Bank Regulation and Supervision: What Works Best?

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First Draft: December 2000
This Draft: January 2002

Abstract:

This paper uses a new database on bank regulation and supervision in 107 countries to assess the relationship between specific regulatory and supervisory practices and banking-sector development and fragility.

Specifically, we examine (i) regulatory restrictions on bank activities and the mixing of banking and commerce; (ii) regulations on domestic and foreign bank entry; (ii) regulations on capital adequacy; (iii) deposit insurance system design features; (iv) supervisory power, independence, resources, loan classification stringency, provisioning standards, diversification guidelines, and prompt corrective action powers; (iv) regulations on information disclosure that foster private-sector monitoring of banks; and (v) government ownership of banks.

The results raise a cautionary flag regarding policies that rely excessively on direct government supervision of and regulatory restrictions on banks. The findings suggest that regulatory and supervisory practices that (1) force accurate information disclosure to empower private-sector monitoring of banks and (2) create incentives for private agents to monitor banks work best to promote bank performance and stability.

JEL Classification: G38; G21; L51; O16
Keywords: Banks; Regulation; Supervision; Economic Development

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This research could not have been completed without the help of Iffath Sharif and Cindy Lee, as well as financial support from the World Bank. Xin Chen provided extraordinary research assistance. We received helpful comments from Asli Demirgüç-Kunt, Simeon Djankov, Patrick Honohan, George Kaufman, Soledad Martinez, Charles Calomiris, Rick Mishkin, Andrei Shleifer, Gerardo Zuniga-Villasenor, and seminar participants at the Banco Central de Chile, The World Bank's Annual Bank Conference on Development Economics, Brookings-Wharton Financial Services Conference, NBER Workshop on Financial Institutions, University of Minnesota, The Reserve Bank of Australia, Harvard University, Stanford University, Yale University, and University of Michigan. The findings do not necessarily represent the opinions of The World Bank, its management, the Executive Directors, or the countries they represent.

I. Introduction

Poorly functioning banking systems impede economic progress, exacerbate poverty, and destabilize economies. Specifically, a substantial literature documents that well-functioning banks accelerate economic growth, which in turn alleviates poverty. Furthermore, there have been an unprecedented number of disruptive banking crises in recent decades.[1]

The staggering scope of recent crises, coupled with evidence on the beneficial effects of banking systems on economic growth, have generated calls for reforms in bank regulation and supervision. The Basle Committee on Bank Supervision has developed an extensive list of "best practices" for the regulation and supervision of banks, which is promoted by the International Monetary Fund and the World Bank. There is a strong sense that if only policymakers in countries around the world would implement particular regulatory and supervisory practices, then bank "safety and soundness" would improve, thereby promoting growth and stability.

There is no evidence, however, that the best practices currently being advocated by international agencies are the best ones for promoting well-functioning banks. There is no evidence that successful practices in the United States, for example, will succeed in countries with different institutional and political environments. There is no evidence, moreover, that each regulatory and supervisory practice can be considered as part of an extensive checklist of desirable best practices in which more checks are better than fewer as opposed to considering regulation and supervision as reflecting broad views about the role of government in society. There is no broad cross-country evidence about which regulatory and supervisory policies work best to promote bank development, efficiency, and stability.

To fill this gap between policy advice and empirical evidence, this paper provides the first cross-country evidence on banking system performance and stability and the regulation and supervision of banks using our newly constructed database on bank regulation and supervision. We conducted a survey of national regulatory agencies and collected information on an extensive list of bank regulations and supervisory practices in over 100 countries. The data, primarily from 1999, are unique in that no researchers, national agencies, or international institutions have collected the

[1]On finance and growth, see Levine (1997). On growth and poverty, see Dollar and Kraay (2000). On the costs of

detailed information that we have assembled for a broad cross-section of countries. We use this new cross-country database to assess which regulatory and supervisory policies are associated with greater bank development, efficiency, and stability.

Specifically, we examine the implications for banking sector performance and fragility of:

- Regulations on bank activities and the mixing of banking and commerce
- Regulations on domestic and foreign bank entry
- Regulations on capital adequacy
- Deposit insurance system design features
- Supervisory power, independence, resources, loan classification stringency, provisioning standards, diversification guidelines, among others
- Regulations fostering information disclosure and private-sector monitoring of banks
- Government ownership of banks

Economic theory provides conflicting predictions about each of these policies. Indeed, economists and policymakers have hotly debated the merits of these specific policies from quite diverse perspectives for over a century. For example, some emphasize the advantages of restricting banks from participating in securities, insurance, and real estate activities or from owning nonfinancial firms. They stress that (i) neither private nor official entities can effectively monitor complex financial conglomerates due to severe informational asymmetries and (ii) both the market and political power enjoyed by such banks can thwart competition and influence supervisory policies in ways that hinder overall financial development. According to this argument, market frictions in conjunction with potential contagion from bank failure and the crucial role of well-functioning banks in fostering economic growth support restrictions on bank activities. Others disagree. The counter argument holds that (i) the market frictions are not that great, (ii) the potential adverse spillovers to the entire economy from permitting complex banks do not warrant regulatory restrictions on bank activities, and (iii) fewer regulatory restrictions permit banks to exploit economies of scale and scope and thereby provide better services to the economy. An examination of countries with different regulatory restrictions on bank activities can help resolve this debate. Below, we discuss the

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recent crises, see World Bank (2000), Boyd, Kwak, and Smith (2000), and Hoggarth, Reis and Saporta (2001).

theoretical and policy arguments surrounding each of the debates listed above and then evaluate them empirically.

Theoretical models and policy analysts also advance subtle, counterfactual arguments about the precise institutional and policy conditions under which regulatory/supervisory practices promote bank performance and stability. Thus, some models predict that the correct answer to questions such as, should governments restrict bank activities, limit bank entry, or create powerful supervisory agencies is, "it depends on other policies and institutions." For instance, in an environment with generous deposit insurance that intensifies moral hazard problems, Boyd, Chang, and Smith (1998) argue that broad banking powers provide excessive opportunities for risk-taking. Thus, their model suggests that regulatory restrictions on bank activities will enhance social welfare in an economy with generous deposit insurance. Similarly, while capital adequacy requirements are the mainstay of current approaches to bank regulation, theory suggests that capital regulations will be particularly beneficial when (i) generous deposit insurance distorts incentives, (ii) official supervision is ineffective, and (iii) large, complex financial conglomerates are difficult for external agents to monitor. According to this view, the proper analysis of capital regulations needs to incorporate interaction terms that gauge the efficacy of these regulations under different institutional and policy environments. The body of the paper describes and empirically assesses many these more subtle predictions. Thus, a novel contribution of this paper is that we examine many counterfactual arguments concerning the conditions under which particular regulatory/supervisory policies promote bank performance and stability.

Besides examining the efficacy of specific bank regulations and supervisory practices, this paper also provides empirical evidence on broad and contrasting approaches to the regulation and supervision of banks. Each of the specific regulatory/supervisory issues noted above can be framed in terms of arguments for greater government intervention -- and the form that those interventions should take -- and arguments against direct government interventions. Specifically, many arguments in favor of government intervention are Pigouvian: the existence of monopoly power, externalities, and informational asymmetries create a potentially constructive role for government interventions to offset these market failures and enhance social welfare. The Pigouvian view takes as given both that there are market failures and that the government can ameliorate those failures. Others disagree. As noted above and discussed below in greater detail, some argue that market failures are not very large

and government interventions frequently do not correct market failures. According to this view, regulations that empower the private-sector to monitor banks will be more effective than direct government interventions at enhancing bank performance and stability. Shleifer and Vishny (1998) go farther and argue that government failures are more important than market failures. When applied to banking, this view holds that powerful bank regulators/supervisors will use their power to extract rents, so that countries with powerful official regulatory/supervisory agencies will tend to have higher levels of corruption with no corresponding increase in bank performance. This view supports laws and regulations that promote private-sector monitoring of banks, while advertising the harmful effects of direct government involvement in the banking industry. Our analyses provide considerable evidence regarding the efficacy of direct government interventions in the banking sector.

A major strength of this paper is that it simultaneously examines an extensive array of regulatory and supervisory information for a broad cross-section of countries at all levels of development and in all parts of the world. The list of issues we examine is so extensive that some may question our expansive approach, preferring a more focused examination of each issue. While recognizing the appeal of tightly focused studies, we follow the growing theoretical and policy literature stressing that the salient issues in bank regulation and supervision are inextricably interrelated. One therefore must examine an extensive array of factors simultaneously to identify those combinations of regulatory and supervisory policies that produce successful banking systems. It is perilous, for example, to examine the impact of official supervisory practices without information on the effectiveness of private-sector monitoring, and vice versa. It is inappropriate, as another example, to examine the relationship between restrictions on bank securities activities and bank fragility without considering the effectiveness of official supervision, and vice versa. As a final example, it is misguided to examine the importance of a wide array of regulatory and supervisory policies without accounting for the degree of government ownership of banks. Thus, we simultaneously examine, and hence control for, the impact of a wide array of bank regulatory and supervisory policies.

While we boldly advertise that this paper provides the first cross-country evidence on a wide range of bank regulatory and supervisory practices, we must be just as bold in advertising its methodological limitations and therefore the tentative nature of its findings. Given that we only have information on regulatory and supervisory practices for one point in time (the late 1990s), we conduct

pure cross-country regressions. One problem with this approach is that it is difficult to control fully for potential simultaneity bias: bank performance may influence the formation of regulations and supervisory policies. While we use instrumental variables to control for simultaneity bias and while these procedures pass basic specification tests, data limitations prohibit us from using time-series or panel procedures to assess the relationship between bank performance and bank regulation and supervision using complementary methods. For very few regulatory variables, we were able to collect historical data and show that these regulations change very little over time and that controlling for these changes does not alter our findings. A second limitation with this paper's investigation is that it only uses aggregate measures of bank performance; we do not yet complement and refine our analyses by employing firm-level, industry-level, and bank-level datasets due to data limitations. As international, microeconomic datasets become available for the period corresponding to the regulatory/supervisory data, we hope to extend the analyses. While these complementary studies will offer additional insights into the influence of bank regulatory and supervisory policies on bank development, firm-financing, and the flow of bank credit, this paper's cross-country comparisons provide a first, tentative assessment of the relationship between banking sector development and the regulation and supervision of banks around the world.

The paper is organized as follows. Section II discusses the theoretical and policy debates regarding each of the issues noted above. Section III discusses the data. Section IV presents regression results and Section V contains conclusions.

II. The Debates and Current Evidence

This section discusses seven policy issues. For each issue, we: (1) stress the theoretical and policy disagreements and (2) emphasize that specific regulatory are inextricably inter-related so it is important to examine them simultaneously. This discussion motivates the use of various interaction terms in our empirical analyses.

II.A. Regulations on bank activities and banking-commerce links

There are five main theoretical reasons for restricting the degree to which banks can engage in securities, insurance, and real estate activities, or own nonfinancial firms. Indeed, it is these types of regulations that help define what observers mean by the term "bank." First, conflicts of interest may arise when banks engage in such diverse activities as securities underwriting, insurance underwriting, and real estate investment. Banks, for example, may attempt to "dump" securities on or shift risk to ill-informed investors so as to assist firms with outstanding loans [Edwards (1979), John, John, and Saunders (1994) and Saunders (1985)]. Second, to the extent that moral hazard encourages riskier behavior by banks, they will have more opportunities to increase risk if allowed to engage in a broader range of activities [Boyd, Chang, and Smith (1998)]. Third, broad financial activities and the mixing of banking and commerce may lead to the formation of extremely large and complex entities that are extraordinarily difficult to monitor. Indeed, the former head of the International Monetary Fund, Michel Camdessus (1997), remarked that we are witnessing "... 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 bank supervisors - to monitor." Fourth, large institutions may become so politically and economically powerful that they become "too big to discipline." Finally, large financial conglomerates may reduce competition and hence efficiency in the financial sector. According to these arguments, the government can ease market failures and thereby enhance bank performance and stability by restricting activities.

There are alternative theoretical reasons for permitting banks to engage in a broad range of activities, however. First, fewer regulatory restrictions on the activities of banks permit the exploitation of economies of scale and scope in gathering and processing information about firms, managing different types of risks for customers, advertising and distributing financial services,

enforcing contracts, and building reputation capital with clients [Barth, Brumbaugh, and Wilcox (2000) and Claessens and Klingebiel (2000)]. Second, fewer regulatory restrictions may increase the franchise value of banks and thereby augment incentives for banks to behave prudently. Third, broader activities may diversify income streams and thereby create more stable banks. Finally, the Shleifer and Vishny (1993) approach to regulation suggests that governments do not restrict bank activities to ease market failures. Instead, according to this view, regulatory restrictions promote government power, create a bigger role for corruption through the granting of exceptions to the rules, and thereby hinder bank performance and stability.

While existing empirical studies provide mixed results regarding these theoretical debates, most of the literature suggests there are positive benefits from permitting broad-banking powers. For instance, expanded banking powers are associated with a lower cost of capital and less stringent cash-flow constraints [Berger and Udell (1996), DeLong (1991) and Ramirez (1995, 1999)]. Vennet (1999), moreover, finds that unrestricted banks have higher levels of operational efficiency than banks with more restricted powers. In terms of diversification, Eisenbeis and Wall (1984) and Kwan and Laderman (1999) argue that since profits from providing different financial services are not very highly correlated, there are diversification benefits from allowing broader powers. Furthermore, broad or universal banks did not systematically abuse their powers in the pre-Glass-Steagall days of the United States [Ang and Richardson (1994), Kroszner and Rajan (1994), Puri (1996), and Ramirez (1995)] or fail more frequently [White (1986)].

In an earlier study, we found that greater regulatory restrictions are associated with: (1) a higher probability of a country suffering a major banking crisis, and (2) lower banking-sector efficiency [Barth, Caprio, and Levine (2001a)]. We found no countervailing positive effects from restricting banking-sector activities. Regulatory restrictions, for example, were not closely associated with less concentration and more competition in either the banking or industrial sector, and also were not closely linked with securities-market development.

This paper expands and improves on past research in four significant ways. First, regarding banking powers, we now have data for substantially (50%) more countries than earlier. Second, and more importantly, we assess whether the positive link that was found between regulatory restrictions and banking crises simply reflects the effects of important omitted variables: namely, the (other parts of the) regulatory and the supervisory system. Countries with more effective supervisory systems

may impose fewer regulatory restrictions. If this were found to be the case, the positive relationship between regulatory restrictions and crises we initially found might simply reflect the fact that countries with weaker supervisory systems compensate by imposing more restrictions on bank activities. Third, we similarly assess whether our initial finding of a positive link between regulatory restrictions and crises reflects another omitted variable: namely, the deposit insurance regime. Countries with 'good' deposit insurance systems - those that do not severely distort incentives toward greater risk-taking behavior by banks—may impose fewer regulatory restrictions on the activities of banks. If so, the positive relationship between regulatory restrictions and crises may simply mean that countries imposing more regulatory restrictions do this to compensate for inappropriate deposit-insurance scheme features. Fourth, we assess whether regulatory restrictions on bank activities are associated with more government corruption and worse bank performance and stability.

II.B. Regulations on domestic and foreign bank entry

Economic theory provides conflicting views on the need for and the effect of regulations on entry into the banking sector. Since banks play such an important role in an economy, widespread failures would reverberate throughout an economy with devastating effects. By effectively screening bank entry, governments can promote bank stability. Also, some researchers stress the naturally monopolistic role of banks. Petersen and Rajan (1995), in particular, demonstrate that banks with monopolistic power have stronger incentives to incur the necessary costs associated with overcoming informational barriers, which then facilitates the flow of credit to more worthy enterprises. Furthermore, banks with monopolistic power may possess considerable franchise value, which enhances prudent risk-taking behavior [Keeley (1990)].[2] Thus, there may be a 'helping-hand' role for the government in limiting destabilizing competition.

The Shleifer and Vishny (1993) approach to regulations provides a quite different perspective on regulating entry. While there may exist valid economic reasons for regulating entry, this view stresses the impact of such limits on facilitating corruption and impeding economic efficiency. Politicians and regulators use entry restrictions to reward friendly constituents, extract campaign support, and collect bribes [Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2001)]. Furthermore,

[2] In contrast, Pagano (1993) shows that departures from perfect competition in credit markets create inefficiencies that raise the cost of capital for firms and retard growth. Also, competition may stimulate both static and dynamic

an open, competitive banking sector may be less likely to produce powerful institutions that unduly influence policymakers in ways that adversely affect bank performance and stability.

Numerous empirical studies exist on banking-market structure, but they overwhelmingly examine only the United States. Many of these studies find that competition matters for static and dynamic efficiency improvements [see the reviews by Berger and Humphrey (1997) and Claessens and Klingebiel (2000)]. Jayaratne and Strahan (1998) provide evidence that when individual states within the United States created a more competitive (and diversified) banking sector by liberalizing their branching restrictions, the rate of economic growth within those states accelerated. Furthermore, Shaffer (1993) finds evidence from an analysis of cross-sectional data for the United States that household income grows faster in markets where the banking sector is less concentrated. In contrast, Petersen and Rajan (1995) find that firms are less credit constrained and younger firms have access to cheaper credit in the more concentrated banking markets of the United States (It must be noted, however, that the United States has a remarkably large number of banks.) In a cross-country study, Demirgüç-Kunt, Levine, and Min (1999) find that foreign entry-and in particular the threat of foreign entry-improves bank performance. In a cross-country, cross-industry study, Cetorelli and Gambera (2000) show that greater banking-sector concentration exerts a depressing effect on overall economic growth, though it promotes the growth of industries that depend heavily on external finance.

This paper importantly contributes to the literature on bank competition in three ways. First, we assess whether countries with greater restrictions on the entry of foreign and domestic banks have less efficient and more fragile banking systems. This fills a lacuna because existing studies do not use direct measures of entry policies.[3] Second, while not emphasized in the formal theoretical literature, the impact of competition may depend on the degree of regulatory restrictions on bank activities and the mixing of banking and commerce, the quantity and quality of bank supervision, the features of any deposit insurance scheme, capital adequacy requirements, the degree of equity market development, and the extent to which government-owned banks play a dominant role in the banking

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efficiency improvements in the banking sector [see the review by Claessens and Klingebiel (2000)].

[3] In examining competition, it is important to distinguish between the degree of concentration and the degree of competition. Indeed, one may simultaneously observe increasing concentration and increasing competition [see, for example, Shaffer (1993) and Berger, Demsetz, and Strahan (1999)]. Yet, entry policies may matter more than actual entry in creating a competitive environment [Boot and Thakor (1997, 2000)]. While this is frequently acknowledged, the absence of data on bank-entry policies means that many studies simply use measures of bank concentration as a proxy for the competitive environment.

sector. Given the richness of our dataset, we can now explore the relationships between competition and banking-sector development, efficiency, and stability when controlling for these specific factors. Third, the dataset covers a much broader and diverse group of countries than any previous analysis of the relationship between competition and bank performance and fragility.

II.C. Regulations on capital adequacy

Traditional approaches to bank regulation emphasize the positive features of capital adequacy requirements [Dewatripont and Tirole (1994)]. Capital, or net worth, serves as a buffer against losses and hence failure. Furthermore, with limited liability, the proclivity for bank owners to shift toward higher risk activities decreases with the amount of capital at risk relative to assets [Lamoreaux (1994)]. With deposit insurance (implicit or explicit), official capital adequacy regulations play a crucial role in aligning the incentives of bank owners with depositors and other creditors [Berger, Herring and Szego (1995), Kaufman (1991), Stevens (2000), Furlong and Keeley (1989) and Keeley and Furlong (1990)].

Researchers, however, disagree over whether the imposition of capital requirements actually reduces risk-taking incentives. Moreover, it is extraordinarily difficult - if not impossible - for regulators and supervisors to set capital standards that mimic those that would be demanded by well-informed, undistorted private-market participants. For instance, Kahane (1977), Koehn and Santomero (1980), Lam and Chen (1985), Kim and Santomero (1988), Flannery (1989), Genotte and Pyle (1991), Rochet (1992), Besanko and Katanas (1996), Blum (1999), Alexander and Baptista (2001) note that actual capital requirements may increase risk-taking behavior. In amore guarded assessment, Thakor (1996) demonstrates the conditions under which risk-based capital requirements increase credit rationing, with negative implications for economic growth. Also, Thakor and Wilson (1995) argue that higher capital requirements may induce borrowers to shift to capital markets and in the process impair capital allocation, while Gorton and Winton (1999) show that raising capital requirements can increase the cost of capital. Thus, theory provides conflicting predictions on whether capital requirements curtail or promote bank performance and stability.[4]

This paper fills the empirical void on the effect of capital requirements by examining the

[4] For a recent review of bank capital regulation, see Santos (2001).

relationship between capital requirements and bank performance and fragility in a broad cross-section of countries [for a discussion of studies of the United States, see Berger, Herring and Szego (1995)]. At a time when the existing formal capital requirements are widely viewed as being arbitrary and inadequate [see, for example, Greenspan (1998) and Caprio and Honohan (1999)], it seems especially timely and important to examine whether they even matter.

Moreover, as emphasized above, we do not consider the impact of capital regulations on bank performance and fragility in isolation; we consider well-specified counterfactuals in which the impact of capital requirements may depend on particular policy and institutional features. The degree to which capital requirements affect bank performance and fragility, for example, is likely to depend upon the specific features of any deposit insurance scheme [see, for example, Chen and Mazumdar (1994) and Mullins and Pyle (1994)]. Also, the marginal impact of capital regulations on bank behavior may depend importantly on the strength of official supervisors. Thus, the detailed and comprehensive dataset exploited here permits us to assess the impact of capital regulations while simultaneously controlling for other important features of the policy environment.

II.D. Deposit insurance design

Countries often adopt deposit insurance schemes to provide protection for unsophisticated and small depositors, who face coordination and free-rider problems.[5] If too many depositors attempt to withdraw their funds at once, an illiquid but solvent bank can fail. Moreover, monitoring banks is expensive and there is an externality associated with monitoring to curtail risk-taking behavior. Therefore, depositors will have a tendency to free ride, so that there is a socially suboptimal level of monitoring. To ameliorate these problems, a proponent of official intervention would favor deposit insurance to protect payment and credit systems from contagious bank runs *plus* tight official oversight to augment private-sector monitoring of banks.

Potential gains from a deposit insurance scheme come at a cost, however. Even in the 1930s, there were concerns that deposit insurance would encourage excessive risk-taking behavior [Barth

[5] After the adoption of a national deposit insurance system in the United States in 1934, in other countries explicit systems grew slowly for the first 30 years, with only 6 being established. Then adoptions accelerated: 22 formal systems existed by the 50th anniversary of the U.S. system, about 70 systems were in place by the close of 2000, and many other countries are planning on adopting an explicit deposit insurance scheme.

(1991)]. Indeed, this argument helped defeat the 150 legislative attempts to institute formal deposit guarantees prior to the establishment of one in 1933 in the United States! The moral-hazard problem, which is aggravated by deposit insurance, continues to be a concern today. Thus, even those subscribing to the 'helping-hand' view may argue that the adverse-incentive costs of deposit insurance outweigh the benefits. Yet, many believe that official regulation and supervision can control the moral-hazard problem, including an appropriately designed insurance system that encompasses coverage limits, scope of coverage (or the extent of uninsured liabilities), coinsurance, funding, premia structure (flat fee or risk-based), who manages the funds and how they are motivated, and membership requirements.[6]

This paper contributes to the pressing and ongoing debate on deposit insurance by examining whether and how the impact of various deposit insurance features depends on the regulatory/supervisory environment. Recently, Demirgüç-Kunt and Detragiache (2000) made a substantial contribution to the banking literature by measuring the effects of the design of deposit insurance on bank fragility.[7] Due to data limitations, however, their analyses could not control for other regulatory and supervisory features. Given our new data, we control for many other regulatory and supervisory policies in assessing the independent impact of deposit insurance on bank development and fragility. Furthermore, we assess whether the impact of deposit insurance on bank behavior depends upon other regulatory policies and supervisory capabilities. For instance, we assess whether the effect of deposit insurance depends on the extent of capital regulations, the power of the official supervisory agency, regulatory restrictions on bank activities, and the extent to which laws promote private sector monitoring of banks.

II.E. Supervision

Some theoretical models stress the advantages of powerful official regulators and supervisors. The line of reasoning essentially is as follows. First, banks are costly and difficult to

[6] Just as Dewatripont and Tirole (1994) show for risk-based capital requirements, it is possible theoretically that with risk-based deposit insurance a higher risk premia will induce greater risk-taking behavior. Once the (capital requirement or) risk-based deposit insurance premia is fixed, bankers may respond by taking greater risk in an attempt to earn their 'required' return. This anomaly depends on limited-liability, as rational bankers would only take this bet if they can shift losses from greater risk taking to a third party.

[7] Briefly, they find that certain design features, such as high coverage limits and scope, having a funded scheme, and exclusively public-sector participation and management all contribute to a greater likelihood of a crisis and, in weak

monitor. Private agents may not have the ability or incentive to supervise banks and will attempt to free-ride. Thus, there will be too little monitoring of banks, which implies sub-optimal performance and stability. Official supervisors can ameliorate this market failure. Second, because of informational asymmetries, some argue that banks are prone to contagious and socially costly bank runs. According to the 'helping-hand' view, government supervision in such a situation can serve a socially efficient role. Third, since many countries choose to adopt a deposit insurance scheme, this situation: (1) creates incentives for excessive risk-taking behavior by banks, and (2) reduces the incentives for depositors to monitor banks. Thus, strong, official supervision will help prevent banks from engaging in excessive risk-taking behavior and thus improve bank performance and stability.

Alternatively, powerful government regulators and supervisors may exert a negative influence. Governments with powerful supervisory agencies may use this power to benefit favored constituents, attract campaign donations, and extract bribes. Powerful regulators/supervisors, according to this view, will be less focused on overcoming market failures and more concerned with currying political support and implementing their own narrow objectives. According to this so-called 'grabbing-hand' view, powerful supervision and regulation will be positively related to corruption and will not improve either bank performance or stability.

In practice, policymakers and international institutions debate and make recommendations on a wide variety of bank regulatory and supervisory practices. In the area of supervisory resources and powers, countries assign very different priorities to bank supervision. We have collected data on the number of supervisors, average tenure of supervisors, legal power of the supervisory agency, and independence of the supervisory agency. We assess whether the impact of official supervisory resources, powers, and independence depends on: (a) the extent of private-sector monitoring, (b) regulatory restrictions on bank activities, and (c) the degree of moral hazard created by deposit insurance schemes. In terms of loan classification and provisioning standards, countries have very different policies concerning the amount of time before a loan is classified in arrears, rules concerning the percentage applied to problem loans for which provisioning must be made, and the extent to which provisioning passes through the income statement. This paper assesses the links between classification and provisioning policies and bank development, performance, and stability.

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institutional environments, less bank development. Also, see Demirgüç-Kunt and Huizinga (2000) and Kane (2000).

Countries also have different rules concerning diversification requirements and restrictions on international lending that may hinder meaningful diversification. Diversification guidelines and the ability to make loans abroad may be particularly important in small economies.

Although these supervisory policies form the core of many policy recommendations to improve bank supervision around the world, this paper provides the first comprehensive cross-country evidence on which supervisory practices work best to promote bank performance and stability.

II.F. Regulations on easing private sector monitoring of banks

Many supervisory agencies encourage private monitoring of banks. For instance, supervisory agencies may require banks to obtain certified audits and/or ratings from international-rating agencies. Some countries make bank directors legally liable if information is erroneous or misleading. Some supervisory agencies compel banks to produce accurate, comprehensive and consolidated information on the full range of bank activities and risk-management procedures. Furthermore, some countries credibly impose a "no deposit insurance" policy to stimulate private monitoring of banks.

Over the years, some economists have advocated greater reliance on the private sector and expressed misgivings with official supervision of banks. For instance, Shleifer and Vishny's (1993) "grabbing-hand" view of government regulations holds that banks will pressure politicians who, in turn, can unduly influence supervisors and regulators. Furthermore, in some countries, supervisors are not well compensated and hence quickly move into banking, resulting in a situation in which supervisors may face mixed incentives when it comes to strict adherence to the rules. Also, since supervisors do not have their own wealth invested in banks, they have different incentives than private creditors when it comes to monitoring and disciplining banks.

Others, however, question placing excessive trust in private-sector monitoring, especially in countries with poorly-developed capital markets, accounting standards, and legal systems. Countries with weak institutional environments will benefit more from official supervisors and regulators containing excessive risk-taking behavior of banks and thereby instilling more confidence in depositors than would exist with private-sector monitoring. This view argues that, in weak

institutional settings, increased reliance on private monitoring leads to exploitation of small savers and hence much less bank development.

This paper examines the relationship between regulatory and supervisory policies designed to promote private-sector monitoring and bank development and stability, while controlling for a full range of regulatory characteristics. We also assess whether private monitoring is particularly effective in countries with particular types of policies and institutions.

II.G. Government ownership of banks

Economists hold sharply different views about the impact of government ownership of banks on financial and economic development [LaPorta, Lopez-de-Silanes, and Shleifer (2001)]. The statist or socialist view argues that government ownership of banks facilitates the mobilization of savings and the allocation of those savings toward strategic projects with long-term beneficial effects on an economy. According to this view, governments have adequate information and sufficient incentives to ensure socially desirable investments. Consequently, government ownership of banks helps economies overcome private capital-market failures, exploit externalities, and invest in strategic sectors. Lewis (1950), Myrdal (1968), and Gerschenkron (1962) specifically advocate government ownership of banks to promote economic and financial development, especially in underdeveloped countries.

Shleifer and Vishny (1993,1994), in contrast, argue that governments do not have sufficient incentives to ensure socially desirable investments. Government ownership tends to politicize resource allocation, soften budget constraints, and otherwise hinder economic efficiency. Thus, government ownership of banks facilitates the financing of politically attractive projects, but not necessarily economically efficient projects.

In an influential study, LaPorta, Lopez-de-Silanes, and Shleifer (2000) piece together data on government ownership of banks from an assortment of sources. They find that countries with higher initial levels of government ownership of banks tend to have both slower subsequent rates of financial-system development and slower economic growth. In a related paper, Barth, Caprio, and Levine (2001a) use data on government ownership from Bankscope. We find that greater government ownership is generally associated with less efficient and less well-developed financial systems. The

data used in these papers, however, do not cover all banks operating in an economy and the degree of coverage varies across countries.

We make two specific improvements on existing studies of government-owned banks. First, we use data collected from each country's bank regulatory agency. Thus, the data cover all banks and the definition of "government owned" is consistent across countries. Second, we control for differences in the regulatory and supervisory environment in assessing the links between government ownership and bank development, performance, and stability. For instance, we examine whether government ownership is better than private ownership with a weak regulatory environment.

III. Data

III.A. The Dataset

We designed and implemented a survey funded by the World Bank to collect information on bank regulations and supervisory practices for more than 107 countries. Barth, Caprio, and Levine (2001b) describe the survey questions and data collection process in detail. The completion of the survey entailed numerous steps: collecting initial survey responses, reconciling different responses from different officials in the same country, cross-checking the data with a survey by the Office of the Comptroller of the Currency (OCC), which included some overlap in the information requested, further reconciling any inconsistencies, and checking our data with information collected by the Institute of International Bankers, and the Financial Stability Forum's Working Group on Deposit Insurance, which provided input on the accuracy of responses for some deposit insurance systems. Thus, in numerous cases, we repeatedly communicated with the authorities to obtain accurate information.

The regulatory and supervisory data are primarily from 1999, with some responses in late 1998 and others in early 2000.[8] In some cases, we group the responses to individual questions into aggregate indexes that we define below. This paper uses those countries with more than one million

[8] Of the 107 responses received, 13 were received in November 1998, 65 were received in 1999, and 29 in 2000, with 19 of the latter received in either January or February.

people and confirms the results when restricting the sample to countries with more than 200,000 people. We have made the data available at the following website: www.worldbank.org/research/interest/intrstweb.htm.

III.B. Variable Definitions

Since Table 1 provides information on the data, sources, and specific survey questions used to construct the variables for this paper, we only briefly define them here in the text.

1. *Bank Activity Regulatory Variables*. We measure the degree to which the national regulatory authorities in our sample countries allow banks to engage in the following three fee-based rather than more traditional interest-spread-based activities:

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

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

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

2. *Mixing Banking / Commerce Regulatory Variables.* We construct two measures of the degree of regulatory restrictiveness on the mixing of banking and commerce.

   a. **Banks Owning Nonfinancial Firms** measures restrictions on the ability of banks to own and control nonfinancial firms.

   b. **Nonfinancial Firms Owning Banks** measures restrictions on the ability of nonfinancial firms to own and control banks

   In addition, we also construct an overall bank restrictiveness variable. It is:

   Restrictions on Bank Activities: includes restrictions on securities, insurance, and real estate activities plus restrictions on the ability of banks to own and control nonfinancial firms. This variable is constructed by adding the values of 1.a., 1.b., 1.c., and 2.a.

3. *Competition Regulatory Variables*. We construct two variables to capture the ability of existing or new banks to enter the banking business.

   a. **Limitations on Foreign Bank Entry/Ownership:** whether there are any limitations placed on the ownership of domestic banks by foreign banks and whether there are any limitations placed on the ability of foreign banks to enter the domestic banking industry. If there are any limitations or restrictions, this variable is assigned a value of 1 and a value of 0 otherwise.

   b. **Entry into Banking Requirements:** measures the specific legal requirements for

obtaining a license to operate as a bank. These might be "prudent" requirements, or excessive regulatory barriers, so it remains an empirical issue as to their effects.

c. **Fraction of Entry Applications Denied**: fraction of applications denied.

(1) **Foreign Denials:** fraction of foreign applications denied.

(2) **Domestic Denials:** fraction of domestic applications denied.

4. *Capital Regulatory Variables*. We include three different measures of capital regulatory stringency.

a. **Overall Capital Stringency** measures the extent of regulatory requirements regarding the amount of capital that banks must have relative to specific guidelines. We consider several guidelines to determine the degree to which the leverage potential for capital is limited.

b. **Initial Capital Stringency** measures the extent to which the source of funds that count as regulatory capital can include assets other than cash or government securities, borrowed funds, and whether the sources of capital are verified by the regulatory or supervisory authorities.

c. **Capital Regulatory Index** incorporates the previous two measures of capital stringency. It ranges in value from 0 to 9, with a higher value indicating greater stringency.

5. *Official Supervisory Action Variables.* We use a variety of variables to capture the degree of official supervisory oversight of banks.

a. **Official Supervisory Power** measures the extent to which official supervisory authorities have the authority to take specific actions to prevent and correct problems.[9]

We also essentially decompose this variable into three constituent parts. The resulting three variables are as follows:

(1) **Prompt Corrective Power** measures the extent to which the law establishes pre-determined levels of bank solvency deterioration that forces automatic enforcement actions such as intervention, and the extent to which supervisors have the requisite, suitable powers to do so.

(2) **Restructuring Power** measures the extent to which supervisory authorities have the power to restructure and reorganize troubled banks.

[9] Note that we have slightly changed the definition of the Official Supervisory Power index from our earlier paper, Barth, Caprio, and Levine (2001b). Specifically, in this paper we do not add on the value 1 for countries in which there are mechanisms of cease and desist-type orders, whose infraction leads to the automatic imposition of civil and penal sanctions on the banks' directors and managers. This supervisory feature seems more of a Prompt Corrective Power characteristic rather than a supervisory power trait. This supervisory feature (Question 11.1 in the survey) therefore is included in the Prompt Corrective Power index. Furthermore, we no longer include Question 8.6 in the Official Supervisory Power index. Question 8.6 concerns the power of the deposit insurance agency and we include it in the Deposit Insurer Power index. All of the results reported below, however, are not altered by this change.

(3) **Declaring Insolvency Power** measures the extent to which supervisory authorities have the power to declare a deeply troubled bank insolvent.

b. **Supervisory Forbearance Discretion** measures the degree to which supervisory authorities may engage in forbearance when confronted with violations of laws or regulations or with other imprudent behavior on the part of banks.

c. **Loan Classification Stringency** measures the degree to which loans that are in arrears must be classified as sub-standard, doubtful, or loss.

d. **Provisioning Stringency** measures the degree to which a bank must provision as a loan is classified first as sub-standard, then as doubtful, and lastly as loss.

e. **Diversification Index** measures whether regulations support geographical asset diversification. It is based on two variables:

(1) **Diversification Guidelines:** whether there are there explicit, verifiable, and quantifiable guidelines for asset diversification.

(2) **No Foreign Loans:** whether banks are prohibited from making loans abroad.

6. *Official Supervisory Experience and Structure*. We attempt to measure the experience and structure of the supervisory regime with the following variables:

a. **Supervisor Tenure:** This variable is the average years of tenure of professional bank supervisors.

b. **Independence of Supervisory Authority-Overall:** This variable measures the degree to which the supervisory authority is independent.

1. **Independence of Supervisory Authority-Political:** This variable measures the degree to which the supervisory authority is independent from the rest of the government

2. **Independence of Supervisory Authority-Banks:** This variable measures the degree to which the supervisory authority is independent from lawsuits from banks and other parties.

c. **Multiple Supervisors:** This variable indicates whether there is a single official regulatory of banks, or whether multiple supervisor share responsibility for supervising the nation's banks. This variable is assigned a value of 1 if there is more than one supervisor and 0 otherwise.

7. *Private Monitoring Variables*. We measure the degree to which private sector monitoring of banks influences bank performance and fragility by using four different indicators.

a. **Certified Audit Required:** This variable captures whether an outside licensed audit is required of the financial statements issued by a bank. Such an audit would presumably indicate the presence or absence of an independent assessment of the accuracy of financial information released to the public.

b. **Percent of 10 Biggest Banks Rated by International Rating Agencies:** The percentage of the top 10 banks that are rated by international credit-rating agencies. The greater the percentage, the more the public may be aware of the overall condition of the banking industry as viewed by an independent third party.

c. **No Explicit Deposit Insurance Scheme:** this variable takes a value of 1 if there is an explicit deposit insurance scheme, and 0 otherwise. A lower value would indicate more private monitoring.

d. **Bank Accounting:** this variable takes a value of 1 when the income statement includes accrued or unpaid interest or principal on nonperforming loans and when banks are required to produce consolidated financial statements.

e. **Private Monitoring Index:** includes (a), (b) [which equals 1 if the percentage is 100; 0 otherwise], (c), and (d). In addition, three other measures are included in the index based on 'yes or no' answers. Specifically, a 1 is assigned if off-balance sheet items are disclosed to the public; if banks must disclose risk management procedures to the public; and if subordinated debt is allowable (required) as a part of regulatory capital. Higher values indicating more private oversight.

8. *Deposit Insurance Scheme Variables.* We use the following three different variables to capture the effect of the deposit insurance regime:

a. **Deposit Insurer Power:** This variable is based on the assignment of 1 (yes) or 0 (no) values to three questions assessing whether the deposit insurance authority has the authority: (1) to make the decision to intervene in a bank, (2) to take legal action against bank directors or officials, or (3) has ever taken any legal action against bank directors or officers. The sum of the assigned values ranges from 0 to 3, with higher values indicating more power.

b. **Deposit Insurance Funds-to-Total Bank Assets:** the size of the deposit insurance fund relative to total bank assets. In the case of the U.S. savings and loan debacle during the 1980s, the insurance agency itself reported insolvency. This severely limited its ability to effectively resolve failed savings and loan institutions in a timely manner. In weak institutional environments, it could also actually increase the looting of institutions [Barth (1991)].

c. **Moral Hazard Index:** based on Demirgüç-Kunt and Detragiache (2000), who used principal components to capture the presence and design features of explicit deposit insurance systems, with the latter including: no coinsurance, foreign currency deposits covered, interbank deposits covered, type of funding, source of funding, management, membership, and the level of explicit coverage The higher the value, the greater is moral hazard.

9. Market Structure Indicators

a. **Bank Concentration:** the fraction of deposits held by the five largest banks.

b. **Foreign-Owned Banks:** the fraction of the banking system's assets that are 50% or more

foreign owned.

c. **Government-Owned Banks:** the fraction of the banking system's assets that are 50% or more government owned.

10. *Outcomes*. To measure bank development, performance and fragility we use the following indicators:[10]

a. **Bank Development:** equals claims on the private sector by deposit money banks and as a share of GDP and is the average value over the 1997-99 period.[11]

b. **Net Interest Margin:** equals net interest income divided by total assets, 1997.

c. **Overhead Costs:** equals total bank overhead costs as a share of total banks assets, 1997.

d. **Nonperforming Loans:** nonperforming loans as a share of total assets, 1999.

e. **Crisis:** whether a country suffered a major banking crisis according to Caprio-Klingebiel (1999) during the 1990s or late 1980s.

III.D. Indexes

Most of these indexes of the bank regulatory and supervisory regime incorporate the answers to many questions from the survey that we conducted. We list the specific questions in Table 1. We used two methods for constructing indexes from the underlying questions. First, many of the questions can be specified as simple zero/one variables as documented in Table 1. Thus, our first method for constructing the indexes simply involves summing the individual zero/one answers. This first method means that we give equal weight to each of the questions in constructing the index.

The second method that we use for constructing indexes involves the construction of the first principal component of the underlying questions. In constructing the first principal component, the factor analytic procedure produces a principal component with mean zero and standard deviation one. One advantage of the principal component method is that we do not specify equal weights on the individual questions. One disadvantage is that it is less transparent how a change in the response to one question will change the index.

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[10] The sources of the outcome variables are as follows. For bank development, we extend the Levine, Loayza, and Beck, (2000) database by using more recent version of the International Monetary Fund's IFS statistics. The net interest margin and overhead cost variables are from the Beck, Demirgüç-Kunt, and Levine (2001a) database on financial structure. Nonperforming loans are from this paper's underlying survey of bank regulation and supervision.

[11] We take the average over the 1997-99 period to smooth any business cycle fluctuations. We obtain the same results using data from 1999.

In the text and tables, we discuss and report the results using the principal component indexes. We have also conducted all of the analyses using the first method for constructing indexes. The choice of the method for constructing indexes does not alter this paper's conclusions.

III.D. Summary Statistics

There is great cross-country, cross-regional, and cross-income group diversity in bank regulatory and supervisory practices. For instance, many countries - such as Australia, Austria, Germany, India, Russia, the United Kingdom, and Zambia impose no restrictions on the ability of banks to engage in securities activities (Securities Activities). In contrast, Cambodia, China, and Vietnam prohibit banks or their subsidiaries from conducting securities activities. Also, some countries during the year prior to the survey had no new banks, including Chile, Egypt, Korea, and Gambia. Other countries had more than 25 new banks, such as the United States, Italy, India, Switzerland, Netherlands, Japan, Germany, and Romania. Barth, Caprio, and Levine (2001b) illustrate additional cross-country differences.

This paper's main messages are contained in the Table 2 correlations:

First, the percentage of the banking system owned by the government (Government-Owned Banks) is positively linked with tighter regulatory restrictions on bank activities (Restrictions on Bank Activities), positively linked with the percentage of entry applications denied (Entry Applications Denied %), positively linked with regulatory prohibitions against making foreign loans (No Foreign Loans), and negatively linked with regulatory variables that promote private monitoring of banks (Private Monitoring Index). Thus, greater government ownership of banks is associated with policies that restrict bank activities, reduce bank competition, erect barriers to international financial integration, and that stymie private sector corporate control of banks.

Second, we do not observe the simple regulatory/supervisory tradeoffs stressed by many theoretical models. For instance, we expected to find that countries that adopt very generous deposit insurance regimes (high values of the Moral Hazard Index) would also have very powerful official supervisors, extensive prompt corrective powers, stringent capital requirements, extensive private monitoring, and perhaps greater restrictions on bank activities to ameliorate the bad incentives associated with generous deposit insurance. We did not confirm these expectations. Although the

generosity of the deposit insurance regime (Moral Hazard Index) is significantly correlated with the stringency of capital regulations, it is not significantly correlated with indexes of Prompt Corrective Power, Official Supervisory Power, Private Monitoring, or Restrictions on Bank Activities. Similarly, we did not find that countries with higher levels of the Private Monitoring Index had correspondingly lower levels of Official Supervisory Power.

Third, the correlations sort countries into those that adopt an open, private sector oriented approach to regulation and supervision, and those that assume a more closed, government-controlled approach. Thus, the Private Monitoring Index is negatively associated with the Entry into Banking Requirements Index, Restrictions on Bank Activities, and Government Ownership. In turn, the Entry Applications Denied (%) is positively associated with Restrictions on Bank Activity and prohibitions on banks making loans abroad.

Fourth, countries with a more open private sector oriented approach to regulation and supervision tend to have better performing and more stable banks. Specifically, countries with better developed banks as measured by greater Bank Development tend to have much higher levels of the Private Monitoring Index, fewer Restrictions on Bank Activities, less Prompt Corrective Power by supervisors, and lower levels of Government ownership of banks. Similarly, more efficient banking systems (as measured by lower levels of the Net Interest Margin index) also tend to have higher levels of the Private Monitoring Index, fewer Restrictions on Bank Activities, and lower levels of Government ownership of banks. We also find that bank Overhead Costs tend to be lower in countries that (i) do not have many impediments to bank entry (Entry into Banking Requirements Index), (ii) promote Private Monitoring, and (iii) have little government ownership of banks. Finally, Major Banking Crises are much more frequent in countries with generous deposit insurance (Moral Hazard Index) and extensive government ownership of the banking industry.

Fifth, government corruption (lower levels of government integrity) tends to be higher in countries where the government plays a large role in supervising, regulating, and owning banks. In particular, corruption tends to be high in countries that have powerful official supervision (Official Supervisory Power), weak private sector monitoring, limit entry (Entry Applications Denied),

restrict foreign loans, high levels of government ownership of banks, restrict bank activities, and weak capital regulations.[12] We now explore the relationship between bank regulation and supervision and both bank performance and stability in greater detail.

IV. Regression Results

IV.A. Bank performance and regulation / supervision: Simple Analyses

To further assess the relationship between bank performance and bank regulations and supervisory practices, we need to control for (a) exogenous determinants of bank performance and (b) potential endogeneity of bank regulations and supervisory practices. We do this in two steps. First, we use existing theory and evidence to identify exogenous determinants of banking sector development. We include these determinants as control variables in the bank performance-regulation/supervision regressions. Second, we select exogenous determinants of bank regulation and supervision and use these as instrumental variables. By doing this, we provide an empirical assessment of whether simultaneity bias is driving the results.

In selecting exogenous determinants of banking sector performance, we use La Porta, Lopez-de-Silanes, Shleifer, and Vishny's (1998, henceforth LLSV) investigation of the impact of legal tradition on financial development. They argue that (a) legal traditions differ in terms of the priority they attach to private property rights and investor rights and (b) the protection of these rights form the basis of financial contracting. Hence, historically determined differences in legal tradition help explain international differences in financial development today. According to this view, the English common law evolved to protect private property owners against the crown. This facilitated the ability of private property owners to transact confidently, with positive repercussions on financial development [North and Weingast, 1989]. In contrast, the French and German civil codes in the 19th century were constructed to solidify State power. Over time, State dominance produced legal

[12] Note, in early version of this paper, we examined whether particular types of regulatory/supervisory practices boost government corruption. While we continued to find a very strong positive relationship between corruption and countries with powerful supervisory agencies, tight restrictions on bank activities, entry barriers that limit competition and a negative relationship between corruption and countries that promote private sector monitoring of banks when (i) controlling for many other country characteristics and (ii) using instrumental variables, we do not pursue this line of investigation here because it is tangential to the paper's main message.

traditions that focus more on the power of the State and less on the rights of individual investors [Mahoney, 2000]. According to this law and finance view, these legal traditions spread throughout the world through conquest, colonization, and imitation, so that much of the international differences in financial development today can be traced back to different legal traditions. Much empirical evidence confirms the law and finance view's predictions [LLSV, 1998; Levine, 1999; Beck and Levine, 2001; Beck, Demirguc-Kunt, and Levine, 2001]. There are five possible legal origins: English Common Law, French Civil Law, German Civil Law, Scandinavian Civil Code, and Socialist/Communist law. Thus, to assess the independent link between bank performance and bank regulations and supervisory practices, we include dummy variables for each country's legal origin (except the Scandinavian law countries).[13] We also consider a wide array of other control variables to assess the robustness of the results as we discuss below.

Table 3 presents regressions on the relationship between bank performance and the regulation and supervision of banks while controlling for legal origin. The dependent variable in all the regressions is Bank Development. In this initial set of simple regressions, we examine the regulatory and supervisory variables one at a time.

The Table 3 results show that bank development does not improve with tighter entry regulations, more restrictions on bank activities, greater power of the supervisory agency, or a higher degree of government ownership of banks. Great supervisory independence, which may proxy for supervisory skills, is linked positively with bank development.[14]

Instead, the results in Table 3 highlight the success of governments that empower the private sector and do not restrict bank activities. More specifically, the results suggest that an overall approach to bank regulation that stresses private-sector incentives is associated with greater banking-system success than an overall approach to bank regulation that emphasizes official government oversight and regulation of bank activities. Consistent with the work in LLSV (1998) and the findings

[13] More specifically, legal origin is the source of the Company Law or Commercial Code of each country [LLSV, 1999]. Note, due to data limitations, there are some regressions in which there are no Socialist legal origin countries.

[14] In many countries, supervisory agencies that are independent are still accountable – i.e., independence shields them from political forces, not from oversight. However, in some cases, greater independence may be associated with less oversight and therefore more possibilities for corrupt behavior by the supervisor. For an insightful model of bank regulations, supervisory responsibilities, and the problems of having a single regulator, see Kahn and Santos (2001).

in Beck, Demirgüç-Kunt, and Levine (2001b), the legal origin variables jointly enter all of the Table 3 regressions significantly.

The Table 3 results do not change when including additional control variables. For instance, some cultural theories of government quality predict that the Catholic and Muslim religions tend to produce comparatively centralized, powerful governments that limit private property rights and exert a strong hand in the economy [Landes, 1998; Putnam, 1993; Weber, 1958]. LLSV (1999) presents empirical evidence that supports this contention. We obtain the same results when we include the religious composition variables. Other theories focus on ethnic diversity [Easterly and Levine, 1997] In ethnically diverse countries, there may be a tendency for governments dominated by one ethnic group to expropriate resource from other groups and play a dominate role in the economy. Again, the Table 3 findings are robust to controlling for ethnic diversity.

We also examined whether specific political and institutional features mitigate the adverse effects of strong government influence over banks. Panel B in Table 3 indicates that Official Supervisory Power has less of an adverse impact on bank development in politically open economies. The Panel B regression implies that in a country like Korea with an intermediate level of political openness (Political Openness is approximately 0), a one standard deviation increase in Official Supervisory Power would induce a decrease in bank development of 0.09 (=1*0.092). This is a large enough change to move from Korea's high level of bank development (0.73) down toward that of Chile's (0.63), which is near the sample average. In contrast, the same increase in official supervisory power in France (where the Political Openness variable equals 2.7) would actually be associated with an *increase* in bank development, +0.07 (= -0.09*1 + 0.06*2.7*1). Thus, official supervisory power is particularly harmful to bank development in countries with closed political systems. This raises a cautionary flag toward current efforts by international financial institutions to boost supervisory power in developing countries.[15]

Besides political openness, we examined an extensive array of institutional factors that might mitigate the adverse impact strong government control of banks on bank development. First, we

[15] Note, however, that Political Openness does not mitigate the pernicious effect of any of the other regulatory/supervisory variables in Table 3 Panel A, such as Restrictions on Bank Activities, Prompt Corrective Action Power, No Foreign Loans, or Government Ownership of Banks.

examined whether greater supervisory independence from the political system, greater supervisory independence from legal action by banks, or having multiple supervisory agencies reduce the negative effects of Restrictions on Bank Activities, Official Supervisory Power, Prompt Corrective Action Power, prohibitions on foreign loans, or Government Ownership of Banks. We do not find any evidence that these institutional features alter the Table 3 findings. Second, we examine the openness of the media, both print and broadcast. Based on data assembled by Djankov, McLiesh, Nenova, and Shleifer (2001), we test whether countries where (a) the government does not repress the media and (b) there is greater private sector ownership of the media ameliorate the negative effects of Restrictions on Bank Activities, Official Supervisory Power, Prompt Corrective Action Power, prohibitions on foreign loans, or Government Ownership of Banks. Again, we confirm the Table 3 results when controlling for these institutional features and when including interaction terms to permit the relationship between bank development and the regulatory/supervisory environment to differ in different institutional settings.

Next, we use instrumental variables to determine whether controlling for potential simultaneity bias alters the Table 3 results. To select instrumental variables for the regulation and supervisory variables, we use theory and recent empirical work. First, as noted above, religious composition may shape governmental approaches to regulation and supervision. Specifically, Landes (1998), Putnam (1993), and Weber (1958) argue that the Catholic and Muslim religions tend to produce comparatively centralized, hierarchical, powerful governments. In turn, these centralized, strong governments will exert a powerful influence on the banking sector through tight regulations powerful regulatory agencies. According to this view, Catholic and Muslim countries will not tend to rely much on private sector monitoring. Thus, we include measures of religious composition as instrumental variables. To measure religious composition, we use LLSV's (1999) measure of the percentage of the population in each country that is Roman Catholic, Protestant, Muslim, or belongs to "other denominations." The numbers are in percent and sum to 100 (so we omit Protestant from the regressions). Second, leading economists, historians, and bio-geographers emphasize the impact of geography on economic institutions. Lands with high rates of disease and poor agricultural yields – such as the tropics – do not support large scale farming, which is necessary for specialization and consequent institutional development [Engerman and Sokoloff, 1997; Acemoglu, Johnson, and Robinson, 2001a,b]. According to this endowment view, countries close to the equator maybe less likely to develop a wide array of institutions associated with supporting private property and

economic interactions. Beck, Demirgüç-Kunt and Levine (2001b) provide empirical support for this theory. Thus, as an instrument for bank regulation and supervision, we use latitudinal distance from the equator. Finally, the other explanatory variables in the equation – the legal origin variables – are naturally included as instruments for the endogenous variables (the regulatory/supervisory variables). As noted above, LLSV (1998) argue that civil law and socialist law countries will tend to support stronger governments relative to private property to a greater degree than common law countries. Thus, legal origin may also influence the approaches to bank regulation and supervision.

The instrumental variable results in Table 4 confirm that (a) the denial of entry applications, regulatory restrictions on bank activities, and government ownership of banks hurt bank development, while (b) regulations that boost private monitoring of banks and tight capital requirements promote bank development. In the instrumental variable results, the coefficient on Official Supervisory Power becomes insignificant. The Table 3 regressions do not reject the test of the overidentifying restrictions, suggesting that the instruments are appropriate. Also, the first stage regressions always reject the null hypothesis that they do not explain any of the cross-country variation in the regulatory supervisory variables.

Thus, controlling for simultaneity does not substantively alter our findings: countries that adopt an approach to bank regulation and supervision that spurs private sector monitoring promote bank performance to a greater degree than countries that adopt an approach to bank regulation and supervision that stress official government restrictions on banks, official oversight of banks, or government ownership of banks. We next explore what work best in greater detail.

IV.B. Bank performance and regulation / supervision: Comprehensive Analyses

Tables 5-7 present our basic regression results when simultaneously including an assortment of bank regulation/supervision indicators. There are two types of regressions. First, we use ordinary least squares regressions to study the links between bank performance and bank regulation and supervision. In the performance regressions, we regress each of the outcome variables (Bank Development, Net Interest Margin, Overhead Costs, and Nonperforming Loans) on each of the supervisory/regulatory variables while controlling for other features of the regulatory and supervisory environment. As above, we include the legal origin variables as control variables in these bank performance regressions, though we draw the same conclusions when omitting these variables or when adding the religious composition and latitude variables.

Second, we use logit regressions to study the links between banking crises and bank regulation and supervision. In the crisis regressions, we use logit regressions and investigate the connections between each regulatory and supervisory indicator and the likelihood of experiencing a banking crisis while controlling for other features of the policy environment. Since many authors point to macroeconomic instability as an important determinant of banking crises, we include the average inflation rate during the five years prior to the crisis in countries that experienced a banking crisis. In countries that did not experience a crisis, we include the average inflation rate during the five years prior to the survey, 1993-1997. In many cases, we experiment with interaction terms to examine whether the impact of one regulatory or supervisory policy on bank performance and stability depends on other features of the institutional and policy environment.

As demonstrated above, we do consider causality issues in our analyses, but must nevertheless seriously qualify our investigation of banking crises. The regulatory and supervisory variables are measured over the 1998-2000 period, but many of the crises occurred throughout the 1990s. In earlier work, we did show that restrictions on bank activities have not changed much over the last two decades [Barth, Caprio, and Levine, 2001a]. We have not been able, however, to construct a time-series database on the full range of bank regulatory and supervisory policies used in this paper. Thus, we interpret the crises regressions in an especially circumspect manner.

We organize the discussion in this subsection around each of the specific policy issues discussed in Section II. Furthermore, in each case, we focus on only one or two key

regulatory/supervisory variables. For example, when discussing banking powers, we focus our attention on Restrictions on Bank Activities, which is an aggregate measure of regulatory restrictions on bank activities. Nevertheless, we have examined each of the components of the indexes (see Appendix available on request). In cases where the individual components produce different results from the aggregate index, we discuss these below.

1. Regulations on bank activities and banking-commerce links

The empirical results in Table 5 indicates that restricting banking activities is negatively associated with bank development (Bank Development). The variable, Restrictions on Bank Activities, is an aggregate index of the extent to which regulations restrict banks from conducting securities, insurance, and real estate activities and from owning nonfinancial firms. The negative link between this regulatory variable and bank performance holds while controlling for the stringency of capital regulations, official supervisory power, the private monitoring index, regulations on the entry of new banks, and government ownership of banks. Bank development is a particularly important indicator to examine because Levine, Loayza, and Beck (2000) find that this variable exerts a positive impact on economic growth.[16]

The size of the coefficient is economically large. For instance, the coefficients suggest that in a country like Egypt that imposes many restrictions on bank activities (i.e. its value is more than one standard deviation above the mean, 1.2), a loosening of restrictions on bank activities such that restrictions fell to the sample mean (0) would increase bank development by 0.14(=1.2*0.118). This would increase Egypt's bank development from 0.49 to 0.63, which is about the level in Italy (whose restrictions index is about equal to the mean value of zero. Again, we do not present this as an exploitable policy experiment but rather as an indicator of the economic size of the coefficient. We also examine the individual components of the aggregate Restrictions on Bank Activities index. These results are available on request. The results indicate that restricting banks from engaging in securities activities is strongly, negatively associated with less bank development.

The results also provide qualified support for the view that restricting bank activities tends to

[16] For more on finance and growth, see King and Levine (1993a,b), Levine and Zervos (1998), Demirgüç-Kunt and Maksimovic (1998), Rajan and Zingales (1998) and Wurgler (2000).

increase the likelihood of suffering a major crisis (Table 6). Specifically, in the full sample, we find a weak, positive link between the likelihood of a crisis and restricting bank activities (Regression 1). The ability of banks to stabilize income flows by diversifying activities, however, may only work in countries with some basic level of securities market development. When restricting the sample to countries where the International Finance Corporation (of the World Bank) has been able to collect at least some data on stock market transactions, we find that greater regulator restrictions (Restrictions on Bank Activities) are indeed positively associated with the likelihood of suffering a crisis (Regression 2). Thus, the results are consistent with the view that diversification of income sources through nontraditional bank activities tends to be positively associated with bank stability, especially in economies with active nonbank-financial markets.

We examine some particular counterfactual theories using interaction terms. For example, Boyd, Chang, and Smith's (1998) model predicts that restricting bank activities may reduce financial fragility in the presence of a generous deposit insurance regime. Thus, we entered an interaction term into the regressions in Table 5 and those in Table 6 that equals Restrictions on Bank Activities * Moral Hazard Index, where Moral Hazard Index is the Demirgüç-Kunt and Detragiache (2000) measure of deposit insurance generosity. The conclusions do not change. The Index, Restrictions on Bank Activities, retains its negative association with bank performance, and its positive association with the likelihood of a crisis and the interaction terms are not significant. Similarly, some argue that in weak institutional environments – environments where the public sector lacks the ability to monitor banks (either because of weak Official Supervisory Powers, absence of Prompt Corrective Powers, or insufficient Capital Regulations), it is important to restrict bank activities. When we include interaction terms for these variables, we again find no support for this contention. [17] We do not find any support for more subtle theories regarding the efficacy of Restrictions on Bank Activities. Thus, the evidence remains consistent with the view that there are diversification benefits from allowing banks to engage in an assortment of activities.

[17] We also experimented with an interaction term that equals Restrictions on Bank Activities * Corrupt. The reason is that some may argue that in corrupt environments it is important to limit the range of permissible bank activities. Our results do not support this suspicion. We continue to find a negative association between Restrictions on Bank Activities and both bank performance and stability when including Restrictions on Bank Activities*Corrupt, with this interaction term entering insignificantly.

2. Regulations on domestic and foreign bank entry

Table 5 indicates that tighter restrictions on entry into banking tend to increase overhead costs. Consistent with recent work by Levine (1999) and Demirgüç-Kunt and Levine (2000) that use different datasets, we find that although regulatory restrictions on competition influence bank performance, there is no link between bank performance and the actual level of bank concentration. Specifically, when we include the actual level of bank concentration in the Table 5 regressions instead of the Entry into Banking Requirements Index, bank concentration is not significantly associated with the bank performance measures (see Appendix available on request).

The impact on bank efficiency from restricting entry, however, is economically small. For instance a one standard deviation increase in Entry into Banking Requirements Index would increase the overhead cost to total bank assets ratio (Overhead) by only 0.003 (=1*0.003), which is small since the mean value of Overhead is 0.039 and the standard deviation is 0.023.

Table 7 indicates that the likelihood of a major banking crisis is positively associated with greater limitations on foreign-bank participation (Limitations on Foreign Bank Entry/Ownership). Consistent with Demirgüç-Kunt, Levine, and Min (1999), we find that foreign-bank ownership per se is not critically linked to the likelihood of a crisis (see Appendix available on request). Rather, it is limitations on foreign-bank entry and ownership that are positively associated with bank fragility.[18]

We examine whether restricting bank entry produces positive effects in particular institutional environments. Specifically, we assess whether there are positive benefits in terms of bank performance and stability to restricting bank entry - both domestic and foreign bank entry - with weak official supervision. Specifically, we examine the following interaction term (Entry into Banking Regulations)*(Official Supervisory Power), (Limitations on Foreign Bank Entry/Ownership)*(Entry into Banking Regulations), and (Limitations on Foreign Bank Entry/Ownership)*(Official Supervisory Power). Furthermore, we also examine the political openness and media openness variables discussed above and obtain similar results. We find no evidence that restricting bank entry enhances performance or stability under any of these institutional

[18] See Rajan and Zingales (2001) and Beck, Demirguc-Kunt, and Levine (2001b) for a discussion of openness and financial sector development.

settings.

3. Regulations on capital adequacy

There is not a robust relationship between capital regulatory restrictiveness and bank development, net interest margins, overhead costs, or nonperforming loans as shown in Table 5. In terms of bank fragility, there is not a robust link between capital regulations and crises when controlling for other characteristics of the regulatory and supervisory environment (Table 6). There are specifications in which capital regulatory stringency enters with a negative coefficient and it sometimes enters with a t-statistic greater than two. Nevertheless, alterations in the conditioning information set suggest that this relationship is fragile, insofar as small changes in the other regressors importantly influence the confidence interval around the capital stringency variable.

As we discussed above, there is a rich theoretical literature on bank capital requirements that identifies how particular policies and institutions influence the desirability and effect of capital regulations. Consequently, we also examine whether more stringent capital regulations produce positive effects in particular policy/institutional environments. In particular, strict capital adequacy regulations may be particularly important in countries with very generous deposit insurance regimes. As we show below, we find no evidence for the proposition that capital regulations ameliorate the risk-taking incentives produced by generous deposit insurance. Similarly, capital regulations may be particularly important in countries with weak Official Supervisory Powers, or a regulatory environment that does not spur Private Monitoring. We find no evidence for these more subtle theories of capital regulation.

While the absence of a relationship between capital regulations and bank performance and stability is consistent with some of the theoretical models discussed earlier, this finding contradicts conventional wisdom and the current focus of policy advice being advanced by international agencies. These results do not suggest that bank capital is unimportant for bank fragility. They do, however, suggest that there is not a strong relationship between the stringency of official capital requirements and the likelihood of a crisis after controlling for other features of the regulatory and supervisory regime.

4. Deposit insurance design

We do not find a strong link between the generosity of the deposit insurance system (Moral Hazard Index) and bank development (Tables 3-5). This is different from the findings in Cull, Senbet, and Sorge (2000), but we use a different estimation procedure and a dataset that controls for other features of the bank regulatory environment.

We find a positive, robust link between the generosity of the deposit insurance system and bank fragility (Table 6). This is consistent with recent work by Demirgüç-Kunt and Detragiache (2000). Countries with more generous deposit insurance schemes have a much higher likelihood of suffering a major banking crisis. The positive relationship between the generosity of the deposit insurance regime and the likelihood of suffering a crisis is robust to alterations in the control variables as we show below. This result is consistent with the view that deposit insurance not only substantially aggravates moral hazard but also produces deleterious effects on bank fragility. The results, moreover, suggest that the adverse incentive effects from deposit insurance overwhelm any stabilizing effects.

Importantly, Demirgüç-Kunt and Detragiache (2000) use annual data to show that deposit insurance generosity predicts future banking crises. They, however, were not able to control for other features of the regulatory/supervisory environment because they did not have data on other features of the regulatory/supervisory environment. We show that deposit insurance generosity is closely associated with recent banking crises while controlling for many regulatory/supervisory features. Given that we do not have time-series data on the regulatory/supervisory environment, however, we are not able to assess whether deposit insurance generosity predicts future banking crises.

The impact of generous deposit insurance on bank fragility is economically large. For instance, if we use regression 3 in Table 6 and compute the drop in the probability of a banking crisis from Mexico reducing its very generous deposit insurance scheme (3.9) to the sample mean (about 0), then Mexico's probability of a crisis would fall by 12 percentage points. We compute the probability using Mexico's values for all of the variables in regression 3 of Table 6. This illustrative example suggests that the incentive effects created by overly generous deposit insurance are more than a theoretical curiosity.

Some models and policy advisers suggest that the moral hazard created by generous deposit

insurance can be mitigated by strong official oversight and stringent capital requirements. Others disagree, having less faith in official monitoring of banks or capital regulations.

Official supervisory power and tighter capital regulations do not mitigate the negative impact of generous deposit insurance on bank fragility (Table 7). However, better-developed private property rights - as proxied by greater adherence to the rule of law (Rule of Law) – and greater political openness mitigate the adverse impact of moral hazard on bank fragility.[19] It is worth noting, however, that the generosity of the deposit insurance regime increases the probability of suffering a crisis even in countries with the highest Rule of Law values (e.g., the cross-over point is Rule of Law =7.4, but the maximum Rule of Law value is 6). Thus, while greater Rule of Law reduces the destabilizing effects of generous deposit insurance, it does not eliminate it. Furthermore, while conventional financial sector policy advice by international financial institutions stresses tighter official supervision and more stringent capital requirements as the antidote to generous deposit insurance, there is little evidence to support this advice.

5. Supervision

We were not able to identify a strong connection between bank performance and official supervision (see Tables 3-5). Specifically, the overall official supervisory power indicator is not related to bank development or bank efficiency or the level of nonperforming loans. Declaring insolvency power is also unrelated to development or efficiency. The prompt corrective power indicator is negatively related to bank development (but these results are not robust to changes in the conditioning information set nor do we get this negative relationship when controlling for endogeneity). There is some weak evidence that supervisory forbearance discretion is positively related to bank efficiency (but this is not robust either). There is, moreover, a positive link between supervisory tenure and bank development. Supervisory independence, loan classification stringency, liquidity requirements, diversification guidelines, and restrictions on making loans abroad are not related to bank development or efficiency or the level of nonperforming loans (see Appendix available on request). In sum, those features of official "core" supervision are not strongly linked to

[19] The Rule of Law is an indicator of the degree to which the country adheres to the rule of law. It ranges from 0 to 6 with higher values indicating greater confidence in the legal system to settle disputes. It is obtained from the International Country Risk Guide and is averaged over 1990-1999.

bank development, bank efficiency, and the level of nonperforming loans in a predictable, convincing manner.

In terms of banking crises, the same basic message emerges with only one exception (Table 6). Official supervisory power – and the assortment of Official Supervisory Action Variables and Official Supervisory Experience and Structure Variables defined above -- do not reduce the probability of suffering a systemic crisis. The one exception involves the diversification index (which aggregates diversification guidelines and the absence of restrictions on making loans abroad). There is a negative relationship between the diversification index and the likelihood of suffering a major crisis in small economies. Specifically, we include the diversification index and an interaction term. The interaction term equals the diversification index multiplied by the logarithm of real per capita GDP in 1995 (these are Purchasing Power Parity adjusted figures from the Penn World Tables.). As shown in Table 6, diversification is negatively associated with the likelihood of a crisis but diversification guidelines have less of a stabilizing effect in bigger countries. The cut-off is high; diversification guidelines have stabilizing effects in all but the nine largest countries.

One may, of course, argue that we do not have sufficiently detailed information on (a) regulatory and supervisory policies, (b) the actual implementation of those policies (except as noted the possibility that independence may proxy for the vigor with which policies are implemented), or (c) the transparency and accountability of the supervisory process to evaluate cross-country differences in regulatory and supervisory regimes. This argument, however, still leads to the conclusion that even very extensive checklists of regulatory and supervisory practices will be insufficient to boost bank performance and stability. Moreover, these arguments – in conjunction with this paper's results – strongly imply that the designers of regulatory/supervisory systems must pay close attention to how the individual components of the regulatory and supervisory regime influence both the incentives and the ability of the private sector to exert sound corporate control on banks.

6. Regulations on easing private-sector monitoring of banks

Private monitoring is strongly positively linked with bank development and negatively associated with net interest margins and the level of nonperforming loans (Table 5). The relationship is economically large. For instance, a one standard increase in the Private Monitoring Index in a

country like Bangladesh with both weak private monitoring and low bank development (0.28), would increase bank development by about 32% (= (0.09*1/0.28)*100).

In terms of crises, there is not much of a link between private-sector monitoring and the likelihood of a banking crisis when controlling for other variables (Table 6). Since capital regulations are a possible vehicle for encouraging prudent behavior by owners, we decided to exclude the capital regulation index from the crisis regressions. Eliminating the capital regulation index does not change the results, however.

Again, the results emphasize that those economies facilitating private-sector monitoring of banks have better performing banks than countries less focused on empowering private-sector corporate control of banks. Taken together with the results of official supervisory power, the results are less consistent with theories emphasizing direct government oversight and more consistent with theories emphasizing private-sector corporate control.

7. Government ownership of banks

In terms of the direct relationship between bank performance and government ownership of banks, Table 5 indicates that government ownership is generally positively related to the level of nonperforming loans in an economy but not robustly linked with the other performance indicators. We find the same results when examining the individual component of the Official Supervisory Power Index.

We do not find a strong, positive relationship between government ownership and the likelihood of a crisis (Tables 8). These results do not confirm those in Caprio and Martinez (2000), who find that government ownership of banks significantly increases bank fragility using a cross-country, time-series analysis. Due to data limitations, they are unable to control for other features of the regulatory/supervisory environment. In contrast, while we control for other features of the regulatory/supervisory environment, we have only examined the cross-country relationship because we do not have time-series observations on the regulatory and supervisory variables.

V. Conclusions

This paper examines the relationship between a broad array of bank regulations and supervisory practices and bank performance and stability. We conduct this analysis using our unique cross-country database on bank regulation and supervision. This dataset permits us to evaluate an extensive list of interconnected bank regulatory and supervisory policies simultaneously. Thus, the paper provides empirical evidence on a large number of contentious policy issues and theoretical debates. The remainder of this conclusion summarizes the paper's findings on specific regulatory and supervisory policies and discusses the broad implications for national approaches to bank regulation and supervision.

We now summarize the results on specific bank regulatory and supervisory policies:

First, restricting bank activities is negatively associated with bank performance and stability, as compared to when banks can diversify into other financial activities. While theory provides conflicting predictions about the implications of restricting the range of bank activities, the results are consistent with the view that broad banking powers allow banks to diversify income sources and enhance stability. This finding, moreover, is not due to reverse causality [(Barth, Caprio, and Levine (2001a)]. Furthermore, since we control for official supervisory procedures, capital regulations, regulations on competition, government ownership of banks, and the moral hazard engendered by generous deposit insurance schemes, the negative relationship between restricting bank activities and bank performance and stability does not seem to be due to an obvious omitted variable. Furthermore, we find no evidence that restricting bank activities produces positive results in particular institutional or policy environments. Specifically, we do not find improvements in bank performance or stability from restrictions on bank activities in economies that offer more generous deposit insurance, have weak official supervision, ineffective incentives for private monitoring, or that lack stringent capital standards.

Second, although we find only an economically weak, negative link between restrictions on bank entry and bank efficiency, the results indicate that barriers to foreign-bank participation enhance bank fragility. Critically, it is not the actual level of foreign presence (or bank concentration). Rather, it is the contestability of the market that is positively linked with bank stability. Finally, we find no evidence that restricting bank entry enhances performance or stability under a myriad of institutional

and policy environments.

Third, the stringency of capital regulations is not very closely linked with bank performance or stability. While consistent with recent studies that offer a cautious assessment of the beneficial effects of capital regulations, these findings contradict conventional wisdom and the current focus of policy advice being promulgated by international agencies. Furthermore, we examined whether capital regulations are particularly important in countries with generous deposit insurance, weak official supervisory agencies, or ineffective laws concerning private sector monitoring of banks. We find no evidence that capital regulations promote bank performance or stability in particular institutional or policy environments.

Fourth, generous deposit insurance schemes are very strongly and negatively linked with bank stability. While many believe that effective regulation and supervision can mitigate the moral hazard produced by generous deposit insurance, the evidence runs contrary to this belief. Strong official supervisory agencies, stringent capital standards, and laws that encourage private sector monitoring of banks do not counterbalance the destabilizing influence of generous deposit insurance.

Fifth, with but one exception, we do not find a strong connection between a large number of official supervisory indicators and bank performance and stability. Thus, measures of supervisory power, resources, independence, loan classification stringency, provisioning stringency, etc., are not robustly linked with bank performance or stability. Again, these results do not support the strategies of many international agencies that focus on empowering official supervisory oversight of bank practices. The one exception involves diversification. There is a negative relationship between the diversification index (which aggregates diversification guidelines and the absence of restrictions on making loans abroad) and the likelihood of suffering a major crisis, especially in small economies. The old adage, “don’t put all your eggs in one basket,” remains relevant for modern banking policy.

Sixth, regulations that encourage and facilitate private monitoring of banks tend to boost bank performance. This holds even when controlling for many other institutional and policy features.

Finally, government ownership of banks is negatively associated with good outcomes and positively linked with corruption. There is no evidence, even in weak institutional settings, that government-owned banks overcome market failures and channel credit to productive ends.

In terms of broad implications, these findings raise a cautionary flag regarding reform strategies that place excessive reliance on countries adhering to an extensive checklist of regulatory and supervisory practices that involve direct, government oversight of and restrictions on banks. Instead, this paper's findings suggest that regulatory and supervisory practices that (1) force accurate information disclosure, (2) empower private-sector corporate control of banks, and (3) foster incentives for private agents to exert corporate control work best to promote bank performance and stability. Our results do not suggest that official regulation and supervision are unimportant. Indeed, the paper stresses that regulations and supervisory practices that force accurate information disclosure and limit the moral hazard incentives of poorly designed deposit insurance schemes critically boost bank performance and stability. Yet, this paper's results emphasize that a strategic approach to bank regulation that stresses private-sector monitoring of banks tends to be associated with greater banking-system success than strategies that place excessive emphasis on direct official government oversight of and restrictions on banks.

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Table 1

Information on Bank Regulatory, Supervisory and Deposit Insurance Variables

Variable	Definition	Source and Quantification	World Bank Guide Questions
1. Bank Activity Regulatory Variables			
(a) Securities Activities	The extent to which banks may engage in underwriting, brokering and dealing in securities, and all aspects of the mutual fund industry.	OCC and WBG 4.1 (higher values, more restrictive) Unrestricted = 1 = full range of activities can be conducted directly in the bank; Permitted = 2 = full range of activities can be conducted, but some or all must be conducted in subsidiaries; Restricted = 3 = less than full range of activities can be conducted in the bank or subsidiaries; and Prohibited = 4 = the activity cannot be conducted in either the bank or subsidiaries.	4.1 What is the level of regulatory restrictiveness for bank participation in securities activities (the ability of banks to engage in the business of securities underwriting, brokering, dealing, and all aspects of the mutual fund industry)?
(b) Insurance Activities	The extent to which banks may engage in insurance underwriting and selling.	OCC and WBG 4.2 (higher values, more restrictive) Unrestricted = 1 = full range of activities can be conducted directly in the bank; Permitted = 2 = full range of activities can be conducted, but some or all must be conducted in subsidiaries; Restricted = 3 = less than full range of activities can be conducted in the bank or subsidiaries; and Prohibited = 4 = the activity cannot be conducted in either the bank or subsidiaries.	4.2 What is the level of regulatory restrictiveness for bank participation in insurance activities (the ability of banks to engage in insurance underwriting and selling)?
(c) Real Estate Activities	The extent to which banks may engage in real estate investment, development and management.	OCC and WBG 4.3 (higher values, more restrictive) Unrestricted = 1 = full range of activities can be conducted directly in the bank; Permitted = 2 = full range of activities can be conducted, but some or all must be conducted in subsidiaries; Restricted = 3 = less than full range of activities can be conducted in the bank or subsidiaries; and Prohibited = 4 = the activity cannot be conducted in either the bank or subsidiaries.	4.3 What is the level of regulatory restrictiveness for bank participation in real estate activities (the ability of banks to engage in real estate investment, development, and management)?

Table 1

Information on Bank Regulatory, Supervisory and Deposit Insurance Variables

Variable	Definition	Source and Quantification	World Bank Guide Questions
2. Mixing Banking / Commerce Regulatory Variables			
(a) Bank Owning Nonfinancial Firms	The extent to which banks may own and control nonfinancial firms.	OCC and WBG 4.4 (higher values, more restrictive) Unrestricted = 1 = a bank may own 100 percent of the equity in any nonfinancial firm; Permitted = 2 = a bank may own 100 percent of the equity of a nonfinancial firm, but ownership is limited based on a bank's equity capital; Restricted = 3 = a bank can only acquire less than 100 percent of the equity in a nonfinancial firm; and Prohibited = 4 = a bank may not acquire any equity investment in a nonfinancial firm.	4.4 What is the level of regulatory restrictiveness for bank ownership of nonfinancial firms?
(b) Nonfinancial Firms Owning Banks	The extent to which nonfinancial firms may own and control banks.	OCC and WBG 2.3 (higher values, more restrictive) Unrestricted = 1 = a nonfinancial firm may own 100 percent of the equity in a bank; Permitted = 2 = unrestricted with prior authorization or approval; Restricted = 3 = limits are placed on ownership, such as a maximum percentage of a bank's capital or shares; and Prohibited = 4 = no equity investment in a bank.	2.3 What is the level of regulatory restrictiveness of ownership by nonfinancial firms of banks?
3. Competition Regulatory Variables			
(a) Limitations on Foreign Bank Entry/Ownership	Whether foreign banks may own domestic banks and whether foreign banks may enter a country's banking industry.	OCC Yes = 1; No = 0	
(b) Entry into Banking Requirements	Whether various types of legal submissions are required to obtain a banking license.	WBG 1.8.1 -1.8.8 Yes = 1; No = 0 Higher values indicating greater stringency.	1.8 Which of the following are legally required to be submitted before issuance of the banking license? 1.8.1 Draft by-laws? Yes / No 1.8.2 Intended organization chart? Yes / No 1.8.3 Financial projections for first three years? Yes / No 1.8.4 Financial information on main potential shareholders? Yes / No 1.8.5 Background/experience of future directors? Yes / No 1.8.6 Background/experience of future managers? Yes / No 1.8.7 Sources of funds to be disbursed in the capitalization of new banks? Yes / No 1.8.8 Market differentiation intended for the new bank? Yes / No
(c) Fraction of Entry Applications Denied	The degree to which applications to enter banking are denied.	WBG (1.9.1 + 1.10.1) / (1.9 + 1.10) (pure number)	1.9 In the past five years, how many applications for commercial banking licenses have been received from domestic entities? 1.9.1 How many of those applications have been denied? 1.10 In the past five years, how many applications for commercial banking licenses have been received from foreign entities? 1.10.1 How many of those applications have been denied?
(1) Domestic Denials	The degree to which foreign applications to enter banking are denied.	WBG 1.9.1 / 1.9 (pure number)	1.9 In the past five years, how many applications for commercial banking licenses have been received from domestic entities? 1.9.1 How many of those applications have been denied?

Table 1

Information on Bank Regulatory, Supervisory and Deposit Insurance Variables

Variable	Definition	Source and Quantification	World Bank Guide Questions
(2) Foreign Denials	The degree to which domestic applications to enter banking are denied.	WBG 1.10.1 / 1.10 (pure number)	1.10 In the past five years, how many applications for commercial banking licenses have been received from foreign entities? 1.10.1 How many of those applications have been denied?
4. Capital Regulatory Variables			
(a) Overall Capital Stringency	Whether the capital requirement reflects certain risk elements and deducts certain market value losses from capital before minimum capital adequacy is determined.	WBG 3.1.1 + 3.3 + 3.9.1 + 3.9.2 + 3.9.3 + (1 if 3.6 < 0.75) Yes = 1; No = 0 Higher values indicating greater stringency.	3.1.1 Is the minimum capital-asset ratio requirement risk weighted in line with the Basel guidelines? Yes / No 3.3 Does the minimum ratio vary as a function of market risk? Yes / No 3.9.1 Are market value of loan losses not realized in accounting books deducted? Yes / No 3.9.2 Are unrealized losses in securities portfolios deducted? Yes / No 3.9.3 Are unrealized foreign exchange losses deducted? Yes / No 3.6 What fraction of revaluation gains is allowed as part of capital?
(b) Initial Capital Stringency	Whether certain funds may be used to initially capitalize a bank and whether they are officially verified.	WBG 1.5: Yes = 1, No = 0: WBG 1.6&1.7: Yes=0, No=1. Higher values indicating greater stringency.	1.5 Are the sources of funds to be used as capital verified by the regulatory/supervisory authorities? Yes / No 1.6 Can the initial disbursement or subsequent injections of capital be done with assets other than cash or government securities? Yes / No 1.7 Can initial disbursement of capital be done with borrowed funds? Yes / No
(c) Capital Regulatory Index	The sum of (a) and (b).	(a) + (b) Higher values indicate greater stringency.	

Table 1

Information on Bank Regulatory, Supervisory and Deposit Insurance Variables

Variable	Definition	Source and Quantification	World Bank Guide Questions
5. Official Supervisory Action Variables			
(a) Official Supervisory Power	Whether the supervisory authorities have the authority to take specific actions to prevent and correct problems.	WBG 5.5 + 5.6 + 5.7 + 6.1 + 10.4 + 111.2 + 11.3.1 + 11.3.2 +11.3.3 + 11.6 + 11.7 + 11.9.1 + 11.9.2 + 11.9.3 Yes = 1; No = 0 Sum of these assigned values, with higher values indicating greater power.	5.5 Does the supervisory agency have the right to meet with external auditors to discuss their report without the approval of the bank? Yes / No 5.6 Are auditors required by law to communicate directly to the supervisory agency any presumed involvement of bank directors or senior managers in elicit activities, fraud, or insider abuse? Yes / No 5.7 Can supervisors take legal action against external auditors for negligence? Yes / No 6.1 Can the supervisory authority force a bank to change its internal organizational structure? Yes / No 10.4 Are off-balance sheet items disclosed to supervisors? Yes / No 11.2 Can the supervisory agency order the bank's directors or management to constitute provisions to cover actual or potential losses? Yes / No 11.3 Can the supervisory agency suspend the directors' decision to distribute: 11.3.1 Dividends? Yes / No 11.3.2 Bonuses? Yes / No 11.3.3 Management fees? Yes / No 11.6 Can the supervisory agency legally declare-such that this declaration supersedes the rights of bank shareholders-that a bank is insolvent? Yes / No 11.7 Does the Banking Law give authority to the supervisory agency to intervene that is, suspend some or all ownership rights-a problem bank? Yes / No 11.9 Regarding bank restructuring and reorganization, can the supervisory agency or any other government agency do the following: ? Yes / No 11.9.1 Supersede shareholder rights? Yes / No 11.9.2 Remove and replace management? Yes / No 11.9.3 Remove and replace directors? Yes / No
(1) Prompt Corrective Power	Whether the law establishes predetermined levels of bank solvency deterioration that force automatic actions, such as intervention.	WBG 11.8 * (11.1 + 11.2 + 11.3.1 + 11.3.2 + 11.3.3 + 6.1) Yes = 1; No = 0 Principal component of the assigned values for the items in parenthesis multiplied by 1 if there is a legally pre-determined level of solvency deterioration forcing automatic actions and by 0 if not.	11.8 Does the Law establish pre-determined levels of solvency deterioration which forces automatic actions (like intervention)? Yes / No 11.1 Are there any mechanisms of cease and desist-type orders, whose infraction leads to the automatic imposition of civil and penal sanctions on the bank's directors and managers? Yes / No 11.2 Can the supervisory agency order the bank's directors or management to constitute provisions to cover actual or potential losses? Yes / No 11.3 Can the supervisory agency suspend the directors' decision to distribute: 11.3.1 Dividends? Yes / No 11.3.2 Bonuses? Yes / No 11.3.3 Management fees? Yes / No 6.1 Can the supervisory authority force a bank to change its internal organizational structure? Yes / No

Table 1

Information on Bank Regulatory, Supervisory and Deposit Insurance Variables

Variable	Definition	Source and Quantification	World Bank Guide Questions
(2) Restructuring Power	Whether the supervisory authorities have the power to restructure and reorganize a troubled bank.	WBG 11.9.1 + 11.9.2 + 11.9.3 Yes = 1; No = 0 Higher values indicate greater restructuring power	11.9 Regarding bank restructuring and reorganization, can the supervisory agency or any other government agency do the following: 11.9.1 Supersede shareholder rights? Yes / No 11.9.2 Remove and replace management? Yes / No 11.9.3 Remove and replace directors? Yes / No
(3) Declaring Insolvency Power	Whether the supervisory authorities have the power to declare a deeply troubled bank insolvent.	WBG 11.6 + 11.7 Yes = 1; No = 0 Higher values indicating greater power.	11.6 Can the supervisory agency legally declare-such that this declaration supersedes the rights of bank shareholders-that a bank is insolvent? Yes / No 11.7 Does the Banking Law give authority to the supervisory agency to intervene-that is, suspend some or all ownership rights-a problem bank? Yes / No
(b) Supervisory Forbearance Discretion	Whether the supervisory authorities may engage in forbearance when confronted with violations of laws and regulations or other imprudent behavior.	WBG 11.9.4 + (12.10 - 1) * (-1) + (11.8 -1) * (-1) + (12.11 -1) * (-1) Yes = 1; No = 0 Sum of these assigned values such that higher values indicate greater discretion.	11.9.4 Can the supervisory agency or any other government agency forbear certain prudential regulations? Yes / No 11.8 Does the Law establish pre-determined levels of solvency deterioration which forces automatic actions (like intervention)? Yes / No 12.10 If an infraction of any prudential regulation is found by a supervisor, must it be reported? Yes / No 12.11 Are there mandatory actions in these cases? Yes / No
(c) Loan Classification Stringency	The classification of loans in arrears as sub-standard, doubtful and loss.	WBG 9.2.1 - 9.2.3 (days) If there is a loan classification system, the actual minimum number of days beyond which a loan in arrears must be classified as sub-standard, then doubtful, and finally loss are summed. Higher values indicate less stringency.	9.2 Classification of loans in arrears based on their quality: after how many days is a loan in arrears classified as: 9.2.1 Sub-standard ? 9.2.2 Doubtful? 9.2.3 Loss?
(d) Provisioning Stringency	The minimum required provisions as loans become sub-standard, doubtful and loss.	WBG 9.3.1 - 9.3.3 (percent) The sum of the minimum required provisioning percentages when a loan is successively classified as substandard, doubtful, and loss. If a range is provided, the minimum percentage is used. Higher values indicate greater stringency.	9.3 What are the minimum required provision as loans become: 9.3.1 Sub-standard? 9.3.2 Doubtful? 9.3.3 Loss?
(e) Diversification Index	Whether there are explicit, verifiable, quantifiable guidelines for asset diversification, and banks are allowed to make loans abroad.	WBG 7.1 + (7.2 - 1) * (-1) Yes = 1; No = 0 Sum of these assigned values, with higher values indicating more diversification.	7.1 Are there explicit, verifiable, and quantifiable guidelines regarding asset diversification? Yes / No 7.2 Are banks prohibited from making loans abroad? Yes / No

Table 1

Information on Bank Regulatory, Supervisory and Deposit Insurance Variables

Variable	Definition	Source and Quantification	World Bank Guide Questions
6. Official Supervisory Resource Variables			
(a) Supervisor Tenure	The average tenure of a professional bank supervisor.	WBG 12.9.1 (years)	12.8 What is the average tenure of current supervisors (i.e., what is the average number of years current supervisors have been supervisors)?
(b) Independence of Supervisory Authority within Government	The degree to which the supervisory authority is independent within the government from political influence.	WBG 12.2, 12.2.1 and 12.2.2 1 = low independence; 2 = medium independence; 3 = high independence	12.2 To whom are the supervisory bodies responsible or accountable? 12.2.1 How is the head of the supervisory agency (and other directors) appointed? 12.2.2 How is the head of the supervisory agency (and other directors) removed?
(c) Independence of Supervisory Authority from the Banking Industry	The degree to which the supervisory authority is protected by the legal system from the banking industry.	WBG 12.14 Yes=0; No=1	12.14 Are supervisors legally liable for their actions?
(d) Independence of Supervisory Authority Overall	The degree to which the supervisory authority is independent from the government and legally protected from the banking industry.	WBG (b) + (c) Higher values signify greater independence	
7. Private Monitoring Variables			
(a) Certified Audit Required	Whether there is a compulsory external audit by a licensed or certified auditor.	WBG 5.1 * 5.3 (Yes = 1; No = 0)	5.1 Is an external audit a compulsory obligation for banks? Yes / No 5.3 Are auditors licensed or certified? Yes / No
(b) Percent of 10 Biggest Banks Rated by International Rating Agencies	The percentage of the top ten banks that are rated by international credit rating agencies.	WBG 10.7.1 (percent)	10.7.1 What percent of the top ten banks are rated by international credit rating agencies (e.g., Moody's, Standard and Poor)?
(c) No Explicit Deposit Insurance Scheme	Whether there is an explicit deposit insurance scheme and, if not, whether depositors were fully compensated the last time a bank failed.	WBG 1 if 8.1 = 0 and 8.4 = 0; 0 otherwise Yes =1; No =0 Higher values indicate more private supervision	8.1 Is there an explicit deposit insurance protection system? Yes / No 8.4 Were depositors wholly compensated (to the extent of legal protection) the last time a bank failed? Yes / No
(d) Bank Accounting	Whether the income statement includes accrued or unpaid interest or principal on nonperforming loans and whether banks are required to produce consolidated financial statements.	WBG (10.1.1 - 1)*(-1) + 10.3 + 10.6 Yes=1; No=0 Sum of assigned values, with higher values indicating more informative bank accounts.	10.1.1 Does accrued, though unpaid interest/principal enter the income statement while the loan is still non-performing? 10.3 Are financial institutions required to produce consolidated accounts covering all bank and any non-bank financial subsidiaries? 10.6 Are bank directors legally liable if information disclosed is erroneous or misleading?
(e) Private Monitoring Index	Whether (a) occurs, (b) equals 100%, (c) occurs, (d) occurs, off-balance sheet items are disclosed to the public, banks must disclose risk management procedures to the public, and subordinated debt is allowable (required) as a part of regulatory capital.	WBG: (a) + [1 if (b) equals 100% ; 0 otherwise] + (c) + (d) + 10.4.1 + 10.5 + 3.5 Yes = 1; No = 0 Higher values indicating more private supervision.	10.4.1 Are off-balance sheet items disclosed to the public? Yes / No 10.5 Must banks disclose their risk management procedures to the public? Yes / No 3.5 Is subordinated debt allowable (required) as part of capital? Yes / No

Table 1

Information on Bank Regulatory, Supervisory and Deposit Insurance Variables

Variable	Definition	Source and Quantification	World Bank Guide Questions
8. Deposit Insurance Scheme Variables			
(a) Deposit Insurer Power	Whether the deposit insurance authority has the authority to make the decision to intervene in a bank, take legal action against bank directors or officials, and has ever taken any legal action against bank directors or officers.	WBG 8.1.5 + 8.6 + 8.7 Yes = 1; No = 0 Sum of assigned values, with higher values indicating more power.	8.1.5 Does the deposit insurance authority make the decision to intervene a bank? Yes / No 8.6 Can the deposit insurance agency/fund take legal action against bank directors or other bank officials? Yes / No 8.7 Has the deposit insurance agency/fund ever taken legal action against bank directors or other bank officials? Yes / No
(b) Deposit Insurance Funds-to-Total Bank Assets	The size of the deposit insurance fund relative to total bank assets.	WBG 8.1.2 (pure number)	8.1.2 What is the ratio of accumulated funds to total bank assets?
(c) Moral Hazard Index	The degree to which moral hazard exists.	Demirguc-Kunt and Detragiache (2000) Higher values indicate more moral hazard.	
9. Market Structure Indicators			
(a) Bank Concentration	The degree of concentration of deposits in the 5 largest banks.	WBG 2.6 (pure number)	2.6 Of deposit-taking institutions in your country, what fraction of deposits is held by the five (5) largest banks?
(b) Foreign-Owned Banks	The extent to which the banking system's assets are foreign owned.	WBG 3.8 (percent)	3.8 What fraction of the banking system's assets is in banks that are 50% or more foreign owned?
(c) Government-Owned Banks	The extent to which the banking system's assets are government owned.	WBG 3.7 (percent)	3.7 What fraction of the banking system's assets is in banks that are 50% or more government owned?

Note: WBG denotes World Bank Guide, which is available at www.worldbank.org/research/interest/intrstweb.htm.

Table 2
Correlations among Selected Variables

	Entry into Banking Requirements Index	Entry Applications Denied (%)	Capital Regulatory Index	Restrictions on Bank Activities Index	Private Monitoring Index	Moral Hazard Index	Official Supervisory Power Index	Prompt Corrective Power Index	No Foreign Loans	Government-Owned Banks (%)	Bank Development	Net Interest Margin	Overhead Costs	Major Banking Crisis
Entry Applications Denied (%)	-0.02 (0.904)	1												
Capital Regulatory Index	0.02 (0.853)	-0.47 (0.000)	1											
Restrictions on Bank Activities Index	0.04 (0.757)	0.36 (0.003)	-0.20 (0.072)	1										
Private Monitoring Index	-0.16 (0.201)	-0.47 (0.000)	0.23 (0.060)	-0.35 (0.004)	1									
Moral Hazard Index	-0.21 (0.152)	-0.19 (0.247)	0.29 (0.046)	-0.23 (0.110)	0.18 (0.230)	1								
Official Supervisory Power	0.01 (0.937)	0.08 (0.620)	-0.19 (0.215)	-0.05 (0.720)	0.07 (0.685)	0.18 (0.375)	1							
Prompt Corrective Power Index	0.10 (0.388)	0.14 (0.284)	-0.04 (0.700)	0.13 (0.269)	-0.21 (0.094)	0.23 (0.122)	0.48 (0.001)	1						
No Foreign Loans	0.03 (0.820)	0.26 (0.034)	-0.02 (0.840)	0.23 (0.040)	-0.21 (0.081)	-0.17 (0.243)	0.03 (0.847)	0.09 (0.408)	1					
Government-Owned Banks (%)	-0.13 (0.273)	0.39 (0.003)	-0.15 (0.209)	0.33 (0.005)	-0.36 (0.005)	-0.06 (0.700)	-0.06 (0.677)	-0.09 (0.431)	0.27 (0.021)	1				
Bank Development	-0.11 (0.325)	-0.20 (0.122)	0.21 (0.070)	-0.39 (0.000)	0.48 (0.000)	0.07 (0.627)	-0.09 (0.546)	-0.24 (0.040)	-0.08 (0.513)	-0.29 (0.014)	1			
Net Interest Margin	0.18 (0.120)	0.11 (0.418)	-0.18 (0.125)	0.28 (0.014)	-0.37 (0.002)	-0.03 (0.852)	0.12 (0.459)	0.14 (0.249)	0.19 (0.095)	0.26 (0.037)	-0.57 (0.000)	1		
Overhead Costs	0.23 (0.041)	-0.02 (0.857)	-0.03 (0.823)	0.04 (0.715)	-0.25 (0.044)	0.12 (0.415)	0.11 (0.496)	0.09 (0.453)	-0.02 (0.836)	0.30 (0.014)	-0.58 (0.000)	0.76 (0.000)	1	
Major Banking Crisis	-0.17 (0.123)	0.14 (0.278)	-0.11 (0.326)	0.18 (0.116)	-0.07 (0.569)	0.43 (0.002)	0.13 (0.398)	0.15 (0.197)	0.17 (0.131)	0.26 (0.027)	-0.21 (0.061)	0.13 (0.275)	0.14 (0.237)	1
Government Integrity	-0.09 (0.509)	-0.48 (0.001)	0.31 (0.018)	-0.55 (0.000)	0.62 (0.000)	0.11 (0.455)	-0.26 (0.154)	-0.24 (0.067)	-0.37 (0.005)	-0.42 (0.002)	0.54 (0.000)	-0.44 (0.001)	-0.42 (0.002)	-0.41 (0.002)

Note: P-values in parentheses.

Table3

Bank Development, Regulation, and Supervision

Dependent Variable: Bank Development (Bank Credit to the Private Sector as Share of GDP)

Panel A: Bank Development														**Panel B: Interaction Term**
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Entry into Banking Requirements	-0.005													
	(0.833)													
Limitations on Foreign Bank Entry/Ownership		-0.025												
		(0.689)												
Entry Applications Denied (%)			-0.075											
			(0.635)											
Capital Regulatory Index				0.044										
				(0.226)										
Restrictions on Bank Activities					-0.143									
					(0.000)									
Private Monitoring Index						0.133								
						(0.000)								
Moral Hazard Index							-0.014							
							(0.420)							
Official Supervisory Power								-0.061						-0.092
								(0.073)						(0.013)
Prompt Corrective Power									-0.096					
									(0.048)					
No Foreign Loans										-0.250				
										(0.001)				
Government-Owned Banks (%)											-0.425			
											(0.001)			
Supervisory Independence												0.070		
												(0.033)		
Multiple Supervisory Agencies													-0.007	
													(0.946)	
Political Openness														0.127
														(0.000)
Official Supervisory Power*Political Openness														0.059
														(0.003)
P-value for the F-test on the legal origin dummy variables[1]	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.414	0.420	0.424	0.417	0.309	0.312	0.434	0.316	0.380	0.420	0.451	0.304	0.420	0.218
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.016)
R-square	0.403	0.341	0.512	0.416	0.533	0.504	0.281	0.427	0.440	0.451	0.488	0.430	0.395	0.495
N	77	59	61	76	76	77	49	77	75	77	69	76	76	59

Note: P-values in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.
Each column represents a separate regression of Bank Development on Common Law, French Civil Law, German Civil Law, Socialist Law, and the indicated variable(s) listed in the first column.

[1] Null hypothesis is that the legal origin dummy variables (Common Law, French Civil Law, German Civil Law, and Socialist Law) enter with zero coefficients.

The following indices are principal component versions: Entry into Banking Requirements, Capital Regulatory Index, Restrictions on Bank Activities, Private Monitoring Index, Official Supervisory Power, Prompt Corrective Power.

For regressions 7 and 14, there are no socialist legal origin countries with data so the Socialist Law dummy variable is excluded.

Table 4
Bank Development, Regulation, and Supervision: Instrumental Variables
Dependent Variable: Bank Development (Bank Credit to the Private Sector as Share of GDP)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Entry into Banking Requirements	-0.536												
	(0.390)												
Limitations on Foreign Bank Entry/Ownership		-0.388											
		(0.092)											
Entry Applications Denied (%)			-0.785										
			(0.004)										
Capital Regulatory Index				0.340									
				(0.024)									
Restrictions on Bank Activities					-0.145								
					(0.010)								
Private Monitoring Index						0.252							
						(0.001)							
Moral Hazard Index							0.109						
							(0.387)						
Official Supervisory Power								-0.167					
								(0.148)					
Prompt Corrective Power									-2.419				
									(0.518)				
No Foreign Loans										-0.624			
										(0.080)			
Government-Owned Banks (%)											-2.075		
											(0.044)		
Supervisory Independence												0.162	
												(0.080)	
Multiple Supervisory Agencies													2.498
													(0.295)
Constant	-0.210	0.290	0.460	0.394	0.308	0.216	0.296	0.137	-0.598	0.421	0.575	0.146	0.420
	(0.835)	(0.000)	(0.000)	(0.077)	(0.000)	(0.002)	(0.139)	(0.494)	(0.742)	(0.000)	(0.002)	(0.421)	(0.000)
OIR-Test[1]	2.30	2.07	1.89	1.14	4.76	1.69	4.41	5.15	0.34	4.85	2.82	6.76	0.30
N	77	59	61	76	76	77	49	77	75	77	69	76	76

Note: P-values in parentheses under the estimated coefficients, using a GMM instrumental variables regression.
Each column represents a separate regression of Bank Development on Common Law, French Civil Law, German Civil Law, Socialist Law, and the variable listed in the first column.
Instruments: Regious composition variables (Catholic, Muslim, and Other Denomination variables), Legal origin dummy variables (Common Law, French Civil Law, German Civil Law, and Socialist Law), and latitudinal distance from the equator.

[1] Over Identifying Restriction Test: Tests null hypothsis that the instruments are uncorrelated with the residual.
5% Critical Values for OIR Test (3 d.f.): 7.82.

For regressions 2 and 7, there are no socialist legal origin countries with data so the Socialist Law dummy variable is excluded.

The following indices are principal component versions: Entry into Banking Requirements, Capital Regulatory Index, Restrictions on Bank Activities, Private Monitoring Index, Official Supervisory Power, Prompt Corrective Power.

Table 5

Bank Development and Performance Regressions

Dependent Variable	Constant[1]	Capital Regulatory Index	Private Monitoring Index	Official Supervisory Power	Entry into Banking Requirements	Government-Owned Banks	Restrictions on Bank Activities	N	R-Square
Bank Development	0.189	-0.011	0.089	-0.042	0.002		-0.118	75	0.597
	(0.004)	(0.725)	(0.003)	(0.172)	(0.939)		(0.001)		
Net Interest Margin	0.042	-0.003	-0.010	0.000	0.003		0.004	75	0.264
	(0.000)	(0.373)	(0.012)	(0.870)	(0.190)		(0.241)		
Overhead Costs	0.032	0.001	-0.006	0.000	0.003		-0.001	75	0.201
	(0.000)	(0.789)	(0.077)	(0.965)	(0.042)		(0.731)		
Nonperforming Loans	0.074	-0.035	-0.042	0.004	0.006		-0.011	68	0.247
	(0.063)	(0.058)	(0.007)	(0.799)	(0.586)		(0.567)		

Dependent Variable	Constant[1]	Capital Regulatory Index	Private Monitoring Index	Official Supervisory Power	Entry into Banking Requirements	Government-Owned Banks	Restrictions on Bank Activities	N	R-Square
Bank Development	0.232	-0.028	0.071	-0.029	-0.002	-0.169	-0.119	68	0.623
	(0.000)	(0.428)	(0.025)	(0.322)	(0.926)	(0.154)	(0.002)		
Net Interest Margin	0.041	-0.002	-0.009	-0.001	0.003	0.006	0.006	66	0.310
	(0.000)	(0.660)	(0.045)	(0.713)	(0.156)	(0.760)	(0.075)		
Overhead Costs	0.029	0.003	-0.004	0.000	0.004	0.022	0.000	66	0.298
	(0.000)	(0.289)	(0.282)	(0.889)	(0.036)	(0.209)	(0.984)		
Nonperforming Loans	0.029	-0.034	-0.028	-0.005	0.011	0.160	-0.021	63	0.318
	(0.366)	(0.096)	(0.085)	(0.713)	(0.235)	(0.030)	(0.209)		

Note: P-values in parentheses under the estimated coefficients, using heteroskedasticity-consistent standard errors from an OLS regression.
Each row is a separate regression.

[1] Each regression also contains legal origin dummy variables (Common Law, French Civil Law, German Civil Law, and Socialist Law).

The following indices are principal component versions: Entry into Banking Requirements, Capital Regulatory Index, Restrictions on Bank Activities, Private Monitoring Index, Official Supervisory Power, Prompt Corrective Power.

Table 6
Banking Crises Regressions

	1	2*	3	4	5
N	52	46	43	51	40
Constant	-0.566	-0.210	-0.314	0.764	-2.732
	(0.323)	(0.799)	(0.626)	(0.505)	(0.011)
Restrictions on Bank Activities	0.631	1.158	0.647	0.771	1.709
	(0.073)	(0.016)	(0.174)	(0.083)	(0.034)
Entry into Banking Requirements	-0.183	-0.279	0.125	-0.309	-0.704
	(0.495)	(0.381)	(0.614)	(0.350)	(0.142)
Capital Regulatory Index	-0.264	-0.749	-1.035	-0.155	-0.107
	(0.471)	(0.173)	(0.069)	(0.735)	(0.885)
Private Monitoring Index	0.391	-0.016		0.169	1.168
	(0.431)	(0.980)		(0.709)	(0.121)
Official Supervisory Index	-0.270	-0.224	-0.243		-0.655
	(0.388)	(0.492)	(0.566)		(0.316)
Government-Owned Banks	2.312	5.269	2.846	1.537	3.414
	(0.195)	(0.087)	(0.185)	(0.496)	(0.256)
Inflation	0.051	0.064	0.031	0.051	0.138
	(0.084)	(0.009)	(0.168)	(0.051)	(0.010)
Moral Hazard Index			0.719		
			(0.000)		
Diversification Index				-13.443	
				(0.012)	
Diversification Index*Ln (GDP)				0.497	
				(0.014)	
Limitations on Foreign Bank Entry/Ownership					1.911
					(0.052)

Note: Each column gives complete logit results.
The P-values in parentheses under the estimated coefficients are based on Huber/White robust standard errors.

* The sample for this regression is restricted to countries with some equity market activity, i.e., to countries where the IFC obtains trading data.

The following indices are principal component versions: Entry into Banking Requirements, Capital Regulatory Index, Restrictions on Bank Activities, Private Monitoring Index, Official Supervisory Power, Prompt Corrective Power.

Table 7
Moral Hazard Index and Bank Crises: Interaction Terms
Dependent Variable: Major Banking Crisis

	1		2		3		4		5	
Constant	-0.314		-1.409		1.760		-0.308		-0.094	
	(0.626)		(0.345)		(0.450)		(0.637)		(0.905)	
Restrictions on Bank Activities	0.647		1.880	**	0.735		0.656		0.627	
	(0.174)		(0.043)		(0.265)		(0.168)		(0.193)	
Entry into Banking Requirements	0.125		0.398		0.249		0.127		0.164	
	(0.614)		(0.279)		(0.432)		(0.613)		(0.599)	
Capital Regulatory Index	-1.035	*	-1.268		-1.075	**	-1.026	*	-1.201	*
	(0.069)		(0.340)		(0.033)		(0.081)		(0.054)	
Official Supervisory Index	-0.243		-1.190		-0.222		-0.246		-0.241	
	(0.566)		(0.224)		(0.598)		(0.567)		(0.582)	
Government-Owned Banks	2.846		9.477		3.963		2.761		2.869	
	(0.185)		(0.114)		(0.191)		(0.222)		(0.172)	
Inflation	0.031		0.025		0.023		0.031		0.030	
	(0.168)		(0.307)		(0.232)		(0.176)		(0.179)	
Moral Hazard Index	0.719	**	1.442	**	2.132	**	0.716	**	0.769	**
	(0.000)		(0.009)		(0.002)		(0.000)		(0.001)	
Moral Hazard Index*Political Openness			-0.513	**						
			(0.013)							
Political Openness			0.762							
			(0.141)							
Moral Hazard Index*Rule of Law					-0.288	**				
					(0.035)					
Rule of Law					-0.295					
					(0.535)					
Moral Hazard Index*Official Supervisory Power							-0.031			
							(0.842)			
Moral Hazard Index*Capital Regulatory Index									-0.131	
									(0.600)	
N	43		40		41		43		43	

Note: ** indicates significant at the 0.05 level, while * indicates significant at the 0.10 level.

Each column gives complete logit results using Huber/White robust standard errors.

The following indices are principal component versions: Entry into Banking Requirements, Capital Regulatory Index, Restrictions on Bank Activities, Private Monitoring Index, Official Supervisory Power, Prompt Corrective Power.