, the banker's best strategy will be to adopt a conservative asset management.

In an economic situation of increased volatility, on the other hand, the banker's optimal response will be to exercise the put option. Protected by deposit insurance, the banker can engage in more risky projects.

As an illustration, following McCulloch (1981), the accounting initial value of a bank's capital ( $K$ ) can be represented as follows:

$$K = A_0 - L_0 \tag{2.1}$$

where  $A_0$  is the value of total assets and  $L_0$  is the value of liabilities. Defining  $q$  as the initial capital/asset ratio, equation (2.1) is equivalently expressed as:

$$L_0 = A_0(1 - q) \tag{2.2}$$

where  $q = \frac{K}{A_0}$ . Let  $\tilde{A}$  be a variable that represents the random value of the bank's assets when the bank is examined by regulators. If  $\tilde{A}$  is greater than  $A_0$ , the banker has excess capital, which can be redistributed to shareholders. In contrast, if  $\tilde{A}$  is lower than  $A_0$ , the bank is at risk of being liquidated. In such a situation, the bank owners have the alternative of replenishing the bank's capital, to achieve the desired minimum level. If  $\tilde{A}$  is below  $L_0$ , however, the bank shareholders "will prefer to abandon the bank and let the insurance agency pay off the depositors, taking a loss of  $L_0 - \tilde{A}$ " (p. 224). In this framework, the liability/asset ratio,  $1 - q$ , is the strike-price/current-price ratio in a put option contract.

In the 1980s, processes of financial liberalization in several countries preceded episodes of bank failures (Vittas 1992). These episodes triggered a debate among experts over the effectiveness of bank regulation and, in particular, over the reliability of deposit insurance in assuring the stability of the payments system. Besides the

well-known effects of deposit insurance (lesser competition and riskier behavior), some additional negative consequences have attracted attention.

Kane (1984) argues that deposit insurance has introduced a new moral hazard problem. Now, taxpayers have become the principal and the regulatory agencies the agent in an informational asymmetric problem. In this new moral hazard problem, regulators have incentives to hide either their incapacity to detect the banks' risky activities early enough or they do not maximize aggregate welfare. This latter situation can happen even if examiners discover deviations of banks from healthy parameters on a timely basis.

To attack the opportunistic behavior of banks derived from the deposit insurance scheme, some experts have recommended eliminating the flat-rate insurance premium. The purpose of this recommendation is to avoid subsidies to banks that pursue excessive risk-taking behavior. This measure, however, requires adequate levels of minimum capital requirements and an insurance premium large enough to cover the fair value of insurance. Other academics go even farther, by proposing the total elimination of the federal deposit insurance system (McCulloch 1981).

### 2.3.3 Limits and Costs of Prudential Regulation

The case in favor of prudential regulation of the banking industry relies mainly on the existence of negative externalities. The instruments used by governments to implement banking regulation, however, usually take a broader scope. In effect, typical regulatory instruments include not only the issuing of licenses or charters, supervision activities, or minimum capital requirements; they also include the setting of price (interest rate) controls and of mechanisms to direct the allocation of credit.

The optimal amount of regulation is difficult to define. Advocates of the public interest theory of regulation argue that a first-best intervention with the right instrument will allow the system to achieve Pareto optimality (Greenwald and Stiglitz 1986). This argument, however, is based on stringent assumptions. One of these assumptions is that the regulatory agency possesses a better information set compared to private agents. Thus, the government agencies can use their power to bring participants to the Coasian world.<sup>2</sup>

Scholars have not reached agreement regarding the size and quality of the information set of the government. Several authors have stressed the importance of adverse selection in the implementation of regulation. Usually, incumbent firms have more information than the regulator about exogenous variables, so even inefficient firms can extract a rent from their interaction with the government. Thus, both efficient and inefficient firms share the benefits of regulation. Moreover, the regulator's instruments, such as examination of accounting statements, are worthless in situations where the competitive environment of the industry is rapidly changing. In this respect, Laffont and Tirole argue that "most dimensions of moral hazard and adverse selection do not show up in accounting statements" (Laffont and Tirole 1994, p. 3). Finally, firms can also utilize many accounting devices to hide relevant information from the examiners.

The informational advantages of the government are particularly doubtful in financial markets. Thus, although the conclusions of some asymmetric information models favor government intervention, these recommendations are not robust. Even a slight modification of the assumptions of these models can support the opposite policy recommendations (Besley 1994, Gonzalez Vega 1994, Green and Lin 2000).

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<sup>2</sup>A major contribution of Coase (1960) was to show that private actors can reach an agreement that corresponds to the outcome of an efficient economic plan. This agreement is viable if property rights among participants are correctly defined and if the participants can costlessly make fully specified and fully binding agreements (Dixit 1996).

The absence of incentives for firms to circumvent regulatory restrictions is a second implicit assumption of public interest theory of regulation (Kane 1996a). Once the regulatory agency sets its rules and procedures, the role of regulators is limited to monitoring key variables regarding the performance of the regulated firms. In contrast, the process of regulation is dynamic. In the banking industry, even the best regulatory systems for monitoring bank risk and bank capital levels become outdated very quickly. This occurs for multiple reasons including, for instance, inherent technological changes in the industry, loopholes in the rules and procedures and, what is more important, the efforts of firms to avoid the regulations (Kane 1996b, Stevens 2000).

Financial regulation triggers incentives for banks to avoid compliance with the rules and requirements enacted. Government regulation often means substantial increases in the transaction costs of financial intermediation. This occurs because regulation restricts financial intermediaries from operating as efficiently as they otherwise would.

As time goes by, there is a substantial increase in the deadweight costs derived from the restricted financial intermediation. There is some point at which the costs are higher than the benefits from a regulatory system, and the regulatory framework becomes obsolete and finally dies.

While the flaws of regulation of financial markets seem substantial, its benefits are uncertain because the constraints negatively affect aggregate welfare. In practice, incumbent banks are the major beneficiaries of regulation, because they earn economic rents. Regulation restricts the entry of competitors. The benefits of regulation for depositors, in contrast, seem small. These benefits are limited to some reduction in information costs. Depositors know, for instance, that the regulatory authorities can punish a fraudulent or poorly-run intermediary by removing its charter (Benston and Smith 1976).

#### 2.4 Endogenous Regulation

In a seminal paper, Stigler (1971) observes that groups with common interests attempt to use the power of the state to tax and transfer wealth in their own benefit. These self-interest groups attempt to maximize the benefits received from the state. They accomplish this goal by demanding government regulation of their own industries. Under this approach, called capture or interest group theory, regulation becomes endogenous. It is the outcome of struggles among firms, consumers, and the government.

In this framework, both industry participants and the regulators together determine the actual degree of economic regulation. Incumbent firms secure economic rents through restrictions that deter the entry of potential competitors. The government, in turn, has an intrinsic interest in the existence of regulation. Interest groups can reward the regulator with votes or money (Peltzman 1976). Interest group theory emphasizes the role of pressure groups in the determination of public policy. “[R]egulation is acquired by the industry and is designed and operated primarily for its benefit” (Olson 1965, p. 3).

The public interest theory and the interest group theory of regulation, however, are not mutually exclusive. The nature of the competitive structure of some industries may allow incumbent firms and/or consumers greater influence on the making of regulatory policy. One crucial determinant of the potential participation in the making of public policy are the costs of organization. As the number of incumbent firms decreases, per firm benefits increase and the costs of organization and controlling free riders decrease (Olson 1965, Stigler 1971).

The choice of the main regulatory instrument is likely to be influenced by the size of the stake of the members of the industry. Four different instrument classes can be distinguished: direct subsidies, entry restrictions, policies that affect substitutes or complements to the industry under consideration, and the setting of prices (Laffont and Tirole 1994). Several industry characteristics can influence the choice of instrument. In industries where the supply is highly elastic, for instance, the best instrument may be barriers to entry. This is rationalized as follows. If a direct subsidy is chosen, the entry of firms seeking the subsidy would drive profits down to zero. In consequence, the best option for the firms is to request entry barriers (Laffont and Tirole 1994, Silverman 1995).

Peltzman (1976) enriches the interest group theory of regulation by introducing the regulator itself as a major player in the formation of the regulatory setting. A rational regulator will maximize its own objective function. Thus, the maximization of social welfare takes the back seat of the regulatory process. Electoral votes, taxes, bribes, and perks to officials can be choice variables in the objective function of regulators.

The demands of different pressure groups are constraints on the regulator's maximization problem. The optimal outcome will be reached at the point where "the marginal political return from a transfer [is] equal to the marginal political cost of the associated tax" (Peltzman 1976).

The analysis of Peltzman suggests that regulation is an optimal economic-political outcome that allows industry participants to share the benefits and costs of economic events. The regulator, in consequence, will not offer the maximum positive transfer to any single economic agent. Regulation is thus inefficient from a purely economic point of view. Not only will regulators not seek the equality of price-marginal cost solution that would be provided by a competitive market, but they will consciously avoid this equilibrium.

In a simple analysis, the regulator will maximize his/her objective function,  $M(p, \pi)$ . This function, which depends on the duple of the industry's price of the good ( $p$ ) and representative profits, ( $\pi$ ), may represent the number of votes or any other variable representing benefits for the regulators. The profit function of the firm,  $f(p, c)$  depends on price and cost ( $c$ ). The optimization problem becomes:

$$\text{Max } L = M(p, \pi) + \lambda [\pi - f(p, c)] \quad (2.3)$$

f.o.c.

$$M_p = \lambda f_p \quad (2.4)$$

$$M_\pi = \lambda \quad (2.5)$$

$$\pi = f(p, c) \quad (2.6)$$

$$M_\pi = -\lambda \quad (2.7)$$

$$-(M_p/f_p) = M_\pi \quad (2.8)$$

$$f_p > 0, \quad \forall p \leq p_m, \quad M_p < 0, \quad M_\pi > 0$$

One can derive several conclusions from these first-order conditions. First, at the optimum the marginal increase in votes derived from an increase in profits equals the reduction in votes due to a price increase (2.8). Combining (2.4) and (2.5), the relative marginal change of the increase in votes due to an increase in price with respect to one dollar increase in profits is equal to the decrease in profits due to the increase in prices ( $\frac{M_p}{M_\pi} = -f_P$ ).

Although regulation is economically inefficient, it is politically desirable for the stronger industry players because it buffers any deleterious impacts of market forces on politically influential groups. By agreeing on the fulfillment of a set of constraints, special-interest groups in the industry are able to capture a share of the available economic rents. “The benefits of inefficient policies accrue as large per capita amounts to a small and concentrated special-interest group, while their costs fall in small per capita amounts on a large and diffuse population. The former has a substantial incentive to become informed about their benefits and solve the free-rider problem involved in taking political action, whereas the latter have a much smaller incentive and therefore remain uninformed and unorganized” (Dixit 1996, p. 41).

Regulation is a dynamic process involving the interaction of the different groups involved. Becker (1983) shows that these groups are continuously allocating their resources toward producing political pressure. At the margin, their efforts are just equal to the reduction in their tax burden or increase in the subsidies they are able to secure. As time goes by, both the marginal benefit and the marginal cost of protection change.

In his paper, Becker conjectures that the present value of the deadweight costs rises at a higher rate than the present value of the benefits derived from regulation. One consequence of such phenomenon is that deregulation episodes can be the result

of an endogenous process, in the same way regulation is. In such events, both the regulators and the regulated agents are likely to make efforts toward a reexamination or the elimination of the obsolete regulatory framework.

#### 2.4.1 Empirical Applications

Although there are many empirical applications of the interest-group theory of regulation, most of them share the problem of the construction of testable models. For instance, even if the researcher correctly specifies the objective function of regulators, inaccuracy problems arise from the use of *proxy* variables instead of latent variables. For example, what is the correct measure of political support? “[An additional] serious problem with this literature is that it normally cannot distinguish between two quite different bases for political action by an interest group: the desire to cure a market failure that falls especially heavily on members of the group, and the desire to redistribute rents in their favor” (Noll 1989, p. 1271).

One main strand of research on endogenous bank regulation relies on the presumption that banks support regulation to keep their monopoly rents. Peltzman (1965) argues that the value of the bank charter, as a measure of market power, is eroded over time. Based on this approach, Keeley (1990) argues that deposit insurance is an efficient mechanism to preserve economic rents. Insurance allows banks to preserve a secure positive difference between the loan and the deposit interest rates. Assuring a continuous non-risky flow of deposits at almost zero cost, bankers can enjoy an easy life by investing in moderately risky projects. The emergence of new competitors or lower profit rates can distort this peaceful life.

Based on this approach, Keeley empirically tests two alternative hypotheses. The first one is that deposit insurance allows banks to attempt to maximize the value of a

put option. The second hypothesis is that the reduction of the value of charters can explain bank failures. This author claims that increased competition and deposit rate deregulation erode the value of bank charters, and thereby they reduce the incentives for banks to act prudently regarding risk taking.

Two simultaneous equations compose Keeley's empirical model. His first equation incorporates the relationship between the value of the charter and other *proxy* variables for the deregulation of the deposit insurance system. As a *proxy* of the charter value, Keeley uses Tobin's  $q$ .<sup>3</sup> In the second equation, Keeley relates a measure of risk with variables showing bank solvency. Keeley's results support the second hypothesis: "various anticompetitive restrictions endowed banks with market power and made banking charters valuable. The potential loss of a charter in the event of bankruptcy created, in effect, a regulatory bankruptcy cost, which counterbalanced the incentive for excessive risk taking due to fixed-rate deposit insurance" (p. 1198).

In a similar setting, Marcus finds that when monopoly power is reflected in a bank charter, a "value-maximizing bank will choose either extreme high-risk or low-risk strategies" (p. 558). Hence, the mid-range outcomes are suboptimal. For solvent banks, the optimal policy is to choose a conservative risk position, while banks that have experienced loan losses will choose a risk-taking position. Marcus (1984) concludes that "as the value of a bank charter falls, the risk-taking strategy is more apt to dominate" (p. 569).

Recently, several authors have used the implicit value of bank charters as a leading indicator of deregulation processes (Giammarino, Schwartz, and Zechner 1989, Fisher, Gueyie, and Ortiz 1997, Fisher and Chenard 1997).

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<sup>3</sup>Tobin's  $q$  is defined as its average *proxy* or  $q = M/C$ , where  $M$  is the market value of the firm and  $C$  is the replacement cost of its tangible assets.

Another strand of the empirical endogenous regulation approach is based on the inability of regulators to monitor banks efficiently. Self-interest will drive the regulatory authority to get, at a high cost, a reputation of being a capable monitor. In consequence, regulators will soften supervision rules to conceal their ineptitude to monitor banks (Boot and Thakor 1993). This outcome is beneficial for both banks and regulators.

Jarrel explores the roots of deregulation in the New York Stock Exchange (NYSE). His main finding is that “the emergence of low-cost, off-board alternatives to block trading on the NYSE, and the acceptance by regional exchanges of large financial institutions as members, prove to be the forces responsible for deregulation” (p. 274). The work of Jarrell is an example of how the deadweight losses imposed by regulation sooner or later lead incumbent participants to call for deregulation.

## 2.5 The Political Economy of Banking Regulation

A group of scholars has suggested that regulation in banking does not follow a social welfare maximization criterion (Kane 1988, Calomiris 1993, Haggard and Lee 1993, Kroszner and Strahan 1997). Krueger (1990) pointed out, in evaluating development models, that “implicitly, it was assumed that the government would behave as a benevolent social guardian, in Fabian Socialist tradition. Economists would serve in government, calculating shadow prices and formulating planning models. Selfless bureaucrats would then carry out the plans. Coordination and administration of public sector activity was implicitly assumed to be costless” (p.12).

In contrast, the policies adopted to carry out public interest goals have been counterproductive. Litan (1987) argued that the easing of restrictions on bank entry into related riskier non-bank or related financial services reduces and not increases

overall bank risk. Benston, Hanweck, and Humprey (1982) went farther by pointing out that the primary rationale of regulation in banking is to levy implicit taxation by the government authorities.

### 2.5.1 Government Failure

The perils of government failure are at the center of the discussion regarding the actual forces behind banking regulation. The recommendations of the proponents of the public interest theory rely on a very strong assumption: that government faces lower information constraints than private market participants. The advocates of interest-group theory, in contrast, argue that regulatory agencies face, at least, the same information constraints as private market participants. They also recognize the existence of powerful political pressures in the formation of public policy. In effect, distributional conflicts and externalities derived from the use of policy instruments motivate the participation of interest groups. “Distributional conflict occurs when one segment of the population petitions the government for action that threatens to hurt one or more other elements of society. Externalities occur when an action by one private party imposes costs or benefits on another private party without any compensation being exchanged” (Kane 1989a, p. 265).

Some authors offer potential explanations of government failure. Kane (1989a), for instance, suggests that a principal-agent problem frames the regulatory system. Regulators know that their instruments become obsolete very quickly. The nature of the financial system is a crucial reason why prudential regulation is highly prone to fail. In effect, the financial system is continuously changing in its technological, market, and legal dimensions. This has been true particularly in the last two decades. The internationalization of capital markets has brought a wave of deep transformations to

financial markets. For instance, new non-bank intermediaries now offer products that compete with traditional banking products (Edwards and Mishkin 1995).

Kane argues that the recognition of detection and action lags in the regulatory mechanisms is an incentive for regulators to hide their incompetence to the public. This creates a moral hazard problem. The regulator (agent) has incentives to hide the actual situation of the banks from the taxpayers (principal). The adverse effects of this relationship on the performance of the banking system could be worse than the potential effects of the absence of regulation. The debacle of the savings and loan institutions in the U.S. illustrates this situation (Kane 1990).

Rent-seeking is an additional determinant of government failure (Krueger 1974, Tollison 1982). Government intervention in financial markets induces economic agents to spend efforts and scarce resources to get a share of the artificially created rents. Rent-seeking is particularly relevant in developing economies (Fry 1988).

## 2.6 Banking Regulation as a Dialectic Process

Adopting the essential ingredients of the interest-group theory of regulation, Kane (1988) moved forward by adding both dynamic elements and political power explanations of policy formation. The inclusion of these elements allowed this author to offer a plausible interpretation of the regulatory process. Under his perspective, “deregulation is an endogenous response by regulators to changes in the economic constraints that financial markets impose upon them” (p.328).

According to Kane, the process of regulation is not just dynamic, but it is dialectic.<sup>4</sup> Regulation and avoidance are nothing more than the two faces of the same coin.

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<sup>4</sup>“Dialectic is philosopher’s shorthand for a process driven by tension between a succession of paired opposites” (Kane 1988, p. 332).

Although they represent opposite forces, one cannot exist without the other. Under this Kanian perspective, neither is there just a process of regulation nor just processes of deregulation. The interaction of incumbent banks and self-interested regulators is the engine of a long-run process that determines the characteristics and instruments of the regulatory framework.

Actual levels of regulation are the output of two forces: demand and supply of regulation. The former is determined by the desire of incumbent firms as a way either to increase or to consolidate their economic rents or to change the rules of the economic game to assist politically important groups. The supply of regulation comes up with the mere existence of a demand.

Kane (1977) distinguishes two effects from the demand for regulation. First, there are intended effects, which explain the motivation of the regulators or the incumbent firms to request regulation. Politicians and regulators are prone to focus just on intended effects.

Unintended effects follow intended effects of regulation. The mere existence of some form of regulation provides incentives for the losing parties to get around the controls or even to make efforts to turn them to their advantage. These effects expand with time, as the incumbent firms identify additional avoidance opportunities and take better advantage of them.

The *regulatory cycle* is composed of three stages. In the first stage, the government establishes a set of regulations to reduce instability and protect the payments system. With this purpose, the government issues charters that grant banks exclusive privileges.

During the second stage, banking under exclusive privileges becomes quite profitable. These profits are a signal for new competitors to enter the industry and for

the government to demand additional financial requirements from incumbent banks. The incumbent banks attempt to stave off new competition by cooperating with the regulators.

In the third stage, financial innovations make the set of regulations obsolete and would-be bankers find alternative paths to profits. The profits of incumbent banks erode, so they engage in circumvention both to satisfy regulatory requirements and to sustain profit levels. At the end of this stage, the incumbent banks demand that the government adopt a new set of rules. Finally, a process of deregulation arises, from which a new set of regulatory arrangements emerges.

Several factors determine the lifetime of each stage of the regulation-avoidance-deregulation process. The main regulatory instrument chosen is one of such factors. In banking, the issuing of charters or licenses and capital requirements are efficient barriers to entry of new banks. As times goes by, however, there is an increase in the deadweight losses derived from the restricted competition. Potential entrants spend even more resources to obtain a share of the economic rents. Non-bank intermediaries, for instance, compete with banks through the issue of similar financial products. The reaction of the incumbent banks is to engage in a fight against the current restrictions. In an attempt to hide their incompetence from the public, regulators commit regulatory forbearance or, in other words, they refrain from engaging in the regulatory right to put an insolvent bank out of business (Kane 1996a).

Once the size of the deadweight losses becomes large enough, however, aggregate welfare considerations come into the scenario again. The time for deregulation arrives (Stigler 1971, Peltzman 1965, Becker 1983). The outreach of deregulation in banking is an empirical issue. Many factors influence the outcome. What is true is that a new regulatory framework is likely to be born from the ashes of the previous one.

## CHAPTER 3

### BANKING REGULATION IN MEXICO, 1940-1978

#### 3.1 Introduction

The purpose of this chapter is to analyze the evolution of banking regulation in Mexico during the 1940–1978 period. The analysis is undertaken under the assumption that the shape of banking regulation is the product of both economic and political forces. On the one hand, because the business of banking is regarded as highly unstable, much of banking regulation and supervision is aimed at promoting a safe and sound banking system. On the other hand, by granting a limited number of charters, government intervention in the banking industry offers the banks some exclusive privileges. In return for these privileges, the government has demanded both financial consideration from the banks and the right to regulate them. Thus, politicians have been far from passive referees in the competition for banking privileges and profits.

This chapter is predominantly concerned with the search for the elements that actually guided the making of banking regulation in Mexico over the 1940–1978 period.

Several relevant events took place during this period. One was the consolidation of the government sector as the leading actor in the economy. Strong government intervention in financial matters was one of the main faces of this predominance. Another relevant event was the consolidation of the banking industry as the main vehicle for the mobilization of capital for the economy.

Although the analysis here focuses on the evolution of the modern Mexican banking industry, a preliminary review of banking in Mexico during the *Porfiriato* era is important for two reasons. First, many of the privileges of the biggest banks were granted in the 19th-century. For instance, for over one hundred years, the *Banco Nacional de México* (BANAMEX) was the broker for the government. Second, the oligopolistic structure of the banking industry was formed during the *Porfiriato*.

A factor that shaped the regulatory framework was the action of incumbent banks seeking to influence both the nature and the degree of regulation. Incumbent banks have been able to effectively influence policy for two main reasons. First, the government has lacked a stable source of funds, so it has had to rely on indirect forms of taxation. The Mexican tax system continues to be rudimentary; even nowadays, the ratio of tax revenues to GDP is about 15 percent.

Absence of sources of direct taxation led the government to rely on indirect forms of taxation. Reserve requirements on deposits mobilized by private banks were used as a source of government funding during the 1946-1968 period. The inflation tax was used during the 1970s.

That the business sector has power over public policy is not controversial; however, the strength and mechanisms of influence have remained a continuing concern. Indeed, a major issue in an analysis of regulation that attempts to separate positive from normative economics is to identify and discriminate among potential motives for regulation.

Chapter 2 reviewed the justification of regulation in the specialized literature. Under the traditional approach of prudential regulation, once a source of market failure is correctly identified, the timely application of the right policy instrument will achieve a Pareto-optimal allocation of resources. The interest-group approach

recognizes the validity of arguments for prudential regulation, but it disputes the feasibility of a correct application in the real world. Prudential regulation ignores, first, that the collective interest of incumbent banks does constrain policymakers and, second, the possibility of government failure. It also ignores that regulators suffer from the same information shortcomings as bankers.

This chapter argues that the Mexican bankers were able to influence the regulatory framework for two main reasons. First, enforcement was severely constrained due to the information and incentive problems that characterize banking. Because the actions of the regulators were limited to the analysis of corporate financial statements for the banks, the moral hazard problems inherent in the bank-depositor relationship remained hidden.

A second factor that determined the relative strength of bankers in influencing regulation was the dearth of sources of funds to meet the financial requirements of the government. The absence of stable sources of funds led the federal government to rely on bank loans and on selling public debt to the private banks to fund its deficit. This situation led the regulators and the incumbent bankers to interact a *quid pro quo* relationship. Banks, mainly the large banks, demanded exemptions or privileges in exchange for lines of credit to the government. Even during the golden years of selective credit controls, the incumbent banks easily circumvented the requirements.

Another factor that hindered the compulsory ability of the regulatory bodies was the lack of control of monetary policy by the federal government. Even though the Central Bank was established early (1936), its influence on the financial sector was not felt until the 1950s.

### 3.2 Origins of the Banking System

Stable money and financial markets did not emerge in Mexico until the eve of the 19th-century. In part, this is explained by the early interference of the federal government in the trade of financial assets. Participation in financial markets was mostly explained by the dearth of traditional sources of funds for the government. Instability, due to ceaseless internal warfare, political struggle and coups, prevented policymakers to build an efficient system to exact income or real estate taxes.

The disorder in the finances of the central government thwarted the further development of financial markets. Extremely unstable debt policies and repudiation of public debt now and then introduced high volatility in interest rates and pushed them up, which severely eroded the trust in government securities as a vehicle for private investment. Repudiation of government debt was not only responsible for the undermining of local capital markets; it also locked the country out from international capital markets.

The lack of financial deepening led some large entrepreneurs to create local banks. The objective of these banks, mostly located in new industrial cities, was to accumulate enough capital to grant loans to their owners' businesses. The potential growth of these local banks was, however, constrained to the market area defined by the size of the region. Being geographically constrained, local banks were poorly diversified and were easy prey of systemic risks, such as bad crops. Most of these banks lasted just a few years or even months.

Political stability was another necessary factor for the creation of a national financial market. This occurred when dictator Porfirio Díaz seized power in 1876. When Díaz came to power, the public finances were bankrupt, tax collection was almost inexistent, and the country was locked out of international markets. The only way

out was for the new government to resort to the available domestic sources of credit to finance its expenses.

The financial requirements of the federal government were partially satisfied with the help of the *Banco Nacional de México* (BANAMEX). In practice, this commercial bank functioned as the financier of the government and it enjoyed the monopoly over the government's financial transactions (Maurer 1997).

On the eve of the Mexican Revolution, the shape of the Mexican banking system was already complete. This structure did not change significantly over the past 100 years. A high degree of concentration of financial assets among a handful of banks has remained the main characteristic of the system.

### 3.3 Origins of Banking Regulation

Lack of well-defined and enforceable financial legislation was a significant factor impeding the early growth of money markets in Mexico. During the 19th-century, government intervention in financial markets was restricted to granting charters of issue. Very often, this decision was based on the expectation of the state or federal governments to obtain a source of funds to cover their expenses.

It was not until 1884 that legislation covering credit operations was enacted by the federal government. One of the main purposes of the Commerce Code of 1884 was to restrict banks without a federal charter from issuing notes in the future and to limit federally chartered banks to issuing amounts equivalent to the lesser of their paid-in capital or three times their gold and silver specie reserves minus their deposits. Furthermore, one of the clauses in the BANAMEX's charter included the promise of the government to impose a five percent tax on the paper currency of all existing banks of issue.

The Commerce Code and the BANAMEX's charter covenants were considered by incumbent bankers as a clear attempt to assure BANAMEX the monopoly of note issue. This originated heated debate, legal maneuvering, and political compromise among the banking community.<sup>1</sup> The result of these actions was to frustrate this initial effort of the federal government to regulate the banking system. Moreover, it reflected the power that bankers would continue to have on the shape of banking regulation.

The discussion shows the intrinsic nature of banking regulation in Mexico since the early days. On the one hand, the government's main impulse to dictate rules was based on its financial requirements. By supporting the leadership and monopoly of a specific bank, the government assured a stable source of funds. This strategy was so successful that, by means of growing public sector deficits financed with bank loans, Porfirian politicians were able to carry out an impressive number of public works, including the construction of railroads and modernization of seaport facilities.

On the other hand, only a few bankers benefited from the privileges granted by the government. Maurer (1997) supports this proposition by means of computing Tobin  $q$ -ratios for Porfirian banks. This ratio measures the difference between a firm's cost of capital and the returns to the firm from its assets. A perfectly competitive firm will have a  $q$ -ratio of one, so the extra return of a unit of assets has the cost of an extra unit of capital. In comparison, a  $q$ -ratio greater than one is an indicator of a firm earning economic rents. Maurer's computations show that the pet banks of the government, "BANAMEX, de Londres y México and Banco Central all enjoyed Tobin's  $q$  figures substantially greater than one, and much greater than their competitors' " (Maurer 1997, p. 186).

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<sup>1</sup>Maurer (1997) vividly describes the debates and legal battles occurred among bankers.

The development of the banking system came to a hiatus with the uprising of the Mexican Revolution, which introduced extreme volatility into financial markets. National politics were characterized by irresponsible decisions of successive provincial caudillos in power, which jeopardized the trust of both domestic and foreign investors. At the end of the revolutionary war, the private banking system created during the stability of the Porfirian regime was in ruins. In the course of the armed fighting, the successive groups that reached power funded their temporal regimes through coerced loans which far exceeded the resources of the banks. As reserves and deposits decreased, paper money was issued to cover these growing loans. The result was hyperinflation for almost 20 years.

### 3.4 Existence of a Regulatory Cycle

The following sections are an interpretation of the historical financial development of Mexico, with a focus on the banking industry, based on the presumption of the existence of a dialectic regulatory cycle.

#### 3.4.1 Formation of the Regulatory Framework

The beginning of the regulatory cycle can be dated back to the early 1940s. At that time, the federal government had already defined its policy to regulate and intervene in financial markets. According to the authorities, the purpose of influencing the allocation of funds was to increase the amount of credit available for “productive” investment in industry and agriculture and to discourage “speculative” activities.

### 3.4.2 Regulatory Power of the Government

Before 1940, the government had also defined the main instruments of regulation and direct intervention in the financial system. However, the power of these instruments was limited for a simple reason: the government lacked the capacity to enforce the rules on the private financial institutions. In addition, the deposit banks, by far the most important financial institutions, were recovering from the arduous previous years characterized by high inflation rates and low confidence of the public in financial institutions.

The precarious situation of the banking industry and the weakness of the government to enforce regulations were well understood by policymakers. In an attempt to correct for both problems, the government tried to promote private financial markets and, at the same time, to subject credit allocation to state control.

To achieve this purpose, the federal government implemented a twofold policy. First, it created several state-owned banks, with the purpose of allocating funds directly to specific industries and for some agricultural products.

In the beginning, the influence of state-owned banks in the financial system was scant. For instance, by 1940, the assets of the *Nacional Financiera* were equivalent to just 2.75 percent of the assets held by deposit banks.<sup>2</sup>

The second tool of government intervention in the financial system was to bring private credit allocation under state control. The first step in this direction was to strengthen the compulsory powers of the Central Bank.

The origin of the Central Bank comes from the 1917 Constitution, which called for the establishment of a modern banking system. To achieve this purpose, Congress

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<sup>2</sup>The following state-owned banks were established before 1940: *Nacional Financiera*, National Urban Mortgage and Public Works Bank, National Foreign Commerce Bank, National Agricultural Credit Bank and National Ejido Credit Bank.

proposed the establishment of a central bank, under government auspices, to control the issue of currency. The functions of this central bank were to include a restructuring of the private banking system on a sound basis.

An initial step was to liquidate the discredited banks of issue and to acquire sufficient capital to fund the new central bank. Several tax increases and cuts in public spending allowed the government to run a surplus. Some of these funds were used to minimally capitalize the new central bank (Banco de México).

During the first ten years of life of the Banco de México, it performed poorly as a central bank. It shared the monopoly of issue with other commercial banks, and just a few of the private banks agreed to be shareholders of the Central Bank.

Banco de México, however, successfully competed for deposits against commercial banks. By 1927, the Central Bank was the country's third largest bank in terms of deposits (Maxfield 1990).

Private commercial banks complained to the government regarding the competition from the Central Bank. The answer of the government was to command the Central Bank to stop undertaking private banking functions. In return, new legislation granted the Central Bank more compulsory powers. Legislation in 1936: (a) gave the Central Bank legal authority to collect mandatory reserve requirements from commercial banks; (b) made Banco de México notes the only legal tender in the country; and (c) increased the amount of credit the Central Bank could make available to the banks and (d) authorized the Central Bank to buy and sell federal government bonds.

### 3.4.3 The Instruments of Regulation

Throughout the period under study, reserve requirements on the deposits of financial institutions were one of the main instruments of regulation. Earlier, the authorities had justified reserves requirements as an instrument of monetary control. They argued that alternative mechanisms of monetary control, such as open market operations and variations in the discount rate, were ineffective in Mexico because of a weak and unorganized securities market (Beteta 1963).

The 1936 Legislation was lax with respect to the powers of the Central Bank to collect mandatory cash reserves. These cash reserves were set up from 15 to 50 percent of current liabilities, yet the Central Bank kept the power to increase this percentage according to the “monetary and credit needs” of the country (Ruiz Equiha 1963).

Later on, the Central Bank began to take advantage of the power to demand reserve requirements not only to control the money supply but also to influence the allocation of credit according to “national priorities”. These priorities were broadened to facilitate more aggressive government intervention in production (Perez-Gea 1993).

The addition of specific economic activities to the menu of “national priorities” made the scheme of required reserves even more complex. By 1941, a different set of required reserve ratios were set according to the type of liability or location of a branch. In 1944, reserve requirements varied for financial institutions located in communities with or without Central Bank branches, and in 1946 a distinction was made between liabilities denominated in domestic or in foreign currency.

Beginning in 1948 and 1949, cash reserve requirements were supplemented by requirements governing the division of bank assets among various types of securities and loans. In 1949, the Central Bank adopted a new modality of required reserves: the marginal reserve requirement. Marginal reserves were applied to marginal increases in the liabilities of commercial banks after a specified date.

The marginal reserve requirement had the intention to offset the presumed inflationary effects of inflows of capital in the early 1950s. In practice, this mechanism penalized those banks that increased credit rapidly during periods of restrictive monetary policy.

Besides the use of compulsory reserve requirements, the Central Bank then made use of other mechanisms of credit control. Table 3.1 lists some of these instruments.

The complexity of the scheme of reserve requirements brought inefficiency costs for both the regulators and the incumbent financial institutions. Larger regulatory staffs were necessary to monitor if the banks were complying with the more complex regulations, and the banks needed more accountants and administrative staff to fulfill the requirements. The opportunity costs and lower profitability of the allocation of credit to non-profitable activities were even more important than the costs in avoidance activities incurred by the commercial banks.

For over 40 years, the financial authorities extolled the benefits of the Mexican selective credit controls. At a Latin American forum, Mario Ramón Beteta, one of the ministers of Finance during the golden years of selective credit in Mexico, argued that

[t]he Mexican experience offers evidence that the policy of selective control has been successful in directing large amounts of banking funds into activities that previously lacked financing, and that this policy has also

broken deeply rooted habits of the banking sectors that considered these activities as unprofitable or traditionally unattractive for the banking business. (Beteta 1963, pp.86–87)

#### 3.4.4 Reserve Requirements as an Instrument of Monetary Control

Central Bank officers justified the implementation of reserve requirements as an instrument of monetary control; an acceleration of the rate of inflation was followed by increases in reserve requirements in an effort to bring inflation down. Extensive use of this instrument began in attempts to offset the presumed inflationary effects of capital inflows during the World War II. Data presented in Table A.3 show this pattern. From 1944 through 1946, in-cash legal reserve requirements levied on the deposit banks were raised to 50 percent.

- 
- Selective Credit Controls.
  - Marginal Reserve Requirements.
  - Automatic Reserve Requirements.
  - Punishable Reserve Requirements.
  - Constraints on Liability Growth.
  - Reserve Requirements on Time Deposits.
  - Portfolio Quotas and Restrictions.
- 

Table 3.1: Instruments of Regulation

On theoretical grounds, Brock (1989) suggests that there is a systematic relationship between the nominal interest rate and the reserve requirement ratio in countries

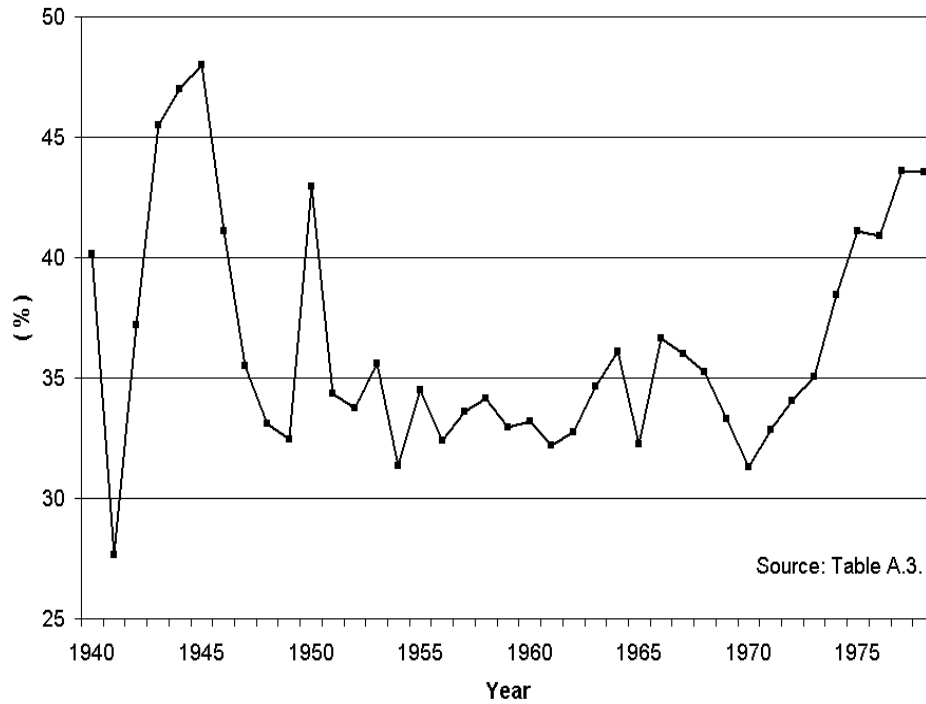


Figure 3.1: Banking System: Average Reserve Requirement Ratio, 1939–1978

that rely on the inflation tax. In brief, this author argues that control of the reserve ratio allows the monetary authorities to tax the currency that is transformed into demand deposits after an increase of the nominal interest rate. In other words, the monetary authorities increase the reserve ratio on demand deposits to compensate for the effects of the asset substitution derived from a higher rate of inflation.

In practical terms, the claim of Brock means a positive correlation between the average reserve ratio and the inflation rate. That is, higher reserve requirements followed accelerations of the inflation rate. Moreover, when the authorities have a fiscal target for the inflation tax, increases in reserve requirements may lead to a reduction of the tax base, as depositors and borrowers move to other assets and financial channels. In response, the authorities may further increase the rate of inflation to

continue to pursue their fiscal target. Reserve requirements may actually be inflationary in these circumstances (McKinnon and Mathieson 1981). That is, when this is the case, increasing reserve requirements may be inflationary rather than deflationary. This conclusion is at odds with traditional monetary policy wisdom.

For the 1939–1978 period, the correlation between these two variables in Mexico was 0.63, that is, higher reserve requirements followed accelerations of the inflation rate. This may support the claim of the Mexican monetary authorities that control of the reserve ratio was the key for the low rate of inflation observed particularly during the period of stabilizing development (1954–1970). But this is a debatable claim. In any case, the average non-interest-bearing reserve ratio shown in Figure 3.1 decreased from 0.46 to 0.17 during the period of stabilizing development, which coincide with lower inflation rates.

The correlation between the average reserve requirements ratio and the inflation rate, however, shows only a partial picture of the use of compulsory reserve requirements with monetary and fiscal purposes. An examination of Table A.3 reveals that the regulators were mostly substituting bank holdings of some kind of government bonds for non-interest-bearing reserves but keeping total reserves at high levels. These government bonds included Central Bank debt and bonds issued by state-owned enterprises. Taking into account reserves in government bonds, the average reserve ratio hovered around 0.34.

Dealing with inflation through the use of reserve requirements had a significant cost for the development of the Mexican financial sector. For the 1939–1978 period, the average reserve ratio was 0.36, which means that 36 percent of total deposits were held as a reserve, thereby reducing the pool of loanable funds for the private sector. This implicit tax on bank liabilities constrained the growth of the financial sector.

Table 3.2 presents selected indicators of financial deepening in Mexico. The data show that the holdings of money ( $M_2$ ) as a percentage of GDP were lower in 1970 than in 1940. In addition, this ratio is small compared to similar ratios in developed countries. The *ex post* estimates of the real interest rate on deposits also show a poor performance of the financial system. With the exception of the 1960-69 period, this rate was negative in real terms. The evidence of Table 3.2 confirms the theoretical prediction of Shaw (1973) and McKinnon (1973) regarding the relationship between financial deepening and real deposit interest rates.

The discussion shows the burden of government taxation levied on financial intermediation. From an aggregate perspective, the results of the extensive use of reserve requirements and other forms of credit controls are negative.

Variable	1940	1950	1960	1970
$M_2$ /GDP (%)	14.5	16.9	12.0	11.5
Bank Liabilities/GDP <sup>a</sup> (%)	8.5	13.9	15.0	30.6
	1940-49	1950-59	1960-69	1970-78
<i>Ex Post</i> Real Interest Rate <sup>b</sup> (%)	-4.7	-1.1	6.0	-1.9

Source: La Economía Mexicana en Cifras, NAFIN.

<sup>a</sup> Liabilities of commercial banks.

<sup>b</sup> Real deposit interest rate.

Table 3.2: Selected Indicators of Financial Deepening in Mexico

The Mexican government was able to set a system of compulsory reserve requirements and instruments of credit control on the private banks for more than 30 years. During almost half of this period (1954–1970), the Mexican economy experienced high growth rates with moderate rates of inflation, an outstanding achievement for a de-

veloping country. Based on these results, the monetary authorities and policymakers, domestic and even foreign, extolled the Mexican way to intervene in financial matters. Indeed, other developing countries adopted this formula.

The private banks did not fiercely complain against the policy of selective credit allocation. Indeed, much of the scheme of regulations was jointly elaborated together by government officials and bank leaders.

Maxfield describes the points of agreement regarding the elaboration of monetary policy among bankers and government officials (Maxfield 1990). Briefly, both groups agreed on two points: (1) keep the inflation rate at moderate levels and (2) restrict competition in the banking industry.

### 3.5 Profitability of Banking

Bankers agreed with the policy of selective credit allocation because the business of banking was profitable and stable. It was profitable because bankers learnt to cope with the stringent government regulations. Circumvention of regulations was easily achieved for a simple reason: money is fungible. In practice, bankers were able to reallocate loans toward profitable activities.

Some estimates of the profitability of the major banks are developed in this section. This task is burdensome because the only reliable sources of information for the period are accounting statements for some commercial banks.

In addition, data on the market value of banking assets are limited because the information on prices of bank shares is scant. Only shares of major banks were traded on a regular basis in the Mexican stock exchange.

The body of evidence employed in this analysis are the corporate financial accounts and common stock data for three of Mexico's commercial banks. With this information, Table A.5 presents a measure of the expected rate of profit in banking.<sup>3</sup>

Table A.5 reveals that expected profits followed three different paths. During the first period (1942–1951), the expected rate of profit declined erratically from 15 to 7 percent. It is worth noting that this period roughly corresponds to the stage of formation of the regulatory framework. A different pattern in the behavior of the expected profit rate is observed for 1952 to 1970. In this period, the expected rate of profit increased more than four times. Finally, from 1970 to 1977 this rate dropped from 25 to 14 percent.

The evidence on the profitability of banking seems to be at odds with the analysis of regulatory policy in Section 3.4.1. In effect, the period of stringent government participation in the allocation of credit to the private sector corresponds to a period when the expected rate of profit in banking was steadily increasing (1951-1970).

To empirically determine whether the use of reserve requirements was systematically related to the expected rate of profit in banking, Table 3.3 shows correlation coefficients between the average reserve requirement ratio and the expected rate of profit in banking during selected periods.

The data presented in Table 3.3 does not offer conclusive evidence regarding the relationship of the reserve requirement ratio and the rate of profit in banking. For instance, the correlation coefficient between these two variables during the 1952-1970

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<sup>3</sup>The profit rate is computed as follows:

$$\pi_t = R_t \times \gamma_t$$

where  $\pi$  is the expected rate of profit in banking in year  $t$ ,  $R$  is a proxy for the risk-free interest rate, and  $\gamma$  is a weighted average of the market-to-book value of three banks (BANAMEX, BANCOMER and BAREJA).

period is positive, but the correlation between the reserve ratio that does not include the banks' holdings of government bonds and the profit rate is negative for the same period. In other words, profits were increasing along with more banks' holdings of government bonds.

This evidence suggests a likely twofold explanation. First, the reserve ratio may have been used by the monetary authorities for strict monetary purposes: to reduce the rate of inflation. Second, the Central Bank was still taxing the banking system by requiring the banks to hold government bonds, which paid low interest rates. Moreover, in the absence of the compulsory authority of the Central Bank, the allocation of public bonds to the banks would be cumbersome.

In conclusion, the Central Bank was implementing a regulatory policy with two objectives in mind. One was to keep the rate of inflation under control; the second one was to extract a rent from the banking industry. This regulatory approach benefited both the government and the bankers. Both cooperated in the making of this regulatory policy.

What factors determined the rate of profit in banking? To answer this question, it is necessary to estimate the rate of return on earning assets of the incumbent banks. This is a rather difficult task because of the lack of data about bank earnings. A roundabout way to approach this task is to compute estimates of the spread between the deposit and lending rates of interest. First-hand information on these rates, however, is scarce and not reliable. Being afraid of the regulators, the corporate reports of the banks avoided information on loan rates of interest.

Period	Average Reserve Ratio		Rate of Profit ( 3 )	Correlation	
	( 1 )	( 2 )		( 4 )	( 5 )
1940–1951	0.39	0.30	10.4	0.26	0.32
1952–1970	0.34	0.12	19.0	0.25	-0.90
1971–1978	0.39	0.22	20.1	0.00	0.13
1940–1978	0.36	0.20	16.6	-0.10	-0.57

(1) Average Reserve Ratio. It includes holdings of Government bonds.

(2) = (1) less holdings of Government bonds.

(3) Average Rate of Profit (%)

(4) Correlation between (1) and (3).

(5) Correlation between (2) and (3).

Source: Appendix A

Table 3.3: Average Reserve Ratios and the Expected Rate of Profit

An estimation of the wedge between deposit and lending rates of interest follows. It is based on the methodology developed by McKinnon and Mathieson (1981). This methodology, however, is based on restrictive assumptions, and it only generates a *proxy* for the actual magnitude.

By ignoring the returns to factors of production employed in banking and assuming that the commercial banking system is competitive, the banks are restricted to make zero profits. In addition, the government requires the banks to hold two types of reserve requirements: (1) non-interest-bearing ratio ( $k$ ) and (2) interest-bearing government bonds ratio ( $k'$ ):

$$i_l(1 - k - k') - i_d = 0 \quad (3.1)$$

where  $i_l$  is the nominal lending interest rate and  $i_d$  is the nominal deposit interest rate. Substituting the Fisher equation for each interest rate and rearranging, equation (3.1) becomes:

$$r_l - r_d = \left( \frac{k + k'}{1 - k - k'} \right) (r_d + \pi) \quad (3.2)$$

where  $i_l = r_l + \pi$ ,  $i_d = r_d + \pi$ ,  $r_d$  is the real deposit interest rate,  $r_l$  is the real lending interest rate, and  $\pi$  is the rate of inflation.

Equation (3.2) is the basis to construct the variable presented in Figure 3.2. An examination of Figure 3.2 shows that the spread between bank loan and deposit interest rates followed an upward trend since 1956. A declining pattern, in contrast, is found for the 1940–1955 period.

Unfortunately, these spreads are estimated under the assumption of zero profits. All they reflect is, directly, changes in reserve requirements and, indirectly, the behavior of inflation rates. They cannot be conclusive used to describe the path of profits.

The next chapter attempts to offer statistical evidence to support the twofold motive for the regulatory policy implemented by the government. It shows that the rate of entry into the banking industry is highly related to the expected rate of profit of the banks and to changes in minimum capital requirements.

### 3.6 Conclusions

In Mexico, the relationship between commercial banks and the government has been symbiotic. On the one hand, the government has implemented its mechanisms of financial repression through the commercial banks. Thus, government officials have intervened in the financial system to direct the allocation of financial resources toward favored activities considered as critical for national economic development.

During the *Stabilizing Development Period*, the Central Bank made extensive use of reserve requirements on bank deposits to influence the allocation of credit. Ceilings

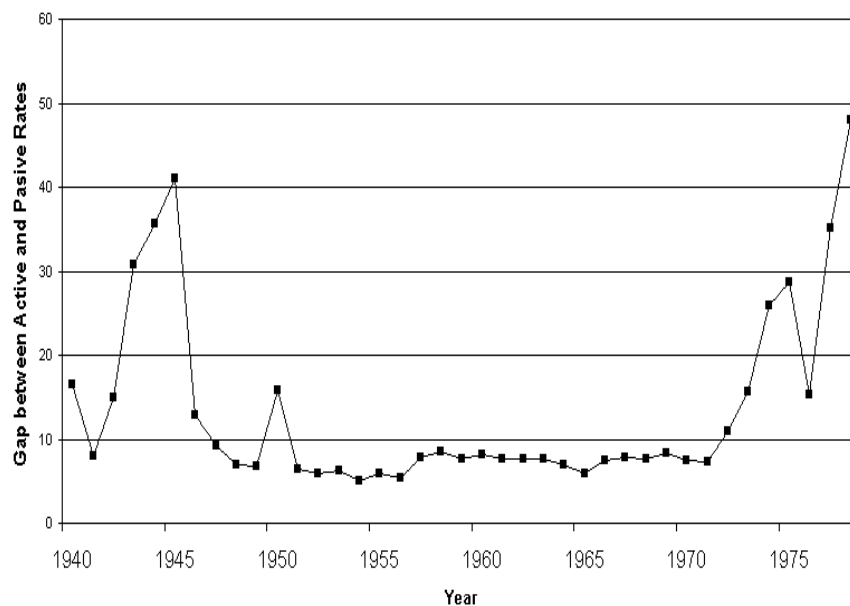


Figure 3.2: Estimated Spread Between Loan and Deposit Rates of Interest, 1940–1978

on the interest rates charged on specific loans were enforced. Later on, government intervention took place through several national state-owned banks and a broad set of trust or guarantee funds for the promotion of particular types of economic activity.

Banks, in turn, received the protection of the government against the potential entry of new competitors, domestic or foreign. Private banks kept the most profitable businesses for themselves. Their market niches included, for instance, loans to wealthy farmers and large industrial firms and, more important, the exchange rate market and related foreign financial transactions.

The macroeconomic and financial stability enjoyed during the *Stabilizing Development Period* ended in the late 1960s. In contrast to the conservatism of previous years, the Echeverria administration (1970–1976) adopted Keynesian policies to promote economic growth.

The resources mobilized by the banking system were insufficient for the requirements of the new public sector policies. In consequence, the government contracted substantial amounts as loans with foreign financial institutions.

Maxfield (1990) suggests that the end of the *Stabilizing Development Period* came along with the termination of the symbiotic relationship between the government and the commercial banks. Beginning in 1970, for instance, the state-owned banks managed the foreign loans contracted by the government. The commercial banks also suffered from the effects of expansionary monetary policy. High rates of inflation and devaluation of the domestic currency eroded the relationship between banks and their borrowers. More important was the attempt by government officials to introduce new controls.

## CHAPTER 4

### ENTRY AND BANK REGULATION

#### 4.1 Introduction

Output and price determination in commercial banking markets bear more relationship with the ease of entry and exit than with the number of banking firms. An important part of the business of banking is the relationship of banks with their customers. Commercial banks set interest rates for each class of loans based both on the perceived *ex ante* risk of projects and on the availability of private information on customers. Because of the existence of private information on customer relations, banks segment their markets. In this way, each bank does business with its own customers. This situation, however, would be disturbed by the entry of a new bank because none of the incumbent banks knows exactly what the new competitor will do to attempt to pull customers away from other banks.

The threat of entry of a new competitor is an incentive for the incumbent banks to unite for a common cause: to request entry restrictions into the industry. In this way, under restricted entry the banks already in the market determine the pricing and availability of credit and deposit services for specific client groups. In contrast, with unrestricted entry, the pricing of banking services is influenced by the threat of entry by intermediaries not already in the market.

In the reports of regulators it is usual to find the rationalization that restrictions on the number of bank charters have the purpose of promoting the soundness of the banking system. The claim is that competition from new banks may lead incumbent banks to adopt riskier positions than otherwise, which may threaten the overall instability of the industry.

What is the purpose of regulation in financial markets? This is a key question regarding the making of banking regulation and the answer requires both theoretical and empirical considerations. With its application to the Mexican case, this dissertation attempts to answer this question in two steps. First, the main factors that determine entry are identified in this chapter. These factors are empirically addressed in the case of the Mexican banking industry for the 1940–1978 period. The second step involves the development of a model about the making of banking regulation. This model endeavors to include both normative and positive political economy elements. This task is undertaken in the next chapter.

## 4.2 Determinants of Entry

Entry into banking was studied early by Peltzman (1965). This author identified a number of factors determining bank entry. The key factor is the expected rate of profit. Everything else constant, an increase in the expected rate of profit will induce new banks to enter the industry. Every new bank brings new equity capital into the industry however, and drives down the expected rate of profit down. In the absence of entry restrictions, this process would continue until profits are exhausted.

The availability of deposits is another variable that explains the effective rate of entry. Deposits are also the link between capital and the expected rate of profit in banking. To have access to deposits from the public, new and incumbent banks raise

capital. The reason is that capital provides insurance to depositors. The more capital a bank has, the more deposits it can mobilize and/or the greater risk it may take on its earning assets.

In Peltzman's analysis, bank capital is identified with accounting capital. Recent investigations in banking however, have revealed the importance of intangible capital. The source of this capital is the banks' private information on its customers. Professional prestige and a reputation of being conservative in risk-taking have the same effect as equity capital on depositors: they represent more insurance to face bad times. The choice of an appropriate empirical proxy for intangible capital, however, remains unresolved. Some possible proxies are the banks' market-book asset ratio, the age of banks, and the size of buildings, among others.

Yet, the main determinant of entry into banking is an external factor: the limited number of charters granted by the government. A limited supply of bank charters is a source of monopoly power in banking for two reasons. First, restricted entry allows banks to buy earning assets (loans) at a lower price and to collect cheap deposits compared to a competitive equilibrium. Second, with no threat of competition, banks are able to segment their markets and discriminate among borrowers and depositors.

A limited supply of bank charters, however, also creates a disturbing force in the market structure of the industry. Monopoly rents attract potential competitors. If barriers to entry are strictly enforced by the government, potential competitors would search for alternative markets not already regulated. Some depositors would be attracted by non-bank financial institutions.

Because bank charters are limited, they are valuable. A more restricted environment is likely to increase the value of bank charters, and the incumbent banks would be prone to follow a more conservative behavior to protect their charters. Some studies have made use of the market-book asset ratio as a proxy of bank charter value (Keeley 1990).

Empirically, both intangible capital and the value of bank charters are observationally equivalent. This is a source of confusion in applied studies. Keeley (1990), for instance, found that in the U.S., during the 1952–1986 period, a decline in the capital-asset ratio was statistically related to decreasing market power. The market-book asset ratio is one of the proxies used for market power. How much of the lower capital-asset ratio accounted for intangible capital, however, remains undetermined.

Next, an empirical model to evaluate the impact of regulation in the Mexican banking industry is discussed. This task is preceded by a consideration of some quantitative and analytical dimensions of the Mexican banking system.

### 4.3 The Mexican Banking Industry

#### 4.3.1 Market Structure

During the period under study, the market structure of the Mexican banking industry is well described by two characteristics: banks were organized in segmented markets and the concentration of the industry persisted for a long time. First, banking regulation required the incumbent banks to restrict their business operations according to the term structure of their liabilities. Banks were required to grant loans that matched their liability structure. In such fashion, from 1940 through the mid-1970s, the commercial banks were grouped into five categories: (1) deposit banks and savings departments, (2) mortgages banks, (3) *financieras*, (4) investment banks, and

(5) *fiduciarias*. The deposit banks had more liquid liabilities (mostly checking accounts and short-term deposits) and investment banks had the longest term liability structure.

Without sound arguments, the authorities alleged that a specialized structure benefited the overall banking system. This would allow regulators to efficiently monitor the business of banking in order to keep a sound system. This segmentation of the banking industry, though, was only virtual. By means of multiple modifications to the banking rules, the authorities continuously allowed exceptions to the segmentation rules.

This inconsistency between the rules regarding the specialization of banks and actual bank procedures illustrates why accounting statements are imperfect portraits of bank operations. It is also a factor that explains the ineffectiveness of regulatory techniques. The restricted banking practices are easy to hide. For instance, by periodically renewing short-term loans, the deposit banks were granting long-term loans even though they were not authorized to do so by the law.

Table 4.1 shows the distribution of banking assets by type of financial institution. By far, deposit banks were the leading actors in the system. Over the whole period, more than 50 percent of total assets were held by these banks. The position of the deposit banks as leaders, however, seems to have been challenged by the *financieras* at the beginning of the 1960s. This is explained by one reason: avoidance of the regulatory framework.

The legal status of *financiera* had been earlier included in the banking legislation. The purpose of this type of financial institution was to mobilize long-term deposits by means of placing bonds among private investors. Yet, for a long period the *financieras* existed just in paper due to a simple reason: the dearth of developed money markets where private bonds could be traded.

As the banking regulatory framework became tighter, making the entry of new banks less frequent, excluded potential competitors turned their attention towards the figure of *financieras*. The main shareholders of *financieras* were the owners of large industrial corporations. In fact, *financieras* ended up being the non-bank banks of syndicates of industrial firms. The role of the *financieras* was to place bonds among the firms in the group and among the public and to grant long-term loans to firms in the group.

To avoid being excluded from the new market, the large deposit banks followed the example of the excluded competitors and founded *financieras*. Typically, the deposit banks used demand deposits to buy long-term bonds issued by their *financieras*. In this way, they were able to circumvent the strict regulations concerning the term matching of liabilities and assets.

For practical purposes, it is laborious to identify *financieras* owned by the non-bank competitors (potential bankers) and those owned by the deposit banks. The figures shown in Table 4.1 for *financieras* include both those not owned by banks and those linked to deposit banks. For this reason, measures of the concentration of assets in deposit banks are likely to be downward biased.

Taking into account the unquestionable leading role of the deposit banks, the rest of the analysis of the Mexican banking system is restricted to this type of banks. In addition, since the deposit banks held most of the assets and liabilities of the

Financial Institution	1940	1952	1960	1970	1976
Deposit <sup>a</sup>	82.5	66.3	53.3	37.3	40.8
<i>Financieras</i>	7.7	21.4	40.7	50.7	47.7
Investment Banks	6.4	8.3	3.1	0.8	0.5
Mortgages	3.4	2.8	2.0	10.7	10.7
<i>Fiduciarias</i>	—	0.6	0.9	0.5	0.3
Total (million pesos)	880	8,457	26,717	144,955	379,131

<sup>a</sup> Includes Savings Departments.

Source: CNB, several issues.

Table 4.1: Share of banking Assets by Type of Bank (%)

Mexican financial system, their owners had direct influence on the making of public policy. For instance, every year, the Mexican Banking Association held meetings with key politicians to discuss the future of financial policy. Indeed, policymakers routinely asked for the opinion of bankers regarding not only financial but national policy issues (Maxfield 1990).

The second main characteristic of the Mexican banking industry was the sustained concentration of the industry during a long period. Table 4.2 presents a summary picture of the historical record with regard to the structure of the banking industry.

Several observations flow from Table 4.2. First, the four-firm assets concentration ratio (C4) indicates that the market share of the largest banks accounted for almost 50 percent of the total for the overall period. Second, with the exception of the last period (1975–1978), the largest banks held more than three times the assets of the average bank. Apparently, neither the entry of banks nor the mergers among banks eroded the shape of this market structure.

#### 4.3.2 Entry

Bank entry is the variable that best shows the development of the commercial banking industry in Mexico during the 1940–1978 period. Variations in entry rates over time

reflected changes in the economic characteristics of the banking industry. They were also responses to modifications to the regulatory framework. Notwithstanding its relevance for the study of the Mexican banking industry, entry has been ignored in empirical investigations. The prestigious study of Brothers and Solis (1967), for example, does not include a word on the subject.

Table 4.2 presents data regarding the number of new banks, exits, and banks merged for the 1940–1978 period. The data show the existence of two phases in the development of the banking industry. The first phase (1940–1959) was one of easy entry into banking. More than 90 percent of the new banks came into the industry during this phase. The second phase, which runs from 1955 through 1978, witnessed a period of continuous bank mergers.

A brief description of the historical development of legal restrictions on banking will help to understand the development of entry into banking.<sup>1</sup> The setting of the basic regulatory framework is dated back to 1941. This set of regulations and subsequent modifications composed the rules that governed the business of banking during the following 30 years. This initial regulatory framework was composed by laws regarding the Central Bank and the commercial banks.

The new Central Bank Law (*Ley Orgánica del Banco de México*) of 1941 broadened the discretionary powers of the Central Bank to enforce regulations on commercial banks. As explained in Chapter 3, before this law the Central Bank could be hardly distinguished from a commercial bank. The 1941 law allowed the Central Bank to set up discount and open market operations. It also included rules that allowed the Central Bank to increase the proportion of commercial banks deposits subject to obligatory, interest-free reserve requirements. More relevant, the new law granted the

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<sup>1</sup>This section is based mainly on Moore (1963) and Brothers and Solis (1967).

Period	C4 Ratio	New	Exits	Mergers	AR
1940-1944	0.56	35	2	2	2.6
1945-1949	0.46	20	2	9	2.9
1950-1954	0.46	12	0	8	3.0
1955-1959	0.48	8	0	34	2.7
1960-1964	0.48	1	0	9	2.2
1965-1969	0.50	3	0	15	3.8
1970-1974	0.51	3	0	4	1.9
1975-1978	0.53	1	0	19	6.0

C4 Ratio: Four-bank asset concentration ratio.

Asset Ratio (AR): Average assets of four largest banks to average assets per bank for all but the four largest banks.

Source: *Anuario Financiero*, Several Issues.

Table 4.2: Deposit Banks: Selected Indicators

Central Bank discretionary powers to increase obligatory reserves up to 50 percent of the commercial banks' total deposits.

A new banking law (*Ley General de Instituciones de Crédito*) was enacted also in 1941. This law reinforced the Central Bank's enforcement capacity but it also endowed the deposit banks with special privileges. The most relevant privilege was that deposit banks were granted the exclusive right to mobilize short-term deposits from the public, which was the largest amount of available funds in the banking system.

In addition, the new banking law allowed deposit banks to extend the maturity of their loans. In contrast, the *financieras* were required to fund their loans only by means of issuing private debt.

Several modifications to the banking laws followed in 1949 and 1954-1957. The more relevant changes occurred in the 1954-1957 period, when the authorities substantially raised the minimum amounts of bank equity capital. The changes to the laws also included rules regarding the use of the banks' marginal liabilities, while the proportion of bank liabilities to be backed with government bonds was increased. In

addition, several rules were enacted to implement a program of selective bank credit, to redirect loans to priority sectors. In the following 18 years, no substantial changes but only quantitative adaptations affected the rules of the banking law.

The regulatory changes at the end of the 1950s coincided with the heightened entry into the banking industry. Whether these changes in fact represented the ending of a relatively free banking era remains as an empirical question.

Despite the increasingly repressive regulation, circumvention of the strict regulatory framework took place ever since it was enacted. The burden of the regulations, however, became clear in the early 1970s, when the government began to monetize the public sector deficit.

Due to an increasing inflation rate, the banks implemented several mechanisms to avoid the stringent regulatory framework. Some of these mechanisms included the opening of branches abroad and the offer of checking accounts in U.S. dollars.

Modifications to the banking law were enacted in the late 1970s to lessen the tighter regulations. An initial step was to allow banks to concentrate into financial groups. This explains the large number of mergers that occurred during the 1970s. Finally, in 1974 the banking law was again modified to authorize multiple service banks (*banca múltiple*).

#### 4.3.3 The Mechanisms of Restriction of Bank Entry

The analysis of entry brings into consideration several issues regarding the purpose of financial regulation. Was regulation based on a prudential approach? Were entry restrictions an instrument to allow regulators and incumbent banks to protect the industry?

Year	Authorized Capital		Paid-in Capital	
	Avg/Min	Avg/Max	Avg/Min	Avg/Max
1940	3.2	0.30	5.3	0.25
1945	5.5	0.34	5.6	0.23
1955	9.1	0.27	7.7	0.23
1960	9.5	0.28	11.4	0.27
1965	18.0	0.23	11.0	0.25
1970	25.1	0.21	24.4	0.22
1975	27.2	0.17	20.2	0.19

Source: *Anuario Financiero*, Several Issues.

Table 4.3: Ratios of Average to Maximum and Minimum Capital of Banks.

The mechanisms that regulators used to restrict the entry of new banks into the industry were two. The first was simply the denial of applications for bank charters. Very little information is available in this respect and whatever is available is very vague. For instance, one of the ministers of finance during the period stated that the granting of charters was based on considerations about the “well-being of Mexico” (Beteta 1963).

The second mechanism to restrict entry into banking was to raise the minimum level of equity capital required to create a bank. The effect of higher capital requirements is undetermined, however, because in addition to a barrier to entry, higher requirements may promote the overall stability of the banking industry. More capital provides greater implicit insurance for depositors. What the ultimate purpose of setting larger minimum capital requirements is then an empirical question.

Table 4.3 offers a measure of the effects of increasing minimum capital requirements on the structure of the banking industry. The variable (Avg/Min) is computed as the ratio of the average equity capital of a sample of 18 banks to the amount of capital of the smallest bank. Everything else constant, higher requirements have the effect of narrowing the gap between the average and the smallest bank capital. As shown

in the table, this variable monotonically increased from 3.2 to 27.2. This behavior is found for both authorized and paid-in capital. Thus, the effect of higher capital requirements in the Mexican case seems to go in the opposite direction as would be expected. This may be due to the rapid growth of the largest banks. The second variable shown in Table 4.3 is the (Avg/Max), which is the ratio of the average capital of the same sample of banks to the capital of the largest bank. This variable decreased from 0.25 to 0.19, reinforcing this interpretation.

The indicators presented in Table 4.3 suggest that the effect of larger minimum capital requirements is ambiguous. The data show that large banks were becoming larger and small banks were getting comparatively smaller. Other effects, not identified, were responsible for this behavior.

#### 4.4 Effects of Regulation on Entry

This section empirically measures the effect of banking regulations on the rate of entry. With this purpose in mind, the initial task is to develop a theoretical model of entry into banking.

The discussion on the factors determining the rate of entry ( $E$ ) into banking is summarized in equation (4.1). A linear relationship among the variables is assumed.

$$E_t = \alpha_0 + \alpha_1\pi_t + \alpha_2R_t + \gamma X_t + \epsilon_t \quad (4.1)$$

where  $\pi$  is the expected rate of profit in banking,  $R$  is a variable indicating regulatory changes,  $X$  is a vector that represents a set of control variables, such as financial ratios,  $\epsilon$  is a random variable independently distributed with zero mean and a constant variance,  $t$  is a time indicator, and  $\alpha_1 > 0$ ,  $\alpha_2 < 0$  and  $\gamma$  are parameters to be estimated.

For the empirical application, the dependent variable is the net rate of entry of deposit banks. The independent variables included are:

1. The expected rate of profit in banking ( $\pi$ ). This variable is measured as:

$$\pi_t = r_t \times \text{market-book asset ratio at time } t$$

where  $r$  is the risk-free interest rate and the market-book asset ratio is computed as a weighted average for the three largest Mexican banks. Market value was computed by multiplying the number of outstanding shares of each bank by the spot price of each share traded in the Mexican stock exchange.

2. The rate of deposit banks leaving the market (exits). Given that since 1941 no bank has been allowed to fail, this variable includes commercial banks that were bought by the government. The *Nacional Monte de Piedad* is an example.
3. The rate of mergers among deposit banks (mergers). This variable was adjusted to include *de facto* mergers. Financial statistics for the deposit banks were reported independently even when they belonged to financial groups. Two examples were the *Banco de Comercio* and the *Banco Mexicano*.
4. The real growth of deposits (grodep) measured as the change in total deposits of the deposit banks and savings departments.
5. The capital-asset ratio of the deposit banks (capass) was included as a control variable for the impact of leverage on returns on equity.
6. The effect of regulation on the rate of entry is measured by a number of proxy variables. The first is a dummy set to 1 for the 1956–1978 period. Based on qualitative information, 1956 opens an era of tightened restrictions in banking.

The second variable indicating regulation assumes that changes in entry restrictions occur when the expected rate of profit differs from an *adequate* (target) rate of profit. That is:

$$\text{Regulation} = \text{constant} + b(\pi - \pi^*)$$

Thus, deviations from the target rate of profit ( $\pi^*$ ) will have effects on the level of regulation by a factor ( $b$ ). For practical purposes, this effect is included by adding a multiplicative element to the dummy variable. The new dummy is then:

$$\text{regulation} = \text{constant} \times \text{dummy} + b \times \text{dummy} \times \pi$$

This specification of regulation has an interesting implication. The sign of the  $b$  parameter in the estimation is a test regarding the motives for banking regulation. If  $b > 0$ , then there is support for a prudential or normative regulation motive. The authorities tighten regulation when the rate of profit increases. If  $b < 0$ , regulations are tightened every time the rate of profit of the overall industry decreases.

Two other variables are included in the regression analysis to measure the degree of regulation. One is the government debt holdings of the Central Bank. A hypothesis of this dissertation is that the degree of banking regulation was in part determined by the financial requirements of the government. Higher public spending was mostly financed by means of government debt, which was mainly bought by the Central Bank. The Central Bank, in turn, commanded the commercial banks to hold part of their required reserves as public sector bonds.

In return, the regulatory authorities (mainly the Central Bank) awarded them some privileges, such as more protection from competitors. Along the same line of reasoning, the second alternative variable to measure regulation is the level of government bonds holdings at the commercial banks.

#### 4.4.1 Identification of the Regulatory Phase

The analysis of Section 4.3.2 identified two phases for the rate of entry into banking, one characterized by easy entry followed by another one with no entry and with mergers among incumbent banks. The switching in the pattern of the rate of entry was explained by historical elements. Since 1956, the government limited even more the granting of new bank charters.

A regression based on Equation 4.1 accounts for the preceding observation. This first version includes a dummy variable that attempts to catch the effects of tightened regulations. This variable is constructed assuming a value of 1 during the 1956–1978 period and 0 otherwise. The regression was estimated by the technique of instrumental variables to avoid problems of simultaneity between the lagged rate of profit and the rate of entry. A Hausman specification test on simultaneity proved the existence of this problem. The instruments used in the regressions were the lagged rate of entry, the gap between the loan and deposit interest rate, the loan-asset ratio, and the log of total deposits.

Regression results are reported in Table 4.4. The estimated coefficients have the expected signs. Past expected profits, as predicted, are found to induce entry, but the growth of deposits has no significant effect. The not significant parameter of exits may indicate the fact that actually no banks failed; the cases of exit reported were banks that were bought by the government.

Size of capital standardized by assets had a significant influence on the rate of entry into banking. This may reflect the downward trend of the capital-asset ratio together with fewer entries into banking observed for the overall period. The positively significant coefficient of the four-bank concentration ratio is also as predicted.

The estimation of equation (4.1) seems to bring support to the hypothesis that regulation was an efficient instrument to stop entry into banking. The coefficient of the regulatory dummy in equation (1) is negative and highly significant. Given that the annual average rate of entry was 6.7 percent for the 1940–1956 period, with a maximum of 17.7 percent, and that the coefficient of the dummy is -9.8, then regulation on average completely restricted the entry of new banks, as it actually happened.

More interesting is the multiplicative effect of the regulatory dummy with the past profit rate. The sign of this coefficient is negative and statistically significant. This finding indicates that regulators permitted less entry when the profits of incumbent banks decreased. This result with respect to the behavior of regulators suggests that the endogenous theory of regulation explains the behavior of bank regulators better than the public interest theory of regulation does.

Two alternative measures of regulation are considered in Table 4.5. They are the government debt instruments held by the commercial banks (SGCG) and the government debt instruments held by the Central Bank (BGCG). Both variables are weighted by the GNP. The negative and significant coefficient of SGCG brings support to the hypothesis that the incumbent banks were less reluctant to buy government debt if entry into the industry was tightened by the authorities.

Variable	Regressions	
	( 1 )	( 2 )
$\pi_{t-1}$	9.68 (3.3) ***	13.95 (5.2) ***
Regulation	-9.85 (-3.4) ***	31.01 (3.4)
Regulation $\times$ $\pi$	-	-14.76 (-4.2) ***
Exits <sub>t</sub>	0.71 (1.01)	1.29 (1.6) **
Mergers <sub>t</sub>	0.13 (1.5) *	0.02 (0.6)
Grodep <sub>t</sub>	0.02 (0.0)	0.22 (0.6)
Capass <sub>t</sub>	1.13 (2.6) ***	0.88 (2.6) ***
C4 <sub>t</sub>	5.73 (3.4) ***	4.93 (3.7) ***
Constant	-9.07 (-0.7)	7.18 (0.6)
R <sup>2</sup> (adjusted)	0.70	0.77

Regressions estimated by Instrumental Variables.

t-statistics are in parentheses.

\*\*\* Significant at the 1 percent level.

\*\* Significant at the 5 percent level.

\* Significant at the 10 percent level.

Table 4.4: Regression Results, Dummy Variables

In contrast, the positive and significant coefficient of BGCG may be interpreted as the desire of the government to allow new banks into the industry with the purpose of having more available resources to tax. This result, together with the result for the capital-asset ratio coefficient suggests another interpretation regarding the sign of both coefficients. Given larger financial requirements of the government, the government had the incentive to allow entry of new banks and bring more capital into the industry with the purpose of having more funds available to be taxed.

Variable	Coefficient	
$\pi_{t-1}$	9.19 (3.2)	***
Sgcg <sub>t</sub>	-1.10 (-1.9)	**
Bgcg <sub>t-1</sub>	0.49 (2.2)	**
Exits <sub>t</sub>	-0.36 (-0.4)	
Mergers <sub>t</sub>	-0.01 (-0.1)	
Grodep <sub>t</sub>	0.58 (1.3)	*
Capass <sub>t</sub>	2.40 (5.1)	***
C4 <sub>t</sub>	5.97 (3.6)	***
Constant	-24.01 (-2.2)	**
R <sup>2</sup> (adjusted)	0.65	

Regressions estimated by Instrumental Variables.

t-statistics are in parentheses.

\*\*\* Significant at the 1 percent level.

\*\* Significant at the 5 percent level.

\* Significant at the 10 percent level.

Table 4.5: Regression Results for Determinants of Entry

#### 4.5 Conclusions

The econometric analysis brings support to the hypothesis that government regulation restricted entry into the Mexican banking industry to allow incumbent banks to make profits. The empirical evidence suggests that restrictions were tightened when the rate of profit of those banks already in the market was threatened by the entry of new banks.

Another finding of this chapter is that the degree of regulatory restrictions was closely related to the financial requirements of the government. In this respect, however, two effects ran in different directions concerning the ease of entry. First, greater financial requirements of the government demanded a broader taxable base. More banks in the industry meant more available funds to be taxed by the use of the multiple mechanisms of selective credit controls of the government. In addition, more banks had the effect of diminishing the power of incumbent banks, making them easier objects of taxation.

Banks had the power to negotiate with the government regarding implementation of the regulations. The empirical evidence shows that banks were less reluctant to buy government debt in exchange for more restrictions on bank entry. This was the second motive of banking regulation.

The existence of two non-prudential motives for banking regulation in Mexico, however, was not at odds with regulation with a prudential purpose. Increasing minimum capital requirements, for instance, had a positive impact on the stability of the industry. It is difficult to believe that the the long-term stability of the Mexican system for over 35 years was just an accident.

Higher minimum capital requirements, however, had a second impact on the market structure of the industry. They created a barrier to potential entrants. It is, then, an empirical task to attempt to differentiate among the effects of regulations. In this direction, the next chapter proposes an empirical model that attempts to include both non-prudential and prudential motives of regulation of the Mexican banking industry.

## CHAPTER 5

### THE MAKING OF BANKING REGULATION

#### 5.1 Introduction

Theoretical work on the economics of regulation follows two main traditions. The *public interest tradition* seeks to provide guidance to regulators as to the type of policies they should adopt. Regulators are assumed to care about both consumer surplus and producer surplus, with the relative weight assigned to each becoming a key parameter. The second one is the *positive political economy tradition*, which this dissertation takes as its main approach. Under this approach, regulations are acknowledged to be chosen by politicians who seek to optimize some kind of political objective.

##### 5.1.1 The Public Interest Tradition

For the banking industry, the public interest tradition advises regulators to intervene to protect small depositors who have little individual incentives to monitor the performance of banks. Thus, regulators become the representatives of small depositors (*Representation Hypothesis*) (Dewatripont and Tirole 1994).

With the aim of lowering the chance of individual bank failure by discouraging opportunistic behavior on the part of banks and thereby enhancing the overall stability of the banking system, regulators have imposed limitations on bank asset choices, have

implemented periodic examinations of bank asset quality, and have required minimum bank capital/asset ratios.

Banking regulation, however, has mainly focused on two instruments. The first one has been to require adequate capital levels, as recommended by the Basel Agreements. Theory predicts that increasing bank capital reduces the risk of bank failure (Stevens 2000). The second instrument has been the limitation of the number of bank charters issued with the purpose of restricting “excessive” competition among banks and ensuring an adequate level of profitability for the incumbent banks, so they have enough incentives to behave conservatively with respect to risk-taking.

Control of entry into the industry, however, means a trade-off for the regulators, because less restrictions may have negative effects on the stability of the industry while less entry opportunities may erode efficiency. This trade-off is represented graphically in Figure 5.1. In this figure, the rate of profit of the overall banking industry (horizontal axis) and the rate of entry into the industry (vertical axis) are plotted. There is a combination of entry ( $N^b$ ) and profit levels ( $P^b$ ) that represents the desired balance between stability and efficiency. Higher profits jeopardize efficiency and require the authorities to increase entry to bring profits down. Lower profits reduce the value of the charter and therefore reduce incentives for cautious behavior. To protect stability, the authorities reduce entry and push profits up. The resulting reaction is represented by the upward-sloping locus  $SE$ .

The procurement of stability would require regulators to tighten entry restrictions in situations where the rate of profit ( $P_1$ ) is lower than the rate that assures the stability of the industry ( $P^b$ ). On the other hand, with the aim of promoting efficiency, regulators would relax entry restrictions in situations where banks are obtaining excessive rates of profit ( $P_o > P^b$ ) (Quadrant I).

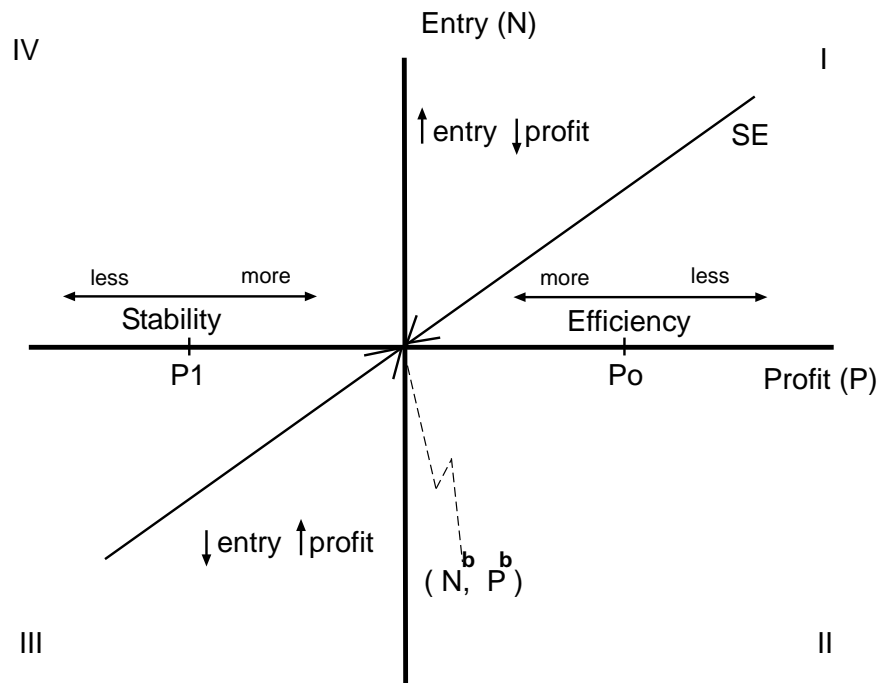


Figure 5.1: Public Interest Regulation

### 5.1.2 The Positive Political Economy Tradition

The positive political economy tradition recognizes that regulation is based on a broad range of government objectives beyond concerns about the stability or the efficiency of the banking system. The nature of the banking industry makes it valuable for the pursuit of varied government objectives. In particular, the authorities have seen the banking system as a source of government budget financing. In developing countries, the government has been able to tax the banking industry through a number of mechanisms (Aspe and Sigmund 1984).

From a positive political economy perspective as well, therefore, entry is the main instrument of regulation. Two motives rule the degree of entry allowed into the

banking industry. The first one reflects the pressure of bankers, who make efforts to influence the decision of regulators regarding the number of charters issued to restrict entry. The best outcome for the incumbent banks is to completely ban the entry of new competitors. The second motive reflects the desire of regulators to increase the number of competitors in order to broaden the taxable base. Thus, the actual regulators' decision regarding the number of new charters to issue is the outcome of a trade-off between two motives: (1) rent-seeking on behalf of the bankers and (2) a fiscal motivation on behalf of the government.

This trade-off is represented by means of Figure 5.2. In the figure, the rate of profit in banking (horizontal axis) is plotted against the rate of entry into the banking industry (vertical axis). The rent-seeking motive is best described in Quadrant II, where bankers pressure regulators to constrain entry in order to obtain a higher rate of profit ( $P_o$ ) than the competitive rate ( $P^b$ ). The fiscal motive is best shown in Quadrant IV. The government proceeds to issue more charters in order to broaden the taxable base. The resulting reaction is represented by the downward-sloping locus  $FR$ . Even if this behavior has a negative impact on the rate of profit for the incumbent banks ( $P_1 < P^b$ ), the taxable base depends on the volume of deposits mobilized, not on bank profits.

## 5.2 A Synthetic View of the Process of Regulation

The approach adopted in this chapter draws on both of these traditions. The model developed here seeks consistency with the public interest tradition in assuming that regulators choose policies to promote both the stability and the efficiency of the banking industry when enforcing minimum capital requirements and controlling entry.

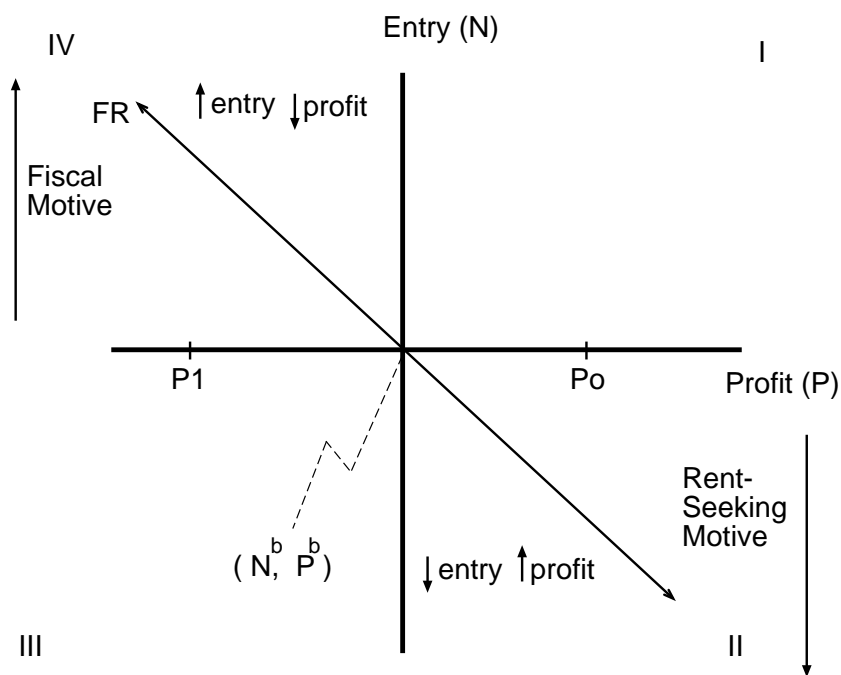


Figure 5.2: Non-Public Interest Regulation

The model also adopts the positive political economy approach because it attempts to capture the effects of the political process on the making of regulatory policy. On the one hand, regulation offers the government the opportunity to tax deposits as a source of budget deficit financing. On the other hand, regulation always has important distributive effects. These effects create a demand for regulation. The model assumes that incumbent banks do accept to be regulated in exchange for a less competitive banking industry. Thus, actual regulation is likely to respond to both public interest and positive political economy motives. What the weights assigned to each dimension in the objective function of the authorities are an empirical issue.

This model of banking regulation is based on the nature of the relationship between the government (regulator) and the incumbent banks. Based on the logic of

concentrated benefits and diffused costs of policy reforms, depositors are not explicit players in the game. Following this logic, the incumbent banks are expected to receive greater consideration than other sectors in the design of regulatory policies.

This approach agrees with the generally accepted assumption that depositors, the unprotected third party in banking transactions, have limited influence on the making of regulation because they are individually small and numerous (Dewatripont and Tirole 1994). This leads to a breakdown of the collective action that would have their views and interests considered (Olson 1965).

### 5.3 The Model

The government implements regulatory policy by means of requiring average capital adequacy levels and restricting entry of new banks into the industry. The level of required capital adequacy in each period ( $K_t$ ) is assumed to be related to the rate of net entry of banks ( $N_t$ ) by the following equation:

$$K_t = \bar{K} + \psi [N_t - g(\pi_t^e)]; \quad (5.1)$$

$$\psi > 0, g'(\pi_t^e) < 0, g''(\pi_t^e) \leq 0$$

where  $\bar{K}$  is a predetermined or desired long-run level of capital adequacy. This magnitude is to be interpreted as the level of capital adequacy that would prevail in the absence of unexpected net entry.

Incumbent banks are assumed to set the prices of their financial products at the beginning of each period (year) based on the expected rate of profit for the overall banking industry ( $\pi_t^e$ ). The timing of the model is summarized in Figure 5.3.

The expectations mechanism of the model assumes that the current rate of entry introduces no direct restrictions on future choices,  $N_{t+i}$ . Then, with current and future rates of entry fixed, the determination of  $N_t$  is a one-period trade-off between a higher rate of entry and a lower rate of profit.

The expected rate of profit is assumed to depend on the expected net rate of entry of banks. Therefore, the expectation about the net rate of entry is formed on the basis of the information set ( $I$ ) available at time ( $t - 1$ ):

$$g(\pi_t^e) = N_t^e = E(N_t^e | I_{t-1}) \quad (5.2)$$

Substituting (5.2) into (5.1) yields

$$K_t = \bar{K} + \psi(N_t - N_t^e) \quad (5.3)$$

In summary, the government implements regulatory policy in the pursuit of two objectives. First, a *normative* or public interest objective is to promote a stable, sound and competitive banking system. The government is assumed to set minimum capital adequacy levels for both incumbent and potential new banks and to control entry of new banks into the industry. The expected effect of these policy tools is to affect the banks' desired positions on their risk/return trade-off.

Second, regulatory policy is also assumed to pursue a positive political economy objective. The government seeks to tax the deposits held by the banking system. There are a number of instruments of taxation to be used by the government. Some of these instruments are described in Chapter 3. The model assumes that the government extracts resources ( $R_t$ ) from the banking industry by means of imposing compulsory minimum reserve requirements on commercial banks and by enacting se-

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$t = 0$	Regulators and Incumbent Banks Agree on Regulatory Policy (targets):
	<ol style="list-style-type: none"> <li>1. Rate of Entry: <math>\phi(t)</math></li> <li>2. Capital Adequacy Ratio: <math>\epsilon</math></li> <li>3. Government Debt/GDP Ratio (Tax Base): <math>\theta</math></li> </ol>
$t = 1$	Regulators have incentives to use their discretionary and coercive power to renege on their commitment to the agreed regulatory policy

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Figure 5.3: The Timing of the Model

lective portfolio quotas. The government's fiscal expectations are described by the following equation:

$$R_t = \bar{R} + \gamma(N_t - N_t^e); \quad \gamma > 0, \quad (5.4)$$

where  $\bar{R}$  represents the amount of resources to be extracted from the banking system in the absence of unexpected entry.

Given expectations about the rate of profit of the overall industry at the beginning of the period, the government has incentives to increase the number of banks in the industry beyond the agreement with the incumbents with the purpose of enlarging the taxation base. Equation (5.4) attempts to capture this moral-hazard problem emerging from the government's incentives to renege on its commitment.

The simplest way to characterize the two objectives of the government in the making of regulatory policy is to assume a quadratic specification of the government's loss function:<sup>1</sup>

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<sup>1</sup>The introduction of a quadratic preference function to model an agent's choices may be dated back to the work of Theil (1964). The recent use of this kind of function to model macroeconomic policy decision-making was popularized by the seminal article of Barro and Gordon (1983).

$$L = \sum_{t=0}^{\infty} q^t \left\{ \frac{w_1}{2} [N_t - \phi(t)]^2 + \frac{w_2}{2} [K_t - \epsilon]^2 + \frac{w_3}{2} [R_t - \theta]^2 \right\} \quad (5.5)$$

where  $w_1$ ,  $w_2$ ,  $w_3$ ,  $\epsilon$ , and  $\theta$  are parameters. The objective of this equation is to model the extent to which the government loses reputation when it deviates from the regulatory targets set at the beginning of a given period. The loss in reputation arises because the regulators may also have an incentive to pursue a strategic advantage and seek short-run gains by renegeing on previously announced policies. Reputation matters, however, for the credibility of future commitments.

The first term in equation (5.5) indicates that costs arise with the departure of the rate of entry from the target value  $[\phi(t)]$  set at the beginning of the period. The target value is assumed to vary with time to capture a number of changes in the conditions of the industry. One possible change may be in the level of contestability of the industry. More contestability, for instance, implies a lower target value. Moreover, variations in the target level of net entry ( $\phi$ ) over time also reflect changes in the expected rate of profit for the overall banking industry due to the development of financial innovations.

The second and third terms in equation (5.5) also indicate that deviations from the targets have costs for the government. One reason is that incumbent banks trust the regulatory authority with respect to the expected net entry of banks, and thereby they form their expectations regarding the rate of profit. Another reason is that higher capital adequacy requirements have the effect of reducing the rate of leverage of the overall system, thereby having a negative impact on the profit rate. Thus, upward deviations from the target levels of capital per bank have negative effects on the overall profitability of the incumbent banks.

Equation (5.5) also assumes that the choice at each date of a net rate of entry into the banking industry is designed to minimize the expected value of costs for the

government, as calculated at some starting date ( $t = 0$ ). This is achieved through the constant, exogenously given real discount rate  $q$ .

The upshot of equation (5.5) is that the final outcome of any government's regulatory policy is based on the weights attributed to the deviations from the normative and political economy targets ( $\epsilon$  and  $\theta$ ), respectively. The magnitude of these weight parameters becomes the key empirical issue.

As long as  $\theta < \bar{R}$  and if  $w_3$  and  $w_2$  are positive, the regulator faces the problem of the dynamic inconsistency of an optimal regulatory policy. If the amount of resources the government can extract from the banking industry is higher than the amount of resources that was already jointly chosen along with the incumbent banks at the beginning of the period, the regulator has incentives to initiate regulatory policy surprises, in order to approach a higher level of fiscal support. This can be shown by substituting (5.3) and (5.4) into (5.5), as follows:

$$L = \sum_{t=0}^{\infty} q^t \left\{ \frac{w_1}{2} [N_t - \phi(t)]^2 + \frac{\tilde{w}_2}{2} \left[ N_t - N_t^e - \frac{1}{\psi} (\epsilon - K_t) \right]^2 + \frac{\tilde{w}_3}{2} \left[ N_t - N_t^e - \frac{1}{\gamma} (\theta - R_t) \right]^2 \right\} \quad (5.6)$$

where  $\tilde{w}_2 = w_2 \psi^2$  and  $\tilde{w}_3 = w_3 \gamma^2$ .

The optimal regulatory policy is that one where both the regulator and the incumbent banks agree on the initial setting levels of two variables. One is the expected rate of profit at which the overall banking industry would be stable (that is, without excessive risk-taking) and the other one is the level of resources the government can extract from the incumbent banks. In other words, the incumbent banks are willingly to *pay* a tax in exchange for protection from would-be bankers.

If the government could make a binding commitment, it would choose to commit to the rule:  $N_t = \phi(t)$ . This rule is obtained by minimizing (5.5) subject to rationality of expectations ( $N_t = N_t^e$ ). The actual achievement of a binding commitment depends, however, on the relative power of both parties (the government and the incumbent banks).

### 5.3.1 Equilibrium Regulatory Policy

Equilibrium regulatory policy coincides with the time consistent rate of net entry. This rate of entry is found by the regulator when its loss function (5.5) is minimized while taking expectations as given. The first-order condition for a minimum is:

$$N_t = \frac{w_1}{\Omega} \phi(t) + \frac{\tilde{w}_2}{\Omega} \bar{k} + \frac{\tilde{w}_3}{\Omega} \bar{r} + \frac{\tilde{w}_2 + \tilde{w}_3}{\Omega} N_t^e \quad (5.7)$$

where  $\Omega = w_1 + \tilde{w}_2 + \tilde{w}_3$ ,  $\bar{k} = \frac{\epsilon - \bar{K}}{\psi}$  and  $\bar{r} = \frac{\theta - \bar{R}}{\gamma}$ . The equilibrium regulatory policy results from the rational expectations solution, when the rate of entry  $N_t$  coincides with  $N_t^e$ . That is, equilibrium involves:

$$N_t = \theta(t) + \frac{\tilde{w}_2}{w_1} \bar{k} + \frac{\tilde{w}_3}{w_1} \bar{r} \quad (5.8)$$

In (5.8), the terms  $\left(\frac{\tilde{w}_2}{w_1}\right)$  and  $\left(\frac{\tilde{w}_3}{w_1}\right)$  reflect two effects that affect the net rate of entry into the banking system in the absence of binding commitments by the government. These effects are zero if and only if either  $\tilde{w}_2$  and  $\tilde{w}_3$  are zero and/or  $\epsilon = \bar{K}$  and  $\theta = \bar{R}$ .

Figure 5.4 shows this equilibrium regulatory policy. In the figure, the combination  $(N^b, P^b)$  indicates the coincidence of both public interest and non-public interest policies when the targets are the same as the rates of entry and profit that would prevail in the absence of government intervention. This occurs at the point of intersection of the public interest and non-public interest loci.

In Figure 5.4, the region above the public interest regulation locus represents situations where the average capital adequacy target is larger than the market determined adequacy level ( $\epsilon > \bar{K}$ ). The opposite occurs in the region below the public interest locus ( $\epsilon < \bar{K}$ ). Similarly, points above the non-public interest regulation locus represent situations where the targeted government's financial requirements are higher than the amount of resources that the government can extract from the banking industry ( $\theta > \bar{R}$ ). The opposite occurs in the region below the non-public interest locus ( $\theta < \bar{R}$ ).

Figure 5.4 also represents a possible situation where the government allows banks to reduce their capital adequacy levels, which permits them to increase their profits ( $P^*$ ). To protect these higher profits, the government reduces the targeted rate of entry ( $N^*$ ). In exchange, the government is able to extract a higher amount of resources from the banking industry. Because of the threat of the government renegeing on the commitment, the incumbent banks expect a premium ( $\lambda$ ) in their profit levels.

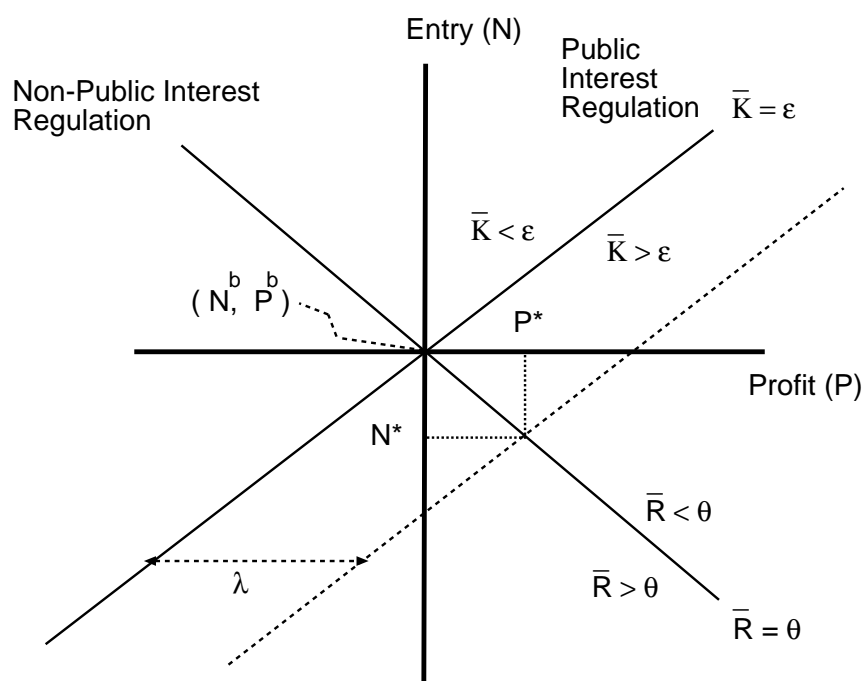


Figure 5.4: Equilibrium Regulatory Policy

#### 5.4 Hypotheses

The model developed in Section 5.3 provides the opportunity to test the following hypotheses.

1. The non-public interest motive received a relative higher weight in the preferences of the regulators over the 1940–1959 period.

In statistical terms,

$$H_0: \hat{w}_3 > \hat{w}_2$$

2. The public interest motive for regulation received a higher weight in the preferences of the regulators over the 1960-1978 period.

In statistical terms,

$$\text{Ho: } \hat{w}_2 > \hat{w}_3$$

The analysis of the previous chapters suggests elements in favor of the non-rejection of both hypotheses. Over the 1940–1959 period, the government increased the rate of entry of banks into the industry with the purpose of broadening the taxable base. This was the leading force in face of a weak degree of collective action on the part of the bankers and the extent of the government’s fiscal requirements. This situation changed around 1960 for several reasons. One historical reason is that the bankers reorganized their syndicate. The annual meeting of the bankers’ syndicate became the forum where the policymakers and bankers gathered to plan the annual financial policy of the country.

An inspection of Figure 5.5 supports both hypotheses. The figure shows a clear positive relationship between the rate of entry and the amount of government debt held by the Central Bank over the 1940–1958 period. The correlation between both variables is 0.59, and it is statistically significant at 1 percent. This positive relationship between these variables suggests that a higher rate of entry allowed the government to obtain more funds from the banking industry.

The relationship between the rate of entry and the government debt held by the Central Bank changed for the 1959–1978 period. Although the correlation between those variables is still positive (0.29), it is lower than the correlation for the previous period.

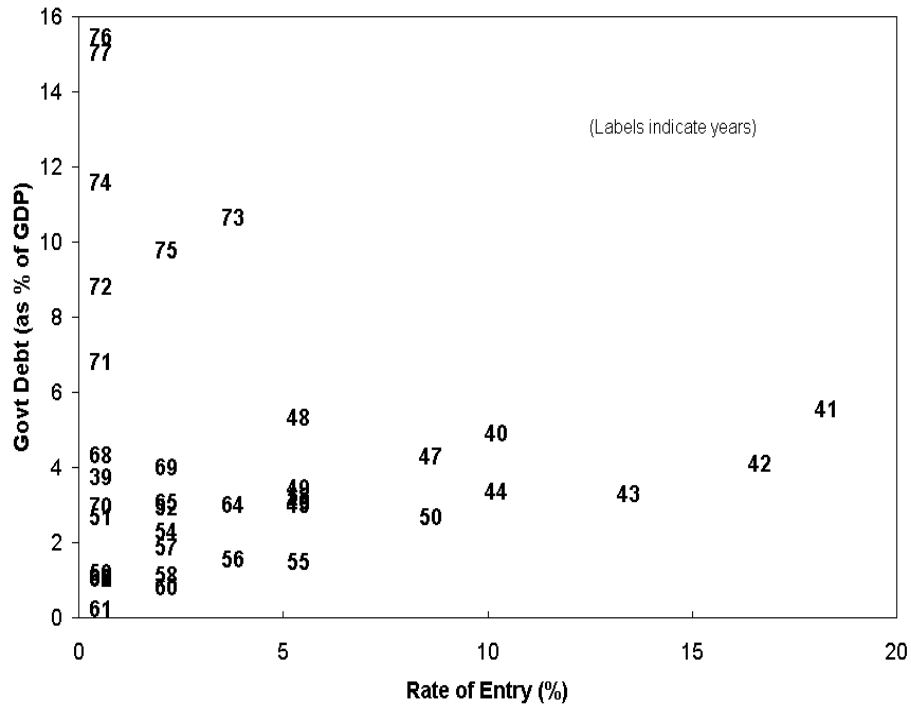


Figure 5.5: Entry and Government Debt Held by the Central Bank

### 5.5 Empirical Estimation

Equation (5.8) captures the two motives for banking regulation. It states that actual regulatory policy is the net effect of public interest and political economy criteria. The specific weight or importance of each effect is an empirical issue. An attempt to empirically estimate the parameters associated with the making of banking regulatory policy in Mexico for the 1940–1978 period follows.

The empirical estimation assumes the following relationships:

$$\bar{K}(t) = k - \alpha\pi_t \quad (5.9)$$

$$\bar{R}(t) = r - \beta R_{t-1} \quad (5.10)$$

$$\phi(t) = \bar{N} + \lambda N_{t-1} \quad (5.11)$$

In (5.9), a negative relationship between the rate of profit of the overall banking industry and the average capital adequacy of incumbent banks is assumed. In order to obtain a higher rate of profit, there is an incentive for banks to reduce the capital adequacy ratio. The financial budgetary requirements of the government are assumed to depend on the immediate past, as reflected by (5.10). In addition, the rate of entry into banking as determined by the market is assumed to depend on its value in the previous period. This is the meaning of (5.11).

Together (5.8), (5.9), (5.10) and (5.11) determine the following equation:

$$N_t = \bar{N} + \lambda N_{t-1} + \frac{w_2}{w_1} \psi(\tilde{k} + \alpha\pi_t) + \frac{w_3}{w_1} \gamma(\tilde{r} + \beta R_{t-1}) \quad (5.12)$$

where  $\tilde{k} = (\epsilon - k)$ ,  $\tilde{r} = (\theta - r)$ , and  $\alpha$ ,  $\beta$ , and  $\lambda$  are parameters. Equation (5.12) is the basis for the empirical application.

This equation implies several characteristics regarding the making of banking regulatory policy. First, absence of binding commitments on the part of the regulator are the main source of changes or modifications of regulatory policy. On the one hand, government actions are driven by opportunistic behavior that creates a moral-hazard problem. This problem emerges from the tendency of the government to finance larger

amounts of the public sector deficit than had been agreed upon. On the other hand, however, the regulator is worried about the stability of the banking system, so the government requires the commercial banks to increase their equity in order to offset the extra risk created by its own opportunistic behavior. The relative importance of the non-public interest and public interest motives for regulation is regarded as an empirical issue.

The second characteristic of the equation is that the making of banking regulation is a dialectic process. This comes from two elements. One element is that the incumbent banks play an active role in the making of regulations. In the model, the incumbent banks have rational expectations regarding the optimal behavior of the regulator. The other element is that the government's behavior is ruled by its financial requirements. Together, these two elements mean that the regulatory framework is amended every period. This continuous modification of the specific regulations occurs even without considering external factors, such as technological change and the specific competitive behavior of potential entrants.

### 5.5.1 Estimation of the Model

The estimation of equation (5.12) has two purposes. The first one is to evaluate the agreement of the model with reality. The data used in the empirical application are the annual net rate of bank entry, the annual percentage change of capital the per bank for deposit banks, and the annual percentage rate of change of the ratio of government debt holdings of the Central Bank with respect to the GDP. The data correspond to the 1940–1978 period and are shown in Appendix A.

The second purpose of the empirical experiment is to obtain a measure of the relative importance of the public interest and non-public interest motives of the making

of banking regulation in Mexico. The hypothesis that banking regulation in Mexico has gone through two stages is tested. During the first stage, the non-prudential motive is supposed to lead the making of regulation (1940–1956). During the second stage (1957–1978), which was characterized by government intervention in financial markets, the prudential motives for regulation should be more important than during the first stage.

### 5.5.2 The 1940–1978 period

Table 5.1 shows the results of the estimation of equation (5.12) for the overall period. The estimated values of  $w_1$ ,  $w_2$  and  $w_3$  do not reject the hypothesis that the making of banking regulation obeys both to prudential and non-prudential motives. The three parameters are positive and strongly significant. In addition, the relative magnitude of the parameters offers clues regarding the weight of prudential and non-prudential factors in the regulatory policy followed throughout the whole period. The evidence suggests a higher weight for the prudential motive of banking regulation than for political economy considerations.

The coefficient of  $\gamma$  has the expected sign, and it is significant at the 5 percent level. This statistical evidence suggests that, on average, the effect of unexpected increases in the rate of entry generated a decrease of -0.50 percent of the government debt holdings of the Central Bank, which were financed mainly with the commercial banks' obligatory reserves. The remaining parameters have the predicted signs. Five of them, however, are not significant.

Parameter	Estimate	t-Statistic	
$w_1$	2.05	2.23	**
$w_2$	1.93	2.06	**
$w_3$	0.97	2.26	**
$\psi$	0.47	0.57	
$\gamma$	-0.50	-1.14	*
$\bar{N}$	0.36	0.19	
$\lambda$	0.72	6.79	***
$\alpha$	1.08	0.96	
$\beta$	0.02	1.80	*
$k$	0.81	0.69	
$r$	1.24	0.99	
Log of likelihood function: -38.59			

- \*\*\* Significant at the 1 percent level.
- \*\* Significant at the 5 percent level.
- \* Significant at the 10 percent level.

Table 5.1: Estimation of the Model, 1940–1978

### 5.5.3 The 1940–1958 and 1959–1978 periods

Tables 5.2 and 5.3 display the regression results for the 1940–1958 and 1959–1978 periods, respectively. The log-likelihood test does not reject the restrictions imposed by theory at the 5 percent levels of confidence for each estimation. In both periods, the signs of the coefficients of  $w_1$ ,  $w_2$  and  $w_3$  correspond to those predicted by theory, and they are all significant. The remaining parameters are significant at the 5 percent level in both estimations.

The estimated parameters of  $w_1$ ,  $w_2$  and  $w_3$  do not reject the hypothesis that the making of banking regulation during the first period was more influenced by the non-prudential motive than by the prudential one. The coefficients of  $w_2$  and  $w_3$  are statistically the same. A similar situation occurs in the second estimation. The

coefficients of the weight parameters do not reject the hypothesis that the making of banking regulation was more influenced by a prudential rather than a normative motive. Thus, the estimated parameters give support to regulation being driven by prudential motives. The coefficient of  $w_2$  is almost 4 times larger than the coefficient of  $w_3$ .

Parameter	Estimate	t-Statistic	
$w_1$	1.71	2.37	**
$w_2$	1.64	2.75	**
$w_3$	1.78	2.05	**
$\psi$	-1.04	-2.65	**
$\gamma$	-0.89	-1.91	**
$\bar{N}$	14.78	2.94	**
$\lambda$	0.60	5.19	***
$\alpha$	4.40	4.50	***
$\beta$	0.10	2.11	**
$k$	6.48	6.45	***
$r$	-4.82	-2.74	**

Log of likelihood function: -46.53

- \*\*\* Significant at the 1 percent level.
- \*\* Significant at the 5 percent level.
- \* Significant at the 10 percent level.

Table 5.2: Estimation of the Model, 1940–1958

Parameter	Estimate	t-Statistic	
$w_1$	5.15	7.78	***
$w_2$	0.87	1.36	*
$w_3$	0.24	1.20	*
$\psi$	-0.72	-6.60	***
$\gamma$	-0.08	-2.40	**
$\bar{N}$	4.14	1.78	*
$\lambda$	-0.28	-1.33	
$\alpha$	10.95	11.0	***
$\beta$	1.44	3.84	***
$k$	9.40	9.44	***
$r$	-12.6	-12.3	***
Log of likelihood function: -26.88			

- \*\*\* Significant at the 1 percent level.
- \*\* Significant at the 5 percent level.
- \* Significant at the 10 percent level.

Table 5.3: Estimation of the Model, 1959–1978

#### 5.5.4 Conclusions

The model of the making of banking regulation developed in this chapter is in accordance with the data from the Mexican banking system for the overall period and for the two sub-periods considered. The coefficients of the key parameters are significant and have the signs predicted by theory.

The empirical evidence supports the hypothesis that the making of banking regulation was determined by both public interest and non-public interest motives. Indeed, the model estimation generates estimates for the weight of each motive. For the overall period, 1940–1978, the model gives the result that banking regulation followed mainly a public interest approach.

## CHAPTER 6

### CONCLUSIONS

#### 6.1 Overview

The essence of this dissertation is the representation of the making of banking regulation as the outcome of public interest and positive political economy motives. Under a discretionary regime, the regulator formulates regulatory policy based on two criteria. One is the concern of the regulator with the public interest, namely with the promotion of the soundness and efficiency of the banking system. The other criterion is derived from the regulator's discretionary and coercive power to regulate. Regulation by itself is rewarding for the regulator. The relative weight of each criterion is deemed to be an empirical issue.

The analysis of the Mexican banking system during the 1940–1978 period provides an excellent application of the positive political economy approach for a number of reasons. One is that the banking system in Mexico has been the object of an extensive intervention by the government. This intervention has reflected a government's rational decision. The deposits mobilized by the commercial banks have been a stable and secure way of financing the public sector deficit.

Incumbent bankers have incentives for regulation. Less competition gives them the opportunity to make higher than normal profits. The protection that incumbent banks receive, however, has a cost. In the Mexican case, this cost was reflected in

the agreement of bankers to comply with a strict program of portfolio quotas, high reserve requirements, and subsidized credit to selected groups.

Because regulation is beneficial for both the regulators and the incumbent banks, they may reach an agreement regarding regulatory policy. This policy, however, is affected by an additional factor: the opportunistic behavior of regulators. In effect, the regulators use their discretionary and coercive power to repudiate the regulatory framework.

## 6.2 Main Findings

The following are the main findings of this dissertation.

First, the econometric analysis of the Mexican banking industry suggests that entry restrictions were tightened when the rate of profit of those banks already in the market was threatened by the entry of new banks. Moreover, the degree of regulatory restrictions was closely related to the financial requirements of the government.

Second, the empirical results show that regulatory policy differed across periods. During the first period (1940–1956), the taxation of banking funds (non-public interest motive) received a higher weight than the public interest motive. This result supports the hypothesis that the government issued a large number of bank charters mainly with the purpose of broadening the base available to extract resources to finance the rising public sector deficit.

The public interest motive, in turn, received a relative higher weight in the making of regulatory policy during the overall 1940–1978 period. This suggests that during a second period (1957–1978), the government was more worried about the stability of the financial system. Almost no entry and a smooth functioning of the commercial banks characterizes this period.

These findings support the claim that the long-run growth with financial stability of the Mexican economy was based on two elements. One asserts that financing of the public sector deficit with banking resources avoided the government's excessive use of the inflation tax. The other element is that whereas regulatory policy reflected non-public interest factors, the promotion of stability in banking was key for the regulators.

### 6.3 Limitations and Future Directions

The model of the making of banking regulation developed in this dissertation fits reality. It is, however, limited for a number of reasons. First, the model assumes that the weights attributed to public interest and political economy motives are exogenously given. A better specification would be to make such weights a function of exogenous variables.

A second limitation is that the model does not embody the effect of financial innovations on the shape of the regulatory framework. The strict enforcement of regulation is a hindrance for incumbent banks to develop new financial products. In contrast, potential entrants operate in parallel financial markets and do not suffer from regulatory restrictions, so they are able to take the lead in financial innovation.

The analysis of banking regulation is still new. Initial attempts have been directed towards the efficient design of mechanisms of prudential regulation. So far, prudential measures to promote the stability of financial markets have produced mixed results. Even the best prudential regulatory schemes have failed in some countries.

The consideration of positive political economy elements, though, is complementary to the efforts of prudential regulation. The analysis of political economy brings elements ignored by the alternative approach, such as the opportunistic behavior of regulators.

The last decade witnessed the fruits of the political economy approach in the field of monetary theory. The conclusion was that no matter how well designed monetary policy is, absence of binding commitments on the part of the monetary authorities leads to higher than optimal levels of inflation. This dissertation offers an equivalent result. The absence of binding commitments on the part of the regulatory authorities hurts efficiency and stability in the banking industry.

In conclusion, the positive political economy approach brings very fruitful elements to the design of better incentive-compatible mechanisms directed toward promoting the soundness and efficiency of the banking system.

## APPENDIX A

### DATA

Year	Private Banks <i>Number</i>	Deposit Banks <i>Number</i>	Liabilities-to- GDP Ratio %	Capital-to- Asset Ratio %	Capital Index <i>1960=100</i>
1940	70	61	8.5	9.1	3.9
1941	126	67	9.3	9.2	5.0
1942	140	76	12.0	10.5	8.5
1943	160	82	15.3	9.3	11.5
1944	185	91	13.9	8.9	14.3
1945	215	97	16.2	8.7	17.7
1946	246	101	12.3	9.6	20.7
1947	254	104	11.5	10.9	24.7
1948	254	104	12.2	10.9	27.8
1949	249	105	12.2	10.3	28.9
1950	246	106	13.9	9.0	32.9
1951	250	108	12.4	9.6	40.1
1952	253	110	12.2	9.1	42.0
1953	250	110	12.8	9.1	44.2
1954	245	107	12.6	8.2	47.1
1955	247	106	12.7	8.3	58.6
1956	245	106	12.7	8.2	65.9
1957	242	106	12.9	7.9	74.6
1958	246	106	13.2	7.8	83.0
1959	245	103	14.7	7.4	93.1
1960	244	102	15.0	6.9	100.0

Table A.1: Banking System: Selected Variables, 1940–1978

Table A.1 (continued)

Year	Private Banks <i>Number</i>	Deposit Banks <i>Number</i>	Liabilities-to- GDP Ratio %	Capital-to- Asset Ratio %	Capital Index <i>1960=100</i>
1961	244	102	15.8	6.6	109.8
1962	252	106	17.1	6.3	120.9
1963	247	103	18.8	6.7	158.5
1964	245	103	20.1	5.9	173.4
1965	246	105	23.0	5.7	193.1
1966	247	106	23.2	5.1	202.9
1967	245	105	24.7	4.8	224.8
1968	240	105	26.2	4.5	248.9
1969	240	104	28.9	4.3	289.1
1970	240	104	30.6	4.1	323.8
1971	241	106	32.1	4.0	364.2
1972	241	106	32.1	3.9	404.1
1973	240	106	30.0	3.9	464.2
1974	239	108	26.9	3.7	518.7
1975	240	109	27.6	3.3	570.3
1976	234	109	26.4	3.2	661.0
1977	198	93	24.9	2.2	632.1
1978	137	51	25.9	1.9	730.7

Source: *Anuario Financiero de México*, Asociación Mexicana de Bancos, Several Issues.

Year	Real GDP Growth %	Inflation Rate %	Exchange Rate <i>Pesos per \$US</i>	Govt Claims Held by CB as % of GDP
1940	1.4	4.5	5.4	3.7
1941	9.7	2.1	4.9	4.9
1942	5.6	9.4	4.9	5.6
1943	3.7	17.7	4.9	4.1
1944	8.2	33.3	4.9	3.3
1945	3.1	6.2	4.9	3.4
1946	6.6	27.4	4.9	3.0
1947	3.4	7.3	4.9	3.1
1948	4.1	2.4	5.7	4.3
1949	5.5	4.4	8.0	5.3
1950	9.9	5.3	8.7	3.4
1951	7.7	18.8	8.7	2.7
1952	4.0	7.9	8.7	2.7
1953	0.3	0.0	8.7	3.0
1954	10.0	9.8	11.3	3.2
1955	8.5	12.2	12.5	2.3
1956	6.8	6.9	12.5	1.5
1957	7.6	7.4	12.5	1.5
1958	5.3	5.2	12.5	1.9
1959	3.0	4.1	12.5	1.1
1960	8.1	5.0	12.5	1.2
1961	4.9	3.4	12.5	0.8
1962	4.7	3.0	12.5	0.2
1963	8.0	3.1	12.5	1.0
1964	11.7	5.7	12.5	1.0
1965	6.5	2.3	12.5	3.0
1966	6.9	3.9	12.5	3.1
1967	6.3	2.9	12.5	1.1
1968	8.1	2.4	12.5	1.0
1969	6.3	4.0	12.5	4.3
1970	6.9	4.5	12.5	4.0
1971	3.4	5.9	12.5	3.0
1972	7.3	6.8	12.5	6.8
1973	7.6	13.3	12.5	8.8
1974	5.9	23.4	12.5	10.6
1975	4.1	16.2	12.5	11.6
1976	2.1	20.1	20.0	9.8
1977	3.3	31.1	22.7	15.5
1978	7.1	17.3	22.7	15.0

Source: *Informe Anual*, Banco de México, Several Issues.

Table A.2: Selected Macroeconomic Variables, 1940–1978

Year	Long-Term Deposits		Other Liabilites	
	Cash in CB	Govt Bonds	Cash in CB	Govt Bonds
1940	10		10	
1941	14		23	
1942	25		25	
1943	25		25	
1944	50		50	
1945	50		50	
1946	50		50	
1947	30	15	30	15
1948	30	10	30	10
1949	30	10	30	10
1950	30	20	30	20
1951	30	20	30	20
1952	30	20	30	20
1953	30	20	30	20
1954	30	20	30	20
1955	30	55	30	55
1956	30	55	30	55
1957	25	50	25	50
1958	25	50	25	50
1959	25	50	25	50
1960	15	60	15	60
1961	15	60	15	60
1962	15	60	15	60
1963	13	60	15	60
1964	13	60	15	60
1965	10	60	15	60
1966	10	60	15	60
1967	10	60	15	60
1968	10	90	15	60
1969	10	90	15	60
1970	10	90	15	60
1971	10	90	15	60
1972	40	40	49	28
1973	40	40	49	28
1974	40	40	49	28
1975	40	40	49	28
1976	49	26	49	26
1977	38	32	100	
1978	38	32	100	

Sources: Annual Reports of Banco de Mexico and Ruiz Equiha (1963).  
Savings Departments are included since 1942.

Table A.3: Deposit Banks: Legal Reserve Requirements, 1940-1978

Year	Reserve Ratio	Year	Reserve Ratio
1939	0.24	1959	0.33
1940	0.40	1960	0.33
1941	0.28	1961	0.32
1942	0.37	1962	0.33
1943	0.46	1963	0.35
1944	0.47	1964	0.36
1945	0.48	1965	0.32
1946	0.41	1966	0.37
1947	0.36	1967	0.36
1948	0.33	1968	0.35
1949	0.32	1969	0.33
1950	0.43	1970	0.31
1951	0.34	1971	0.33
1952	0.34	1972	0.34
1953	0.36	1973	0.35
1954	0.31	1974	0.38
1955	0.35	1975	0.41
1956	0.32	1976	0.41
1957	0.34	1977	0.44
1958	0.34	1978	0.44

Source: Own calculations based on *Annual Report*, Banco de México, several numbers.

Table A.4: Banking System: Average Reserve Ratio, 1939–1978

Year	Market-to-Book Value	Risk-Free Rate of Interest (%)	Expected Rate of Profit (%)
( 1 )	( 2 )	( 3 )	( 4 )=( 2 )×( 3 )
1940	1.05	5.5	5.8
1941	1.57	7.2	11.3
1942	2.17	7.0	15.2
1943	2.09	6.2	12.9
1944	2.08	5.8	11.9
1945	1.94	6.0	11.6
1946	1.76	4.9	8.6
1947	1.60	6.0	9.6
1948	1.54	6.0	9.2
1949	1.70	6.0	10.2
1950	2.00	6.0	12.0
1951	1.32	5.0	6.6
1952	1.53	5.0	7.6
1953	1.58	5.0	7.9
1954	1.87	5.0	9.3
1955	1.84	5.2	9.5
1956	2.18	5.5	11.9
1957	2.06	8.5	17.5
1958	1.88	8.9	16.7
1959	1.84	8.8	16.2
1960	1.85	10.0	18.4
1961	1.77	10.0	17.6
1962	1.87	10.0	18.7
1963	2.20	9.0	19.7
1964	2.60	8.4	21.8
1965	3.63	9.0	32.6
1966	3.53	9.3	32.9
1967	2.70	10.1	27.3
1968	2.30	10.0	22.9
1969	2.03	12.2	24.8
1970	2.09	12.2	25.5
1971	1.85	11.1	20.6
1972	1.92	10.6	20.4
1973	1.46	12.7	18.5
1974	1.53	14.2	21.7
1975	1.51	12.0	18.1
1976	1.62	12.0	19.4
1977	0.98	14.4	14.1
1978	1.83	15.0	27.3

Sources: Anuario Financiero de Mexico, several issues.

( 2 ) : Weighted average of banking shares traded in the Mexico City Stock Exchange.

( 3 ) : 1940–1966 - Interest Rate of *Certificados de Participación* de NAFIN.

1967–1978: Interest Rate of *Pagarés Financieros*.

Table A.5: Banking System: Expected Rate of Profit, 1940–1978

## APPENDIX B

### REGULATORY CHRONOLOGY

1916 All bank charters are eliminated by the Federal Government.

1924 New Financial Institutions Law. This law included six types of banks: mortgage (*hipotecarios*), working capital (*refaccionarios*), agricultural (*agrícolas*), industry (*industriales*), saving and deposits (*depósito y ahorro*), and trust (*fideicomisos*).

The Federal Government created the National Banking Commission.

1925 Creation of the Banco de México.

1926 Creation of the Agrarian Credit Bank.

Trust Banks Law is enacted. Trust Banks were allowed to have savings departments.

The Financial Institutions Law of 1924 is reformed. A new classification of financial institutions was added: (1) single issue bank, (2) mortgage banks, (3) working capital banks (*bancos refaccionarios*), (4) deposit and discount banks, (5) trust banks, (6) savings banks, (7) warehouse banks, and (8) guarantee companies.

- 1941 A new banking law is enacted (*Ley General de Instituciones de Crédito*).
- Financieras* are upgraded to the rank of financial institution. Previously, they were considered as “auxiliaries” of financial institutions.
- Reforms to the Central Bank Law.
- 1942 Savings Departments are added to the scheme of required reserves with a reserve ratio of 10 percent of their total liabilities.
- 1950 Legislation authorized *financieras* to accept loans and deposits from the public.
- 1954–1957 Several modifications to the banking laws. Mainly, the authorities substantially raised the minimum amounts of bank equity capital. The changes also included rules regarding the use of the banks’ marginal liabilities and the proportion of bank liabilities to be backed with government bonds was increased.
- 1958 *Financieras* are added to the scheme of required reserves.
- 1974 New banking law. It introduces the category of multiple service banks (*Banca Múltiple*).

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