

## **Banking Systems Around the Globe: Do Regulation and Ownership Affect Performance and Stability?**

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## **I. Introduction**

Financial systems in countries throughout the world range from fairly rudimentary to quite sophisticated and from extremely fragile to relatively stable. A growing number of studies provide empirical evidence showing that well-functioning financial systems accelerate long-run economic growth by allocating funds to more productive investments than poorly-developed financial systems.<sup>1</sup> This convincing evidence has intensified calls for financial-sector reforms that improve financial-system performance and thereby promote economic development.

Stable banking systems are an important component of well-functioning financial systems as has been vividly demonstrated by recent developments around the globe. When banking or, more generally, financial systems temporarily break down or operate ineffectively, the ability of firms to obtain funds necessary for continuing existing projects and pursuing new endeavors is curtailed. Severe disruptions in the intermediation process can even lead to financial crises and, in some cases, undo years of economic and social progress. Since 1980 more than 130 countries have experienced banking problems that have been costly to resolve and disruptive to economic development. This troublesome situation has led to calls for banking reform by national governments and such international organizations as the World Bank and the International Monetary Fund. Apart from some fairly general proposals for reform, such as greater transparency and an international financial authority, there are relatively few proposals

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<sup>1</sup> For cross-country evidence supporting this relationship, see King and Levine (1993a,b), Levine and Zervos (1998), Beck, Levine, and Loayza (2000), and Levine, Loayza, and Beck (2000). In a similar vein, Rajan and Zingales (1998) provide cross-country, industry-level evidence. Demirguc-Kunt and Maksimovic (1998) show that financial development increases economic growth using firm-level data, while Wurgler (1999) shows the benefits of financial development for the allocation of investment across industries based upon their growth opportunities. In a related context, Jayratne and Strahan (1996) show that liberalizing restrictions on inter-state branching in the United States has led to more rapid state growth. More generally, Gertler (1988) and Levine (1997) provide literature reviews on the importance of financial systems.

for specific structural, regulatory and supervisory reforms.<sup>2</sup> This is understandable because there is relatively little empirical evidence to support any specific proposal.

To determine specific banking reforms that will limit bank fragility and promote well-functioning financial systems requires two steps. First, one must obtain cross-country data on bank ownership, regulation and supervision. This enables one to establish the extent to which banks operate in different ownership, regulatory and supervisory environments. Only by knowing the regulatory environment can one really know what a “bank” is or what a “bank” does in different countries. Surprisingly, such information is not widely available from official sources for a wide range of countries. Yet, in practical terms, it is the regulatory environment that actually defines what is meant by the term “bank.” Second, one must use such data to assess the relationships between different environments and bank performance or, more generally, financial performance. Only by doing this can one really know whether “banks” matter. In other words, such an effort enables one to better identify those bank ownership, regulatory and supervisory practices that will foster financial stability and enhance long-run economic growth.

The purposes of this paper are: (1) to collect and report cross-country data on bank regulation and ownership, and (2) to evaluate the links between different regulatory/ownership practices and both financial-sector performance and banking-system stability. In so doing our paper helps fill the gap between questions posed by policymakers about how to reform banking systems and currently available evidence on the issue produced by researchers. The paper in several respects substantially extends the preliminary investigation reported in Barth, Caprio, and

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<sup>2</sup> The most notable exception is the Basel Committee on Banking Supervision’s proposed new capital adequacy framework, which provides for more risk classes and raises the possibility of using credit ratings to set risk weights. For more information, see Caprio and Honohan (2000).

Levine (1999). This is done by enlarging our earlier sample of 45 countries to more than 60 countries; updating existing data; materially improving the quality of the data; adding new information on the banking environment in different countries; and testing additional hypotheses. Documentation is provided showing the substantial cross-country variation in regulatory restrictions on various activities of banks, in legal restrictions on the mixing of banking and commerce, and in bank ownership structure. Although the socio-economic determinants of regulatory choices by governments are examined, the focus is on examining which types of regulatory practices and ownership structures are associated with well-functioning, stable banking systems.

Motivated by a long and divisive policy debate (especially in the United States)<sup>3</sup> over the extent to which the activities of banks should be limited, this paper examines the following questions:

1. Do countries with regulations that impose tighter restrictions on the ability of commercial banks to engage in securities, insurance, and real estate activities have (a) less efficient but (b) more stable financial systems?
2. Do countries that restrict the mixing of banking and commerce – both in terms of banks owning nonfinancial firms and nonfinancial firms owning banks -- have (a) less efficient but (b) more stable banking systems?
3. Do countries in which state-owned banks play a large role have more poorly functioning financial systems?

Those who favor restricting commercial banks to “traditional” deposit taking and loan making argue that there are inherent conflicts of interest that arise when banks engage in such activities as securities underwriting, insurance underwriting, real estate investment, and owning

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<sup>3</sup> For reviews of the literature regarding this issue, see Kwan and Laderman (1999) and Santos (1998a,b, and c). Also, see Barth, Brumbaugh and Yago (1997), Kane (1996), Kroszner and Rajan (1994) and White (1986) for discussions of some of these issues. On November 12, 1999, laws in the U.S. restricting banks from engaging in securities and insurance activities were repealed [see Barth, Brumbaugh and Wilcox (2000)].

nonfinancial firms. Expanding the array of permissible activities, moreover, may provide greater opportunities for moral hazard to distort the investment decisions of banks, especially when they operate within a deposit insurance system [Boyd, Chang, and Smith 1998]. Furthermore, in an unrestricted environment, the outcome may be the existence of a few large, functionally diverse, and dominant banks that could (1) complicate monitoring by bank supervisors and market participants<sup>4</sup> and (2) lead to a more concentrated and less competitive nonfinancial sector. Relatively few regulatory restrictions on commercial banking activities and relatively few legal impediments to the mixing of banking and commerce may therefore produce less efficient and more fragile financial systems.

Those who favor substantial freedom with respect to the activities of commercial banks argue that "universal" banking creates more diversified and thereby more stable banks. Fewer regulatory restrictions may also increase the franchise value of banks and thereby augment incentives for bankers to behave more prudently, with positive implications for bank stability. Furthermore, the opportunity to engage in a wide range of activities enables banks to adapt and hence provide the changing financial services being demanded by the nonfinancial sector more efficiently. Thus, fewer regulatory restrictions on the activities of commercial banks and the mixing of banking and commerce may produce more efficient and more stable financial systems.<sup>5</sup> The lack of appropriate cross-country data, however, has impeded the ability to examine the relationship between commercial bank regulations and both the functioning and stability of the financial system.

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<sup>4</sup> As Camdessus (1997) states: "... the development of new types of financial instruments, and the organization of banks into financial conglomerates, whose scope is often hard to grasp and whose operations may be impossible for outside observers – even (sic!) banking supervisors – to monitor."

<sup>5</sup> Mishkin (1999 p.686), furthermore, states that "The benefits of increased diversification opens up opportunities for reform of the banking system because it makes broad-based deposit insurance less necessary and weakens the political forces supporting it."

This paper attempts to rectify this situation and in so doing provides the following answers to the questions posed above. First, we do not find a reliable statistical relationship between regulatory restrictions on the ability of commercial banks to engage in securities, insurance, and real estate activities and (i) the level of banking sector development, (ii) securities market and nonbank financial intermediary development, or (iii) the degree of industrial competition. Indeed, based on the cross-country evidence, it would be quite difficult for someone to argue confidently that restricting commercial banking activities impedes -- or facilitates -- financial development, securities market development, or industrial competition. We do, however, find that regulatory restrictions on the ability of banks to engage in securities activities tend to be associated with higher interest rate margins for banks.<sup>6</sup> Thus, even though there may be some negative implications for bank efficiency due to restricting commercial bank activities, the main message is that there is little relationship between regulatory restrictions on banking powers and overall financial development and industrial competition.

Second, in terms of stability, we find a strong and robust link to the regulatory environment. Countries with greater regulatory restrictions on the securities activities of commercial banks have a substantially higher probability of suffering a major banking crisis. More specifically, countries with a regulatory environment that inhibits the ability of banks to engage in the businesses of securities underwriting, brokering, dealing, and all aspects of the mutual fund business tend to have more fragile financial systems. The positive link between regulatory restrictions and major or even systemic banking crises, moreover, does not appear to be due to reverse causation.

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<sup>6</sup> This may reflect the fact that in such a situation banks are limited to the extent they can cover costs with fee income.

Third, we find no beneficial effects from restricting the mixing of banking and commerce. We specifically examine (1) the ability of banks to own and control nonfinancial firms and (2) the ability of nonfinancial firms to own and control commercial banks. There is not a reliable relationship between either of these measures of mixing banking and commerce and the level of banking sector development, securities market and nonbank financial intermediary development, or the degree of industrial competition.

Fourth, restricting the mixing of banking and commerce is associated with *greater* financial fragility. Whereas restricting nonfinancial firms from owning commercial banks is unassociated with financial fragility, restricting banks from owning nonfinancial firms is positively associated with bank instability. We find that those countries that restrict banks from owning nonfinancial firms have a robustly higher probability of suffering a major banking crisis. Thus, one of the major reasons for restricting the mixing of banking and commerce – to reduce financial fragility – is not supported by the cross-country evidence presented in this paper. This finding is particularly notable in the wake of the East Asian crisis and the haste with which many have concluded that all things Asian – including close ownership links – lead to crises. Besides the fact that for decades such links did not produce crises, our research shows that neither concerns about financial sector development nor financial fragility should prompt calls for a more restrictive environment.<sup>7</sup>

Fifth, greater state ownership of banks tends to be associated with more poorly developed banks, non-banks, and securities markets. In an independent study using alternative measures of bank ownership, La Porta, Lopez-de-Silanes, and Shleifer (1999) also examine the relationship between government ownership and financial development. They convincingly

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<sup>7</sup> For a view on ownership links that is relatively unfashionable today, see Lamoreaux (1994).

show that government ownership retards financial development. Thus, even though the proponents of state ownership of banks argue that it helps overcome informational problems and better directs scarce capital to highly productive projects, the data assembled here and by La Porta, Lopez-de-Silanes, and Shleifer (1999) tell a different story. On average, greater state ownership of banks tends to be associated with more poorly operating financial systems.

Besides documenting the substantial cross-country variation in commercial banking regulations and ownership, our analysis of the data highlight some negative implications of imposing regulatory restrictions on the activities of commercial banks. Specifically, regulations that restrict the ability of banks to (a) engage in securities activities and (b) own nonfinancial firms are closely associated with greater banking sector instability. The analyses, moreover, suggest no countervailing beneficial affects from restricting the mixing of banking and commerce or from restricting the activities of banks in the areas of securities, insurance, and real estate.

The research upon which this paper is based is still ongoing, so our paper should be viewed as a progress report. We are collecting considerably more information about bank structure, regulation and especially supervision, and the sample of countries is being enlarged. The new cross-country data that we are collecting on the supervisory environment will permit us – and others – to investigate more fully the interrelated issues of regulatory and supervisory practices or policies. Nonetheless, our efforts to date represent substantial progress on understanding what a “bank” does in different countries and whether it matters. By publishing the existing data and reporting the empirical results, we are hoping both to contribute to the ongoing debate over appropriate banking reforms and to facilitate further research on this important topic.



## **II. Bank Regulations & Ownership vs. Financial Development & Industrial Competition**

The first section in this part examines the relationship between commercial banking regulations and state ownership of banks on the one hand and the level of financial sector development and the degree of industrial sector competition on the other. The objective is to assess whether governments that (1) restrict the activities of banks, (2) inhibit the mixing of banking and commerce, and (3) own a substantial fraction of the banking sector tend to have (a) more or less efficient and developed banks, (b) better or worse functioning securities markets and nonbank financial intermediaries, and (c) greater or lesser competition in the nonfinancial sector. To examine all these issues, we have constructed an extensive data set.

The section's first subsection introduces the regulatory and ownership variables. We define the variables, briefly describe their construction, and present summary statistics. The second subsection briefly describes the various measures of financial sector development and industrial competition that are employed. The final subsection presents our regression results and a summary of our conclusions.

### **A. Regulatory Restrictions and Ownership**

#### *1. Data Collection and Definitions*

We have constructed indices on the degree to which government regulators permit commercial banks to engage in securities, insurance, and real estate activities. We have also constructed indices on the degree to which regulators permit commercial banks to own nonfinancial firms and vice versa. Furthermore, we have obtained information on the degree of state ownership of commercial banks. We have assembled this data and checked its accuracy

through a number of different channels. Specifically, we have obtained the data used in this paper primarily from international surveys conducted independently by the Office of the Comptroller of the Currency (OCC) and the World Bank. We have confirmed the responses for as many countries as possible using information from Barth, Nolle, and Rice (2000), the Institute of International Bankers (Global Survey, various years), Euromoney (Banking Yearbook, various years), and various central bank and bank regulatory agency publications. When inconsistencies have arisen, we have – through the OCC and World Bank – attempted to communicate with the relevant national regulatory authorities to resolve them. While some remaining problems undoubtedly exist, we nonetheless believe we have assembled the most accurate and comprehensive data on commercial bank regulatory policies to date.

Bank activities: We use measures of the degree to which national regulatory authorities allow commercial banks to engage in the following three “nontraditional” activities:

**Securities:** the ability of commercial banks to engage in the business of securities underwriting, brokering, dealing, and all aspects of the mutual fund industry.

**Insurance:** the ability of banks to engage in insurance underwriting and selling.

**Real Estate:** the ability of banks to engage in real estate investment, development, and management.

We have assessed each country’s regulations concerning these activities and rated the degree of regulatory restrictiveness for each activity from 1 to 4, with larger numbers representing greater restrictiveness. The definitions of the 1 through 4 designations are as follows:

- (1) Unrestricted – A full range of activities in the given category can be conducted directly in the commercial bank.
- (2) Permitted – A full range of activities can be conducted, but all or some must be conducted in subsidiaries.
- (3) Restricted – Less than a full range of activities can be conducted in the bank or subsidiaries.
- (4) Prohibited – The activity cannot be conducted in either the bank or subsidiaries.

Mixing banking and commerce: We have constructed two measures of the degree of regulatory restrictions on the mixing of banking and commerce. Again, we have rated the regulatory restrictiveness for each variable from 1 to 4. The variable definitions and the definitions of the 1-4 designations are as follows:

**Nonfinancial Firms Owning Banks**: the ability of nonfinancial firms to own and control banks.

- (1) Unrestricted – A nonfinancial firm may own 100% of the equity in a bank.
- (2) Permitted – Unrestricted with prior authorization or approval.
- (3) Restricted – Limits are placed on ownership, such as a maximum percentage of a bank's capital or shares.
- (4) Prohibited – No equity investment in a bank.

**Banks Owning Nonfinancial Firms**: the ability of banks to own and control nonfinancial firms.

- (1) Unrestricted – A bank may own 100% of the equity in any nonfinancial firm.
- (2) Permitted – A bank may own 100% of the equity in a nonfinancial firm, but ownership is limited based on a bank's equity capital.
- (3) Restricted – A bank can only acquire less than 100% of the equity in a nonfinancial firm.
- (4) Prohibited – A bank may not acquire any equity investment in a nonfinancial firm.

State ownership: We also have data on the degree of state ownership of banks:

**Stateowned Bank Assets**: State-owned bank assets as a share of total commercial bank assets.

In terms of timing, the data represent the regulatory environment in 1997. In an earlier study, we collected information on these regulations for a smaller sample of countries in 1995. Even though there were very few regulatory changes, some of our assessments changed, as more information became available. We discuss the issue of regulatory change as it relates to our findings in greater detail below when we examine the linkages between the regulations and banking crises.

## 2. *Summary Statistics*

Table 1 lists the numerical values for each of the six indicators for the regulatory environment. We also compute a summary index of the first four indicators of the regulatory restrictions imposed on banks. Specifically, **Restrict** equals the average of Securities, Insurance, Real Estate, and Banks Owning Nonfinancial Firms. Table 2 presents summary statistics indicating the extensive cross-country variation in the data. For example, there were nine countries with very restrictive regulatory systems ( $\text{Restrict} > 3$ ): Japan, Mexico, Rwanda, Ecuador, Barbados, Botswana, Indonesia, Zimbabwe, and Guatemala. The value for the United States is 3. There were nine countries that permitted wide latitude in terms of commercial banking activities ( $\text{Restrict} < 1.75$ ): Switzerland, Suriname, South Africa, the Netherlands, Luxembourg, United Kingdom, New Zealand, Austria, and Israel. Furthermore, there is substantial representation in terms of both geographical location and income level of the sample countries. Besides the 24 OECD countries, there are 14 Latin American countries, 11 countries

from Sub-Saharan Africa, and 12 from Asia, as well as 5 countries from northern Africa and (non-OECD) Europe.

At the outset, we expected to observe that governments that restricted banking activities in one area, say securities activities, would also restrict banking activities in other areas, like real estate activities. We therefore expected extremely large, positive correlations among the Securities, Insurance, Real Estate, Banks Owning Nonfinancial Firms, and Nonfinancial Firms Owning Banks variables. There is clearly a positive association among the different regulatory variables, but it is not extremely high. Table 3 shows the correlations among the six regulatory/ownership indicators. While Securities and Real Estate are significantly correlated with three of the four other regulatory indicators at the 0.05 significance level, Insurance and Banks Owning Nonfinancial firms are significantly correlated with only two of the four other indicators, and Nonfinancial Firms Owning Banks is not significantly correlated with any of the others. Furthermore, the correlation coefficients on the statistically significant relationships are all below 0.50. Thus, there is cross-country diversity in the individual regulatory restrictions. This suggests that it is important to examine each of the regulatory variables individually, rather than only using a single index such as **Restrict** to capture the regulatory environment. Thus, even though we report the results on Restrict, we focus our discussion almost entirely on the individual regulatory variables because they provide much more information.

#### B. Financial Sector Performance and Industrial Competition: Definitions

This subsection describes the paper's indicators of bank development, securities market development, and industrial competition. For each category, we considered a wide array

of measures. We highlight the measure presented in the tables as well as mention the other measures that were studied.

### *1. Bank Development*

**Net Interest Margin** equals net income divided by total assets and is the average value over the 1990-95 period (source: Beck, Demirguc-Kunt, and Levine 1999). While recognizing that many factors influence interest rates besides the degree of efficiency of bank operations, we include this in our measures of bank development because of its wide use in the literature and its empirical availability.

**Private Credit** equals claims on the private sector by deposit money banks and other financial institutions as a share of GDP and is the average value over the 1980-95 period (source: Levine, Loayza, and Beck 2000). This is a general and widely used measure of financial sector development. We also used such other measures as: (a) claims by deposit money banks on the private sector, (b) liquid liabilities, and (c) total assets of the commercial banking sector relative to GDP in 1997. These alternative measures do not alter any of the conclusions, however.

**Bank Concentration** equals the share of total assets of the three largest banks and is the average value over the 1990-95 period (source: Beck, Demirguc-Kunt, and Levine 1999). This variable captures the degree of concentration in the banking industry. We also used such measures as the number of banks per capita and the share of total assets of the single largest bank. These alternative measures produced similar results, however.

### *2. Securities Development*

**Total Value Traded** equals the value of domestic equities traded on domestic exchanges divided by GDP, averaged over the 1980-95 period (source: Beck, Demirguc-Kunt,

and Levine 1999). Levine and Zervos (1998) show that stock market liquidity is important for economic growth. They further note that it is liquidity per se, not equity market capitalization, that is crucial. We also used measures of primary market activity and bond market activity. Specifically, we collected information on the (i) total amount of outstanding domestic debt securities issued by private or public domestic entities as a share of GDP, (ii) total equity issues as a share of GDP, and (iii) private, long-term debt issues as a share of GDP. While these alternative measures yield similar results, they are available for far fewer countries.

**Nonbank Credits** equals nonbank financial institution claims on the private nonfinancial sector as a share of GDP and is the average value over the 1980-95 period (source: Beck, Demirguc-Kunt, and Levine 1999). To assess the robustness of our findings, we also used direct measures of the size of particular nonbank financial institutions, including insurance companies, mutual funds, and private pension funds. Again, these alternative measures produced similar findings, but they are available for far fewer countries.

### *3. Industrial Competition*

**Industrial Competition** is based upon a survey question in which respondents indicate the degree to which they agree with the following statement: “market domination is not common in your country” (source: Dutz and Hayri 1999). To examine whether commercial bank regulatory restrictiveness is associated with industrial competition, we also examined such measures as: (i) the degree of business freedom and competition, (ii) the percentage of economic activity controlled by the 30 largest companies, and (iii) the perceived effectiveness of antitrust policy. These alternative measures produced similar results, however.

### C. Empirical Results

The objective here is to present a rudimentary, first-cut empirical evaluation of the relationship between:

1. bank regulatory restrictions		(a) bank development
2. mixing banking and commerce	and	(b) securities development
3. state ownership of banks		(c) industrial competition.

Future work will deal more rigorously with specific hypotheses about such relationships as well as with numerous methodological issues.

Toward this end, we first present the simple correlations between each of the measures of the regulatory/ownership environment and the indicators of bank development, securities development, and industrial competition. We then present regression results in which we control for economic development (i.e., the level of real per capita GDP) and an index of the quality of government. More specifically, **Development** equals the logarithm of real per capita GDP in 1980 (source: Penn World Tables). **Good Government** equals the summation of three variables: (i) risk of expropriation by the government, (ii) degree of corruption, and (iii) law and order tradition of the country, with greater values signifying less risk of expropriation, less official corruption, and a greater law and order tradition (source: LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (henceforth LLSV) 1999).

It is important to control for other features of the environment in evaluating the relationship between the commercial bank regulatory/ownership regime with financial development and industrial competition. For instance, there may be countries in which corrupt governments that do not enforce the rule of law and tend to expropriate private property have



selected policies that have led to both poor economic performance and underdeveloped financial systems. If such governments also uniformly enact certain types of commercial bank regulations, we would not want to interpret a significant correlation between bank regulations and financial development as representing an independent link unless we control for the quality of the government. We therefore use the simple measures described immediately above to control for some natural characteristics of the policy environment in assessing whether there is an independent link between the commercial bank regulatory/ownership structure and the financial/industrial system more generally. These variables to some extent also serve as a proxy for the overall quality of bank supervision. Heteroskedasticity-consistent standard errors are reported for these regression results.

The empirical findings are startlingly *under-whelming* as summarized in Tables 4-10. First, it would be very difficult for someone to argue confidently that restricting the activities of commercial banks adversely affects financial development, securities market development, or industrial competition. At the same time, it would be very difficult for someone to argue confidently that easing restrictions on commercial banking activities facilitates greater financial development, securities market development, or industrial competition. Specifically, although countries with more restrictive regulations tend to have less well-developed banking sectors and securities markets as well as lower levels of industrial competition, the correlations are frequently not statistically significant nor do they retain their values when controlling for other factors in a regression context. Indeed, Securities, Insurance, and Real Estate do not enter any of the regressions significantly when one includes Private Credit, Bank Concentration, Industrial Competition, Total Value Traded, or Non-Bank Credits. As discussed above, these conclusions

are robust to a wide assortment of measures of banking sector development, industrial competition, and securities market development.

Second, it would be very difficult to argue that restricting the mixing of banking and commerce – either by restricting bank ownership of nonfinancial firms or by restricting nonfinancial firm ownership of banks -- impedes or facilitates overall financial development or industrial competition. Banks Owning Nonfinancial Firms and Nonfinancial Firms Owning Banks do not enter *any* of the regressions significantly. These findings hold when using alternative measures of banking sector development, industrial competition, and securities market development.

Third, there is some evidence that restricting commercial banks from securities and real estate activities tends to raise net interest margins. Thus, restricting commercial banks from securities and real estate activities may have some negative implications for bank efficiency. Taken as a whole, however, the analysis of the data indicate little link between the restrictiveness of commercial bank regulations and the mixing of banking and commerce on the one hand and financial development (taken broadly) and industrial competition on the other.

Fourth, in terms of state ownership, the empirical evidence suggests a negative relationship between the degree of state ownership of banks and financial development.<sup>8</sup> Countries with greater state ownership of banks tend to have less developed banks and nonbanks. It should also be noted in this context that underdeveloped financial systems tend to exert a negative influence on long-run growth [see Levine, Loayza, and Beck (2000) and Levine (1999)]. Although considerably more research needs to be done before a causal interpretation

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<sup>8</sup> In this regard, Cetorelli and Gambera (1999, p.23) in a study assessing the relevance of the market structure for the “finance-growth relationship” state that “it would be interesting to investigate whether it matters if banks are privately-or state-owned.”

can be given to these findings, it may justify some concern among policymakers in countries where state banks play a major role in credit allocation. In this sample alone it appears that about half the world's people live in countries with banking systems that are a majority state-owned (Brazil, China, Egypt, India, Pakistan, and recently Indonesia), which underscores the importance of this concern.

In sum, the lack of a close and reliable link between the regulatory environment and overall financial development and industrial competition is robust to various alterations in the conditioning information set and to redefinitions of the regulatory indicators. In the analysis, however, the regulatory variables take values ranging from one through four. This particular scaling may create an interpretation problem because the difference between a two and a three may not be the same as the difference between a three and a four, or a one and two. We therefore examine the sensitivity of the empirical results to this scale in three ways. First, we created a new regulatory indicator that assumed values of one through three, rather than one through four. This new variable equals one if the original indicator equals one; the new variable equals two if the original indicator equals two or three; and the new variable equals three if the original indicator equals four. Second, we created an additional regulatory indicator for each category (Securities, Insurance, Real Estate, Banks Owning Nonfinancial Firms, and Nonfinancial Firms Owning Banks) with values of either one or zero. The additional regulatory indicator takes the value one if the original indicator was one or two, and zero otherwise. Finally, we also used separate dummy variables for each value between one and four. In this case, we created four dummy variables -- Securities1, Securities2, Securities3, and Securities4. Securities1 equals one if Securities equals one and zero otherwise; Securities2 equals one if Securities equals two and zero otherwise; and so on. We created these new variables for all the

regulatory indicators. Using these alternative indicators, however, did not change this section's conclusions. The results are robust to changes in the other regressors too. Also, it is important to note that these conclusions are robust to the inclusion of regional dummy variables. Thus, the results are not simply reflecting regional differences in regulatory policies. Furthermore, we conducted the analysis using the individual components of Good Government instead of the conglomerate index. This modification also did not alter the results. Lastly, we confirmed our empirical results using indexes of bureaucratic efficiency, government red tape, and the degree to which governments repudiate contracts.

### **III. Regulatory Restrictions, Ownership, and Banking Crises**

This section evaluates the relationship between banking crises and (i) regulatory restrictions on the activities of commercial banks, (ii) regulatory restrictions on the mixing of banking and commerce, and (iii) state ownership of banks. Allowing banks to engage in a wide range of activities may increase bank fragility by expanding the set of external risks affecting banks and by allowing banks themselves to choose among a broader assortment of risky ventures. On the other hand, allowing banks more freedom may lower bank fragility through greater diversification of the sources of profits for banks. This paper assesses which of these two opposing forces tends to dominate. In terms of state ownership of banks, we believe the links will be more opaque. State-owned banks that encounter difficulties may receive subsidies through various channels, so that the banks are never identified as being in a crisis. Nonetheless, we conduct the analysis with the information available. After describing our definition of whether a country experienced a banking crisis or not, we present probit regressions incorporating the regulatory/ownership variables and a wide array of factors to control for other

potential influences on bank fragility. We find that regulatory restrictiveness is positively linked with financial fragility. We then present evidence suggesting that this result is *not* due to reverse causation.

#### A. Definition of a Crisis

To investigate the relationship between the regulatory/ownership environment and financial fragility, we use two measures of whether a country's banking system suffered a crisis during the last 15 years.

**Systemic** is based upon Caprio and Klingebiel's (1999) determination as to whether a country experienced a systemic banking crisis. The variable takes the value one if there was a systemic crisis and zero otherwise. They define a systemic crisis as meaning all or most of the banking system's capital was eroded during the period of the crisis. The assessments are made for countries from the late 1970s into early 1999.

**Major** equals Systemic except for two adjustments. First, the Caprio and Klingebiel (1999) indicator of systemic banking crises is expanded to include countries that experienced major, though perhaps not systemic, banking crises over the 1985-97 period. This results in the addition of: Canada (15 members of Canadian Deposit Insurance Company failed), Denmark (cumulative losses of 9 percent of loans), Hong Kong (9 out of 18 banks failed over the period), India (nonperforming loans estimated as 16 percent of total loans), Italy (58 banks accounting for 11 percent of total loans were forcibly merged), and the United States (estimated savings and loan clean-up costs of 3.2 percent of GDP). Second, we exclude two countries (Israel and Spain) from the Caprio/Klingebiel list of systemic banking crises because their crises occurred in the late 1970s and therefore are outside our sample period. We report the results using Major, but

reach similar conclusions using Systemic. The values of Major and Systemic are listed in Table A3.

## B. Empirical Results

The empirical results indicate that countries that restrict commercial banks from engaging in securities activities and countries that restrict commercial banks from owning nonfinancial firms have a higher probability of suffering a major banking crisis. Table 11 summarizes these findings. Besides simple correlations, we present probit regressions that control for other characteristics of the national environment. Specifically, we control for the level of economic development (Development) and the quality of the government (Good Government) in the probit regressions. As shown, countries with greater regulatory restrictions on commercial bank securities activities and the ability of banks to own and control nonfinancial firms have a higher probability of experiencing major banking sector distress.

The positive and significant relationship between financial fragility and regulatory restrictions on the securities activities of banks and restrictions on commercial bank ownership of nonfinancial firms is robust to a number of alterations in the econometric specification. First, we obtain the same results using a logit estimation procedure. Second, we obtain similar results when controlling for the degree of private property rights protection, the degree to which regulations restrict the opening and operation of businesses, a measure of bureaucratic efficiency, the rate of economic growth, inflation, the existence of a deposit insurance scheme, and the size of the financial intermediary sector (**Private Credit**). Thus, we control for the standard variables used in the large and growing empirical literature that tries to explain banking crises. The coefficients on Securities and Banks Owning Nonfinancial Firms remain significantly positive in

the crisis regressions (when also including Development and Good Government). Third, as noted above, we obtain similar results when using Systemic instead of Major as the indicator of whether a country experienced a banking crisis or not. Fourth, we obtain similar results when using the alternative measures of Securities and Bank Ownership of Nonfinancial Firms as discussed above. Specifically, we also use the regulatory measures based on (i) values from one through three, (ii) values of zero or one, and (iii) values of individual dummy variables for each of the values one through four. These alternative specifications do not alter the findings. Fifth, these conclusions are robust to the inclusion of regional dummy variables; the results are not driven by regional factors. Sixth, since the degree of securities market development may influence financial fragility, we also included measures of the degree of securities market development. Specifically, we used measures of: (i) equity market liquidity, (ii) the issuance of equity (in the primary market) as a share of GDP, and (iii) the issuance of long-term bonds (in the primary market) as a share of GDP. This modification did not alter the results and these securities market indicators enter the crisis regressions insignificantly. Similarly, we also tried controlling for the net interest income of banks (**Net Interest Margin**), the degree of banking sector concentration (**Bank Concentration**), and a measure of the degree to which the financial system is primarily bank-based or market-based (**Structure**).<sup>9</sup> These additional variables did not enter the crises regressions significantly. Moreover, including these measures did not alter this section's major conclusion: there is a positive, significant and robust relationship between bank fragility and regulatory restrictions on securities market activities and bank ownership of nonfinancial firms.<sup>10</sup>

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<sup>9</sup> For a detailed discussion and analysis of bank-based vs. market-based financial systems, see Allen and Gale (forthcoming) and Levine (2000).

<sup>10</sup> The source of the additional variables used in this analysis is Beck, Demirguc-Kunt, and Levine (1999).

### C. Endogeneity

Endogeneity is an issue that merits further consideration. Countries that experience banking crises might have responded to them by adopting regulatory restrictions on the activities of banks. If this situation actually happened, it would be inappropriate to interpret the results in Table 11 as suggesting that regulatory restrictions increase the probability of a crisis occurring. To control for potential simultaneity bias, we have used a two-step instrumental variable estimator. The different instruments that are employed are presented in an appendix. Using instrumental variables did not alter the main results: countries in which banking systems face greater regulatory restrictions on securities activities and on owning nonfinancial firms have a higher probability of suffering a major crisis (see Barth, Caprio, and Levine 1999). However, because the instrumental variables are not very good predictors of regulatory restrictions (see Appendix), we decided to examine the issue of endogeneity using a more laborious – albeit less statistically rigorous – procedure.

Table 12 presents the results of this effort. As the table indicates, for those countries in our sample experiencing a crisis, information is provided regarding the dates of the banking crises, the scope of the problems, and the estimated costs of resolution. In addition, information is provided as to whether or not there was any change in regulations with respect to securities, insurance, and real estate activities as well as to the mixing of banking and commerce during or shortly after a banking crisis occurred. For some countries and for some time periods, the required regulatory information has not yet been obtained. But for the majority of our countries such information was available from publications of the Institute of International Bankers, materials from the Office of the Comptroller of the Currency, and the World Bank Survey.



Banking crises generally did not induce governments to enact more restrictive regulations. Indeed, the overall indication is that there was no change in these regulations: of the 250 possible entries in the table, 141 showed no subsequent change at all – neither during nor immediately after the crisis, 14 showed a change in the direction of fewer restrictions (only 2 of which could be linked to a crisis), and only 3 showed greater restrictions post-crisis; in 92 cases we have no data. So even in the relatively few cases in which there was a change during or after a crisis, it was in the direction of broader powers for banks, meaning that we were using fewer restrictions than actually existed. This biases the results against the conclusion that greater restrictions increase the likelihood of a crisis.

Governments generally do respond to banking crises, but the response has typically been in the direction of limiting the bank safety net or raising its cost, as in the cases of the early crises from the 1980s in Argentina and Chile, rather than attempting to restrict banks' powers. Interestingly, both countries in fact have moved in the other direction, providing added powers to banks, which is consistent with the general trend toward broader powers. More generally, any concern about the endogeneity in the crisis regressions would appear to be unwarranted.<sup>11</sup> Re-estimating the probit regressions in Table 11 with the data from Table 12, moreover, does not produce any significant changes.

Thus, although the analysis does not fully resolve the endogeneity issue, the results clearly suggest that greater regulatory restrictions on the ability of commercial banks to engage

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<sup>11</sup> The inability to make limits on powers stick may be one reason for this trend. Bandiera, Caprio, Honohan, and Schiantarelli (1999) characterized financial reforms as a vector of variables pertaining to changes over long periods of time in interest rate regulation, reserve requirements, directed credit, bank ownership (moves toward privatization), liberalization of securities markets, prudential regulation, and international financial liberalization. They did not include changes in banks' powers insofar as there were so few changes. Note also that in the particular case of the U.S. banks were allowed to underwrite corporate debt in 1989 and corporate equity in 1990 through subsidiaries, but subject to a revenue restriction. In 1999 there were more than 40 banking organizations that had established such subsidiaries.

in securities activities and the ability of commercial banks to own and control nonfinancial firms tend to increase the probability that a country will experience a major banking crisis.<sup>12</sup>

#### **IV. Summary and Conclusions**

The purposes of this paper have been twofold. The first is to present comprehensive and detailed information on the regulatory environment and ownership structure of commercial banks in a large number of countries around the world. It is found that there is substantial variation among the more than 60 countries in our sample as to what banks are allowed to do with respect to securities, insurance and real estate activities. A “bank” in one country, in other words, is not necessarily the same as a bank in another country. As a result of all the banking crises in different countries in recent years, there have been numerous calls for banking reforms. Yet, they typically fail to address the issue as to exactly which regulatory environment is most appropriate for simultaneously promoting bank performance and stability. The information presented here helps one to address this issue by initially recognizing the substantial cross-country variation in bank regulation that exists. This variation occurs, moreover, in countries that differ in terms of geographical location and level of economic development, among other ways. At the same time, it is found that state ownership of banks varies from a high of 80 percent to a low of zero percent in our sample of countries.

The second purpose is to assess whether or not it matters as to what a bank is permitted to do with respect to securities, insurance and real estate activities. As summarized in Table 13, it matters most as to whether restrictions are placed on securities activities. The tighter

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<sup>12</sup> In this respect, Kwan and Laderman (1999, p.24) in a review of literature pertaining to the U.S. state that “On the effects of securities activities on banking organizations safety and soundness, the bulk of empirical evidence indicated some potential for risk reduction in expanding banks’ securities powers.”

the restrictions placed on this activity, on average, the more inefficient are banks and the greater the likelihood of a banking crisis. The likelihood of a banking crisis is also greater, on average, the tighter the restrictions placed on bank ownership of nonfinancial firms. Perhaps surprisingly, none of these restrictions produce any beneficial effects with respect to financial development, nonbank sector and stock market development, or industrial competition. Nor is it found that any of them lessen the likelihood of a banking crisis or enhance bank efficiency. At the same time, the greater the share of bank assets controlled by state-owned banks, on average, the less will be financial development as well as the development of the nonbank sector and the stock market.

It is important to emphasize that this paper is the product of an ongoing research project. Thus, as more information is collected and analyzed, the findings and conclusions reported here may be modified. This means that the paper actually represents a progress report on a timely and important public policy issue. Much more work remains. We are in the process of collecting and analyzing information on supervision. Optimal regulatory restrictions may depend importantly on the type of supervisory regime. Indeed, the choice of regulatory restrictions may be importantly influenced by the efficiency of supervision. We plan to explore these relationships in future research. The bottom line, however, is that the paper presents new cross-country data and analyses on what a bank is and whether or not it matters. And for now it does indeed matter what a bank is permitted to do. The imposition of tight restrictions on some activities of banks appears not to be beneficial but, worse yet, downright harmful in some important ways.

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## **Tables**



**Table 1**  
**Country Data on Bank Regulations and State Ownership of Bank Assets**

	SECURITIES	INSURANCE	REAL ESTATE	BANKS OWNING NONFINANCIAL FIRMS	RESTRICT	NONFINANCIAL FIRMS OWNING BANKS	STATE-OWNED BANK ASSETS
Argentina	3	2	2	3	2.50	1	0.305
Australia	1	2	3	2	2.00	3	0.000
Austria	1	2	1	1	1.25	1	0.044
Barbados	3	4	3	4	3.50	2	0.195
Belgium	2	2	3	3	2.50	1	0.000
Bolivia	2	2	4	4	3.00	1	0.000
Botswana	2	4	4	4	3.50	2	0.000
Brazil	2	2	3	3	2.50	1	0.510
Canada	2	2	2	3	2.25	3	0.000
Chile	3	2	3	3	2.75	3	0.238
Colombia	2	2	2	4	2.50	1	0.19
Cyprus	2	2	4	3	2.75	3	0.034
Denmark	1	2	2	2	1.75	1	0.000
Ecuador	2	4	4		3.33		
Egypt, Arab Rep.	2	2	3	3	2.50		0.666
El Salvador	2	2	4	4	3.00	2	0.069
Fiji	2	3	4	2	2.75	3	0.085
Finland	1	3	2	1	1.75	1	0.411
France	2	2	2	2	2.00	2	0.145
Gambia	2	4	2	4	3.00	2	0.000
Germany	1	3	2	1	1.75	1	0.429
Ghana	2	1	4	2	2.25	2	0.388
Greece	2	3	3	1	2.25	1	0.628
Guatemala	4	4	4	3	3.75	2	0.051
Guyana	1	3	3	3	1.75	3	0.233
Hong Kong	1	2	2	3	2.00	3	0.000
Iceland	2	2	4	3	2.75	1	0.644
India	2	4	4	2	3.00	2	0.800
Indonesia	2	4	4	4	3.50	1	0.415
Ireland	1	4	1	1	1.75	1	0.000
Israel	1	1	1	1	1.00	1	
Italy	1	2	3	3	2.25	3	0.250
Japan	3	4	3	3	3.25	3	0.000
Jordan	2	4	3	2	2.75	1	0.000
Korea, Republic of	2	2	2	3	2.25	3	0.000
Lesotho	2	4	3	3	3.00	2	0.720
Luxembourg	1	3	1	1	1.50	3	0.000
Madagascar	2	4	3	3	3.00	2	0.220
Malaysia	2	2	3	2	2.25	2	0.096
Malta	1	3	3	3	2.50	4	0.475

**Table 1 (continued)**  
**Country Data on Bank Regulations and State Ownership of Bank Assets**

	SECURITIES	INSURANCE	REAL ESTATE	BANKS OWNING NONFINANCIAL FIRMS	RESTRICT	NONFINANCIAL FIRMS OWNING BANKS	STATE-OWNED BANK ASSETS
Mexico	3	4	3	3	3.25	2	0.415
Netherlands	1	2	2	1	1.50	1	0.000
New Zealand	1	1	1	2	1.25	2	0.000
Nigeria	1	2	2	2	1.75		0.130
Norway	2	2	2	2	2.00	2	0.376
Pakistan	2	4	3	1	2.50	1	0.501
Peru	2	2	2	2	2.00	2	0.000
Philippines	1	2	2	3	2.00	3	0.198
Portugal	1	2	3	2	2.00	1	0.170
Rwanda	1	4	4	4	3.25	1	0.000
Seychelles	2	2	2	2	2.00	2	0.364
Singapore	2	2	2	3	2.25	1	
South Africa	2	2	1	1	1.50	2	0.000
Spain	1	2	3	1	1.75	2	0.019
Sri Lanka	2	2	2	2	2.00	3	0.580
Suriname	1	1	1	3	1.50	3	0.277
Sweden	4	2	3	3	3.00	1	0.000
Switzerland	1	1	1	3	1.50	1	0.151
Tanzania	2	3	4	3	3.00	2	0.501
Thailand	2	2	2	3	2.25	3	0.290
Turkey	3	2	4	3	3.00	1	0.365
United Kingdom	1	2	1	1	1.25	1	0.000
United States	3	3	3	3	3.00	3	0.000
Uruguay	3	2	3	4	3.00		0.455
Venezuela	2	2	3	3	2.50	3	0.072
Zimbabwe	2	4	4	4	3.50	2	0.246

**Table 2**  
**Summary Statistics for Regulatory and State-Ownership Variables**

	RESTRICT	SECURITIES	REAL ESTATE	INSURANCE	BANKS OWNING NONFINANCIAL FIRMS	NONFINANCIAL FIRMS OWNING BANKS	STATE-OWNED BANKS ASSETS
Mean	2.40	1.85	2.67	2.55	2.55	1.92	0.21
Median	2.38	2	3	2	3	2	0.15
Maximum	3.75	4	4	4	4	4	0.80
Minimum	1	1	1	1	1	1	0
Std. Dev.	0.67	0.75	0.98	0.95	0.97	0.86	0.23
Skewness	0.00	0.69	-0.18	0.47	-0.26	0.31	0.80
Kurtosis	2.12	3.39	2.03	2.01	2.09	1.84	2.55
Jarque-Bera Probability	2.13	5.71	2.93	5.13	2.94	4.48	7.21
	0.35	0.06	0.23	0.08	0.23	0.11	0.03
Observations	66	66	66	66	65	62	63

**Table 3**  
**Correlations for Regulation and State-Ownership Variables**

	<b>RESTRICT</b>	<b>SECURITIES</b>	<b>INSURANCE</b>	<b>REAL ESTATE</b>	<b>BANKS OWNING NONFINANCIAL FIRMS</b>	<b>NONFINANCIAL FIRMS OWNING BANKS</b>	<b>STATE-OWNED BANKS ASSETS</b>
<b>Restrict</b>	1.00	0.70 (0.00)	0.64 (0.00)	0.81 (0.00)	0.72 (0.00)	0.05 (0.52)	0.18 (0.17)
<b>Securities</b>		1.00	0.25 (0.04)	0.43 (0.00)	0.42 (0.00)	0.00 (0.97)	0.11 (0.38)
<b>Insurance</b>			1.00	0.41 (0.00)	0.18 (0.16)	-0.03 (0.85)	0.13 (0.32)
<b>Real Estate</b>				1.00	0.49 (0.00)	0.04 (0.74)	0.26 (0.04)
<b>Banks Owning Nonfinancial Firms</b>					1.00	0.19 (0.14)	0.01 (0.96)
<b>Nonfinancial Firms Owning Banks</b>						1.00	-0.09 (0.51)
<b>State-owned Banks Assets</b>							1.00

Note: P-value is in parentheses.

**Table 4**  
**Relationship Between Bank Regulatory Restrictiveness and**  
**Alternative Measures of Financial Development**

	<b>Net Interest Margin</b>	<b>Private Credit</b>	<b>Bank Concentration</b>	<b>Industrial Competition</b>	<b>Total Value Traded</b>	<b>Non-Bank Credits</b>
A. Correlations						
Restrict	0.365	-0.299	-0.182	-0.324	-0.249	-0.068
(P-value)	(0.005)	(0.020)	(0.174)	(0.032)	(0.070)	(0.671)
B. Regressions						
Restrict	0.007	-0.016	-0.101	-0.163	-0.022	0.067
(P-value)	(0.020)	(0.832)	(0.046)	(0.422)	(0.480)	(0.188)
Number of Countries	57	60	57	44	54	41
<i>R-square</i>	0.28	0.47	0.12	0.29	0.18	0.46

Note: Regressions include a constant, the logarithm of real per capita GDP, and the variable GOOD GOVERNMENT, which combines measures of expropriation risk, the law and order tradition of the country, and the level of corruption.

Note: RESTRICT equals the average of regulatory restrictions on the ability of banks to engage in (a) securities activities, (b) insurance activities, (c) real estate activities, and (d) the ownership of non-financial firms.

**Table 5**  
**Relationship Between Restriction of Securities Activities of Banks and**  
**Alternative Measures of Financial Development**

	<b>Net Interest Margin</b>	<b>Private Credit</b>	<b>Bank Concentration</b>	<b>Industrial Competition</b>	<b>Total Value Traded</b>	<b>Non-Bank Credits</b>
A. Correlations						
SECURITIES	0.369	-0.121	-0.199	-0.273	-0.152	0.155
(P-value)	(0.005)	(0.359)	(0.137)	(0.073)	(0.274)	(0.332)
B. Regressions						
SECURITIES	0.007	0.010	-0.065	-0.131	-0.007	0.056
(P-value)	(0.016)	(0.860)	(0.197)	(0.316)	(0.809)	(0.121)
Number of Countries	57	60	57	44	54	41
<i>R-square</i>	<i>0.30</i>	<i>0.47</i>	<i>0.09</i>	<i>0.29</i>	<i>0.17</i>	<i>0.47</i>

Note: Regressions include a constant, the logarithm of real per capita GDP, and the variable GOOD GOVERNMENT, which combines measures of expropriation risk, the law and order tradition of the country, and the level of corruption.

Note: SECURITIES: the ability of banks to engage in the business of securities underwriting, brokering, dealing, and all aspects of the mutual fund business.

Larger values imply greater restrictions on bank activities.

4 = prohibited; 3 = banks (and subsidiaries) restricted in activities; 2 = permitted in subsidiaries; 1 = permitted directly in the bank.

**Table 6**  
**Relationship Between Restriction of Insurance Activities of Banks and**  
**Alternative Measures of Financial Development**

	<b>Net Interest Margin</b>	<b>Private Credit</b>	<b>Bank Concentration</b>	<b>Industrial Competition</b>	<b>Total Value Traded</b>	<b>Non-Bank Credits</b>
A. Correlations						
INSURANCE	-0.035	-0.194	-0.086	-0.110	-0.200	-0.031
(P-value)	(0.797)	(0.138)	(0.527)	(0.477)	(0.147)	(0.845)
B. Regressions						
INSURANCE	-0.003	-0.011	-0.038	-0.010	-0.023	0.026
(P-value)	(0.321)	(0.843)	(0.272)	(0.926)	(0.405)	(0.382)
Number of countries	57	60	57	44	54	41
<i>R-square</i>	<i>0.25</i>	<i>0.47</i>	<i>0.06</i>	<i>0.27</i>	<i>0.18</i>	<i>0.43</i>

Note: Regressions include a constant, the logarithm of real per capita GDP, and the variable GOOD GOVERNMENT, which combines measures of expropriation risk, the law and order tradition of the country, and the level of corruption.

Note: INSURANCE: the ability of banks to engage in the business of insurance underwriting and selling insurance products/services as principal and as agent..

Larger values imply greater restrictions on bank activities.

4 = prohibited; 3 = banks (and subsidiaries) restricted in activities; 2 = permitted in subsidiaries; 1 = permitted directly in the bank.

**Table 7**  
**Relationship Between Restriction of Real Estate Activities of Banks and**  
**Alternative Measures of Financial Development**

	<b>Net Interest Margin</b>	<b>Private Credit</b>	<b>Bank Concentration</b>	<b>Industrial Competition</b>	<b>Total Value Traded</b>	<b>Non-Bank Credits</b>
A. Correlations						
REAL ESTATE	0.395	-0.346	-0.068	-0.236	-0.360	-0.218
(P-value)	(0.002)	(0.007)	(0.617)	(0.123)	(0.008)	(0.171)
B. Regressions						
REAL ESTATE	0.006	-0.035	-0.045	-0.074	-0.042	0.022
(P-value)	(0.021)	(0.445)	(0.181)	(0.631)	(0.105)	(0.480)
Number of Countries	57	60	57	44	54	41
<i>R-square</i>	<i>0.29</i>	<i>0.47</i>	<i>0.07</i>	<i>0.28</i>	<i>0.22</i>	<i>0.42</i>

Note: Regressions include a constant, the logarithm of real per capita GDP, and the variable GOOD GOVERNMENT, which combines measures of expropriation risk, the law and order tradition of the country, and the level of corruption.

Note: REAL ESTATE: the ability of banks to engage in real estate investment, development, and management.

Larger values imply greater restrictions on bank activities.

4 = prohibited; 3 = banks (and subsidiaries) restricted in activities; 2 = permitted in subsidiaries; 1 = permitted directly in the bank.



**Table 8**  
**Relationship Between Restriction of Banks Owning Non-Financial Firms and**  
**Alternative Measures of Financial Development**

	Net Interest Margin	Private Credit	Bank Concentration	Industrial Competition	Total Value Traded	Non-Bank Credits
A. Correlations						
BANKS OWNING NONFINANCIAL FIRMS	0.339	-0.209	-0.081	-0.316	0.001	-0.101
(P-value)	(0.011)	(0.111)	(0.552)	(0.037)	(0.993)	(0.534)
B. Regressions						
BANKS OWNING NONFINANCIAL FIRMS	0.004	0.021	-0.033	-0.102	0.027	0.049
0.007199	(0.066)	(0.629)	(0.266)	(0.411)	(0.270)	(0.131)
Number of Countries	56	59	56	44	53	40
<i>R-square</i>	<i>0.26</i>	<i>0.47</i>	<i>0.06</i>	<i>0.29</i>	<i>0.19</i>	<i>0.46</i>

Note: Regressions include a constant, the logarithm of real per capita GDP, and the variable GOOD GOVERNMENT, which combines measures of expropriation risk, the law and order tradition of the country, and the level of corruption.

Note: BANKS OWNING NONFINANCIAL FIRMS: the ability of banks to own and control nonfinancial firms.

Larger values imply greater restrictions on bank activities.

4 = prohibited; 3 = less than 100% ownership; 2 = unrestricted, but ownership is limited based on bank's equity capital; 1 = 100% ownership permitted.

**Table 9**  
**Relationship Between Restriction of Non-Financial Firms Owning Banks and**  
**Alternative Measures of Financial Development**

	Net Interest Margin	Private Credit	Bank Concentration	Industrial Competition	Total Value Traded	Non-Bank Credits
A. Correlations						
NONFINANCIAL FIRMS OWNING BANKS	-0.056	0.065	-0.130	-0.193	0.029	0.132
(P-value)	(0.690)	(0.996)	(0.354)	(0.216)	(0.842)	(0.429)
B. Regressions						
NONFINANCIAL FIRMS OWNING BANKS	-0.003	0.072	-0.032	-0.123	0.011	0.043
(P-value)	(0.364)	(0.165)	(0.412)	(0.272)	(0.701)	(0.139)
Number of Countries	53	56	53	43	50	38
<i>R-square</i>	<i>0.27</i>	<i>0.48</i>	<i>0.06</i>	<i>0.35</i>	<i>0.15</i>	<i>0.44</i>

Note: Regressions include a constant, the logarithm of real per capita GDP, and the variable GOOD GOVERNMENT, which combines measures of expropriation risk, the law and order tradition of the country, and the level of corruption.

Note: NONFINANCIAL FIRMS OWNING BANKS: the ability of non-financial firms to own banks.  
Larger values imply greater restrictions on bank activities.  
1 = limits placed on ownership; 0 = no limits placed on ownership.

**Table 10**  
**Relationship Between State Ownership of Banks Assets and**  
**Alternative Measures of Financial Development**

	Net Interest Margin	Private Credit	Bank Concentration	Industrial Competition	Total Value Traded	Non-Bank Credits
A. Correlations						
STATE-OWNED BANK ASSETS	0.216	-0.345	0.095	-0.247	-0.273	-0.380
(P-value)	(0.117)	(0.009)	(0.496)	(0.115)	(0.052)	(0.017)
B. Regressions						
STATE-OWNED BANK ASSETS	0.011	-0.275	0.007	-0.414	-0.129	-0.242
(P-value)	(0.522)	(0.088)	(0.962)	(0.562)	(0.065)	(0.012)
Number of Countries	54	57	54	42	51	39
<i>R-square</i>	<i>0.24</i>	<i>0.48</i>	<i>0.05</i>	<i>0.28</i>	<i>0.18</i>	<i>0.49</i>

Note: Regressions include a constant, the logarithm of real per capita GDP, and the variable GOOD GOVERNMENT, which combines measures of expropriation risk, the law and order tradition of the country, and the level of corruption.

STATE OWNERSHIP BANK ASSETS: Percentage of bank assets accounted for by state-owned banks.

**Table 11**  
**Relationship Between Bank Crises and Bank Regulations and Policies**

	GOOD GOVERNMENT	RESTRICT	SECURITIES	INSURANCE	REAL ESTATE	BANKS OWNING NONFINANCIAL FIRMS	STATE- OWNED BANK ASSETS	NONFINANCIAL FIRMS OWNING BANKS	FINANCIAL STRUCTURE
A. Correlations									
BANK CRISIS	-0.301	0.393	0.377	-0.006	0.298	0.418	0.217	0.188	-0.157
(P-value)	(0.019)	(0.002)	(0.003)	(0.964)	(0.020)	(0.001)	(0.102)	(0.161)	(0.267)
B. Simple Probit Regressions									
BANK CRISIS	-0.056	0.689	0.584	-0.154	0.300	0.527	0.873	0.237	-0.265
(P-value)	(0.372)	(0.020)	(0.015)	(0.436)	(0.123)	(0.010)	(0.296)	(0.233)	(0.643)
Number of Countries	61	61	61	61	61	60	58	57	52
<i>Probability</i> (LR stat)	<i>0.052</i>	<i>0.009</i>	<i>0.006</i>	<i>0.089</i>	<i>0.039</i>	<i>0.005</i>	<i>0.105</i>	<i>0.124</i>	<i>0.014</i>

Note: Simple Probit Regressions include a constant, the logarithm of real per capita GDP, and the variable GOOD GOVERNMENT, which combines measures of expropriation risk, the law and order tradition of the country, and the level of corruption. The Good Government regression includes Development only.

Probability (LR statistic) is the P-value for the test that the coefficients on the (nonconstant) regressors equal zero.

**Table 12**  
**Banking Crises: Dates, Costs and Bank Regulatory Responses**

Country	Year of Crisis	Scope of Problem	Estimate of Total Losses/Costs	Change in Regulations for Allowable Activities: Yes or No					Coding of Banking Crises	
				Securities	Insurance	Real Estate	Bank Ownership of Non-financial Firms	Non-financial Firm Ownership of Banks	Systemic	Major
Argentina	1980-1982*	More than 70 institutions were liquidated or subject to central bank intervention accounting for 16 percent of assets of commercial banks and 35 percent of total assets of finance companies.	55.3 percent of GDP.	N/A	N/A	N/A	N/A	N/A	1	1
	1989-1990*	Non-performing assets constituted 27 percent of the aggregate portfolio and 37 percent of the portfolios of state-owned banks. Failed banks held 40 percent of financial system assets.		Yes, since 1991, allowed to act as underwriter in issuing private debt	No	No	No	No		
	1995*	Suspension of eight banks and collapse of three banks. Overall through the end of 1997, 63 out of 205 banking institutions were either closed or merged.	Direct and indirect cost to public estimated at 1.6 percent of GDP.	No	No	No	No	No		
Bolivia	1986-1987*	Five banks were liquidated. Total NPLs of banking system reached 29.8 percent in 1987; in mid-1988 reported arrears stood at 92 percent of commercial banks' net worth.		N/A	N/A	N/A	N/A	N/A	1	1
	1994-*	Two banks with 11 percent of banking system assets were closed in November 1994. In 1995, four out of 15 domestic banks, which accounted for 30 percent of banking system assets experienced liquidity problems and suffered from high levels of NPLs.		No	No	No	No	No		
Brazil	1990*	(deposit to bond conversion)		No	No	No	No	No	1	1
	1994-ongoing*	By end 1997, the Central Bank had intervened in, or put under the Temporary Special administration Regime (RAET) system, 43 financial institutions. Also by end 1997 non-performing loans of the entire banking system had reached 15 percent.	In 1996, negative net worth of selected state and federal funds banks estimated at 5-10 percent of GDP. Costs of individual bank recapitalization, by end 1997: Banco Economico, USD 2.9 billion. Bameridus: USD 3 billion. Banco do Brazil, USD 8 billion.	No	No	No	No	No		
Canada	1983-1985**	Fifteen members of the Canadian Deposit Insurance Corporation, including two banks, failed.		No, but changed from prohibited to permitted in 1987.	No, but changed from prohibited to permitted in 1992.	No	No	No	0	1

**Table 12 (continued)**  
**Banking Crises: Dates, Costs and Bank Regulatory Responses**

Country	Year of Crisis	Scope of Problem	Estimate of Total Losses/Costs	Change in Regulations for Allowable Activities: Yes or No					Coding of Banking Crises	
				Securities	Insurance	Real Estate	Bank Ownership of Non-financial Firms	Non-financial Firm Ownership of Banks	Systemic	Major
<b>Chile</b>	1981-1983*	Authorities intervened in four banks and four non-bank financial institutions (with 33 percent of outstanding loans) in 1981. In 1983, seven banks and one financiera accounting for 45 percent of total assets. By end-1983, 19 percent of loans were non-performing.	1982 - 1985: government spent 41.2 percent of GDP.	No, but changed from restricted to permitted in 1997/8	No, but starting in 1997 banks were allowed to intermediate (sell) insurance through subsidiaries.	No, but starting in 1993 banks were allowed to invest in real estate through subsidiaries that specialized in (housing and office space) leasing.	No	No, but changed from unrestricted to permitted in 1993		
<b>Colombia</b>	1982-1987*	Central Bank intervened in six banks accounting for 25 percent of banking system assets.	Costs of restructuring estimated to be around 5 percent of GDP.	No	No, but changed from permitted to prohibited in 1998	No	No, but changed from permitted to prohibited in 1994	No	1	1
<b>Denmark</b>	1987-1992**	Cumulative loan losses over the period 1990-1992 were 9 percent of loans; 40 of the 60 problem banks were merged.		No	No	No	No	No	0	1
<b>Ecuador</b>	early 1980s*	Implementation of exchange program (domestic for foreign debt) to bail out banking system.		N/A	N/A	N/A	N/A	N/A	1	1
	1996-ongoing*	Authorities intervened in several smaller financial institutions in late 1995 to early 1996 and in the fifth largest commercial bank in 1996. Seven financial institutions, which accounted for 25-30 percent of commercial banking assets, were closed in 1998/99. In March 1999, authorities declared a one week bank holiday		N/A	N/A	N/A	N/A	N/A		
<b>Egypt, Arab Rep.</b>	early 1980s*	Government closed several large investment companies. Four public sector banks were given capital assistance.	Nine state-owned commercial banks recorded NPL ratios of 37 percent on average in 1989.	N/A	N/A	N/A	N/A	N/A	1	1
	1991-1995**	Four public sector banks were given capital assistance.		N/A	N/A	N/A	N/A	N/A		
<b>El Salvador</b>	1989*	Nine state-owned commercial banks recorded NPL ratios of 37 percent on average in 1989.		N/A	N/A	N/A	N/A	N/A	1	1
<b>Finland</b>	1991-1994*	Savings banking sector badly affected; Government took control of three banks that together accounted for 31 percent of total system deposits.	Recap. costs amounted to 11 percent of GDP.	No	No	No	No	No	1	1
<b>Ghana</b>	1982-1989*	Seven audited banks (out of 11) insolvent; rural banking sector affected.	Restructuring costs estimated at 6 percent of GNP.	N/A	N/A	N/A	N/A	N/A	1	1

**Table 12 (continued)**  
**Banking Crises: Dates, Costs and Bank Regulatory Responses**

Country	Year of Crisis	Scope of Problem	Estimate of Total Losses/Costs	Change in Regulations for Allowable Activities: Yes or No					Coding of Banking Crises	
				Securities	Insurance	Real Estate	Bank Ownership of Non-financial Firms	Non-financial Firm Ownership of Banks	Systemic	Major
<b>Ghana</b>	1997 ongoing**	NPL levels increased sharply during 1997 from 15.5 percent of loans outstanding to 26.5 percent. Two state-owned commercial banks accounting for 33.9 percent of market share in bad shape. Three banks, accounting for 3.6 percent of market share in terms of Nine Deposit Taking Companies failed. Seven banks or Deposit Taking Institutions were either liquidated or taken over.	One large investment bank fails. Non-performing assets of the 27 public sector banks estimated at 19.5 percent of total loans and advances as of end of March 1995. Non-performing assets to total assets reached 10.8 percent in 1993-1994. At end 1998, NPLs estimated at 16 percent of total	No	No	No	No	No		
<b>Hong Kong</b>	1982-1983**	Nine Deposit Taking Companies failed.		N/A	N/A	N/A	N/A	N/A	1	1
	1983-1986**	Seven banks or Deposit Taking Institutions were either liquidated or taken over.		N/A	N/A	N/A	N/A	N/A		
	1998**	One large investment bank fails		No	No	No	No	No		
<b>India</b>	1993-ongoing**	Non-performing assets of the 27 public sector banks estimated at 19.5 percent of total loans and advances as of end of March 1995. Non-performing assets to total assets reached 10.8 percent in 1993-1994. At end 1998, NPLs estimated at 16 percent of total loans.		No	No	No	No	No	0	1
<b>Indonesia</b>	1994**	Classified assets equal to over 14 percent of banking system assets with over 70 percent in the state banks.	Recapitalization cost for five state banks expected to amount to 1.8 percent of GDP.	Yes, a regulation prohibiting banks from underwriting securities was issued in Aug, 1995. The decree however allowed banks to act as arranger, issuer, dealer, investor or buying agent	No	No	No	No	1	1
	1997-ongoing*	As of March 1999, Bank of Indonesia had closed down 61 banks and nationalized 54 banks, of a total of 240. NPLs estimates for the total banking system range from 65-75 percent of total loans.	Fiscal costs estimated to range from 50-55 percent of GDP.	No	No	No	No	No		
<b>Italy</b>	1990-1995**	During 1990-1994, 58 banks (accounting for 11 percent of total lending) were merged with other institutions.		No	No	No	No, but changed from prohibited to restricted in 1995	No	0	1

**Table 12 (continued)**  
**Banking Crises: Dates, Costs and Bank Regulatory Responses**

Country	Year of Crisis	Scope of Problem	Estimate of Total Losses/Costs	Change in Regulations for Allowable Activities: Yes or No					Coding of Banking Crises	
				Securities	Insurance	Real Estate	Bank Ownership of Non-financial Firms	Non-financial Firm Ownership of Banks	Systemic	Major
Japan	1990s*	Banks suffering from sharp decline in stock market and real estate prices; official estimate of NPLs: 40 trillion Yen (USD 469 billion) in 1995 (10 percent of GDP); unofficial estimates put NPLs at 1 trillion or 25 percent of GDP; for some of bad loans, banks have already made provisions. At end 1998, total banking system NPLs estimated at Yen 87.5 trillion (USD 725 billion), about 17.9 percent of GDP. In March 1999, Hokkaido Takushoku bank closed, Long Term Credit Bank nationalised; Yatsuda Trust merged with Fuji Bank, and Mitsui Trust merged with Chuo Trust.	In 1996, rescue costs estimated at over USD 100 bn. In 1998, government of Japan announced the Obuchi Plan which provides 60 trillion Yen (USD 500 billion), about 12.3 percent of GDP, in public funds for loan losses, recapitalization of banks and depositor protection	No	No	No	No	No	1	1
Korea, Republic of	1997-ongoing*	By March 1999, two out of 26 commercial banks accounting for 11.8 percent of total banking system assets nationalized; 5 banks, accounting for 7.8 percent of total banking system assets closed. Seven banks accounting for 38 percent of banking system assets, placed under special supervision. Overall, banking system NPL expected to peak at 30-40 percent.-	Fiscal costs of crisis estimated to reach 34% in 1999.	No	No, but changed from prohibited to permitted in 1995	No	No	No	1	1
Madagascar	1988*	25 percent of banking sector loans deemed irrecoverable.		No	No	No	N/A	N/A	1	1
Malaysia	1985-1988**	Insolvent institutions account for 3.4 percent of financial system deposits; marginally capitalized and perhaps insolvent institutions account for another 4.4 percent of financial system deposits.	Reported losses equivalent to 4.7 percent of GNP.	N/A	N/A	N/A	N/A	N/A	1	1
	1997-ongoing*	Finance company sector is being restructured and number of finance companies is to be reduced from 39 to 16 through mergers. Two finance companies were taken over by Central Bank including MBf Finance, the largest independent finance company. Two banks, deemed insolvent, accounting for 14.2 percent of financial system assets, to be merged with other banks. Overall, at end 1998, NPLs estimated between 25-35 percent of total banking system assets.	Net loss estimated at USD 14.9 bn, or 20.5 percent of GDP by 1999.	No, but changed from restricted to permitted in 1991	No, but changed from restricted to permitted in 1991	No	No, but changed from restricted to permitted in 1991	No		



**Table 12 (continued)**  
**Banking Crises: Dates, Costs and Bank Regulatory Responses**

Country	Year of Crisis	Scope of Problem	Estimate of Total Losses/Costs	Change in Regulations for Allowable Activities: Yes or No					Coding of Banking Crises	
				Securities	Insurance	Real Estate	Bank Ownership of Non-financial Firms	Non-financial Firm Ownership of Banks	Systemic	Major
Mexico	1981/82 (perhaps until reprivatized 1990/91)*	Government took over troubled banking system.		N/A	N/A	N/A	N/A	N/A	1	1
	1995-ongoing*	Out of 34 commercial banks as of 1994, nine banks were intervened in and 11 more banks participated in the loan/purchase recapitalization program. These nine intervened banks accounted for 18.9 percent of total financial system assets and were deemed in 1993: insolvent banks account for 20 percent of total assets and 22 percent of banking system deposits; 1995: almost half of the banks reported to be in financial distress.	Distressed banks accounted for 3.9 percent of banking system assets.	No	No	No	No	No		
Nigeria	1990s*	1993: insolvent banks account for 20 percent of total assets and 22 percent of banking system deposits; 1995: almost half of the banks reported to be in financial distress		No	No	No	No	No	1	1
	1997**	Distressed banks accounted for 3.9 percent of banking system assets.		No	No	No	No	No		
Norway	1987-93*	Central Bank provided special loans to six banks, suffering from post-oil recession of 1985-86 and from problem real estate loans; state took control of three largest banks (equivalent to 85 percent of banking system assets, whose loan losses had wiped out capital), partly through a Government Bank Investment Fund (Nkr 5 billion) and the state-backed Bank Insurance Fund had to increase capital to Nkr 11 billion.	Recapitalization costs amounted to 8 percent of GDP.	No	No	No	No	No	1	1
Peru	1983-1990*	Two large banks failed. The rest of the system suffered from high levels of non-performing loans and financial disintermediation following the nationalization of the banking system in 1987.		No	No	No	No	No	1	1
Philippines	1981-1987*	Two public banks accounting for 50 percent of banking system assets, six private banks accounting for 12 percent of banking system assets, 32 thrifts accounting for 53.2 percent of thrift banking assets and 128 rural banks.	At its peak, central bank assistance to financial institutions amounted to 19.1 bn pesos (3 percent of GDP).	N/A	N/A	N/A	N/A	N/A	1	1

**Table 12 (continued)**  
**Banking Crises: Dates, Costs and Bank Regulatory Responses**

Country	Year of Crisis	Scope of Problem	Estimate of Total Losses/Costs	Change in Regulations for Allowable Activities: Yes or No					Coding of Banking Crises	
				Securities	Insurance	Real Estate	Bank Ownership of Non-financial Firms	Non-financial Firm Ownership of Banks	Systemic	Major
<b>Philippines</b>	1998-ongoing*	Since January 1998, one commercial bank, seven out of 88 thrifts and 40 out of 750 rural banks have been placed under receivership. Banking system NPLs reached 10.8 percent by August of 1998 and 12.4 percent by November 1998. Expected to reach 20 percent in 1999.	Net loss estimated at USD 4.0 bn, or 6.7 percent of GDP by 1999.	No	No	No	No	No		
<b>Sri Lanka</b>	1989-1993*	State-owned banks comprising 70 percent of banking system estimated to have non-performing loan ratio of about 35 percent.	Restructuring cost amounted to 25 bn rupees (5 percent of GDP).	N/A	N/A	N/A	N/A	N/A	1	1
<b>Sweden</b>	1991*	Nordbanken and Gota Bank insolvent, accounting for 21.6 percent of total banking system assets. Sparbanken Foresta intervened, accounting for 24 percent of total banking system assets. Overall, five of six largest banks, accounting for over 70 percent of banking system assets experienced difficulties.	Cost of recapitalization amounted to 4 percent of GDP.	No	No	No	Yes, changed from prohibited to restricted in August 1991	No	1	1
<b>Tanzania</b>	Late 1980s; 1990s*	1987: the main financial institutions had arrears amounting to half of their portfolio; 1995: The National Bank of Commerce which accounted for 95 percent of banking system assets, insolvent since 1990-92, possibly longer.	1987: implied losses amount to nearly 10 percent of GNP.	N/A	N/A	N/A	N/A	N/A	1	1
<b>Thailand</b>	1983-1987*	Authorities intervened in 50 finance and security firms & 5 commercial banks or about 25 percent of total financial system assets; 3 commercial banks judged insolvent (14.1 percent of commercial banking assets).	Government cost for 50 finance companies estimated at 0.5 percent of GNP; government cost for subsidized loans amounted to about 0.2 percent of GDP annually.	N/A	N/A	N/A	N/A	N/A	1	1
<b>Thailand</b>	1997-ongoing*	Up to March 1999, Bank of Thailand intervened in 70 finance companies (out of 91) which together accounted for 12.8 percent of financial system assets or 72 percent of finance company assets. It also intervened in six banks that together had a market share of 12.3 percent. At end 1998, banking system NPLs had reached 46 percent of total loans.	Net losses estimated at USD 59.7 bn, or 42.3 percent of GDP in 1999.	No	No	No	No	No		

**Table 12 (continued)**  
**Banking Crises: Dates, Costs and Bank Regulatory Responses**

Country	Year of Crisis	Scope of Problem	Estimate of Total Losses/Costs	Change in Regulations for Allowable Activities: Yes or No					Coding of Banking Crises	
				Securities	Insurance	Real Estate	Bank Ownership of Non-financial Firms	Non-financial Firm Ownership of Banks	Systemic	Major
Turkey	1994**	Three banks failed in April 1994.	Up to June 1994, authorities spent 1.1 percent of GDP.	No	No	No	No	Yes, changed from unrestricted to permitted. As of 1993, banks may only acquire shares, including bonus shares, of a nonfinancial firm up to a maximum of 15% of their own fund, and the total sum of investment in these companies may not exceed 60% of the banks' total funds.	1	1
United States	1984-1991**	More than 1,400 savings & loans and 1,300 banks failed.	Cost of savings & loan clean up amounted to an estimated USD 180 billion equivalent to 3.2 percent of GDP.	No	No	No	No	No	0	1
Uruguay	1981-1984*	Affected institutions accounted for 30 percent of financial system assets; insolvent banks accounted for 20 percent of financial system deposits.	Costs of recapitalizing banks estimated at USD 350 million (7 percent of GNP); Central Bank's quasi-fiscal losses associated with subsidized credit operations and purchase of loan portfolios amounted to 24.2 percent of GDP during 1982-85.	N/A	N/A	N/A	N/A	N/A	1	1
Venezuela	Late 1970s and 1980s**	Notable bank failures: Banco Nacional de Descuento (1978); BANDAGRO (1981); Banco de los Trabajadores de Venezuela(1982); Banco de Comercio (1985) BHCU (1985); BHCO (1985); Banco Lara (1986).		N/A	N/A	N/A	N/A	N/A	1	1
	1994-ongoing*	Insolvent banks accounted for 30 percent of financial system deposits. Authorities intervened in 13 out of 47 banks which held 50 percent of deposits in 1994, and in five additional banks in 1995.		No	No	No	No	No		
Zimbabwe	1995-ongoing*	Two out of five commercial banks recorded high NPL ratio		No	No	No	No	No	1	1

Note: \* denotes systemic banking crises, whereas\*\* denotes non-systemic banking crises.

Source: Authors based upon Gerald Caprio and Daniela Klingebiel, "Episodes of Systematic and Borderline Financial Crises", May 1999; "Global Survey", Institute of International Bankers, various years; and the Office of the Comptroller of the Currency.

**Table 13: Summary of Empirical Results**

	<b>Bank Inefficiency</b>	<b>Financial Development</b>	<b>Concentration &amp; Bank per capita</b>	<b>Industrial Competition</b>	<b>Non-Bank &amp; Stock Market</b>	<b>Bank Crisis</b>
Securities Restrictions	++					++
Insurance Restrictions						
Real Estate restrictions	++	-			-	+
Bank Owning Nonfinancial Firms Restrictions	+		-			++
Nonfinancial Firms Owning Banks Restrictions						
State-Owned Bank Assets	+	-			--	

"+" indicates a significant positive correlation

"++" indicates significant positive relationship, controlling for GDP per capita and government quality.

"-" indicates a significant negative correlation

"--" indicates a significant negative relationship, controlling for GDP per capita and government quality.

## **Appendices**

## Appendix 1: Bank Regulations and the Socio-Economic Environment

This Appendix presents correlations between the commercial bank regulatory indicators and the degree of state ownership of banks and a variety of political, cultural, legal, and economic characteristics. These socio-economic factors may influence bank regulations and state ownership of banks. For instance, it has been found that income diversity and ethnic diversity influence many policy decisions [see Engermann and Sokoloff, (1998) and Easterly and Levine (1997)]. Consequently, we examine the associations between ethnic and income diversity and the commercial bank regulatory decisions of governments. Furthermore, LLSV (1998) emphasize that Common Law Countries tend to provide greater protection to outside investors in firms (creditors and minority shareholders). This may influence public demand for regulation. Thus, we examine the relationship between the legal environment and both regulatory regime and state ownership of banks. Also, regulatory policies reflect the outcome of political decisions. Thus, it is worth examining whether countries with good public institutions tend to select particular financial sector policies. Lastly, we include the level of economic development. Not only is it worth examining whether relatively successful countries tend to have particular regulatory/ownership patterns, but economic development may be highly correlated with a variety of institutional and other national traits that are both associated with financial sector policies and for which we do not have direct measures. The goal here is to present some summary statistics regarding the relationship between the bank regulatory environment and the socio-economic environment more generally. More specifically, the six indicators that we study are as follows:

**Development:** Real per capita GDP in 1980 (source: Penn World Tables).

**Good Government:** Average value of three variables: (i) risk of expropriation by the government, (ii) the degree of corruption, and (iii) the law and order tradition of the

country. Each variable is based on a scale from 0 to 10, where higher values signify better government (source: LLSV 1999).

**Income Diversity:** Average of gini-coefficient for each country over the period 1980-1995 (source: Deininger and Squire 1996).

**Ethnic Diversity:** Average value of five indices of ethnolinguistic fractionalization, with higher values denoting greater diversity. The scale extends from 0 to 1 (source: Easterly and Levine 1997).

**Common Law Country:** Dummy variable with a value of one if the country has an English, Common Law, heritage, and zero otherwise (source: LLSV 1999).

**Legal Rights of Investors:** An index of the legal rights of creditors and minority shareholders (source: computed from LLSV 1998).<sup>13</sup>

Table A1 presents simple correlations (and P-values for the correlations) between the regulatory/ownership indicators and the six indicators of the national environment. A few findings worth mentioning are as follows. First, legal heritage and the legal rights of investors are not strongly associated with commercial banking regulations or state ownership of banks. Second, while ethnic diversity is not highly correlated with the regulatory/ownership environment, income diversity is strongly linked. Countries with greater income diversity tend to have more restrictions on their commercial banks with respect to (i) engaging in securities market activities and (ii) owning nonfinancial firms. Third, governments in richer countries (and good governments – those with low corruption, a strong law and order tradition, and low risk of

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<sup>13</sup> We calculate this from LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Specifically, for shareholder rights, we add 1 if: (1) the country allows the shareholders to mail their proxy to the firm; (2) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (3) cumulative voting or proportional representation of minorities in the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10 percent (the sample median); or (6) shareholders have preemptive rights that can only be waived by a shareholders' vote. Then, we add 1 for creditor rights if: (7) the country imposes restrictions, such as creditors' consent, to file for reorganization; (8) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (9) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of assets of a bankrupt firm; and (10) the debtor does not retain the administration of its property pending the resolution of the reorganization. Thus, the legal rights of investors index can potentially assume values between 0 and 10.

expropriation) tend to (i) impose fewer regulatory restrictions on their banks and (ii) own a small percentage of the banking industry. The level of economic development and the quality of the government are very highly correlated (0.82)



**Table A1**  
**Correlations for Bank Regulations and Environment in which Banks Operate**

	RESTRICT	SECURITIES	INSURANCE	REAL ESTATE	BANKS OWNING NONFINANCIAL FIRMS	NONFINANCIAL FIRMS OWNING BANKS	STATE-OWNED BANK ASSETS
<b>DEVELOPMENT</b>	-0.440 (0.000)	-0.110 (0.379)	-0.378 (0.002)	-0.450 (0.000)	-0.342 (0.005)	-0.050 (0.700)	-0.346 (0.005)
<b>GOOD GOVERNMENT</b>	-0.374 (0.003)	-0.224 (0.083)	-0.176 (0.174)	-0.374 (0.004)	-0.380 (0.003)	-0.161 (0.230)	-0.286 (0.030)
<b>INCOME DIVERSITY</b>	0.347 (0.010)	0.396 (0.003)	0.106 (0.447)	0.158 (0.255)	0.371 (0.006)	0.195 (0.171)	0.080 (0.571)
<b>ETHNIC DIVERSITY</b>	0.092 (0.464)	-0.006 (0.959)	0.067 (0.592)	0.134 (0.285)	0.048 (0.707)	0.139 (0.283)	0.042 (0.744)
<b>COMMON LAW COUNTRY</b>	-0.060 (0.634)	-0.086 (0.493)	0.093 (0.458)	-0.042 (0.735)	-0.078 (0.535)	0.233 (0.068)	-0.042 (0.744)
<b>LEGAL RIGHTS OF INVESTORS</b>	-0.069 (0.653)	-0.061 (0.690)	0.092 (0.547)	-0.035 (0.818)	-0.193 (0.208)	0.141 (0.380)	-0.027 (0.866)

**Table A2**  
**Data on Financial Development and the Political/Economic Environment**

	DEVELOPMENT	GOOD GOVERNMENT	NET INTEREST MARGIN	PRIVATE CREDIT	BANK CONCENTRATION	INDUSTRIAL COMPETITION	TOTAL VALUE TRADED	NON-BANK CREDITS
Argentina	6506	12.7	0.082	0.15	0.57	3.05	0.017	0.01
Australia	12520	20.4	0.019	0.81	0.67	3.04	0.144	0.34
Austria	10509	20.8	0.019	0.87	0.72	4.03	0.040	0.04
Barbados	6379	0.0	0.033	0.40	1.00		0.003	0.08
Belgium	11109	20.9	0.023	0.37	0.62	3.93	0.034	
Bolivia	1989	8.0	0.035	0.20	0.46		0.000	0.02
Botswana	1940	16.5	0.052	0.11	0.95		0.005	
Brazil	4303	15.2	0.120	0.25	0.68	3.31	0.064	0.09
Canada	14133	21.7	0.018	0.77	0.58	3.90	0.153	0.28
Chile	3892	14.9	0.045	0.50	0.49	3.62	0.038	0.06
Colombia	2946	11.2	0.064	0.27	0.46	2.17	0.007	0.13
Cyprus	5295	15.7	0.067	0.77	0.88		0.015	0.21
Denmark	11342	21.7	0.049	0.42	0.75	4.76	0.064	
Ecuador	3238	13.7	0.072	0.19	0.41		0.017	0.04
Egypt, Arab Rep.	1645	11.1	0.012	0.28	0.65	4.19	0.004	0.04
El Salvador	2014	8.3	0.039	0.24	0.86			0.00
Fiji	3609	0.0		0.30				0.02
Finland	10851	21.7	0.016	0.67	0.86	2.77	0.044	
France	11756	20.5	0.035	0.91	0.41	3.72	0.084	0.09
Gambia, The	1017	15.0		0.16				
Germany	11920	20.8	0.025	0.92	0.44	4.53	0.187	0.07
Ghana	976	10.3	0.071	0.03	0.94		0.004	
Greece	5901	15.2	0.035	0.40	0.77	3.18	0.016	0.18
Guatemala	2574	8.2	0.054	0.15	0.43		0.000	0.01
Guyana	1927	7.9	0.044	0.30	1.00			0.08
Hong Kong	8719	18.3	0.020	1.36	0.80	3.88	0.506	
Iceland	11566	21.6		0.39		2.00	0.005	
India	882	13.0	0.030	0.27	0.42	2.87	0.048	0.03
Indonesia	1281	10.8	0.041	0.26	0.43	3.29	0.018	
Ireland	6823	19.5	0.016	0.63	0.79	4.07	0.144	0.36

**Table A2 (continued)**  
**Data on Financial Development and the Political/Economic Environment**

	DEVELOPMENT	GOOD GOVERNMENT	NET INTEREST MARGIN	PRIVATE CREDIT	BANK CONCENTRATION	INDUSTRIAL COMPETITION	TOTAL VALUE TRADED	NON-BANK CREDITS
Jordan	3384	12.0	0.022	0.62	0.90	2.63	0.091	0.07
Korea, Republic of	3093	14.7	0.023	0.81	0.33	2.45	0.266	0.35
Lesotho	994	0.0		0.16	1.00			0.02
Luxembourg	11893	22.0	0.007	0.24	0.38	3.00	0.016	
Madagascar	984	11.7	0.060	0.16	0.96			
Malaysia	3799	16.5	0.025	0.80	0.54	3.88	0.427	0.21
Malta	4483	14.0	0.023	0.60	0.97			0.11
Mexico	6054	13.4	0.053	0.18	0.59	2.76	0.063	0.03
Netherlands	11284	22.0	0.015	1.28	0.73	4.77	0.191	0.54
New Zealand	10362	21.7	0.025	0.54	0.77	3.40	0.080	0.13
Nigeria	1438	8.8	0.047	0.15	0.83		0.000	0.02
Norway	12141	21.9	0.031	0.89	0.85	3.47	0.061	0.40
Pakistan	1110	9.2	0.029	0.23	0.78		0.019	
Peru	2875	9.9	0.072	0.10	0.72	2.94	0.014	0.03
Philippines	1879	8.6	0.042	0.29	0.47	2.67	0.053	0.07
Portugal	4982	18.5	0.035	0.63	0.45	4.27	0.021	
Rwanda	757	0.0	0.044	0.08	1.00			0.01
Seychelles	2906	0.0		0.10				
Singapore	7053	19.4	0.021	0.95	0.73	4.16	0.446	0.16
South Africa	3496	14.9	0.039	0.79	0.78	2.28	0.076	0.28
Spain	7390	18.6	0.038	0.72	0.46	4.06	0.062	0.06
Sri Lanka	1635	10.2	0.051	0.19	0.83		0.013	
Suriname	3737	8.6		0.37				
Sweden	12456	21.4	0.027	1.09	0.89	2.86	0.137	0.64
Switzerland	14301	22.0	0.016	1.78	0.74	4.00	0.975	0.34
Tanzania	480	13.2						
Thailand	2178	14.3	0.030	0.68	0.54	2.62	0.203	0.17
Turkey	2874	13.2	0.094	0.14	0.45	3.14	0.062	0.01
United Kingdom	10167	20.3	0.020	0.74	0.58	4.46	0.355	
United States	15295	21.2	0.039	1.31	0.18	4.22	0.344	0.66
Uruguay	5091	12.6	0.056	0.31	0.86		0.001	
Venezuela	7401	13.5	0.078	0.39	0.52	2.28	0.014	0.18
Zimbabwe	1206	11.1	0.044	0.22	0.82	2.40	0.010	0.09

**Table A3**  
**Banking Crises Around the Globe**

	<b>Systemic</b>	<b>Major</b>		<b>Systemic</b>	<b>Major</b>
Argentina	1	1	New Zealand	0	0
Australia	0	0	Nigeria	1	1
Austria	0	0	Norway	1	1
Barbados	0	0	Pakistan	0	0
Belgium	0	0	Peru	1	1
Bolivia	1	1	Philippines	1	1
Botswana	0	0	Portugal	0	0
Brazil	1	1	Rwanda	0	0
Canada	0	1	Seychelles	0	0
Chile	1	1	Singapore	0	0
Colombia	1	1	South Africa	0	0
Cyprus	0	0	Spain	0	0
Denmark	0	1	Sri Lanka	1	1
Ecuador	1	1	Suriname	0	0
Egypt, Arab Rep.	1	1	Sweden	1	1
El Salvador	1	1	Switzerland	0	0
Fiji	0	0	Tanzania	1	1
Finland	1	1	Thailand	1	1
France	0	0	Turkey	1	1
Gambia, The	0	0	United Kingdom	0	0
Germany	0	0	United States	0	1
Ghana	1	1	Uruguay	1	1
Greece	0	0	Venezuela	1	1
Guatemala	0	0	Zimbabwe	1	1
Guyana	0	0			
Hong Kong	0	1			
Iceland	0	0			
India	0	1			
Indonesia	1	1			
Ireland	0	0			
Israel	0	0			
Italy	0	1			
Japan	1	1			
Jordan	0	0			
Korea, Republic of	1	1			
Lesotho	0	0			
Luxembourg	0	0			
Madagascar	1	1			
Malaysia	1	1			
Malta	0	0			
Mexico	1	1			
Netherlands	0	0			