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POLICY RESEARCH WORKING PAPER

# Bank Regulation and Supervision

## What Works Best?

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The regulatory and supervisory practices most effective in promoting good performance and stability in the banking sector are those that force accurate information disclosure, empower private sector monitoring of banks, and foster incentives for private agents to exert corporate control.

The World Bank  
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## Summary findings

Barth, Caprio, and Levine draw on their new database on bank regulation and supervision in 107 countries to assess different governmental approaches to bank regulation and supervision and evaluate the efficacy of different regulatory and supervisory policies.

First, the authors assess two broad and competing theories of government regulation: the *helping-hand* approach, according to which governments regulate to correct market failures, and the *grabbing-hand* approach, according to which governments regulate to support political constituencies.

Second, they assess the effect of an extensive array of regulatory and supervisory policies on the development and fragility of the banking sector. These policies include the following:

- Regulations on bank activities and the mixing of banking and commerce.
- Regulations on entry by domestic and foreign banks.
- Regulations on capital adequacy.
- Design features of deposit insurance systems.

- Supervisory power, independence, and resources; stringency of loan classification; provisioning standards; diversification guidelines; and powers to take prompt corrective action.

- Regulations governing information disclosure and fostering private sector monitoring of banks.

- Government ownership of banks.

The results raise a cautionary flag with regard to reform strategies that place excessive reliance on a country's adherence to an extensive checklist of regulatory and supervisory practices that involve direct government oversight of and restrictions on banks. The findings, which are much more consistent with the grabbing-hand view of regulation than with the helping-hand view, suggest that the regulatory and supervisory practices most effective in promoting good performance and stability in the banking sector are those that force accurate information disclosure, empower private sector monitoring of banks, and foster incentives for private agents to exert corporate control.

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This paper—a joint product of Finance, Development Research Group, and the Financial Sector Strategy and Policy Department—is part of a larger effort in the Bank to analyze the effect of financial sector regulation on development. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Agnes Yaptenco, room MC3-446, telephone 202-473-8526, fax 202-522-1155, email address [ayaptenco@worldbank.org](mailto:ayaptenco@worldbank.org). Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The authors may be contacted at [jbarth@business.auburn.edu](mailto:jbarth@business.auburn.edu), [gcaprio@worldbank.org](mailto:gcaprio@worldbank.org), or [rlevine@csom.umn.edu](mailto:rlevine@csom.umn.edu). November 2001. (63 pages)

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# **Bank Regulation and Supervision: What Works Best?**

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## 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.<sup>1</sup>

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 Basel Committee on Bank Supervision, International Monetary Fund, and World Bank all now promote an extensive list of “best practices” to be adopted by each and every country for the regulation and supervision of banks. 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 best, or even better than alternative standards, in every country. 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.

We draw upon our unique, new database [Barth, Caprio, and Levine (2001b)] on bank regulation and supervision in 107 countries to examine the relationship between bank regulation/supervision and bank performance and stability. We: (1) assess different broad governmental approaches to bank regulation and supervision and (2) evaluate the efficacy of specific regulatory and supervisory policies. More specifically, we first assess two broad and competing theories of government regulation. Pigou’s (1938) classic treatment of regulation holds that monopoly power, externalities, and informational asymmetries create a constructive role for the

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<sup>1</sup>On finance and growth, see Levine (1997). On poverty and growth, see Dollar and Kraay (2000). On the costs of recent crises, see World Bank (2000), Boyd, Kwak, and Smith (2000), and Hoggarth, Reis and Saporta (2001).

strong *helping hand* of government to help offset market failures and thus enhance social welfare. The helping-hand view takes as given both that there are market failures and that the government can ameliorate these failures. Applied to banking, this view of government considers official supervision of banks, limits on bank activities, restrictions on bank entry, and a deposit insurance scheme as (potentially) appropriate policies that alleviate market failures and improve resource allocation.

Everyone does not share this helping hand view of regulation, however. Shleifer and Vishny (1998), for instance, argue that governments frequently do not implement regulations to ameliorate market failures. Instead, governments implement regulations in a *grabbing-hand* manner that supports political constituencies [Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2001)]. The grabbing-hand alternative is based on the assumption that government failure is at least as important as market failures. Accordingly, the grabbing-hand theory predicts that countries with powerful official supervisors, limits on bank activities, and restrictions on entry will tend to have higher levels of corruption with no corresponding improvement in bank performance or stability. This view therefore predicts that governments focusing more on empowering private-sector control of banks are more likely to promote bank development than governments taking a more hands-on approach to regulation. One might also conceive of an *ineffective-hand* view of regulation and supervision. According to this view, even if there are market failures and even if governments demonstrate exemplary integrity, official regulations and supervisory procedures are generally ineffective at actually easing market failures. This ineffective-hand view predicts that stronger official regulation and supervision, while not necessarily or intentionally contributing to corruption, will not boost bank performance and stability.<sup>2</sup> While focusing on the helping-hand vs. grabbing-hand taxonomy, we empirically evaluate many different perspectives on bank regulation and supervision.

Second, this is the first paper to use extensive cross-country data to examine a wide array of very specific regulatory/supervisory debates. In particular, we assess the implications for banking-sector development, performance and fragility of:

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<sup>2</sup> One could introduce the “invisible-hand” view, where the market produces an efficient outcome and in which government regulations are likely to be ineffective at best and perhaps harmful to financial sector performance.

- 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 on information disclosure and fostering private-sector monitoring of banks
- Government ownership of banks

Economic theory provides conflicting views as to what should be done with respect to each of these specific regulatory/supervisory issues. Indeed, economists and policymakers have hotly debated the merits of these specific policies from a quite diverse set of perspectives. While the helping-hand/grabbing-hand taxonomy helps frame each of these debates, the existing theoretical literature does not unambiguously fit into the helping- and grabbing-hand categories. As a result, we review the theoretical debates below using a variety of perspectives on bank regulation and supervision. Thus, even if one rejects the helping-hand versus grabbing-hand taxonomy, this paper provides the first cross-country evidence on numerous regulatory and supervisory issues.

Methodologically, this paper examines a comprehensive 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 the expansive approach pursued, preferring a more focused examination of each issue. Indeed, a more narrow study may be more consistent with specific theoretical models that treat one - or a part of one - of the issues considered here.

There are two crucial advantages to pursuing a broad, methodological approach, however. First, the salient issues in bank regulation and supervision are so interrelated that one 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. Second, we pursue a comprehensive approach to examining bank regulation and supervision because it allows us to assess the broad, competing views of regulation - the helping-hand versus grabbing-hand approaches - using a wide array of quite different bank regulatory and supervisory policies in more than 100 countries.

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, (2) frame much of the disagreement in terms of the helping-hand/grabbing-hand debate, and (3) emphasize that the specific issues are so inter-related that it is difficult to analyze the separate regulatory/supervisory policies in isolation from one another. This discussion also 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, a helping-hand from 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 grabbing-hand view holds 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.<sup>3</sup>

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 the helping-hand/grabbing-hand views: we test 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. The helping-hand view suggests the government can play a positive role in screening entry. Since banks play such an important role in an economy, widespread failures would reverberate throughout an economy with devastating effects. By effectively screening bank

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<sup>3</sup>Thus well-motivated, helping-hand regulators who read this study could espouse an easing of certain restrictions!

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)].<sup>4</sup> Thus, there may be a helping-hand role for the government in limiting destabilizing competition. In addition, regulators may need to limit entry in accordance with the ability of official agencies to supervise banks. Specifically, since it is costly to monitor banks and since there are externalities associated with monitoring banks, many private agents will free-ride, resulting in a socially sub-optimal level of monitoring. Consequently, official supervisors play a crucial and necessary role in overseeing banks, according to the helping-hand view.

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

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<sup>4</sup> 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 efficiency improvements in the banking sector [see the review by Claessens and Klingebiel (2000)].

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.

Besides helping to distinguish between the helping-hand and grabbing-hand views of government regulation, 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.<sup>5</sup> 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 sector. Given the richness of our dataset, we can now explore whether the relationships between competition and banking-sector development, efficiency, and stability depend on 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

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<sup>5</sup> 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.

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 [Benston (1992), 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 a 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.<sup>6</sup>

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

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<sup>6</sup> For a recent review of bank capital regulation, see Santos (2001).

Mazumdar (1994) and Mullins and Pyle (1994)]. 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.

Before concluding this subsection, we note that capital regulatory policies do not fit easily into the helping-hand/grabbing-hand taxonomy. Capital regulations may be designed to align incentives, and also reflect the ‘government knows best’ orientation of the helping-hand view. On the other hand, onerous capital regulations may reflect excessive government involvement, according to the grabbing-hand view, unless the capital regulations are part of a regulatory package that empowers private-sector oversight of banks.

## **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.<sup>7</sup> 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 helping-hand proponent 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 (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

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<sup>7</sup> 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 50<sup>th</sup> 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.

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.<sup>8</sup>

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 framework and supervisory capacity. Recently, Demirgüç-Kunt and Detragiache (2000) made a substantial contribution to the literature by measuring the effects of the design of deposit insurance on bank fragility.<sup>9</sup> Without the benefit of data on the overall regulatory framework, however, these analyses could not control for other regulatory and supervisory features. Given our data, we control for many other regulatory and supervisory policies in assessing the independent impact of deposit insurance on bank development and fragility and thereby conduct a more comprehensive analysis than past studies.

## **II.E. Supervision**

The helping-hand view of government suggests an important, powerful role for official regulators and supervisors. The line of reasoning essentially is as follows. First, banks are costly and difficult to 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

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<sup>8</sup> 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.

<sup>9</sup> 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

from engaging in excessive risk-taking behavior and thus improve bank performance and stability.

The grabbing-hand view highlights the potential negative implications of powerful government regulators and supervisors. As noted above, 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. Thus, the grabbing-hand view predicts that 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.

Countries also have different rules concerning diversification requirements and restrictions on international lending that may hinder meaningful diversification. Simple portfolio diversification theory suggests that greater diversification is an effective way to reduce risk and thus fragility. It is also a simple device to inhibit banks from assuming excessively concentrated risks. Diversification guidelines and the ability to make loans abroad may be particularly important in small economies. This research will provide the first comprehensive and detailed cross-country empirical evidence on

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



the importance or implications of making alternative choices among many different combinations of regulatory and supervisory practices. These supervisory policies form the core of many policy recommendations to improve bank supervision. Nonetheless, due to data limitations, there exists no 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, economists have advocated greater reliance on the private sector and expressed misgivings with official supervision of banks. The grabbing-hand view 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. Viewed from a helping-hand perspective, 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 better-developed 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 helping-hand 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.

The grabbing-hand view, in contrast, argues that governments do not have sufficient incentives to ensure socially desirable investments [Kornai (1979), and Shleifer and Vishny (1993,1994)]. 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.

Besides using our analysis of government banks to assess the helping-hand/grabbing-hand views, 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.<sup>10</sup> 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 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](http://www.worldbank.org/research/interest/intrstweb.htm).

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<sup>10</sup> Of the 107 responses received, 13 were received in November 1998, 65 were received in 1999, and 29 in 2000, with 19

### 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.

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of the latter received in either January or February.

- 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.<sup>11</sup>

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

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<sup>11</sup> 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.

- 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:<sup>12</sup>
- 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.
  - 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 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.

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

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<sup>12</sup> 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.



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.

Table 2 contains correlations. Some key patterns emerge. 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 expected to find simple regulatory tradeoffs. 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. Rather, the correlations suggest that countries tend to adopt either an open, private sector oriented approach to regulation and supervision, or they assume a more closed, government-owned, state dominated approach to the regulation and supervision of banks.

Third, the Table 2 correlations indicate a close correspondence between selected regulatory and supervisory variables and both government integrity (lower levels of corruption) and the level of economic development. In particular, corruption – and economic under-development -- tend to be high in countries that have powerful official supervision (Official Supervisory Power). have weak private sector monitoring, limit entry (Entry Applications Denied), restrict foreign loans, have high levels of government ownership of banks, restrict bank activities, and have weak capital regulations. These correlations are consistent with the grabbing-hand view of government. We now explore the relationship between bank regulation and supervision and both bank performance and stability in greater detail.

## **IV. Regression Results**

### **IV.A. Corruption and bank regulation and supervision**

The helping-hand and grabbing-hand views of regulation make quite different predictions about: (a) the relationship between bank regulation/supervision and government integrity or lack of corruption, and (b) the relationship between bank regulation/supervision and bank performance. As noted earlier, the helping-hand view holds that market failures provide an important role for governments to regulate bank entry, restrict the activities of banks, strictly supervise and regulate bank behavior, grant deposit insurance, and perhaps own banks to direct credit to strategic sectors. According to this view, these types of regulatory/supervisory policies can ameliorate market failures and enhance bank performance and stability. The grabbing-hand view, in contrast, argues that strong government regulation and supervision of banks will not ease market failures or improve bank performance and stability. According to this view, government limits on bank entry, restrictions on bank activities, powerful official supervision of banks, and government ownership of banks will be associated with higher levels of corruption but with no compensating improvement in bank performance. In this preliminary subsection, we run a series of simple regressions to shed some

empirical light on the helping-hand versus grabbing-hand debate.

To assess the impact of bank regulations and supervisory practices on corruption, we need to control for (a) exogenous determinants of government corruption and (b) the 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 government corruption. We include these determinants as control variables in the corruption-regulation regressions but without controlling for endogeneity. Second, we also use instrumental variables to control for simultaneity.

In selecting exogenous determinants of government corruption, we use La Porta, Lopez-de-Silanes, Shleifer, and Vishny's (1999, henceforth LLSV) comprehensive investigation of the quality of government. They note that some cultural theories of government quality predict that the Catholic and Muslim religions tend to produce comparatively centralized, powerful governments with correspondingly higher levels of corruption [Landes, 1998; Putnam, 1993; Weber, 1958]. LLSV (1999) present strong empirical support for these theories. Countries where a high percentage of the population is either Catholic or Muslim tend to have more corrupt governments than countries dominated by other religions and especially than those heavily populated by Protestants. Other theories focus on ethnic diversity [Alesina, Baqir, Easterly, 1999]. In ethnically diverse countries, there may be a tendency for governments dominated by one ethnic group to expropriate resources from other ethnic groups with adverse implications for government integrity [Easterly and Levine, 1997]. Again, LLSV (1999) find a strong positive link between greater ethnic diversity and higher levels of corruption.<sup>13</sup> Thus, to assess the independent link between corruption and bank regulations and supervisory practices, we include measures of religious composition (the percentage of the country that is Catholic, Muslim, Protestant, or another denomination) and ethnic diversity. We also consider a wide array of other control variables to assess the robustness of the results as we discuss below.

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<sup>13</sup> Note, La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999) find a strong connection between corruption and both ethnic diversity and religious composition only when they do not control for income per capita. The very strong link between corruption and low income per capita is consistent with the view that corruption hinders economic development [Mauro, 1995]. As La Porta et al (1999) argue, however, including per capita income in the corruption regression may spuriously eliminate the connection between corruption and both ethnic diversity and religious composition due to the impact of corruption on economic development, i.e., it is inappropriate to add an endogenous control variable. We do not include income per capita in the regressions for the same reason.

Table 3 presents regressions on the relationship between government integrity and the regulation and supervision of banks while controlling for ethnic diversity and religious composition. The dependent variable in all the regressions is an index of government integrity, with bigger values signifying less corruption.<sup>14</sup> To measure ethnic diversity, we use Easterly and Levine's (1997) measure of ethnolinguistic fractionalization. It measures the probability that two randomly selected people from a given country will not belong to the same ethnolinguistic group. 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. Thus, in the regressions, we include the Roman Catholic, Muslim, and Other Denomination variables, while omitting Protestant. The ethnic diversity and religious variables enter all of the regressions jointly significantly, which confirms the findings of LLSV (1999). We include each of the regulation and supervisory indexes sequentially.

The results in Table 3 Panel A are more consistent with the grabbing-hand view of regulation than the helping-hand view. Greater denial of entry applications, more regulatory restrictions on bank activities, greater official supervisory power, prohibitions on banks making loans abroad, and greater government ownership of banks are all strongly, negatively linked with government integrity. In contrast, regulatory regimes that empower private sector monitoring of banks through information disclosure have significantly lower levels of government corruption. Government corruption is essentially unrelated to a dummy variable that takes on the value one when there are multiple bank regulatory authorities and zero otherwise (Multiple Supervisory Agency). These results are robust to changes in the control variables.<sup>15</sup>

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<sup>14</sup> The variable Corrupt ranges from 0 to 6, with greater values signifying less corruption, or greater integrity. It is obtained from the International Country Risk Guide and is averaged over the 1990-99 period.

<sup>15</sup> As a robustness check, we extended the list of control variables in the corruption regressions. Specifically, LLSV (1999) note that some theories suggest the civil law countries tend to have more centralized, less competitive political regimes that are more conducive to government corruption than the more open, competitive political systems associated with common law countries. They argue that the common law developed to protect private property owners against the crown and therefore places great emphasis on restraining government excesses. In contrast, Napoleon used the codification of the French civil law to expand the discretionary powers of the State. LLSV (1999) find that French civil law countries have higher levels of corruption than Common law countries. We include indicators of legal origin in the Table 3 regressions. This does not alter the results. Furthermore, we added a direct measure of political openness, i.e., the Political Openness variable discussed on the next page. While Political Openness is negatively associated with corruption, it does not change the findings on bank regulations and supervisory practices.

The sizes of the coefficients are economically important. For instance, the estimates suggest that a one standard deviation increase in the Private Monitoring Index is associated with an increase in government integrity of 0.83 ( $= (0.83) * (1)$ ), which is about 56% of one standard deviation of the government integrity index (Corrupt). More concretely, the estimates suggest that if Kenya were to increase the degree to which its regulatory regime empowered private sector monitoring of banks from its low current level to that of Chile, it would induce a corresponding reduction in corruption from its currently very high levels to levels observed in Argentina, Brazil, and Chile, which are close to the sample mean. While this type of conceptual experiment should be viewed skeptically, we include it as illustrative example of the economic size of the estimated coefficients.

We extend the analyses in a number of ways to assess whether particular political and institutional settings reduce the positive association between strong official supervision and corruption. For example, we include an interaction term for the openness of the political system. The political openness measure is from Beck, Demirgüç-Kunt, and Levine (2001b) and is an overall index of the extent of electoral checks and balances on decision makers, the competitiveness of legislative elections, the influence of special interest groups, and the extent to which the voting system favors narrow groups. The results in Panel B in Table 3 indicate that countries with more open political systems ameliorate the corrupting effects of official supervisory power: higher official supervisory power is negatively associated with government integrity, but this effect is reduced in more open political systems. For instance, the Panel B regression implies that in a country like Korea with an intermediate level of political openness (such that Political Openness is approximately 0), a one standard deviation increase in official supervisory power would induce a decrease in political integrity of 0.51 ( $= 1 * 0.509$ ). This is a large enough change to move from Korea's level of political integrity down to Mexico's. 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 government integrity, +0.25 ( $= -0.509 * 1 + 0.281 * 2.7 * 1$ ). Thus, official supervisory power is particularly corrupting in countries with closed political systems. Political openness, however, does not mitigate the pernicious effects of any of the other regulatory and supervisory variables in Table 3 Panel A, such as Entry Applications Denied, Restrictions on Bank Activities, or Government

Ownership of banks.<sup>16</sup>

Besides political openness, we examined an extensive array of additional supervisory and institutional factors that might mitigate the corrupting influence of official supervisory power and the pernicious effects of having a restricted banking system. In terms of supervisory structure, we examined whether greater supervisory independence from the political system, greater supervisory independence from legal action by banks, greater overall supervisory independence, or having multiple supervisory agencies reduce the corrupting effects of strong and restrictive regulation and supervision. We find that neither greater supervisory independence nor the existence of multiple regulators ameliorates the positive association between corruption and greater denial of entry applications, more regulatory restrictions on bank activities, or greater official supervisory power. In terms of the institutional environment, we examine the openness of the media, both print and broadcast. Based on the data assembled in Djankov, McLiesh, Nenova, and Shleifer (2001), we test whether countries (a) where the government does not repress the media and (b) where the media is privately-owned suffer less corruption from regulation and supervision of banks. Although we confirm Djankov et. al.'s (2001) findings that corruption is positively correlated with government ownership of the media and government repression of the media, we do not find that an open, privately-owned media systematically ameliorates the corrupting influences of official supervisory power or restrictions on bank entry.

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 that stresses legal systems and natural resource endowments. LLSV (1998) argue that Common law countries protect private property rights against the State to a greater degree than Civil law countries. In contrast, LLSV (1998) argue that the civil law is frequently used to empower the state against private property holders. Thus, according to what is known as the law and finance view, civil law countries will tend to have a hands-on, government-controlled approach to supervision and regulation, while Common law countries will tend to rely more heavily on private sector corporate control of banks. LLSV (1999) show that French civil law countries (as well as Socialist countries) have much lower levels of private

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<sup>16</sup> Supervisory independence does not have a different impact depending on the extent of political openness.

property rights protection than Common law, German civil law, or Scandinavian civil law countries. Furthermore, leading economists, historians, and bio-geographers emphasize the impact of geography on economic development and institutions. According to this endowment view, 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 [Kamarck (1976) and Gallup, Sachs, and Millinger (1998)]. Thus, 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 instruments for the regulation and supervision, we use dummy variables for legal origin and latitudinal distance from the equator. There are five possible legal origins: English Common Law, French Commercial Code, German Commercial Code, Scandinavian Commercial Code, and Socialist/Communist laws. In the regressions, we include dummy variables for each of these except the Scandinavian Commercial code countries.<sup>17</sup> Since we assume that the other variables in the corruption regression (religious composition and ethnic diversity) are exogenous, they are also included as instruments for the regulatory/supervisory variables.

The instrumental variable results in Table 4 strongly confirm the grabbing-hand view relative to the helping-hand view. After controlling for other determinants of government corruption and after controlling for potential simultaneity bias, the data indicate that government corruption is positively associated with the denial of bank entry applications, restrictions on bank activities, official supervisory power, and government ownership of banks. We also find that corruption is negatively associated with the extent to which the regulatory regime empowers private sector monitoring of banks. Furthermore, after controlling for potential simultaneity, we find that greater supervisory independence is negatively associated with corruption. Except for the Prompt Corrective Power, No Foreign Loans and Multiple Supervisors regressions, the regressions pass the test of the overidentifying conditions, i.e., we do not reject that the instruments are appropriate. For these three regressions, we have less confidence in the instrumental variable results in that the instruments explain corruption beyond their association with these regulatory/supervisory indicators.

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<sup>17</sup> 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.

In sum, the results indicate that empirical support for the grabbing-hand view of bank regulation and supervision is not due to simultaneity bias. Moreover, even if one believes the direction of causality runs from corruption to regulatory/supervisory policies and even if one rejects the instrumental variable results, the findings are still more consistent with a grabbing-hand view of bank regulation and supervision than with a helping hand view. That is, corruption goes hand-in-hand with official supervisory power, restrictions on bank activities, and denial of bank entry applications.

#### **IV.C. Bank performance and regulation / supervision: Simple Analyses**

We examine the relationship between bank development and the regulation/supervision indicators in Table 5. Table 5 is similar to Table 3 except the dependent variable is Bank Development. Also, instead of using the religious composition variables and ethnic diversity as control variables, we use the legal origin variables as regressors. As noted earlier, the law and finance view holds that French civil law countries and Socialist law countries tend to develop strong governments that limit financial development, while Common law countries (and perhaps to a somewhat lesser degree German and Scandinavian civil law countries) tend to stress private property rights and thereby promote bank development.

The Table 5 results do not support the helping-hand theory. This theory predicts that to alleviate market failures and improve bank performance, governments may restrict foreign-bank ownership, limit bank entry, restrict bank activities, rigorously supervise banks, and perhaps direct credit through government-owned banks. In contrast, Table 5 shows 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.<sup>18</sup>

Instead, the results in Table 5 highlight the success of governments that empower the private sector and do not restrict bank activities. More specifically, the results suggest that an overall

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<sup>18</sup> 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).



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 in Beck, Demirgüç-Kunt, and Levine (2001b), the legal origin variables jointly enter all of the Table 5 regressions significantly.<sup>19</sup>

We also considered a wide assortment of interaction terms to assess whether the adverse effects of government control of banks is mitigated in different political and institutional settings. Panel B in Table 5 indicates that Official Supervisory Power has less of an adverse impact on bank development in politically open economies. Using the same example as above, 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 level of bank development down to that of Chile's. 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. Besides political openness, we examined whether the same array of additional political, supervisory, and media factors that we used in the corruption analyses mitigate the damaging influence of official supervisory power and restrictions on bank activities. As above, we find that the answer is no.

The instrumental variable results in Table 6 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.<sup>20</sup> In the instrumental variable results, the coefficient on Official Supervisory Power becomes insignificant. Nevertheless, the results remain inconsistent with

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<sup>19</sup> Using alternative control variables does not change these conclusions. For instance, we obtain the same results when we include the religious composition variables. Furthermore, since Boyd, Levine, and Smith (2001) demonstrate the rate of inflation hinders financial development, we also controlled for the average rate of inflation over the 1985-1998 period and found that it does not change the Table 5 results.

<sup>20</sup> Similar to the corruption regressions, we use the legal origin dummies, religious composition variables, and latitudinal distance from the equator as exogenous variables in the Table 6 regressions.

the helping-hand proposition that Official Supervisory Power boosts banking sector development. The Table 6 regressions do not reject the test of the overidentifying restrictions, suggesting that the instruments are appropriate. Thus, controlling for simultaneity does not substantively alter our findings.

In sum, when examining the bank regulation and supervisory practice indicators one-at-a-time, we find that corruption is positively linked with greater denial of entry applications, more regulatory restrictions on bank activities, greater official supervisory power, and more extensive government ownership of banks. Yet, these same “helping hand” policies do not boost performance. Instead, the empirical results show that regulations that spur private sector monitoring promote bank performance and lower corruption. We next explore what work best in greater detail.

#### **IV.D. Bank performance and regulation / supervision: Comprehensive Analyses**

Tables 7-9 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.

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.

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 7 indicate 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.<sup>21</sup>

The size of the coefficient is economically large. For instance, the coefficients suggest that in

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<sup>21</sup> For more on finance and growth, see King and Levine (1993a,b), Levine and Zervos (1998), Demirgüç-Kunt and

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 effects of 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 increase the likelihood of suffering a major crisis (Table 8). 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.

Regarding interaction terms, we assessed whether other regulatory/supervisory policies and institutional factors affect the impact of regulatory restrictions on bank activities on bank performance and stability. For example, Boyd, Chang, and Smith (1998) show 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 7 and those in Table 8 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

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Maksimovic (1998), Rajan and Zingales (1998) and Wurgler (2000).

performance, and its positive association with the likelihood of a crisis and the interaction terms are not significant.<sup>22</sup> Thus, the evidence is consistent with the view that there are diversification benefits from allowing banks to engage in an assortment of activities.

## 2. Regulations on domestic and foreign bank entry

Table 7 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 7 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 8 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.<sup>23</sup>

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 - under

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<sup>22</sup> 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.

<sup>23</sup> See Rajan and Zingales (2001) and Beck, Demirguc-Kunt, and Levine (2001b) for a discussion of openness and financial sector development.

corrupt regimes or with weak official supervision. Specifically, we examine the following interaction terms (Entry into Banking Regulations)\*(Corrupt), (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 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 7. 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 8). 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.

We also examine whether more stringent capital regulations produce positive effects in particular policy 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 official regulatory restrictions ameliorate the risk-taking incentives produced by generous deposit insurance.

While 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 5-7). This is different from the findings in Cull, Senbet, and Sorge (2000), using a different estimation procedure and a different dataset.

We find a very strong and robust link between the generosity of the deposit insurance system and bank fragility (Table 8). 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.

The impact of generous deposit insurance on bank fragility is economically large. For instance, if we use regression 3 in Table 8 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 percent. We compute the probability using Mexico's values for all of the variables in regression 3 of Table 8. This illustrative example suggests that the incentive effects created by overly generous deposit insurance are not merely a theoretical consideration.

Regarding interaction effects, we carefully assess whether other policy actions ameliorate the negative effects of generous deposit insurance. For instance, the helping-hand view holds that the moral hazard effects of deposit insurance can be counteracted by rigorous official oversight of banks and tight capital regulations. Others disagree, having less faith in official monitoring of banks and greater faith in private-sector monitoring of banks. Table 9 presents further evidence that is inconsistent with the helping-hand view. Official supervisory power and tighter capital regulations do not mitigate the negative impact of generous deposit insurance on bank fragility. 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.<sup>24</sup> 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.

## 5. Supervision

In contrast to the helping-hand view of government, the main message that emerges from our study encompassing a large number of official supervisory policies is that we were not able to identify a strong connection between bank performance and official supervision (see Tables 5-7). 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 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 8). Official supervisory power, declaring insolvency power, loan classification stringency, and supervisor are all unrelated to the likelihood of a crisis. In turn, prompt corrective power and provisioning stringency are unrelated to the likelihood of a crisis.

The one exception involves the diversification index (which aggregates diversification

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<sup>24</sup> 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



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 8, 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 7). 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 8). Since capital

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Country Risk Guide and is averaged over 1990-1999.

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 7 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. However, we have only examined the cross-country relationship between government ownership and crises. In contrast, they use a cross-country, time-series panel. Unfortunately, we do not have time-series observations on the regulatory and supervisory variables.

## V. Conclusions

Based on our survey of regulatory and supervisory policies in 107 countries, this paper makes two contributions. First, we assess two broad theories of bank regulation and supervision. The helping-hand view holds that governments implement rigorous, official oversight of bank activities to alleviate market failures and thereby enhance bank performance and stability. In contrast, the grabbing-hand view holds that countries that implement rigorous, official oversight of banks produce higher levels of government corruption *without* a corresponding improvement in bank performance or stability. Second, this is the first paper to examine an extensive list of specific regulatory/supervisory policy debates for a broad cross-section of countries. Since the central issues in bank regulation and supervision are interrelated, our comprehensive dataset makes it possible to conduct a unified assessment of bank regulation and supervision.

The results are generally inconsistent with the helping-hand view of regulation and more consistent with the grabbing-hand view of government. In contrast to the helping-hand view, tighter entry regulations, restrictions on bank activities, powerful supervisory agencies, deposit insurance, and government ownership of the banking industry are not positively associated with bank performance or stability. Indeed, the findings are more consistent with the grabbing-hand view. Regulatory barriers to bank entry, regulatory restrictions on bank activities, greater supervisory power, and government ownership of banks are positively associated with government corruption. This is consistent with the grabbing-hand argument that strong government regulation and supervision will not focus on easing market failures and improving bank performance and stability. Interestingly, greater political openness does mitigate the impact of increasing supervisory powers, both in terms of the impact of the latter on corruption and bank development, but only where openness is particularly advanced; for most countries, greater supervisory powers go with greater corruption and worse outcomes for bank development. This is a nice illustration of the need for caution in exporting 'best practices' from industrial to emerging market countries, as weaknesses in emerging market institutions may literally turn the results on their head.

The evidence suggests that regulatory and supervisory strategies that focus on empowering the private sector and limiting the adverse incentive effects from generous deposit insurance work best to promote bank performance and stability. Countries without excessively generous official deposit insurance regimes have greater bank development and less bank fragility. Countries that

impose fewer regulatory restrictions on bank activities enjoy better bank performance and a lower probability of suffering a major banking crisis. Countries that do not impose severe limits on foreign-bank entry enjoy greater banking-sector stability. Countries with policies that promote private monitoring of banks have better bank performance. Thus, the results are consistent with the view that legal and regulatory reforms that promote and facilitate private monitoring of financial institutions offer a useful financial reform strategy.

The paper also assesses particular regulatory and supervisory practices. 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 economies that offer more generous deposit insurance.

Second, fewer barriers to foreign-bank participation enhance bank stability. 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.

Third, the stringency of capital regulations is not very closely linked with bank performance or stability. Our findings are consistent with recent studies that offer a more cautious assessment of the beneficial effects of capital regulations.

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.

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 are counter to the strategy 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 and reduce corruption.

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

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 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
<i>1. Bank Activity Regulatory Variables</i>			
(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
<b>2. Mixing Banking / Commerce Regulatory Variables</b>			
(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?
<b>3. Competition Regulatory Variables</b>			
(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.	$WBG \left( \frac{1.9.1 + 1.10.1}{1.9 + 1.10} \right)$ (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?

**Table 1**  
**Information on Bank Regulatory, Supervisory and Deposit Insurance Variables**

Variable	Definition	Source and Quantification	World Bank Guide Questions
(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?
(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?
<b>4. Capital Regulatory Variables</b>			
(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
<b>5. Official Supervisory Action Variables</b>			
(a) Official Supervisory Power	Whether the supervisory authorities have the authority to take specific actions to prevent and correct problems.	<p>WBG 5.5 + 5.6 + 5.7 + 6.1 + 10.4 + 11.2 + 11.3.1 + 11.3.2 + 11.3.3 + 11.6 + 11.7 + 11.9.1 + 11.9.2 + 11.9.3</p> <p>Yes = 1; No = 0</p> <p>Sum of these assigned values, with higher values indicating greater power.</p>	<p>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</p> <p>5.6 Are auditors required by law to communicate directly to the supervisory agency any presumed involvement of bank directors or senior managers in illicit activities, fraud, or insider abuse? Yes / No</p> <p>5.7 Can supervisors take legal action against external auditors for negligence? Yes / No</p> <p>6.1 Can the supervisory authority force a bank to change its internal organizational structure? Yes / No</p> <p>10.4 Are off-balance sheet items disclosed to supervisors? Yes / No</p> <p>11.2 Can the supervisory agency order the bank's directors or management to constitute provisions to cover actual or potential losses? Yes / No</p> <p>11.3 Can the supervisory agency suspend the directors' decision to distribute:</p> <p>11.3.1 Dividends? Yes / No</p> <p>11.3.2 Bonuses? Yes / No</p> <p>11.3.3 Management fees? Yes / No</p> <p>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</p> <p>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</p> <p>11.9 Regarding bank restructuring and reorganization, can the supervisory agency or any other government agency do the following: ? Yes / No</p> <p>11.9.1 Supersede shareholder rights? Yes / No</p> <p>11.9.2 Remove and replace management? Yes / No</p> <p>11.9.3 Remove and replace directors? Yes / No</p>
(1) Prompt Corrective Power	Whether the law establishes predetermined levels of bank solvency deterioration that force automatic actions, such as intervention.	<p>WBG 11.8 * (11.1 + 11.2 + 11.3.1 + 11.3.2 + 11.3.3 + 6.1)</p> <p>Yes = 1; No = 0</p> <p>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.</p>	<p>11.8 Does the Law establish pre-determined levels of solvency deterioration which forces automatic actions (like intervention)? Yes / No</p> <p>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</p> <p>11.2 Can the supervisory agency order the bank's directors or management to constitute provisions to cover actual or potential losses? Yes / No</p> <p>11.3 Can the supervisory agency suspend the directors' decision to distribute:</p> <p>11.3.1 Dividends? Yes / No</p> <p>11.3.2 Bonuses? Yes / No</p> <p>11.3.3 Management fees? Yes / No</p> <p>6.1 Can the supervisory authority force a bank to change its internal organizational structure? Yes / No</p>



**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
<b>6. Official Supervisory Resource Variables</b>			
(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	
<b>7. Private Monitoring Variables</b>			
(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?

**Table 1**  
**Information on Bank Regulatory, Supervisory and Deposit Insurance Variables**

Variable	Definition	Source and Quantification	World Bank Guide Questions
(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
<b>8. Deposit Insurance Scheme Variables</b>			
(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.	
<b>9. Market Structure Indicators</b>			
(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](http://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 (%)	Foreign Owned Banks (%)	Government Integrity
Entry into Banking Requirements Index	1.000											
Entry Applications Denied (%)	-0.015 (0.904)	1.000										
Capital Regulatory Index	0.021 (0.853)	-0.465 (0.000)	1.000									
Restrictions on Bank Activities Index	0.035 (0.757)	0.364 (0.003)	-0.202 (0.072)	1.000								
Private Monitoring Index	-0.218 (0.049)	-0.434 (0.000)	0.185 (0.098)	-0.328 (0.003)	1.000							
Moral Hazard Index	-0.208 (0.152)	-0.190 (0.247)	0.286 (0.046)	-0.234 (0.110)	0.183 (0.209)	1.000						
Official Supervisory Power	0.094 (0.399)	0.099 (0.431)	-0.063 (0.575)	0.146 (0.193)	-0.091 (0.418)	0.010 (0.945)	1.000					
Prompt Corrective Power Index	0.061 (0.589)	0.009 (0.943)	-0.047 (0.684)	0.070 (0.541)	-0.002 (0.983)	0.106 (0.472)	0.500 (0.000)	1.000				
No Foreign Loans	0.026 (0.820)	0.263 (0.034)	-0.023 (0.840)	0.229 (0.040)	-0.210 (0.058)	-0.170 (0.243)	0.099 (0.377)	0.036 (0.752)	1.000			
Government-Owned Banks (%)	-0.131 (0.273)	0.385 (0.003)	-0.150 (0.209)	0.332 (0.005)	-0.362 (0.002)	-0.060 (0.700)	-0.007 (0.957)	-0.063 (0.598)	0.271 (0.021)	1.000		
Foreign-Owned Banks (%)	0.197 (0.112)	0.045 (0.748)	0.170 (0.173)	0.043 (0.736)	-0.182 (0.143)	-0.291 (0.072)	0.176 (0.158)	0.044 (0.723)	0.055 (0.661)	-0.225 (0.069)	1.000	
Government Integrity	-0.088 (0.509)	-0.482 (0.001)	0.312 (0.018)	-0.554 (0.000)	0.594 (0.000)	0.112 (0.455)	-0.393 (0.002)	-0.155 (0.248)	-0.366 (0.005)	-0.422 (0.002)	-0.062 (0.684)	1.000
Ln(GDP/Capita)	-0.069 (0.575)	-0.471 (0.000)	0.319 (0.008)	-0.494 (0.000)	0.690 (0.000)	0.255 (0.081)	-0.246 (0.042)	-0.103 (0.406)	-0.275 (0.022)	-0.500 (0.000)	-0.216 (0.116)	0.776 (0.000)

Notes: P-values in Parentheses.  
Principal components version of the indexes.

**Table 3**  
**Government Integrity, Regulation, and Supervision**  
 Dependent Variable: Corrupt (bigger values imply less corruption, i.e., greater government integrity)

**Panel A: Government Integrity**

	1	2	3	4	5	6	7	8	9	10	11	12	13
Entry into Banking Requirements	0.085 (0.397)												
Limitations on Foreign Bank Entry/Ownership		-0.260 (0.407)											
Entry Applications Denied (%)			-1.269 (0.013)										
Capital Regulatory Index				0.303 (0.085)									
Restrictions on Bank Activities					-0.591 (0.003)								
Private Monitoring Index						0.833 (0.001)							
Moral Hazard Index							0.040 (0.589)						
Official Supervisory Power								-0.402 (0.008)					
Prompt Corrective Power									-0.324 (0.147)				
No Foreign Loans										-1.789 (0.000)			
Government-Owned Banks (%)											-2.727 (0.003)		
Supervisory Independence												0.231 (0.122)	
Multiple Supervisory Agencies													0.002 (0.995)
Political Openness													
Official Supervisory Power*Political Openness													
P-value for the F-test on ethnic diversity and religious composition <sup>1</sup>	(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	6.512 (0.000)	6.416 (0.000)	6.988 (0.000)	6.234 (0.000)	5.724 (0.000)	5.656 (0.000)	6.372 (0.000)	5.912 (0.000)	6.397 (0.000)	6.683 (0.000)	6.904 (0.000)	5.743 (0.000)	6.422 (0.000)
R-square	0.384	0.362	0.586	0.417	0.502	0.525	0.378	0.453	0.403	0.549	0.562	0.405	0.379
N	56	43	44	55	55	56	47	56	55	56	50	56	56

**Panel B:**  
**Interaction Term**

14
-0.509 (0.000)
0.618 (0.000)
0.281 (0.001)
(0.030)
5.171 (0.000)
0.637
52

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 Government Integrity on Ethnic Diversity, Catholic, Muslim, Other religions, and the indicated variable(s) listed in the first column.  
<sup>1</sup> Null hypothesis is that the Ethnic Diversity, Catholic, Muslim, and Other Denomination variables 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.

**Table 4**  
**Government Integrity, Regulation, and Supervision: Instrumental Variables**  
 Dependent Variable: Corrupt (higher values imply less corruption, i.e., greater government integrity)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Entry into Banking Requirements	3.289 (0.589)												
Limitations on Foreign Bank Entry/Ownership		-2.148 (0.066)											
Entry Applications Denied (%)			-10.288 (0.002)										
Capital Regulatory Index				1.776 (0.005)									
Restrictions on Bank Activities					-2.540 (0.002)								
Private Monitoring Index						1.960 (0.000)							
Moral Hazard Index							0.453 (0.060)						
Official Supervisory Power								-1.644 (0.005)					
Prompt Corrective Power									0.764 (0.585)				
No Foreign Loans										-3.491 (0.002)			
Government-Owned Banks (%)											-15.638 (0.068)		
Supervisory Independence												1.239 (0.001)	
Multiple Supervisory Agencies													2.617 (0.224)
Constant	12.621 (0.031)	5.974 (0.000)	6.386 (0.000)	5.290 (0.000)	3.916 (0.000)	4.718 (0.000)	5.975 (0.000)	3.095 (0.008)	6.838 (0.000)	6.180 (0.000)	7.741 (0.000)	4.385 (0.000)	6.467 (0.000)
OIR-Test <sup>1</sup>	3.86	4.31	5.72	1.76	1.32	4.02	6.95	6.61	14.80**	11.48**	2.30	4.76	9.88**
N	56	43	44	55	55	56	47	56	55	56	50	56	56

Note: P-values in parentheses under the estimated coefficients, using a GMM instrumental variables regression.

Each column represents a separate regression of Government Integrity on Ethnic Diversity, Catholic, Muslim, Other religions, and the indicated variable listed in the first column.  
 Instruments: Legal origin dummy variables (Common Law, French Civil Law, German Civil Law) and latitudinal distance from the equator, Ethnic Diversity,  
 and religious dummy variables (Catholic, Muslim, and Other religions)

<sup>1</sup> Over Identifying Restriction Test: Tests null hypothesis that the instruments are uncorrelated with the residual.

5% Critical Values for OIR Test (3 d.f.): 7.82.

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**  
**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 (0.835)	0.290 (0.000)	0.460 (0.000)	0.394 (0.077)	0.308 (0.000)	0.216 (0.002)	0.296 (0.139)	0.137 (0.494)	-0.598 (0.742)	0.421 (0.000)	0.575 (0.002)	0.146 (0.421)	0.420 (0.000)
OIR-Test <sup>1</sup>	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: Religious 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.

<sup>1</sup> Over Identifying Restriction Test. Tests null hypothesis 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 7**

**Bank Development and Performance Regressions**

Dependent Variable	Constant <sup>1</sup>	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 (0.004)	-0.011 (0.725)	0.089 (0.003)	-0.042 (0.172)	0.002 (0.939)		-0.118 (0.001)	75	0.597
Net Interest Margin	0.042 (0.000)	-0.003 (0.373)	-0.010 (0.012)	0.000 (0.870)	0.003 (0.190)		0.004 (0.241)	75	0.264
Overhead Costs	0.032 (0.000)	0.001 (0.789)	-0.006 (0.077)	0.000 (0.965)	0.003 (0.042)		-0.001 (0.731)	75	0.201
Nonperforming Loans	0.074 (0.063)	-0.035 (0.058)	-0.042 (0.007)	0.004 (0.799)	0.006 (0.586)		-0.011 (0.567)	68	0.247

Dependent Variable	Constant <sup>1</sup>	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 (0.000)	-0.028 (0.428)	0.071 (0.025)	-0.029 (0.322)	-0.002 (0.926)	-0.169 (0.154)	-0.119 (0.002)	68	0.623
Net Interest Margin	0.041 (0.000)	-0.002 (0.660)	-0.009 (0.045)	-0.001 (0.713)	0.003 (0.156)	0.006 (0.760)	0.006 (0.075)	66	0.310
Overhead Costs	0.029 (0.000)	0.003 (0.289)	-0.004 (0.282)	0.000 (0.889)	0.004 (0.036)	0.022 (0.209)	0.000 (0.984)	66	0.298
Nonperforming Loans	0.029 (0.366)	-0.034 (0.096)	-0.028 (0.085)	-0.005 (0.713)	0.011 (0.235)	0.160 (0.030)	-0.021 (0.209)	63	0.318

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

<sup>1</sup> 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 8**  
**Banking Crises Regressions**

	1	2*	3	4	5
N	52	46	43	51	40
Constant	-0.566 (0.323)	-0.210 (0.799)	-0.314 (0.626)	0.764 (0.505)	-2.732 (0.011)
Restrictions on Bank Activities	0.631 (0.073)	1.158 (0.016)	0.647 (0.174)	0.771 (0.083)	1.709 (0.034)
Entry into Banking Requirements	-0.183 (0.495)	-0.279 (0.381)	0.125 (0.614)	-0.309 (0.350)	-0.704 (0.142)
Capital Regulatory Index	-0.264 (0.471)	-0.749 (0.173)	-1.035 (0.069)	-0.155 (0.735)	-0.107 (0.885)
Private Monitoring Index	0.391 (0.431)	-0.016 (0.980)		0.169 (0.709)	1.168 (0.121)
Official Supervisory Index	-0.270 (0.388)	-0.224 (0.492)	-0.243 (0.566)		-0.655 (0.316)
Government-Owned Banks	2.312 (0.195)	5.269 (0.087)	2.846 (0.185)	1.537 (0.496)	3.414 (0.256)
Inflation	0.051 (0.084)	0.064 (0.009)	0.031 (0.168)	0.051 (0.051)	0.138 (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 9**  
**Moral Hazard Index and Bank Crises: Interaction Terms**  
 Dependent Variable: Major Banking Crisis

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



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