

**An International Comparison and Assessment of the
Structure of Bank Supervision**

James R. Barth

Auburn University

and

The Milken Institute

jbarth@milkeninstitute.org or jbarth@business.auburn.edu

Luis G. Dopico

Auburn University

luisgarciadopico@ftnetwork.com

Daniel E. Nolle

Office of the Comptroller of the Currency

daniel.nolle@occ.treas.gov

James A. Wilcox

University of California, Berkeley

jwilcox@haas.berkeley.edu

February 21, 2002

The opinions expressed in this paper are those of the authors, and do not necessarily represent those of the Office of the Comptroller of the Currency or the United States Department of the Treasury. The authors are extremely grateful to Cindy Lee for excellent assistance with the data and to Susanne Trimbath for helpful comments.

I. Introduction

Countries around the world, at every stage of economic development, have experienced banking crises or significant systemic banking problems over the past two decades.¹ In addition, these countries, and even countries not experiencing crises or systemic problems, have been affected by significant changes in their banking structures. Under these circumstances, policy makers and industry participants alike have raised important questions about the appropriate role, structure, and regulation and supervision of the banking industry. Much of the discussion on these issues has been undertaken within the context of a given country's institutional framework. Yet, increasingly, policy makers and industry participants are focusing on the fact that countries' banking and financial systems are interdependent. As a consequence, there is a growing need for understanding how banking and financial systems in different countries function.

This demand has begun to be addressed by a growing body of research. An emerging literature describes the extent to which bank structure, powers, and deposit insurance schemes vary across countries, and an increasing number of studies use cross-country data to identify fundamental factors affecting banking industry performance, financial stability, and impact on economic development. This work is helping shape policy prescriptions for dealing with and preventing banking and financial crises, and for restructuring banking and financial systems. Nevertheless, gaps remain in the analysis. One key issue, on which the current study focuses, is the role and impact of the supervisory structure of the banking industry.

¹ See Caprio and Klingebiel (1999) and Lindgren and Saal (1996).

Drawing upon a database that includes banking data for over 100 countries, our analysis proceeds in two stages. There has been relatively little analysis of banking supervision across such a wide range of countries, and so in the first stage, which describes key features of the international banking landscape, we highlight cross-country similarities and differences in the structure of banking supervision. By this we mean the extent to which countries rely on a single, or multiple, supervisory authorities, as well as the role the central bank plays in bank supervision. The second phase of our analysis uses difference of means tests to hone in on whether or not significant relationships exist between banking supervision on the one hand, and key aspects of banking system structure, performance, and the range of activities in which banks are permitted to engage on the other. Our overall aim is to provide analytic stepping stones that both researchers and policy makers can use in their quest to better understand the structure and impact of banking supervision.

The paper is structured as follows. Section II describes the unique and wide-ranging data set on which our empirical analysis is based. That section then provides background information on cross-country differences in banking systems, highlighting key dimensions of banking industry structure and permissible activities, as well as the degree to which banking and commerce can be mixed via ownership opportunities. Section III reviews previous research on the issue of the structure of banking supervision. Most of that work is conceptual, as opposed to empirical in nature. We summarize arguments for and against having single versus multiple supervisors, and arguments for and against having the central bank as a bank supervisory authority. In section IV we provide cross-country comparisons of the structure of banking supervision, and use a difference of means test to ascertain whether differences in the structure of supervision

correlate in a statistically significant way with key differences in banking industry structure and powers. We also test whether there are systematic differences in the structure of supervision and the implementation of supervision. Section V presents our conclusions.

II. Cross-Country Comparisons of Banking Industry Structure and Powers

While the primary aim of banking supervision, banking system safety and soundness, is the same across countries, supervision takes place within the context of the structure of the banking industry. Taking account of the range of activities permitted to banks (i.e., “banking powers”) is also essential to understanding the environment in which banking supervision is carried out. In this section we compare key dimensions of banking structure and powers across countries.

II.A. The Data

The World Bank and the U. S. Office of the Comptroller of the Currency (OCC) obtained data on bank supervision by directly surveying the national banking supervisors in over 100 countries. The World Bank survey gathered information primarily for 1999 from 107 countries, as described in Barth, Caprio, and Levine (2001b). The World Bank survey concentrated on bank regulation and supervisory practices. It also included measures of the market structure of banking. The OCC survey gathered annual information from 110 countries for the years 1996-1999.² The OCC survey focused on data for banking market structure and performance. By combining the results from both surveys, we increased the number of countries in our final data set to 133. In addition,

² Unless otherwise noted, we use the data that mainly pertain to 1999.

when the same variable was collected by both surveys for overlapping but not identical groups of countries (such as the percentage of total bank assets held by foreign-owned banks), one survey data set could be used to validate and supplement the other data set.

II.B. Banking Industry Structure: Key Cross-Country Dimensions

Countries vary widely in the relative importance of their banking systems within the economy. Even for countries with similar relative importance of banking, there are large and economically meaningful differences in the degree to which the banking system is market-driven or government-directed. In addition, countries vary in the degree to which entry is possible, both from the point of view of relative concentration of market power, and foreign participation in the banking system. Market forces, government involvement, and entry possibilities all influence the performance and future structure of a country's banking system and financial stability. In addition, these factors are likely to be intertwined with the structure and implementation of supervision of the banking system.

II.B.1. Banking Industry Structure: Size and Accessibility

Countries vary widely in the relative size, and by implication the relative importance, of their banking systems. Figures 1 and 2 give two measures of the size of the banking system: banking assets as a percent of GDP, and banking system assets as a percent of total financial system assets. The values in Figure 1 have little intrinsic meaning, but they allow us to compare across countries. In about half the countries, banking system assets are less than 100% of GDP. These “small banking system countries” include economies at all stages of economic development, but as a general rule

this group is dominated by less developed economies. There are a relatively greater number of developed economies in the “large banking systems” group, where banking system assets equal more than 100% of GDP, although this group includes many offshore financial centers as well, including, as an extreme outlier, Luxembourg.³

Figure 2 compares the size of the banking system relative to the total financial system, as measured by the sum of banking system assets, stock market capitalization, and bonds outstanding.⁴ The relative ranking of many countries is roughly the same using this measure as the bank assets-to-GDP ratio illustrated in Figure 1, but the banks-to-equity-plus-bond markets measure has more intrinsic meaning. For any given country, one can meaningfully speak about the relative size of the banking system as compared to the capital market. It is clear that, among the countries included in this figure, the United States has a banking system that is small relative to the rest of the financial system. This is the result of two interdependent factors: 1) banks in the United States are more restricted in the range of financial activities in which they can engage, as compared to other countries, and 2) capital markets in the United States are very deep both domestically and on an international basis.⁵ Most of the other countries (all of which are

³ See Errico and Musalem (1999) for detailed categorization of countries which are counted as offshore financial centers.

⁴ Neither the World Bank survey nor the OCC survey of national banking supervisors asked for information on nonbank financial industries. We were able to collect equity and bond market information for only a few countries. See Barth, Nolle, and Rice (2000) for construction and use of this measure in earlier analysis.

⁵ Most of our “size” data are from 1999. Even though the United States enacted the Gramm-Leach-Bliley Act (GLBA) that year, enactment was in November and so is unlikely to have had much impact in that year. While GLBA liberalized the range of activities in which Financial Holding Companies can engage via separate nonbank subsidiaries, restrictions remain on (and, it could be argued, in the case of insurance were increased on) activities in which banks can engage. Hence, U.S. banks are still relatively restricted in their range of activities compared to banks in many other countries. In addition, GLBA tightened restrictions on the mixing of banking and commerce. See Barth, Brumbaugh, and Wilcox (2000) for a description of GLBA and a discussion of these issues.

OECD members) have banking systems that account for half or more of the size of their total financial systems. Clearly, banking system health and stability are extremely important issues to these countries.

One (admittedly crude) way to gauge the accessibility of banking to the population is to examine the average number of banks serving a specified unit of the population (here, every 100,000 people), as illustrated for 133 countries in Figure 3. One could argue that the more banks there are per population unit, the easier is access to both the credit extension and payments system “outputs” of banks.⁶ Figure 3 shows that a majority of countries has less than 1 bank per 100,000 population, but a minority has several banks per 100,000 population. Note that many offshore financial centers appear at the high end of the distribution. In offshore financial centers, the banking industry could be characterized as an “export industry,” rather than primarily a mechanism for credit extension and payment system access.

II.B.2. Banking Industry Structure: Government Ownership

Following the international banking crises of the mid-to-late 1990s, analysts and policy makers developed a keen interest in the degree to which the government is involved in a banking system. It is now widely recognized that, in general, government ownership of banks is likely to short-circuit market pressures on banks to make credit extension and investment decisions based on economic assessments of risk and return.

⁶ There are of course some qualifications to this measure: 1) given that many countries (e.g., Japan) have banking systems with a small number of relatively large banks which in turn have vast branch networks, if physical presence is a measure of financial system accessibility, a better measure would be the number of banking offices -- i.e., banks + branches. However, neither the World Bank nor the OCC data contain detailed information on the number of branches. 2) The advent of electronic banking means that physical presence will correlate less well with the degree of accessibility. Currently, however, for most countries remote-banking access is not widespread.

As a result, the likelihood of credit problems and poor profitability is higher for government-owned banks, leading, possibly, to a greater likelihood of systemic banking problems.

Figures 4 and 5 show, respectively, the percent of banks owned by government, and the percent of banking assets owned by government, across 122 and 126 countries, respectively. There are wide differences in government involvement in banking across countries. Figure 4 shows that in 39 countries the government owns no banks, but government ownership of banks exceeds 20 percent in 18 countries. Figure 5 shows that for about one-third of the countries, government ownership of banking assets is relatively small -- 10 percent or less; but for the top one-third, government ownership of banking assets is quite substantial -- 30 percent or more. Note that for some the two measures give a somewhat different picture. For example, while Guatemala is at the high end of the spectrum in terms of percent of banks that are government owned, it is in the lower third in terms of percent of bank assets that are government owned.

II.B.3. Banking Industry Structure: Concentration and Entry

Concentration of economic power and entry conditions determine the competitive environment of an industry (i.e., the extent to which industry prices and outputs are set by market forces or are under the control of a few firms). The degree of competition in a banking market could be expected to have either of two effects on the supervisory environment. On the one hand, the more competitive/contestable a banking market is, the more likely it is that market forces will do some of the things one expects regulation and supervision to do (e.g., insure competitive prices for banking services, drive banks toward more efficient production, and promote access to funds for banking customers, thereby

promoting economic growth and development). Intense competition could also encourage excessive risk taking, however. In that case, policy makers may respond by increasing the scope of regulation and supervision.

Our database allows us to gauge and compare the competitive environment across countries in two respects. Figure 6 shows 108 cross-country differences in the concentration of banking system assets in the three largest banks.⁷ In a few countries, including the United Kingdom, Germany, the United States, and Japan, the largest 3 banks account for less than 25 percent of banking system assets. There is a fairly smooth distribution of countries along a spectrum up to several countries, including both developed and developing economies, in which the top three banks account for 90 percent or more of total banking system assets.

Another gauge of the degree of competition exhibited by a banking industry is entry conditions. In turn, a key dimension of entry is the degree to which foreign banks have entered the banking system. Indeed, in the wake of the international banking crises of the 1990s, some industry analysts and policy makers have advocated a reduction in the barriers to foreign entry into banking as an effective way of fostering healthy competition in a banking system.⁸ Figures 7 and 8 show two ways to measure and compare foreign involvement in banking. Figure 7 illustrates the wide, but nevertheless continuously distributed, differences across 108 countries in the percent of banks that are foreign-

⁷ We calculated other measures of concentration, including percent of assets accounted for by the largest bank, and the five largest banks, and the percent of deposits accounted for by the top 3 and top 5 banks. Each measure gives roughly similar relative rankings for many, but not all, of the countries. We chose to focus on the 3-bank asset concentration ratio because we had more observations for this measure of concentration than for any of the others.

⁸ In addition, the entry of foreign banks could affect the supervisory system within a country by an indirect route: foreign entry could result in the “importation” of supervision, due to the oversight that home country supervisors exercise.

owned.⁹ Figure 8 shows the percent of bank assets that are foreign-owned in 125 countries. The two measures give the same qualitative result for some countries (in Germany, for example, foreign ownership is relatively low by either measure), but very different answers for other countries. In Japan, for example, foreign ownership is relatively high -- 61.3 percent -- measured by percent of banks, but very low -- 0.6 percent -- measured by percent of bank assets accounted for by foreign banks, because foreign-owned institutions are very small. Both measures of foreign ownership give information on entry conditions, however.

II.B.4. Banking Industry Structure: Summary

Table 1 summarizes across groups of countries several of the key structural aspects of banking, including the percent of world banking assets accounted for by a given group.¹⁰ Clearly, a handful of relatively wealthy, mostly Northern Hemisphere countries account for the vast majority of world banking system assets. Obviously, the scope and quality of bank supervision in these countries is important, in part because of their crucial role in the global banking system. In general, in two of the three regions containing many developing economies (i.e., Africa and “Non-U.S. Americas”), the

⁹ Both the World Bank and the OCC surveys instructed national supervisory authorities to provide data based on separately capitalized banking institutions (i.e., “banks”), as compared to including other banking institutions (in particular, “branches”) which are not separately capitalized (and the reporting on which would have placed a substantially greater burden on many national supervisory authorities). In some countries, such as the United States, where many foreign banks operate via large branch networks, the absence of these branches gives a significantly different picture of foreign ownership in the banking system. Essentially, the surveys were designed with the realization that there are tradeoffs between comprehensiveness of coverage and rate of response.

¹⁰ Note that while the regional groups do not overlap -- i.e., a given country is categorized in only one group -- the multilateral groups are not mutually exclusive -- e.g., all G-10 member countries are included in the OECD, and many are also of course included in the Europe geographic group. The groups were chosen because they allow meaningful summary comparisons.

banking industry is on average relatively smaller as a percent of GDP than for regions dominated by developed countries.

However, bank supervision in developing and emerging market countries is important in at least two senses. First, capital markets are very shallow in most developing and emerging market economies, and hence the banking industry is the main source of external finance. Second, as illustrated by the peso crisis of 1994/95, and the Southeast Asian and Russian banking crises of the late 1990s, a banking or financial crisis in a particular developing or emerging market economy may spill over to other developing or emerging market economies as financial market participants and international creditors re-evaluate country risk profiles. Table 1 also shows the very different character of the banking industry in offshore financial centers. In particular, banking looms large relative to the overall economy, and the number of banks per capita is several times higher than in most other country groups.

II.C. Permissible Powers and Ownership

The range of activities in which banks are allowed to engage, and the ownership relationships into which they can enter, are important because they are likely to affect banking industry performance. These characteristics of a banking system are also likely to influence, and to be influenced by, banking supervision. In view of these considerations, an examination across countries of banking “powers” and ownership opportunities is warranted.

II.C.1. Permissible Powers for Banks

In all countries, credit extension is the core activity of banks. However, in many countries “banking” encompasses other “nonbank” financial service activities. Major

nonbank financial services categories include securities activities (underwriting, dealing, and brokerage services for securities and mutual funds), insurance activities (underwriting and selling all kinds of insurance, and acting as a principal or agent), and real estate services (investment, development, and management). Table 2 shows, across 107 countries, the extent of permissible banking securities, insurance, and real estate activities, stratified by the extent to which banks can engage in the given activity.

“Unrestricted” signifies that the full range of services can be undertaken directly by a bank. “Permitted” means that a full range of the given type of activity can be engaged in, but that some or all aspects of the activity cannot be conducted directly in the bank and must be housed in an affiliate (subsidiary or other institution) of a bank. “Restricted” means that less than a full range of services under the activity category are allowed.

“Prohibited” means a bank is not permitted to engage in any aspect of the given activity.

There is great variation in the range of nonbank activities across countries, but it is clear that in the majority of countries, banks can engage in a wide range of securities activities, either directly or via an affiliate (i.e., securities activities are either unrestricted or permitted). Relatively few countries allow banks to engage without restrictions in insurance activities, although the most common restriction is on the location from which insurance activities are housed, not the range (i.e., the “permitted” category). The majority of countries restrict relatively heavily the real estate activities of banks (i.e., the “restricted” or the “prohibited” categories). Nevertheless, a sizeable minority of countries -- more than in the “unrestricted” category for insurance activities -- allow banks to engage directly in the full range of real estate activities.

Figure 9 offers a way to summarize the overall extent of permissible banking activities. Barth, Caprio, and Levine (2001b) devised an index for each of the three

banking activities, which assigns a number from 1 (“unrestricted”) to 4 (“prohibited”) for the degree to which there are legal/regulatory restrictions on a given activity (i.e., securities, insurance, and real estate activities). They sum the index values for each of the three activities to make a composite index for the overall restrictiveness of banking “powers.” Hence, the lower the overall index number, the wider (i.e., the less restrictive) is the range of activities in which banks can engage. As reference points, Figure 9 shows that Germany, which has a low composite index number (3 is the lowest possible value), gives very wide powers to its banks, whereas the United States and Japan, which have relatively high index numbers, restrict the range of activities in which banks can engage.

II.C.2. Ownership Opportunities for Banks: Mixing Banking and Commerce

Countries differ in the extent to which banking firms are allowed to take ownership positions in nonfinancial firms, as well as the extent to which nonfinancial firms can own banks. Ownership stakes going either way constitute “mixing” banking and commerce. Mixing banking and commerce raises a number of issues with possible supervisory and economic growth implications. In particular, where banks are allowed to own nonfinancial firms, the role of banks as financial intermediaries could become more complex than in a system where banks are prohibited from such ownership. On the one hand, in such a system, firms -- especially, perhaps, small, startup firms -- not affiliated via an ownership arrangement with banks may find that credit extension to them is restricted in favor of bank-owned firms. To the extent that the creditworthiness of unaffiliated firms is greater than bank-owned firms, there will be a misallocation of credit. On the other hand, evaluating and monitoring creditworthiness could be more efficient and effective in a system where banks can take ownership positions in nonbank

firms, thereby reducing principal-agent problems and information asymmetries. To the extent that is true, the likelihood of systemic banking problems would be reduced.

Table 3 groups countries both with respect to the ability of banks to own nonfinancial firms, and nonfinancial firms to own banks. For each country, the ownership laws/regulations were characterized as “unrestricted,” “permitted,” “restricted,” or “prohibited,” following Barth, Caprio, and Levine (2001b). “Unrestricted” signifies that a bank/nonfinancial firm may own 100 percent of the equity in a nonfinancial firm/bank; “permitted” refers to the legal ability of i) a bank to own up to 100 percent of the equity of a nonfinancial firm/bank, but ownership is limited based on the bank’s equity capital, and ii) a nonfinancial firm to own a bank, subject to prior approval or authorization; “restricted” signifies that a i) bank may acquire less than a 100 percent ownership share in a nonfinancial firm, or ii) a nonfinancial firm faces limits on its ownership share of a bank (such as a less-than-100-percent share); and “prohibited” signifies that no equity investment is allowed.

Figure 10 allows us to summarize across countries the extent to which banking and commerce can be mixed via bank and nonfinancial firm ownership. As with the securities, insurance, and real estate activities of banks, a numerical value was assigned to each of the degree-of-ownership terms, with an “unrestricted,” “permitted,” “restricted,” and “prohibited” designations receiving values of 1 through 4, respectively, following Barth, Caprio, and Levine (2001b). The sum of the values assigned to both of the ownership categories was taken to construct an overall index of the degree to which banking and commerce can be mixed in a given country, with lower values of the composite index indicating greater legal opportunities in this respect. As points of reference, in Germany the legal ability to mix banking and commerce is relative great, as

compared to the United States and Japan, where there are much higher legal barriers to mixing banking and commerce.

III. Structure of Banking Supervision: Previous Literature

As an increasing amount of cross-country data on banking is gathered, researchers have begun to focus on aspects of banking which had been taken as given in single-country studies of banking industry structure and performance.¹¹ In particular, while single-country studies, generally speaking, have taken banking industry regulation and supervision as given, recent cross-country banking studies have empirically tested for causal connections between banking industry performance and key aspects of banking regulation and supervision, including deposit insurance and permissible activities for banks.¹² To date, however, there has been relatively little research on the *structure* of banking regulation and supervision, in particular the number of supervisory authorities and the role of the central bank in supervision. Indeed, as Abrams and Taylor (2001) note, “the subject of regulatory structure has ... been under-researched.”¹³

¹¹ For a detailed description of a wide-ranging database covering the banking industry in over 100 countries see Barth, Caprio, and Levine (2001b).

¹² For information on large cross-country databases, see in particular Barth, Caprio, and Levine (2001b), and Beck, Demirgüç-Kunt, and Levine (2001). For cross-country studies focusing on deposit insurance see, e.g., Demirgüç-Kunt and Detragiache (2000), Demirgüç-Kunt and Sobaci (2000), Demirgüç-Kunt and Huizinga (2000), Lindgren, Garcia, and Saal (1996), and Kane (2000). For cross-country studies focusing on banking powers see, e.g., Barth, Nolle, and Rice (2000), and Barth, Caprio, and Levine (2001a, and c).

¹³ Abrams and Taylor (2001), p. 10. Taylor and Fleming (1999) point out that although the recent, significant changes in the structure of supervision that took place in northern Europe generated a great deal of discussion within governments and in the press, they did not “lead to a significant academic debate.” (p.2).

“Regulation” refers to the set of laws and rules applicable to banking, and “supervision” is defined as the monitoring by authorities of banks’ activities and the enforcement of banking regulations. See, e.g., Spong (2001), and Jordan (2001). However, as Spong (2001) explains, there is a widely used practice of referring to the authorities responsible for bank supervision interchangeably as “supervisors” and “regulators,” a practice we follow here unless otherwise specifically noted. For an explanation of how supervision,

The topic is important, however, because supervisory policy issues have arisen as a result of fundamental changes in banking and financial systems, as well as global financial crises.¹⁴ Consolidation within banking systems in many countries have led to environments in which fewer, but larger and more complex banks have increased their dominance.¹⁵ In addition, traditional distinctions between the business of banking and other financial service providers have blurred as financial institutions have moved into new product lines. Furthermore, growing disintermediation has placed increasing competitive pressures on banks to find new sources of revenue, pressures that have been heightened in recent years by technological advances in telecommunications allowing nonbank financial and nonfinancial firms to enter banks' traditional product and geographic markets.¹⁶ The greater globalization of banking and financial markets has meant that foreign banks play increasingly important roles in many countries, and financial markets are more intensely interconnected than had been the case even a few years ago. Finally, recent financial crises have profoundly affected the structure of banking systems in many countries, both because of the failure of banks and because of the imposition of remedial measures.

These changes in banking have increased the complexity of risk management for banks, thereby raising the challenges faced by supervisory authorities in monitoring

regulation, market discipline, and corporate governance can be integrated into a "regulatory regime," see Llewellyn (2001) and related comments by Estrella (2001).

¹⁴ A point stressed by Abrams and Taylor (2000), who nevertheless provide perspective on this issue relative to other regulatory and supervisory issues.

¹⁵ See Group of Ten (2001) for timely and comprehensive research on the nature, causes, and consequences of consolidation the eleven G-10 countries, Australia, and Spain.

¹⁶ For a recent discussion of the impact of technological changes on the structure and performance of the banking industry, see Furst, Lang, and Nolle (2001). For a recent theoretical discussion of how technology has profoundly altered the nature of the "production" of banking activities, see Williams and Gillespie (2001).

banks' risk management, and promoting the safety and soundness of the banking system.¹⁷ This development has in turn raised questions about the applicability of existing bank regulation and supervision. Among the questions being asked by policy makers, market participants, and analysts are two about the structure of supervision: 1) is a single bank regulatory authority to be preferred over multiple authorities?; and 2) should the central bank be responsible for banking supervision? Some of the existing studies emphasize one or the other of these issues, though a few deal with both.¹⁸

Before considering the literature on each of these issues, it is useful to note several studies that provide basic facts about the supervisory landscape across countries. Two of these studies review the supervisory structure of banks and nonbank financial services, and a third study describes the range of central bank supervisory functions. Goodhart and Schoenmaker (1995) examine the role of the central bank in bank supervision for 24 countries. Llewellyn (1999) summarizes the range of financial services for which various supervisory authorities in 123 countries are responsible. Sinclair (2000) provides a comparative summary of the “financial stability functions” of central banks in 37 countries.

¹⁷ See, e.g., Basel Committee on Banking Supervision (2001), p. 1.

¹⁸ A small group of studies describe the recent trend toward unifying supervision of not only banking but also other financial services in a single supervisory authority. For example, Briault (1999) describes the recent unification of not only banking supervision but also other financial services under the Financial Services Authority in the United Kingdom. In addition he mentions the 1991 unification of all financial sector supervision under the Finansinspektionen in Sweden, the unification in the mid-to-late-1980s in Denmark and Norway of the supervision of banking, securities, and insurance, as well as recent consolidation of supervisory authorities in Japan, Korea, and Iceland. Taylor and Fleming (1999) give

III.A. Multiple or Single Supervisory Authorities?

A group of recent studies has considered the issue of whether a single supervisory authority is to be preferred to multiple supervisory authorities. There are two variants of this literature, both of which rely primarily on theory or logical argument and do not provide much empirical evidence. One variant focuses on just the banking industry, the other on the broader issue of the number of supervisory authorities for all major financial services, especially banking, securities, and insurance. Kahn and Santos (2001) develop a theoretical model of the optimal allocation of bank regulatory powers covering the lender of last resort function, deposit insurance, and banking supervision. They conclude that a banking system with a single supervisory authority responsible for all of these powers may not monitor banks' activities sufficiently closely, and may exercise too much forbearance toward troubled institutions. Wall and Eisenbeis (2000) argue that a single bank supervisory authority may be preferable to a multiple authority system because such a system reduces the chance that conflicting policies will be pursued in the face of multiple supervisory goals.

The second branch of the optimal-number-of-supervisory-authorities research includes several studies dealing with the issue of the whether there should be a single supervisor for all financial services. Many points in the debate in this broader arena nevertheless have direct relevance for the narrower issue of whether there should be a single supervisor or multiple supervisors for the banking industry. The debate on the issue can be summarized in terms of arguments for a single banking supervisory authority, and arguments against.

detailed descriptions of the supervisory restructuring in Norway, Denmark, Sweden, and the United

III.A.1. Arguments for a Single Banking Supervisor

Key arguments for having a single bank supervisory authority can be grouped into three categories: safety and soundness arguments, costs of supervision arguments, and costs to market participants arguments, as follows:

Safety and Soundness

- *Consolidated supervision*: Under a multiple regulator regime, as banking organizations grow larger and more complex, they may include affiliated institutions that are supervised by different authorities, none of whom has responsibility for consolidated supervision of the whole banking organization. A single agency could avoid gaps that can arise with a regime based upon several agencies. [Llewellyn (1999)].
- *Regulatory arbitrage*: In the case of multiple supervisory authorities, financial institutions may engage in regulatory arbitrage, propelling multiple supervisory authorities into a “competition on laxity.” [Llewellyn (1999), Abrams and Taylor (2001)].
- *Conflict resolution*: A single regulator may be better able to resolve conflicts that emerge between different regulatory goals because of lower “frictions” in deciding upon and implementing resolutions. [Briault (1999), Llewellyn (1999), Wall and Eisenbeis (2000)].
- *Accountability*: A single regulator could be more transparent and accountable than multiple regulators, and may find it more difficult to “pass the buck” if it makes a mistake. [Briault (1999), Llewellyn (1999), Abrams and Taylor (2001)].
- *Regulatory flexibility*: A single regulator may have more flexibility to respond to changes in the financial landscape than would be the case for separate agencies, each of which has its own bureaucratic, political, and legal hurdles to overcome. [Abrams and Taylor (2001)].
- *Cross-border supervision*: A single supervisory authority can aid in international supervisory cooperation, because foreign supervisors will have a single contact point. [Abrams and Taylor (2001)].

Costs to Supervisory Authorities

- *Efficiencies and economies of scale*: A single supervisory authority will be larger, and therefore will permit finer specialization of labor and more intensive utilization of inputs than would separate, smaller supervisory authorities. Larger size may permit

acquisition of information technologies that become cost-effective only beyond a certain scale of operations. In addition, there would be no duplication of support infrastructures. [Briault (1999), Llewellyn (1999), Abrams and Taylor (2001)].

- Abrams and Taylor (2001, p.17) argue that “The economies of scale argument is most applicable in countries where supervisory agencies tend to be small, notably in small countries or those with small financial systems.”
- *Resource allocation*: A single, large(er) supervisory authority will be better able to attract, develop, and maintain professional staff expertise, and employ a single, coherent human resources policy, including career planning, in-house training programs, and the provision of more opportunities and professional challenges. [Briault (1999), Llewellyn (1999), Abrams and Taylor (2001)].
- Abrams and Taylor (2001, p. 19) argue that “The shortage of supervisory resources is a serious problem in a number of countries,” particularly emerging markets.
- *Economies of scope*: To the extent that financial institutions continue to diversify into a greater range of activities, a single regulator might be more efficient at monitoring those activities, in part because it will be able to use a single set of central support services, and operate a single database for licensing firms and approving individuals. [Briault (1999), Llewellyn (1999)].

Costs to Market Participants

- *Regulatory burden*: A fragmented supervisory system may increase the regulatory burden on complex organizations supervised by many supervisors. In addition, a single regulator provides a single point of contact for supervised institutions. [Briault (1999), Llewellyn (1999), Abrams and Taylor (2001)].
- *Transparency*: A system with a single regulator may be simpler for banks and consumers to understand. [Llewellyn (1999)].

III.A.2. Arguments against a Single Banking Supervisor

Arguments against having a single banking supervisory system include the following:

Safety and Soundness

- “*Lessons learned*”: Multiple supervisory authorities may take somewhat different approaches to supervision, yielding valuable information that would not be generated by a single supervisor approach. [Llewellyn (1999)].

Costs to Supervisory Authorities

- *Diseconomies of scale*: A single large supervisory authority could become excessively bureaucratic and inefficient. [Llewellyn (1999), Abrams and Taylor (2001)].

Costs to Market Participants

- *Supervisory responsiveness and innovation in the banking industry*: A multiple supervisors regime may encourage competition among supervisors to be more responsive to innovations in the regulated industry. [See Kane (1984) and Romano (1997, 2001) for studies of how regulatory competition leads to innovations in products; Kupiec and White (1996), and Romano (2001) on how competition among regulators leads to innovations in institutional practices; and Romano (1985, 2001) for how regulatory competition leads to innovations in legal rules.]¹⁹
- *Excessive power*: A single large regulator would be extremely powerful and this power might become excessive. [Taylor (1995), Kane (1996), Briault (1999), Llewellyn (1999)].

III.B. Should the Central Bank be a Bank Supervisor?

The second important structure-of-banking-supervision issue with which policy makers have wrestled is whether the central bank should be responsible for banking supervision. As with the number-of-supervisory-authorities issue, there are reasonable arguments on both sides of this issue, but relatively little empirical analysis.

III.B.1. Arguments for the CB to Supervise Banks

Safety, Soundness, and Systemic Stability

- *Access to information*: Because banks are the conduits through which changes in short-term interest rates are transmitted, the central bank needs to have accurate and timely information about the condition and performance of banks as a precondition

¹⁹ In a related vein, Romano (2001) and Choi and Guzman (1998) argue that if firms in a given regulated industry have substantially different characteristics, such that they might benefit from different supervisory approaches, a system of multiple supervisory authorities might have an advantage over a single supervisor, applying a single supervisory approach.

for effective conduct of monetary policy. In addition, without “hands on” bank supervision responsibility, the central bank may take too little account of conditions in the banking sector when setting monetary policy. Further, the central bank needs to have access to information on the solvency and liquidity of banks in order to exercise its function of lender of last resort. Having such information in a timely manner is especially crucial in times of financial crises, and the best way to ensure access is by assigning on-going banking supervision responsibility to the central bank. Having supervisory power may also aid the central bank in acting quickly and precisely via the banking system in time of crisis. [Goodhart and Schoenmaker (1993), Goodhart (1995), Haubrich (1996), Briault (1999), Peek, Rosengren, and Tootle (1999), Abrams and Taylor (2001)

Using data for 104 bank failures in 24 countries during the 1980s, Goodhart and Schoenmaker (1995) find that countries with banking supervision and monetary policy combined in the central bank had fewer bank failures.²⁰

- *Independence*: Independence for bank supervisory authorities enhances their ability to enforce actions. Central banks often have a strong guarantee of their independence, so assigning them with bank supervision promotes the kind of independent action necessary for successful banking system supervision. [Giddy (1994), Abrams and Taylor (2001)]. Abrams and Taylor (2001, p. 28) also make the point that the strategy of entrusting bank supervision to the central bank may be particularly important in transitional and emerging market economies, in order to increase the chances of avoiding “politicization of bank regulation.”

Costs to Supervisory Authorities

- *Resource allocation*: The central bank may have a comparative advantage in recruiting and retaining the best staff, due to its ability to provide superior compensation and professional development to staff. [Abrams and Taylor (2001)]. Abrams and Taylor (2001, p. 27) further state that “[t]his argument is particularly strong in countries where the absolute level of human capital with this skill is very small.”

²⁰ They note, however, “the regime with the smallest number of bank failures is not necessarily the most efficient one in welfare terms” [Goodhart and Schoenmaker (1995, p. 551)]. In this same study, Goodhart and Schoenmaker also find empirical evidence that can be interpreted to have relevance for moral hazard behavior. In particular, they conclude (p. 553) that “a system where the central bank remains in charge of supervision and regulation is somewhat more likely to involve the commercial banks financing rescues and less likely to make a call upon the public (tax-payers’) purse than when the regulatory function is hived off to a separate agency.”

III.B.2. Arguments against the Central Bank Supervising Banks

Safety, Soundness, and Systemic Stability

- *Conflict of interests*: In the case where the central bank has dual responsibility for banking supervision and monetary policy, it may pursue a too loose monetary policy in order to avoid adverse effects on bank earnings and credit quality. [Goodhart and Schoenmaker (1993, 1995), Haubrich (1996), Briault (1999), Abrams and Taylor (2001)].
- *Reputation risk*: If the central bank is responsible for bank supervision and bank failures occur, public perception of its credibility in conducting monetary policy could be adversely affected. [Haubrich (1996), Briault (1999), Abrams and Taylor (2001)].
- *Access to information*: To the extent central banks need timely and accurate information, this can be accomplished through information-sharing arrangements with bank supervisory authorities. [Haubrich (1996)]. Haubrich also notes that, with the responsibility for supervision removed from the central bank and placed in another agency, it is possible that a debate over the proper course of both supervision and macroeconomic policies may benefit from a “competition of ideas.” Abrams and Taylor (2001) suggest that recently actualized or probable changes in the payment system (e.g., changes to a real time gross settlement system) may reduce the amount of oversight the central bank needs to have over payment system participants, thus reducing information needs somewhat.
- *Independence*: Briault (1999) argues that the wider is the role of the central bank, the more subject it could become to political pressures, thus threatening its independence.
- Using cross-country data, Goodhart and Schoenmaker (1995), and Di Noia and Di Giorgio (1999) find a positive correlation between the rate of inflation on the one hand, and the central bank having responsibility for both monetary policy and supervision.²¹

Clearly, *a priori*, arguments on both sides of these supervisory structure issues appear reasonable. Ultimately, of course, empirical research is needed to decide such issues. As a first step in that direction, we turn to a comparison of the structure of banking supervision across a wide range of countries.

²¹ Goodhart and Schoenmaker (1995) note the lack of theoretical underpinning for this result, and point out that independent central banks, which are much better at fighting inflation, are also more likely not to have responsibility for banking supervision. Briault (1999, p. 28) observes that “less independent central banks tend to combine monetary policy and regulatory functions.”

IV. Structure of Banking Supervision: Empirical Evidence

Countries vary widely in the characteristics of their banking systems. Each of these main characteristics is likely to be intertwined with and affected by banking supervision, but relatively little systematic information on the nature of these relationships exists, in part because a large database of cross-country information has not been available. In order to investigate possible interrelationships of supervision and other significant aspects of banking systems, we group countries according to key dimensions of supervision, and then re-examine cross-country data on structure, performance, and powers.

IV.A. Cross-Country Comparisons of the Structure of Banking Supervision

As a first step, it is necessary to ascertain which countries have 1) single/multiple banking supervisory authorities, and 2) the central bank as a banking supervisor. Tables 4 and 5 lay out these basic facts.

IV.A.1. Single or Multiple Supervisory Authorities?

Bank supervisory systems can be categorized according to the number of authorities responsible for supervision. We have grouped countries according to whether they have a single bank supervisory authority, or multiple supervisory authorities, and stratified countries by income levels in Table 4. That table shows that most countries have a single bank supervisory authority. For both single- and multiple-supervisor systems there does not appear to be any obvious pattern according to income level.

IV.A.2. Supervisory Role of the Central Bank

The role of the central bank is a second key aspect of the administrative structure of bank supervisory systems. In Table 5 we have grouped countries into three categories, stratified by income level. The left-hand column shows that 66 out of our total of 107 countries have only the central bank as a banking supervisor. The middle column shows that 13 countries assign banking supervision responsibilities to the central bank, but that the central bank shares these responsibilities with at least one other supervisory authority. Adding both of these groups together, 74% of the countries in our database have the central bank as a banking supervisor. For the 28 countries (26%) that do not assign banking supervision to the central bank, Table 5 reveals that about half the countries in which the central bank is not a supervisory authority fall into a single income level -- the highest.

IV.B. Structure of Banking Supervision: Which Differences are Significant?

Tables 4 and 5 make clear that countries differ in how they structure banking supervision, but little empirical information exists indicating in what respect these differences matter. To address this gap, we conducted simple difference of means tests to ascertain if there are significant differences in banking industry structure, permissible powers, and ownership opportunities relative to differences between countries in banking supervisory structure. Our objective in employing this approach is not to test hypotheses about the economic impact of the structure of banking supervision, but rather to contribute to the necessary “ground work” that should be done in order to provide guidance for future empirical modeling efforts.

Our investigation is divided into four parts. We assess whether there are statistically significant correlations between the two key aspects of the structure of banking supervision and the following dimensions of banking systems: 1) structure; 2) concentration and entry; 3) permissible powers and ownership; and 4) the implementation of supervision.

VI.B.1. Structure of Supervision and the Structure of the Banking Industry

Table 6 compares the mean values of five aspects of banking industry structure for countries with single versus multiple banking supervisors, and for countries where the central bank is, and is not, a banking supervisory authority. The left-hand column of results shows that, although means differ for the relative size of a banking system, the average size bank, the relative accessibility of banks to the population, the percent of banks that are government owned, and the percent of banking assets that are government owned across countries with single- versus multiple-supervisor systems, none of these differences are statistically significant. In contrast, there are several statistically significant differences in banking industry structure between countries where the central bank is a banking supervisor compared to those where it is not. In particular, countries where the central bank is a banking supervisory authority have banking systems with a significantly smaller average size, and have greater government ownership of banks and banking assets.

IV.B.2. Structure of Supervision and Concentration and Entry

Mean values for five measures of entry conditions are compared in Table 7, both for countries with single- and multiple-supervisor systems, and for countries where the

central bank is, or is not a banking supervisory authority. Those measures of entry conditions in 1999 include the 3-bank concentration ratio, the percent of new banks-to-total banks, the percent of entry applications denied, and two measures of foreign penetration into a banking system. As with the comparison of mean values of aspects of banking industry structure discussed above, we found no statistically significant difference in mean values of these factors in single- versus multiple-supervisory systems.

There were, however, two aspects of entry conditions that were different for systems with and without the central bank as a banking supervisor. A far greater percentage of applications to start a new bank were denied in systems with the central bank as a supervisor than in those systems without the central bank as a banking supervisor. And, countries with the central bank as a banking supervisory authority had a much lower percent of foreign owned banks.

IV.B.3 Structure of Supervision and Permissible Powers and Ownership

Table 8 investigates possible correlations between the breadth of activities and ownership opportunities afforded banks and the structure of supervision. The left-hand set of results shows that there is no statistically significant difference in any of our indices of banking powers or ownership for single- versus multiple-supervisory systems. This lack of statistically significant results extends to ownership opportunities and central bank versus non-central bank supervisory systems. Hence, we find no empirical evidence of a connection between the structure of banking supervision and the extent of the legal ability for mixing banking and commerce.

There are, however, three statistically significant results for the permissible range of banking activities and the role of the central bank in supervision. In particular,

countries where the central bank is a banking supervisory authority tend to allow a narrower range of banking powers (i.e., the composite index of banking powers is higher) than do countries where the central bank is not a supervisory authority. This is especially true in the case of insurance activities -- central bank supervisory systems tend to impose more restrictions on banks in this respect -- and appears to be marginally significant in the case of bank real estate powers.

IV.B.4. Structure and Implementation of Supervision

Last, we explore whether there are meaningful correlations between the structure of banking supervision and measures used by supervisors to carry out supervisory responsibilities. We display in Table 9 mean values of indices of several measures of what we have labeled collectively the “implementation of banking supervision.” Two of these give a general measure of the scope of banking supervisors’ powers. The “independence of supervisory authorities” reflects the degree to which banking supervisors operate in regulatory and political environments that constrain their abilities to take independent action.²² “Overall supervisory power” is a composite index calculated by summing values assigned to the answers given by national supervisory authorities to sixteen separate questions in the World Bank survey on supervisory powers and practices.²³ We also include a measure of the resources available to carry out banking supervision: the number of professional bank supervisors employed by supervisory authorities relative to the number of banks that must be supervised.

²² We follow Barth, Caprio, and Levine (2001b) in the construction of this variable.

²³ We follow the construction of the “official supervisory power” variable, as described in Barth, Caprio, and Levine (2001b).

All banking supervisory systems rely on decisions made by supervisory authorities. But systems also rely to some extent on market forces to enhance safety and soundness. We include in Table 9 “private sector monitoring” as a measure of such “market discipline,” that is, the extent to which private sector participants scrutinize banks’ activities. Following Barth, Caprio, and Levine (2001b), this variable takes account of the extent to which banks are subject to external auditing, evaluation by external rating agencies, and requirements for public disclosure of accounting and other information.²⁴

A second gauge of the extent to which market forces play a role in disciplining banks is whether or not regulators allow banks to count subordinated debt toward meeting regulatory capital requirements. In those banking systems where subordinated debt can be counted as bank capital, private sector participants are likely to take a greater interest in scrutinizing bank capital, thereby helping to ensure banking system safety and soundness. The variable “sub-debt as a component of capital” takes a value of 1 if subordinated debt can be included in meeting regulatory capital requirements, and 0 otherwise.

Deposit insurance can be thought of as a measure to help regulatory authorities ensure the safety and soundness of the banking system, although the net effect of this factor is conceptually ambiguous. On the one hand, the existence of deposit insurance reduces the likelihood of systemic bank runs; and, because supervisory authorities are, in general, charged with protecting the deposit insurance system, its existence may enhance the quality of supervision, *ceteris paribus*, inasmuch as supervisors may more carefully examine banks in order to avoid being blamed for deposit insurance payouts when a bank

²⁴ See Barth, Caprio, and Levine (2001b) for a detailed description of this variable.

fails. On the other hand, the existence of deposit insurance may reduce incentives for depositors to monitor bank safety and soundness, and may also encourage moral hazard behavior on the part of bankers. We include in Table 9 an “explicit deposit insurance” variable, which takes the value of 1 if a country has an explicit deposit insurance system, and 0 otherwise.²⁵

As in the case of the other dimensions of banking systems we investigated, we find no evidence that implementation of supervision is statistically significantly different in single- versus multiple-supervisor systems. However, there are three respects in which the implementation of supervision differs significantly between central bank and non-central bank supervisory systems, as shown in the right-hand column of Table 9. First, the statistically significant lower mean value for the “sub-debt as a component of capital” variable means that central bank-as-supervisor systems are less likely to allow the use of subordinated debt as a component of capital. This may in turn reflect a supervisory approach that relies less on market discipline than in systems where the central bank is not a supervisory authority. Second, central bank-as-supervisor structures are less likely to have explicit deposit insurance systems. In addition, the overall level of moral hazard, as measured by our index, is significantly lower for banking systems where the central bank is a supervisory authority.

²⁵ Many countries without an explicit deposit insurance scheme are generally perceived to have an “implicit” deposit insurance scheme, i.e., one in which it is expected that the supervisory authorities will protect all, or at least most, depositors in the event that a bank fails. It is possible that such a system will result in greater moral hazard behavior, and less depositor discipline, than an explicit deposit insurance scheme.

IV.B.5. Summary of Difference of Means Tests

Almost half of the specific dimensions of banking industry structure, powers, and the implementation of supervision are significantly correlated with whether a banking system assigns supervisory responsibility to the central bank. The central bank is more likely to be a supervisory authority in banking systems with smaller size banks. The central bank is also more likely to be a supervisory authority in banking systems with high government ownership, low entry, and low foreign ownership, and central bank-as-supervisor systems are associated with a narrower range of powers allowed banks. In addition, where the central bank is a supervisory authority, there is less reliance on market discipline, as reflected in the use of sub-debt as capital, and banking systems are less likely to have explicit deposit insurance schemes. Finally, and at least as significant as the statistical results for the central bank versus non-central bank results, none of the banking system attributes we examined were significantly correlated with whether a supervisory system relied on single banking supervisor or multiple authorities.

V. Summary and Conclusions

As our detailed comparative data shows, banking systems, even for countries at similar stages of economic development, differ greatly around the world. Such differences are reflected in important aspects of banking industry structure, as well as in the range of activities and legal ownership opportunities accorded banks. We also illustrated that countries differ in the ways in which they have structured banking supervision. In particular, some countries have chosen banking supervisory systems which rely on a single authority, while others rely on multiple authorities to carry out

banking supervision. In addition, some countries assign banking supervision to the central bank, while others do not.

A small body of previous research has investigated the importance of different bank supervisory structures, but most of that work has been conceptual, as opposed to empirical, in nature. Nevertheless, the issue of the appropriate structure of bank supervision has occupied policy makers over the past decade or so, as reflected in the fact that a number of countries have radically changed the structure of their supervisory systems. Hence, it is important to have more empirical information on the issue, and our analysis takes several important first steps toward that goal.

We find that there are several key correlations between banking industry structure and powers, and whether the central bank is a banking supervisor or not. In general, banking systems with relatively small banks, large government ownership in banking, and relatively high entry barriers are also those systems more likely to have the central bank as a banking supervisory authority. In addition, central bank-as-supervisor systems tend to be more restrictive in the range of activities allowed to their banks. They also rely less on market discipline, but also less heavily on having an explicit deposit insurance scheme. We could, however, find no correlation between the number of banking supervisory authorities (i.e., a single- or a multiple-supervisor system) and any of the key attributes of banking systems we investigated. That fact could imply that it is less urgent than some have thought for policy makers to grapple with the issue of single versus multiple banking supervisory authorities. Before drawing conclusions more firmly however, we advocate further research to investigate causal links between bank supervisory structure and banking industry structure and performance.

Bibliography

- Abrams, R.K. and M.W. Taylor (2000). "Issues in the Unification of Financial Sector Supervision," IMF Working Paper, no.213.
- Abrams, R.K. and M.W. Taylor (2001). "Assessing the Case for Unified Sector Supervision," paper presented at the 2001 Risk Management and Insurance International Conference.
- Barth, J.R., G. Caprio Jr., and R. Levine. (2001a). "Banking Systems Around the Globe: Do Regulations and Ownership Affect Performance and Stability?" in Frederic S. Mishkin, Editor: *Prudential Supervision: What Works and What Doesn't*, University of Chicago Press, 2001.
- Barth, J.R., G. Caprio Jr., and R. Levine (2001b). "The Regulation and Supervision of Bank Around the World: A New Database," in Robert E. Litan and Richard Herring, Editors, *Integrating Emerging Market Countries into the Global Financial System*, Brookings-Wharton Papers on Financial Services, Brookings Institution Press.
- Barth, J.R., G. Caprio Jr., and R. Levine (2001c). "Bank Regulation and Supervision: What Works Best," *World Bank Policy Research Working Paper*, August"
- Barth, J. R., L. G. Dopico, D.E. Nolle, and J.W. Wilcox (2001). "Bank Safety and Soundness and the Structure of Bank Supervision: A Cross-Country Analysis," paper presented at the *2001 FMA Annual Meeting*, Toronto, Canada, October 18.
- Barth, J. R.; R. D. Brumbaugh, and J. A. Wilcox (2000). "The Repeal of Glass-Steagall and the Advent of Broad Banking," *Journal of Economic Perspectives* 14(2), Spring, 191-204.
- Barth, J. R., D. E. Nolle, and T. N. Rice (2000). "Commercial Banking Structure, Regulation and Performance: An International Comparison," *Modernizing Financial Systems*, edited by Dimitri B. Papadimitriou, Macmillian Press and St. Martin's Press.
- Barth, J.R. (1991). *The Great Savings and Loan Debacle*, The AEI Press: Washington, D.C.
- Basel Committee on Banking Supervision (2001). "The Relationship Between Banking Supervisors and Banks' External Auditors," Consultative Paper issued by the Basel Committee on Banking Supervision and the International Federation of Accountants (February).
- Beck, T.; A. Demirgüç-Kunt, and R. Levine (2001a). "A New DataBase on Financial Development and Structure," *World Bank Economic Review*, 14(3), 597-605.

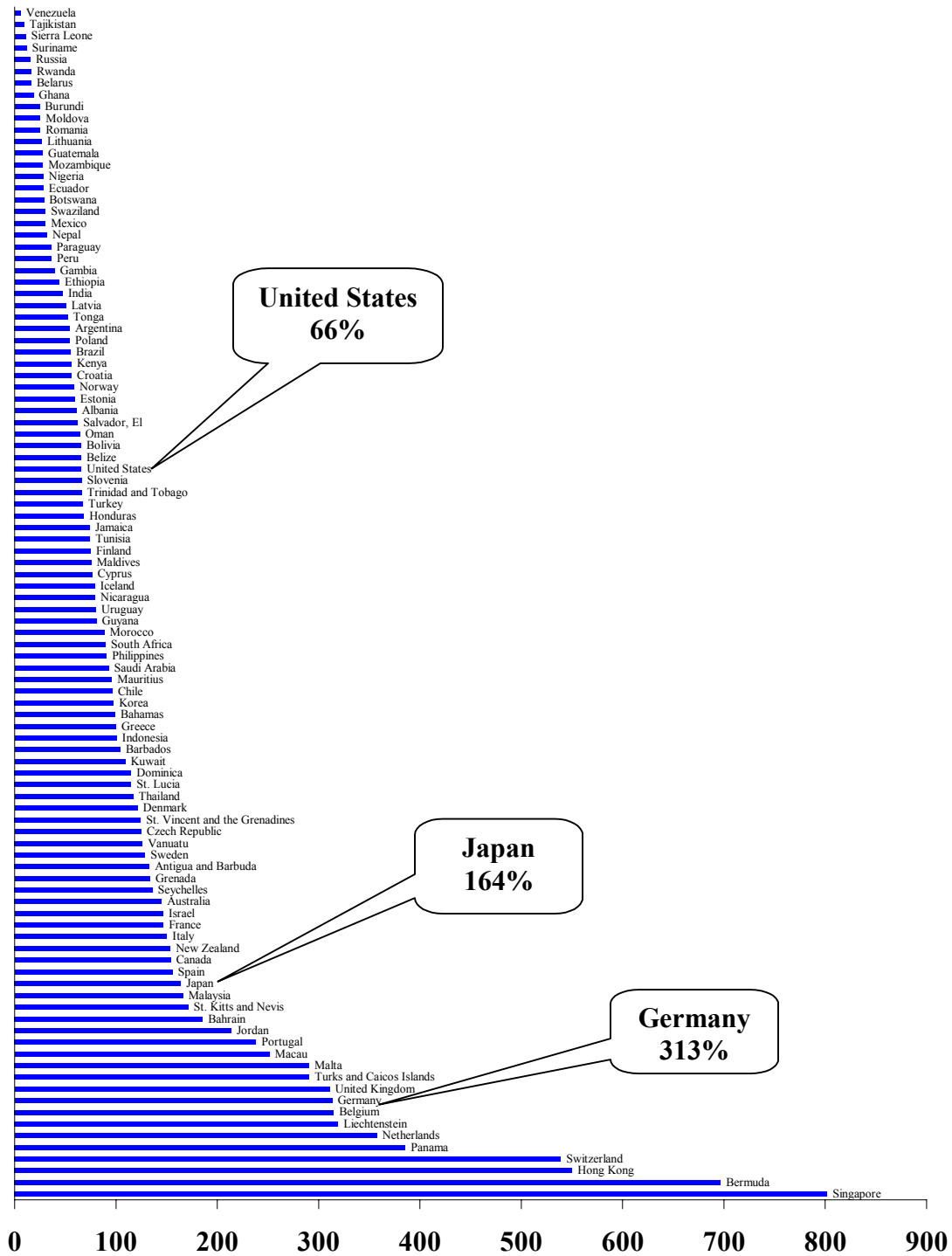
- Beck, T., A. Demirgüç-Kunt, and R. Levine (2001b). "Law, Politics, and Finance," University of Minnesota (Carlson School of Management), draft.
- Boyd, J.H.; S. Kwak, and B.D. Smith (2000). "Banking Crises: What Comes After?" University of Minnesota (Carlson School of Management), Department of Finance, draft.
- Briault, C. (1999). "The Rationale for a Single National Financial Services Regulator," Financial Services Authority Occasional Paper, series 2.
- Caprio, G. Jr., and D. Klingebiel (1999). "Episodes of Systemic and Borderline Financial Crises," World Bank, draft.
- Caprio, G. Jr., and Martinez (2000). "Avoiding Disaster: Policies to Reduce the Risk of Banking Crises," World Bank draft, and Egyptian Center for Economic Studies Working Paper No. 47.
- Caprio, G. Jr., and P. Honohan (1999). "Restoring Banking Stability: Beyond Supervised Capital Requirements," *Journal of Economic Perspectives* 13(4), 43-64.
- Carmichael, Jeffrey (2001). "Options for Financial Regulatory Structure," Paper presented at the conference on *The Future of Financial Regulation in Taiwan*, Taipei, July 6, 2001.
- Choi, S. J. and A. T. Guzman (1998). "Portable Reciprocity: Rethinking the International Reach of Securities Regulation," *California Law Review*, Vol. 81.
- Claessens, S. and D. Klingebiel (2000). "Competition and Scope of Activities in Financial Services," Washington D.C.: World Bank, draft, April.
- Clark, A. (2000). "The Role of Regulation in Global Financial Markets," Remarks presented at the Conference organized by the City University Business School and the University of London, July 13 2000.
- Courtis, Neil (ed.) (1999). *How Countries Supervise Their Banks, Insurers and Securities Markets*, London: Central Banking Publications.
- Demirgüç-Kunt, A. and E. J. Kane (2001). "Deposit Insurance Around the Globe: Where Does It Work?" The World Bank (July).
http://www.worldbank.org/research/interest/confs/upcoming/deposit_insurance/home.htm.
- Demirgüç-Kunt, A. and E. Detragiache, (2000). "Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation," draft, The World Bank,
http://www.worldbank.org/research/interest/confs/upcoming/deposit_insurance/da ta.htm.

- Demirgüç-Kunt, A. and T. Sobaci, (2000). "Deposit Insurance Around the World: A Data Base," The World Bank,
http://www.worldbank.org/research/interest/confs/upcoming/deposit_insurance/data.htm.
- Demirgüç-Kunt, A. and H. Huizinga (2000). "Market Discipline and Financial Safety Net Design," The World Bank, draft (earlier draft, Policy Research Paper No. 2183, 1999).
- Demirgüç-Kunt, A., and V. Maksimovic (1998). "Law, Finance, and Firm Growth," *Journal of Finance* 53, 2107-2137.
- Demirgüç-Kunt, A., R. Levine and H.G. Min (1999). "Opening to Foreign Banks: Issues of Stability, Efficiency, and Growth," *The Implications of Globalization of World Financial Markets Korea*, Bank of Korea.
- Dewatripont, M. and J. Tirole (1994). *The Prudential Regulation of Banks*, Cambridge: MIT Press.
- Di Noia, C. and G. Di Giorgio (1999). "Should Banking Supervision and Monetary Policy Tasks be Given to Different Agencies?" *International Finance*, vol. 2:3, 361-378.
- Erricco, L. and A. Musalem (1999). "Offshore Banking: An Analysis of Micro- and Macro-Prudential Issues," IMF Working Paper, Monetary and Exchange Affairs Department (January).
- Estrella, A. (2001). "Comments on 'A Regulatory Regime for Financial Stability,'" David T. Llewellyn, paper presented at the 29th *Economics Conference*, Oesterreichische Nationalbank., Vienna (May 31).
- Furst, K., W.W. Lang, and D.E. Nolle (2001). "Internet Banking in the U.S.: Landscape, Prospects, and Industry Implications," *Journal of Financial Transformation* 2 (July): 45-52.
- Giddy, I.H. (1994). "Who Should Be the Banking Supervisors," Paper presented at the Seminar on Current Legal Issues Affecting Central Banks, IMF, May 10, 1994.
- Goodhart, C. and D. Schoenmaker (1995). "Should the Functions of Monetary Policy and Banking Supervision Be Separated?" *Oxford Economic Papers* 47, 539-560.
- Goodhart, C. and D. Schoenmaker (1993). "Institutional Separation Between Supervisory and Monetary Agencies," Special Paper No.52, London School of Economics Financial Markets Group (April).
- Goodhart, C.A.E. (1995). "Some Regulatory concerns," London School of Economics Financial Markets Group, Special Paper, no. 79 (December).

- Greenspan, A. (1998). "The Role of Capital in Optimal Banking Supervision and Regulation," in Federal Reserve Bank of New York, "Financial Services at the Crossroads: Capital Regulation in the Twenty-First Century, Proceedings of a Conference," FRBNY Economic Policy Review 4:3, October.
- Group of Ten (2001). Report on Consolidation in the Financial Sector (January).
- Group of Thirty (1997). *Global Institutions National Supervision and Systemic Risk: A Study Group Report*.
- Hadjjemmanuil, C. (2001). "Institutional Structure of Financial Regulation: A Trend Towards 'Megaregulators'?" Paper presented at the conference on *The Future of Financial Regulation in Taiwan*, Taipei, July 6, 2001.
- Haubrich (1996). "Combining Bank Supervision and Monetary Policy," *Economic Commentary*, Federal Reserve Bank of Cleveland (November).
- Jordan, J.L. (2001). "Effective Supervision and the Evolving Financial Services Industry," Economic Commentary, June, Federal Reserve Bank of Cleveland (June).
- Kahn, Charles M. and Joao A. C. Santos (2001). "Allocating Bank Regulatory Powers: Lender of Last Resort, Deposit Insurance and Supervision," draft paper (June).
- Kane, E.J. (2000). "Designing Financial Safety Nets to Fit Country Circumstances," The World Bank, draft.
- Kane, E.J. (2000). "How Offshore Financial Competition Disciplines Exit Resistance by Incentive-Conflicted Bank Regulators," *Journal of Financial Services Research* 17(1), 265-291.
- Kane, E.J. (1996). "De Jure Interstate Banking: Why Only Now?" *Journal of Money, Credit, and Banking*, Vol. 28.
- Kane, E. J. (1984). "Regulatory Structure in Futures Markets: Jurisdictional Competition between the SEC, the CFTC, and Other Agencies," *Journal of Futures Markets*, vol. 4.
- Kupiec, P. H. and A. P. White, (1996). "Regulatory Competition and the Efficiency of Alternative Derivative Product Margining Systems," *Finance and Economics Discussion Series*, Board of Governors of the Federal Reserve System, no. 96-11 (June).
- Lindgren, C. J., G. Garcia, and M. Saal (1996). *Bank Soundness and Macroeconomic Policy*, Washington, DC: International Monetary Fund.

- Llewellyn, D. T. (2001). "A Regulatory Regime for Financial Stability," paper presented at the 29th *Economics Conference*, Oesterreichische Nationalbank., Vienna (May 31).
- Llewellyn, D.T. (1999). "The Economic Rationale for Financial Regulation," *Financial Services Authority Occasional Paper*, series 1.
- Llewellyn, D.T. (1999). "Introduction: the Institutional Structure of Regulatory Agencies," in N. Courtis (ed), *How Countries Supervise Their Banks, Insurers, and Securities Markets*, (London: Central Bank Publications), xi-xix.
- Peek, J., R.S. Rosengren and G.M.B. Tootell (1999). "Is Bank Supervision Central to Central Banking," Federal Reserve Bank of Boston, Working Paper no. 99-7.
- Romano, R. (2001). "The Need for Competition in International Securities Regulation," *Yale International Center for Finance* (June).
- Romano, R. (1997). "The Political Dynamics of Derivative Securities Regulation," *Yale Journal of Regulation*, vol. 14.
- Romano, R. (1985). "Law as a Product: Some Pieces of the Incorporation Puzzle," *Journal of Law, Economics and Organization*, vol. 1.
- Sinclair, P. J. N. (2000). "Central Banks and Financial Stability," Bank of England, *Bank of England Quarterly Bulletin* (November).
- Spong, K. (2001). *Banking Regulation: Its Purposes, Implementation, and Effects* (5th edition), Federal Reserve Bank of Kansas City.
- Stevens, E. (2000). "Evolution in Banking Supervision," Economic Commentary, Federal Reserve Bank of Cleveland.
- Taylor, M. and A. Fleming (1999). "Integrated Financial Supervision: Lessons from Northern European Experience," *World Bank, Policy Research Working Paper*, no.2223 (November).
- Taylor, M. (1995). "Twin Peaks: A Regulatory Structure for the New Century," Centre for the Study of Financial Innovation, London (December).
- Wall, L.D. and R.A. Eisenbeis (2000). "Financial Regulatory Structure and the Resolution of Conflicting Goals," *Journal of Financial Services Research* 17(1), 223-245.

Figure 1. Banking System Assets Relative to GDP - 1999
(percent)



Note: Luxembourg = 3,423%

Figure 2. Bank Assets Relative to Total Financial Assets – 1999
(percent)

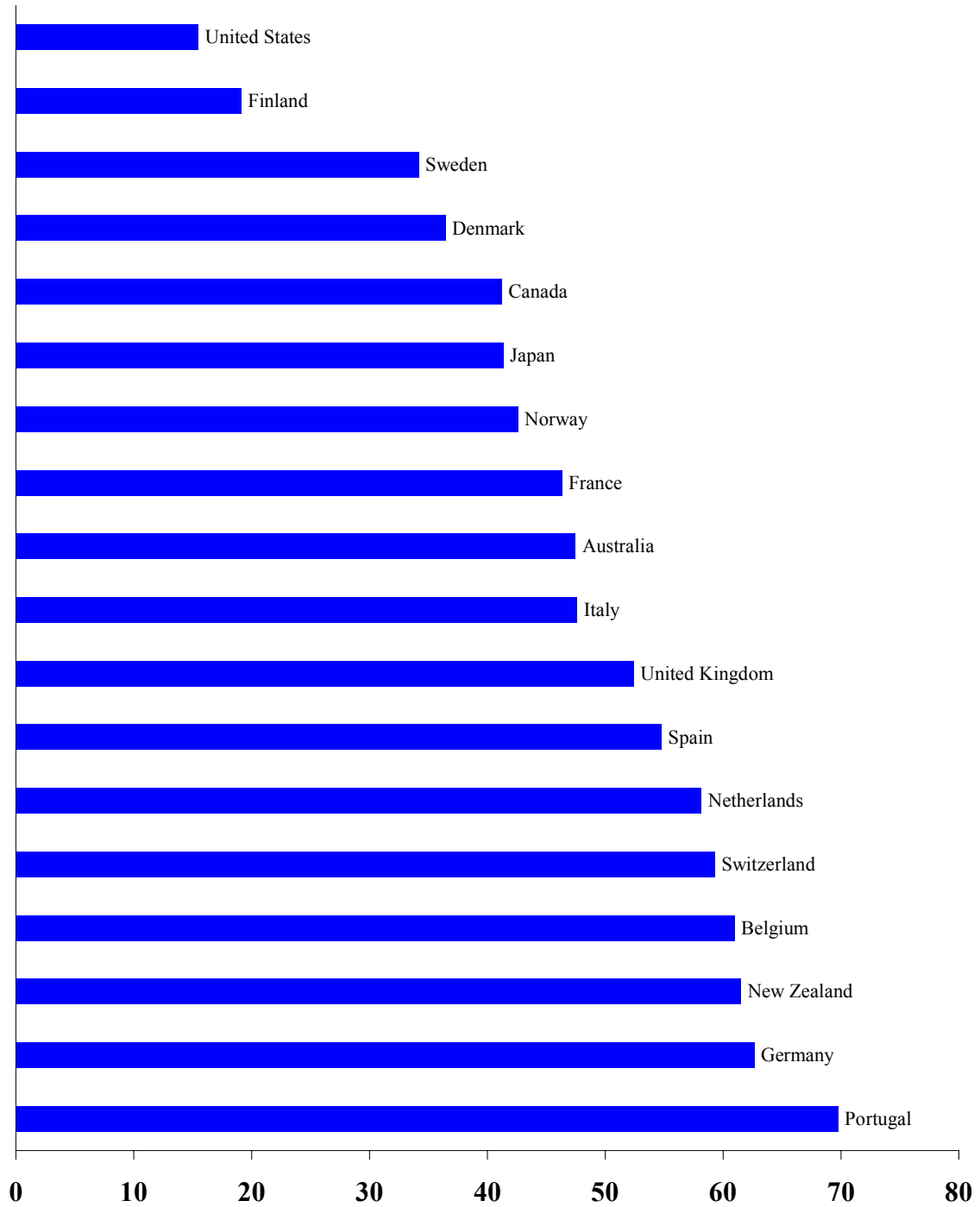
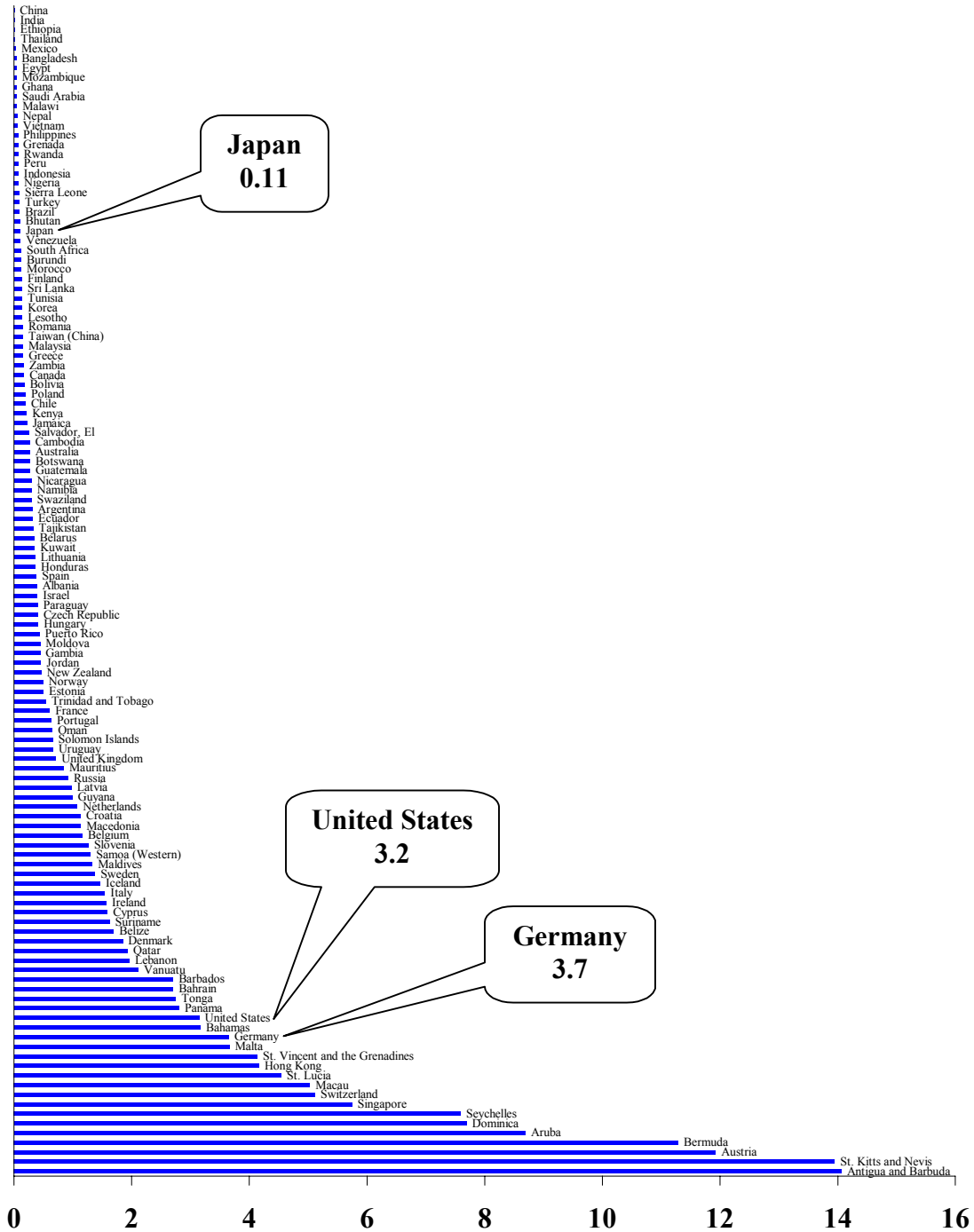
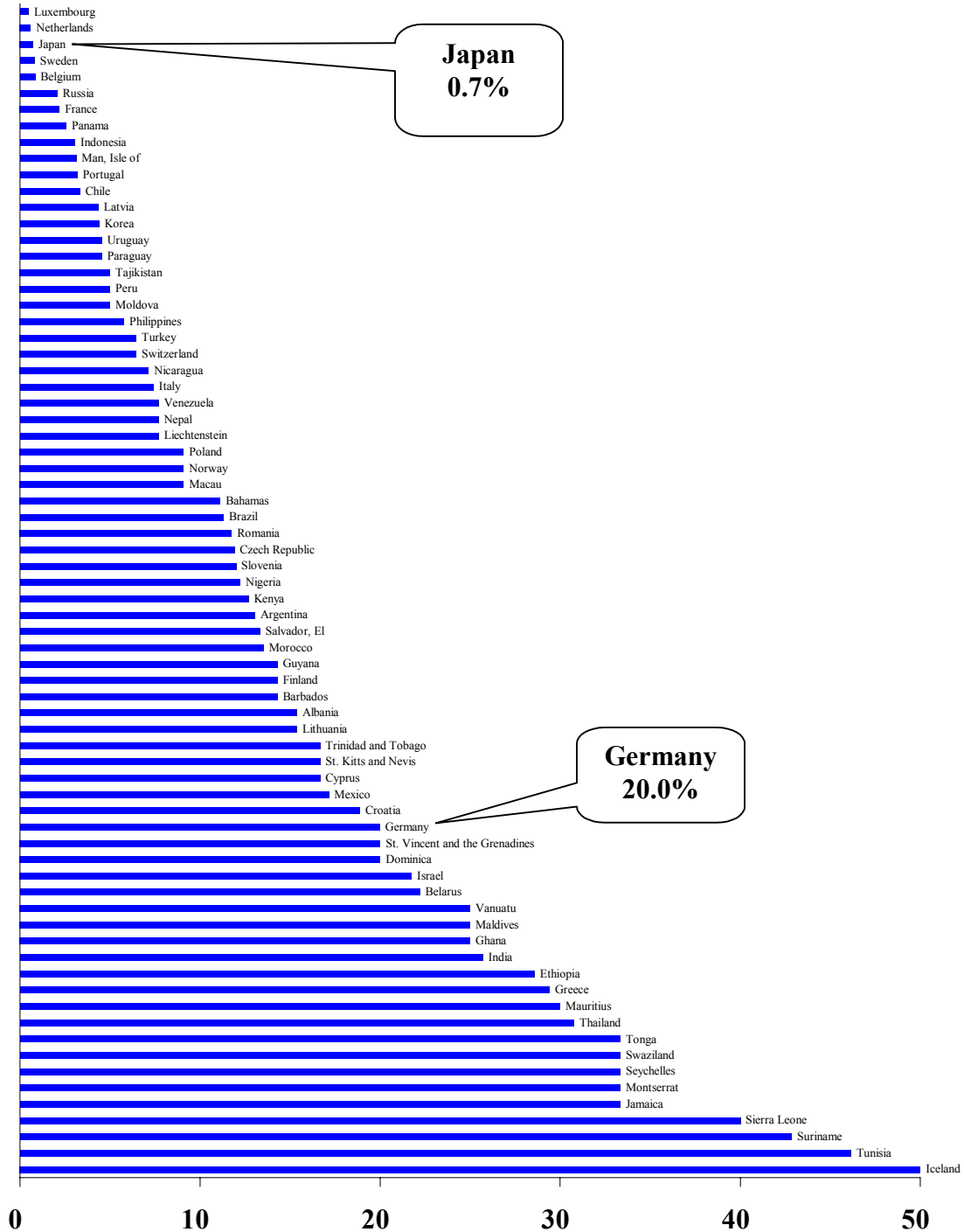


Figure 3. Number of Banks per 100,000 Population – 1999



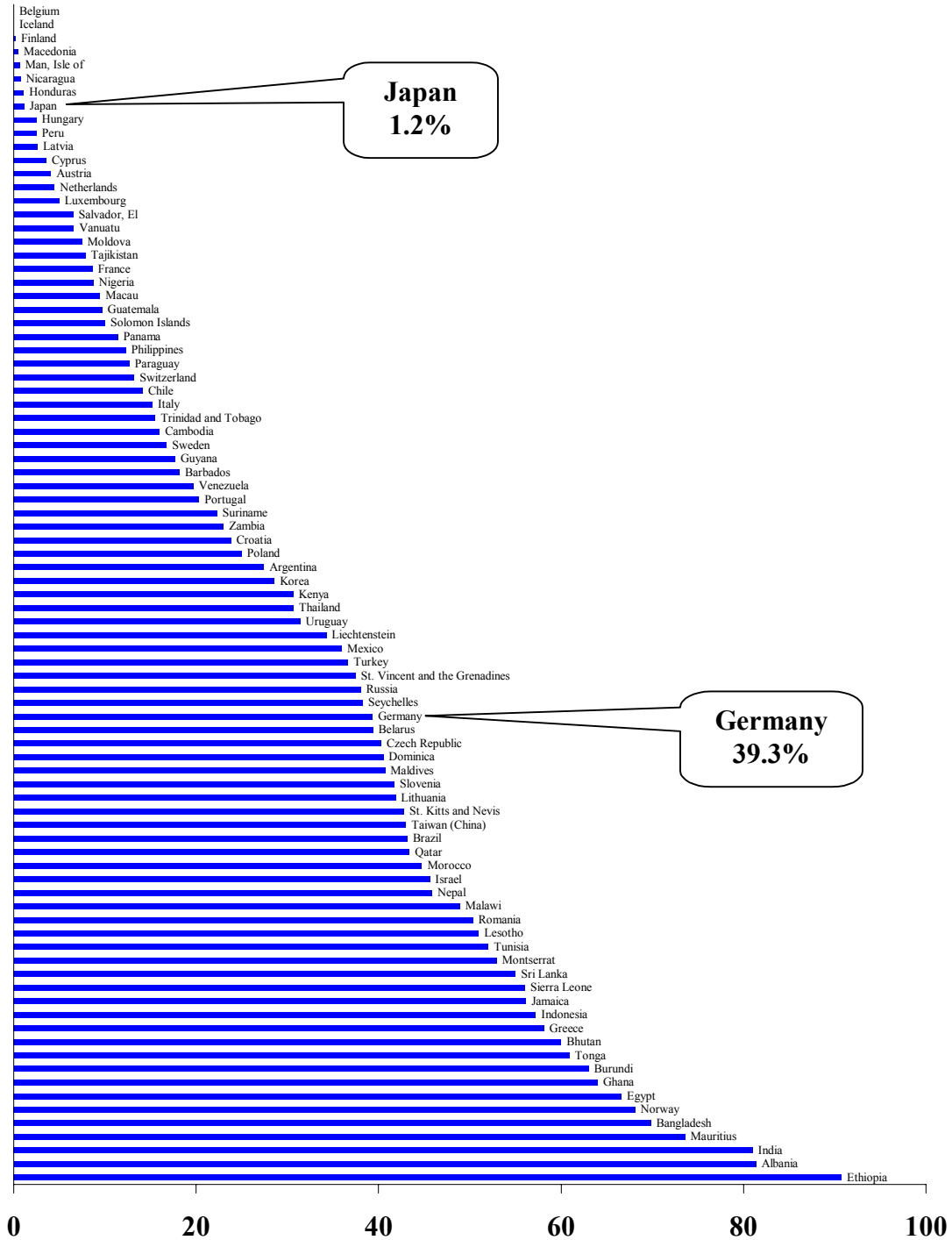
Note: Cayman Islands = 1,151, Guernsey = 122, Gibraltar = 90, Jersey = 86, Man, Isle of = 84, Luxembourg = 49, Turks and Caicos Islands = 47, Liechtenstein = 41, Anguilla = 33, Montserrat = 23, British Virgin Islands = 21.

Figure 4. Percent of Banks That Are Government Owned – 1999



Guatemala = 94%. Percent of banks that are government owned = 0 for: Anguilla, Antigua and Barbuda, Aruba, Australia, Bahrain, Belize, Bermuda, Bolivia, Botswana, British Virgin Islands, Canada, Cayman Islands, Denmark, Estonia, Gambia, Gibraltar, Grenada, Guernsey, Hong Kong, Jersey, Jordan, Kuwait, Lebanon, Malaysia, Malta, Mozambique, New Zealand, Oman, Puerto Rico, Rwanda, Western Samoa, Saudi Arabia, Singapore, South Africa, Spain, St. Lucia, Turks and Caicos Islands, United Kingdom, United States.

Figure 5. Percent of Bank Assets That Are Government Owned – 1999



Percent of bank assets that are government owned = 0 for Anguilla, Antigua and Barbuda, Aruba, Australia, Bahrain, Belize, Bermuda, Bolivia, Botswana, British Virgin Islands, Canada, Cayman Islands, Denmark, Estonia, Gambia, Gibraltar, Grenada, Guernsey, Hong Kong, Jersey, Jordan, Kuwait, Lebanon, Malaysia, Malta, Mozambique, New Zealand, Oman, Puerto Rico, Rwanda, Western Samoa, Saudi Arabia, Singapore, South Africa, Spain, St. Lucia, Turks and Caicos Islands, United Kingdom, United States.

Figure 6. Concentration in Banking Systems -1999
 (Percent of banking system assets accounted for by 3 largest banks)

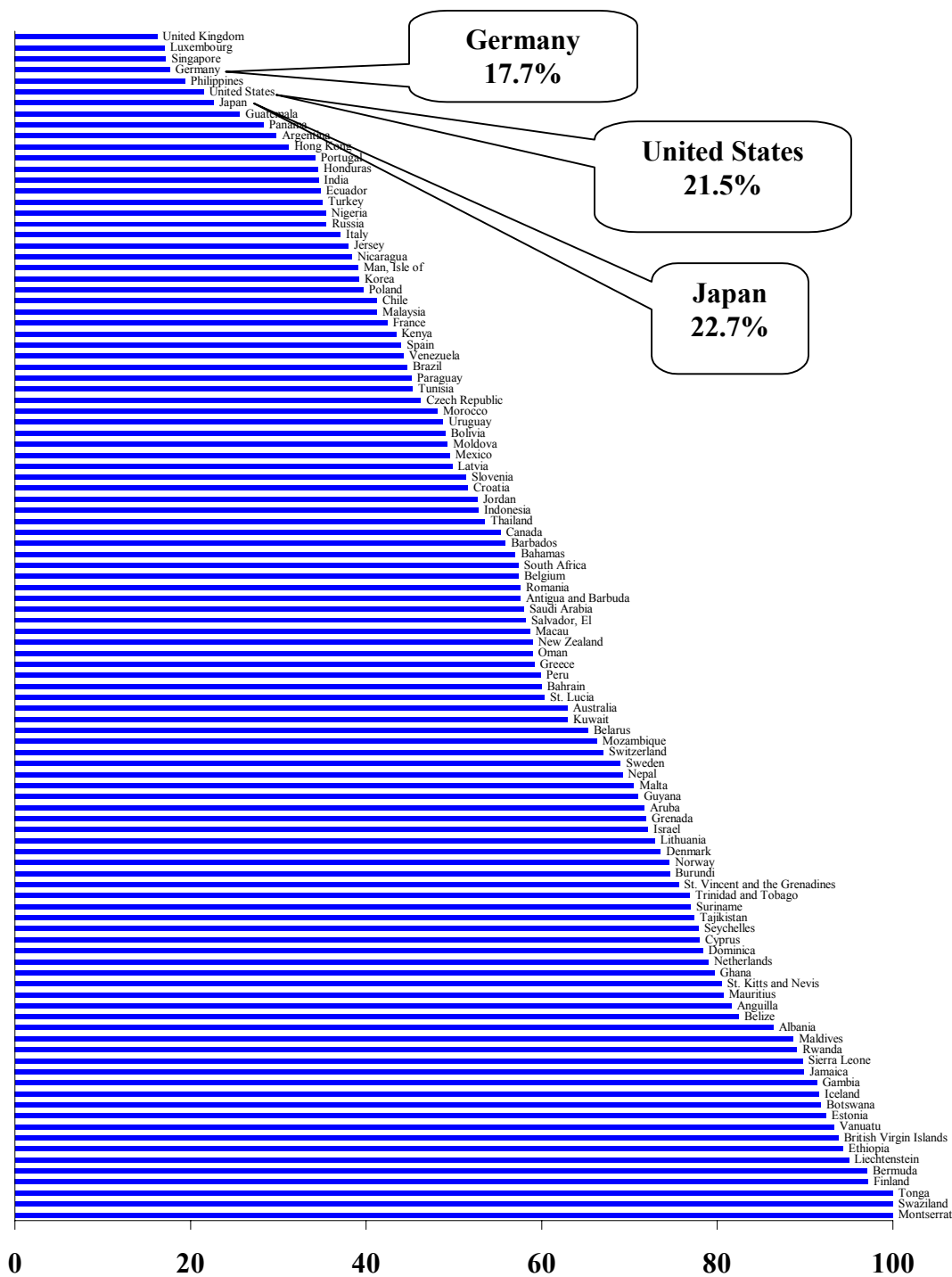
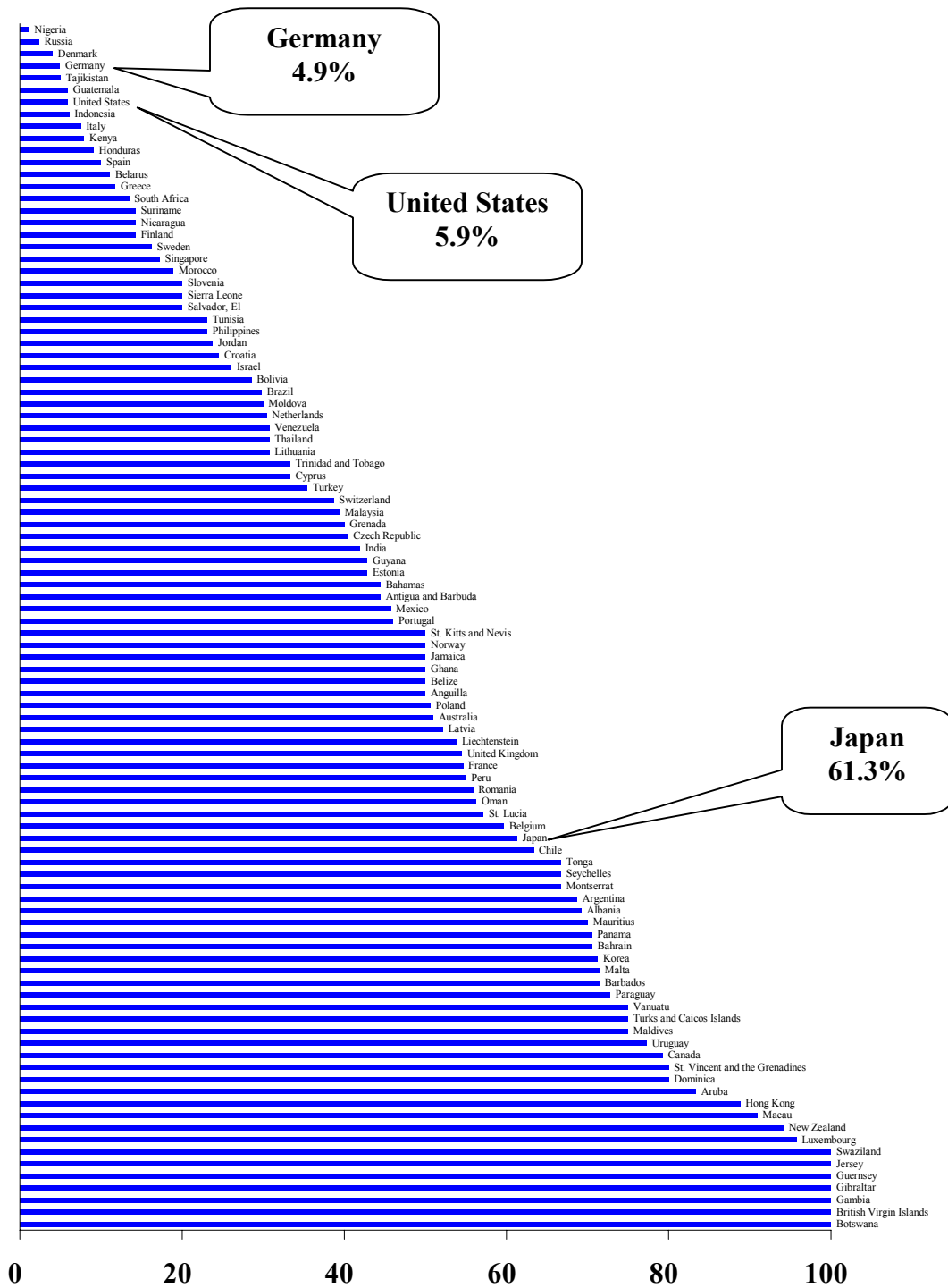
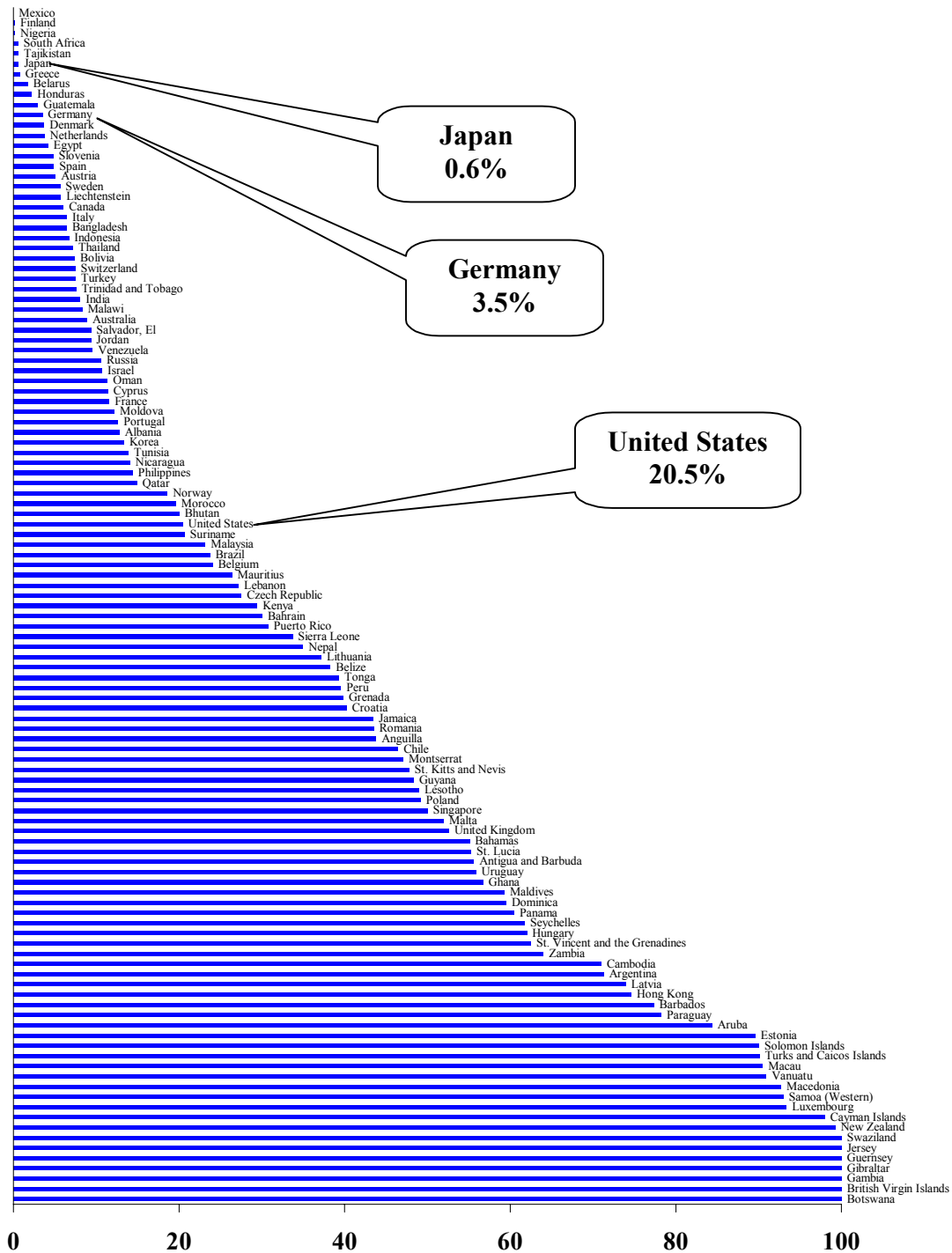


Figure 7. Percent of Banks That Are Foreign Owned – 1999



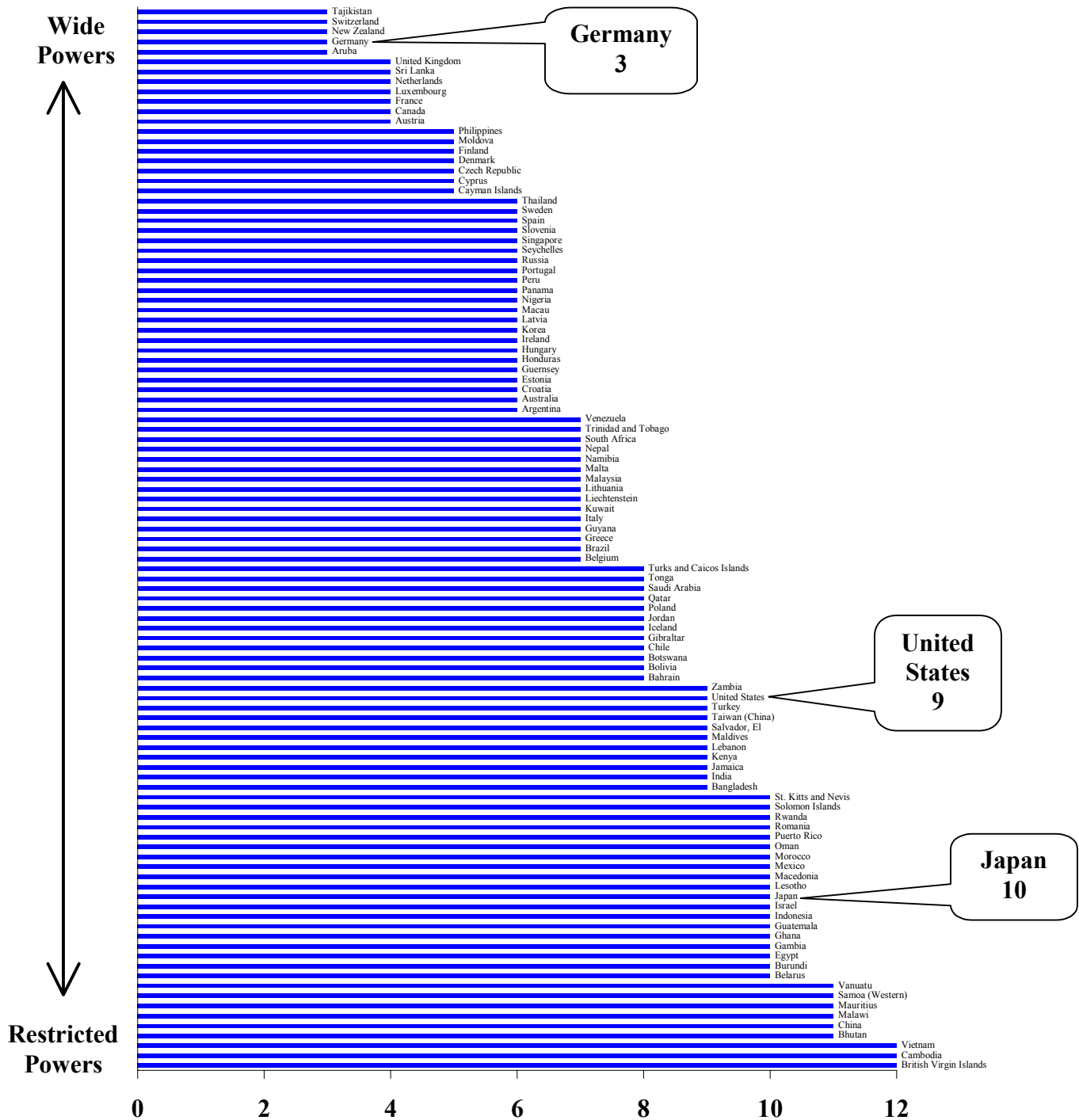
Percent of banks that are foreign owned = 0 for Bermuda, Burundi, Iceland, Kuwait, Man, Isle of, Mozambique, Rwanda, Saudi Arabia.

Figure 8. Percent of Bank Assets That Are Foreign Owned – 1999



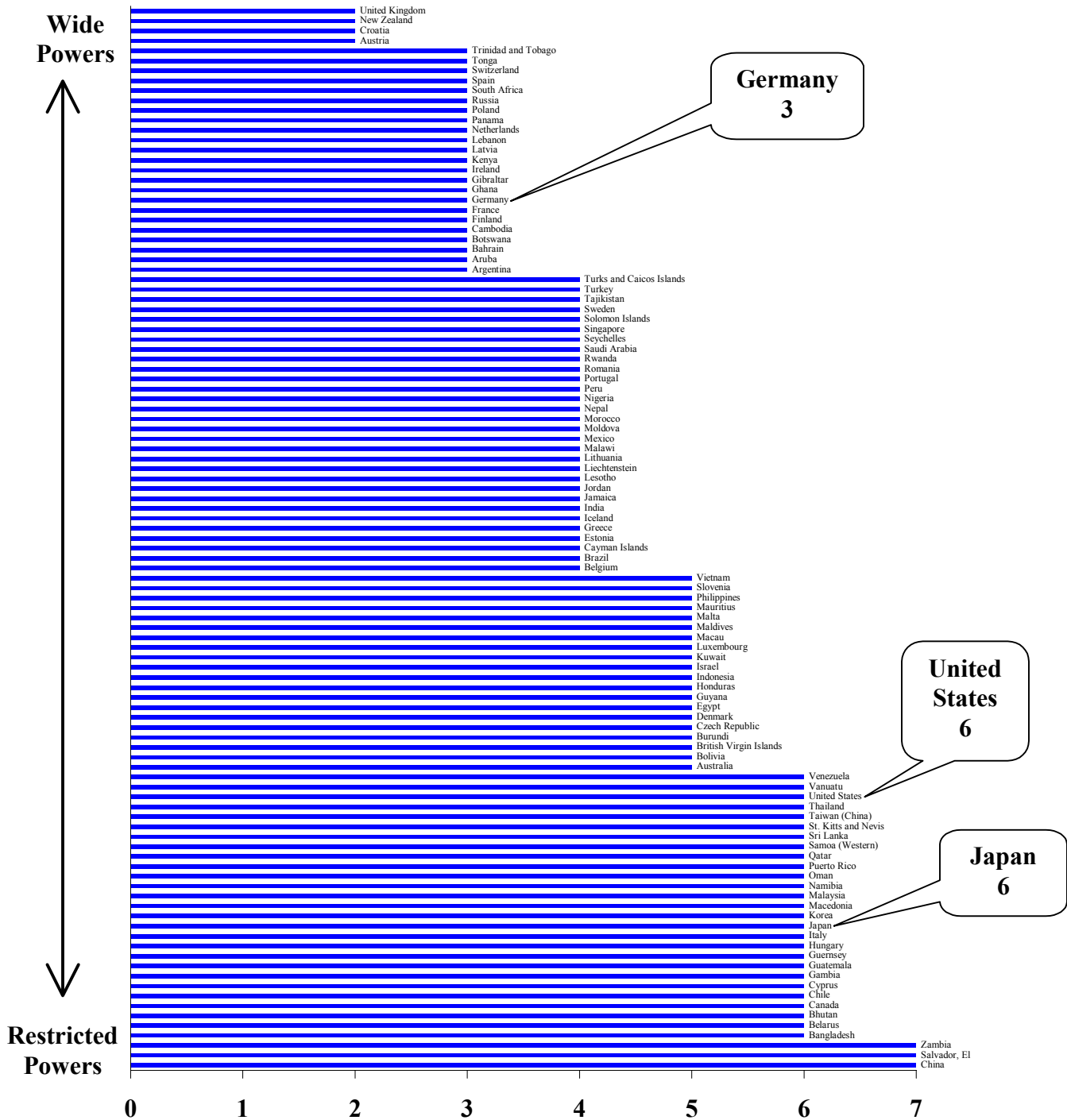
Percent of bank assets that are foreign owned = 0 for Bermuda, Burundi, Iceland, Kuwait, Man, Isle of, Mozambique, Rwanda, Saudi Arabia.

Figure 9. Banking Powers Vary Widely Across Countries – 1999



An index of the overall restrictiveness of permissible banking powers was calculated by summing index values ranging from 1 (unrestricted) to 4 (prohibited) for securities, insurance, and real estate activities, respectively, following Barth, Caprio, and Levine (2001b).

Figure 10. Mixing of Banking and Commerce - 1999



An index of the overall degree to which banking and commerce can be mixed via ownership was calculated by summing index values ranging from 1 (unrestricted) to 4 (prohibited) for separate indices for banks owning nonfinancial firms and nonfinancial firms owning banks, following Barth, Caprio, and Levine (2001b).

Table 1. Banking System Structure: Key Characteristics, by Geographic Region/Multilateral Group – 1999

Region/Multilateral Group	Percent of world banking assets	Banking assets/GDP (%)	Number of banks per 100,000 people	Government ownership; % of banking assets	Foreign ownership: % of banking assets
Europe	52.7	226.7	1.2	17.3	18.7
Africa	0.5	70.6	0.1	15.1	7.3
Asia: Japan	18.0	164.1	0.1	1.2	0.6
Non-Japan Asia	9.0	161.3	0.1	13.6	35.2
Americas: United States	14.3	65.9	3.9	0.0	20.5
Non-U.S. Americas	2.3	48.6	0.2	33.3	31.8
G-10	80.7	155.1	1.9	10.5	13.8
OECD	90.1	151.3	1.5	10.7	14.9
APEC	43.1	106.5	0.5	2.4	14.8
Offshore Financial Centers	0.9	561.1	5.7	1.8	71.1

Table 2. Banking Powers Vary Widely Across Countries

	Securities Activities			Insurance Activities			Real Estate Activities		
Unrestricted	Aruba Australia Austria Bahrain Bangladesh Botswana Canada Cayman Islands Czech Republic Denmark Finland France Germany Guyana India	Ireland Italy Jordan Kuwait Latvia Lebanon Liechtenstein Luxembourg Macau Malta Moldova Nepal Netherlands New Zealand	Panama Philippines Portugal Qatar Russia Singapore Spain Sri Lanka Sweden Switzerland Taiwan (China) Tajikistan United Kingdom Zambia	Aruba Germany Guernsey	Macau New Zealand Sri Lanka	Switzerland Tajikistan	Aruba Austria Canada Cayman Islands Cyprus Finland	France Germany Ireland Luxembourg Netherlands	New Zealand Russia Switzerland Tajikistan United Kingdom
Permitted	Argentina Belgium Bolivia Brazil Chile Croatia Cyprus Egypt Estonia Gambia Ghana Gibraltar Greece Guernsey	Honduras Hungary Iceland Indonesia Israel Kenya Korea Lesotho Lithuania Malaysia Morocco Namibia Nigeria	Oman Peru Poland Romania Rwanda Salvador, El Saudi Arabia Seychelles Slovenia South Africa Thailand Tonga Turks and Caicos Islands Venezuela	Argentina Australia Austria Belgium Bolivia Brazil Canada Chile Croatia Cyprus Czech Republic Denmark Estonia France Guernsey Hungary	Iceland Italy Korea Kuwait Latvia Liechtenstein Lithuania Luxembourg Malaysia Maldives Moldova Namibia Netherlands Nigeria Panama Peru	Philippines Portugal Saudi Arabia Seychelles Singapore Slovenia South Africa Spain Sweden Thailand Tonga Trinidad and Tobago Turkey United Kingdom Venezuela	Argentina Croatia Czech Republic Denmark Estonia Greece Honduras	Hungary Korea Moldova Nepal Nigeria Peru	Philippines Seychelles Slovenia Sri Lanka Thailand Trinidad and Tobago
Restricted	Belarus Bhutan Burundi Guatemala Jamaica Japan	Macedonia Malawi Maldives Mauritius Mexico Puerto Rico	Solomon Islands St. Kitts and Nevis Trinidad and Tobago Turkey United States	Bahrain Botswana Cayman Islands China Finland Gibraltar	Greece Guatemala Guyana Jamaica Malta Poland	Salvador, El Solomon Islands St. Kitts and Nevis Turks and Caicos Islands United States Vanuatu	Australia Belarus Belgium Brazil Burundi Gibraltar Guernsey Guyana Jamaica Japan Jordan	Kenya Latvia Lithuania Macedonia Malaysia Malta Mexico Namibia Panama Poland Portugal	Puerto Rico Qatar Samoa (Western) Singapore South Africa Spain Sweden Turks and Caicos Islands United States Venezuela
Prohibited	British Virgin Islands Cambodia	China Samoa (Western) Vietnam	Vanuatu	Bangladesh Belarus Bhutan British Virgin Islands Burundi Cambodia Egypt Gambia Ghana India Indonesia Ireland	Israel Japan Jordan Kenya Lebanon Lesotho Macedonia Malawi Mauritius Mexico Morocco	Nepal Oman Puerto Rico Qatar Romania Russia Rwanda Samoa (Western) Taiwan (China) Vietnam Zambia	Bahrain Bangladesh Bhutan Bolivia Botswana British Virgin Islands Cambodia Chile China Egypt Gambia Ghana Guatemala Iceland	India Indonesia Israel Italy Kuwait Lebanon Lesotho Liechtenstein Macau Malawi Maldives Mauritius Morocco	Oman Romania Rwanda Salvador, El Saudi Arabia Solomon Islands St. Kitts and Nevis Taiwan (China) Tonga Turkey Vanuatu Vietnam Zambia

Unrestricted - The full range of activities can be conducted directly in the bank.

Permitted - The full range of activities can be conducted, but some activities must be housed in affiliates of the bank rather than directly in the bank.

Restricted - Less than a full range of activities is permitted.

Prohibited - Banks are not permitted to engage in the activities.

**Table 3. Legal Ability to Mix Banking and Commerce
Varies Widely Across Countries**

	Bank Owning Nonfinancial Firms			Nonfinancial Firm Owning Banks		
Unrestricted	Argentina Aruba Austria Bahrain British Virgin Islands	Croatia India Kenya Maldives Nepal	New Zealand South Africa Spain United Kingdom	Austria Bolivia Botswana Brazil Cambodia Croatia Finland France Germany Ghana Gibraltar Iceland Indonesia	Ireland Jamaica Jordan Latvia Lebanon Morocco Netherlands New Zealand Nigeria Panama Poland Portugal Romania	Russia Rwanda Saudi Arabia Solomon Islands Sweden Switzerland Tajikistan Tonga Trinidad and Tobago Turkey Turks and Caicos Islands United Kingdom
Permitted	Australia Belgium Botswana Burundi Cambodia Cayman Islands Estonia Finland France Germany Ghana Gibraltar Greece	Guernsey Guyana Ireland Latvia Lebanon Lesotho Liechtenstein Lithuania Luxembourg Malawi Mauritius Mexico Moldova	Netherlands Panama Peru Philippines Poland Russia Seychelles Singapore Switzerland Tonga Trinidad and Tobago Vietnam	Argentina Aruba Bahrain Belgium Cayman Islands Czech Republic Denmark Egypt Estonia Gambia Greece	Honduras Israel Kenya Kuwait Lesotho Liechtenstein Lithuania Macau Malawi Malta	Mexico Moldova Namibia Peru Puerto Rico Seychelles Singapore Slovenia South Africa Spain
Restricted	Bangladesh Belarus Bhutan Brazil Canada Chile China Cyprus Czech Republic Denmark Egypt Guatemala Honduras Hungary Iceland Israel	Italy Jamaica Japan Jordan Korea Kuwait Macau Macedonia Malaysia Malta Morocco Nigeria Oman Portugal Qatar Romania	Rwanda Samoa (Western) Saudi Arabia Slovenia Solomon Islands Sri Lanka St. Kitts and Nevis Sweden Taiwan (China) Tajikistan Thailand Turkey Turks and Caicos Islands United States Vanuatu Venezuela	Australia Bangladesh Belarus Bhutan Burundi Canada Chile Cyprus Guatemala Guyana Hungary India	Italy Japan Korea Luxembourg Macedonia Malaysia Mauritius Nepal Oman Philippines Qatar	Salvador, El Samoa (Western) Sri Lanka St. Kitts and Nevis Taiwan (China) Thailand United States Vanuatu Venezuela Vietnam Zambia
Prohibited	Bolivia Gambia Indonesia	Namibia Puerto Rico	Salvador, El Zambia	British Virgin Islands China	Guernsey	Maldives

Unrestricted - A nonfinancial firm/bank may own 100 % of the equity in a bank/ nonfinancial firm.

Permitted - For banks owning nonfinancial firms: a bank may own up to 100% of a nonfinancial firm but ownership share is limited based on a bank's equity capital. For nonfinancial firms owning banks: unrestricted ownership, but prior authorization/ approval necessary.

Restricted - Limits are placed on type and/or percent of ownership interests.

Prohibited - No equity investment permitted.

Table 4. Single Supervisory Authority Predominates

Income Level	Single Bank Supervisory Authority				Multiple Bank Supervisory Authority		
High Income	Aruba Austria Belgium British Virgin Islands Canada Cayman Islands Cyprus Denmark	Finland France Greece Guernsey Iceland Ireland Israel Italy	Japan Kuwait Liechtenstein Luxembourg Macau Netherlands New Zealand Portugal	Qatar Singapore Slovenia Spain Sweden Switzerland Turks and Caicos Islands United Kingdom	Australia Germany	Gibraltar Taiwan	United States
Upper Middle Income	Bahrain Botswana Brazil Chile Croatia	Estonia Lebanon Malaysia Malta Mauritius	Mexico Oman Panama Saudi Arabia Seychelles	South Africa St. Kitts and Nevis Trinidad and Tobago Venezuela	Argentina Czech Republic	Hungary Korea	Poland Puerto Rico
Lower Middle Income	Bolivia China Egypt Guatemala Guyana	Honduras Jamaica Jordan Lithuania Macedonia	Maldives Morocco Namibia Peru Philippines	Romania Salvador, El Samoa (Western) Sri Lanka Tonga	Belarus Latvia	Thailand Turkey	Vanuatu
Low Income	Bangladesh Bhutan Burundi Cambodia Gambia	Ghana India Indonesia Kenya Lesotho	Malawi Moldova Nepal Nigeria Solomon Islands	Tajikistan Vietnam Zambia	Rwanda		
Offshore Financial Centers	Aruba Bahrain British Virgin Islands Cayman Islands	Cyprus Guernsey Macau Malta	Mauritius Oman Samoa (Western) Seychelles	Solomon Islands St. Kitts and Nevis Turks and Caicos Islands	Gibraltar	Puerto Rico	Vanuatu

Table 5. Majority of Countries Rely on Central Bank as a Supervisor

Income Level	Central Bank Only	Central Bank Among Multiple Supervisors	Central Bank Not a Supervisory Authority
High Income	Aruba Italy Portugal Cayman Islands Kuwait Qatar Cyprus Macau Singapore Greece Netherlands Slovenia Ireland New Zealand Spain Israel	Germany United States Taiwan	Australia Finland Liechtenstein Austria France Luxembourg Belgium Gibraltar Sweden British Virgin Islands Guernsey Switzerland Canada Iceland Turks and Caicos Islands Denmark Japan United Kingdom
Upper Middle Income	Bahrain Lebanon Saudi Arabia Botswana Malaysia Seychelles Brazil Malta South Africa Croatia Mauritius St. Kitts and Nevis Estonia Oman Trinidad and Tobago	Argentina Hungary Czech Republic Poland	Chile Mexico Puerto Rico Korea Panama Venezuela
Lower Middle Income	China Lithuania Romania Egypt Macedonia Russia Guatemala Maldives Samoa (Western) Guyana Morocco Sri Lanka Jamaica Namibia Tonga Jordan Philippines	Belarus Turkey Latvia Vanuatu Thailand	Bolivia Peru Salvador, El Honduras
Low Income	Bangladesh India Nepal Bhutan Indonesia Nigeria Burundi Kenya Solomon Islands Cambodia Lesotho Tajikistan Gambia Malawi Vietnam Ghana Moldova Zambia	Rwanda	
Offshore Financial Centers	Aruba Macau Samoa (Western) Bahrain Malta Seychelles Cayman Islands Mauritius Solomon Islands Cyprus Oman St. Kitts and Nevis	Vanuatu	British Virgin Islands Guernsey Turks and Caicos Islands Gibraltar Puerto Rico

**Table 6. The Structure of Supervision and Banking Industry Structure:
Difference of Mean Tests**

Industry Structure	Single Supervisor	Multiple Supervisor	Central Bank Is a Supervisor	Central Bank Is Not a Supervisor
Banking assets/GDP (%)	180.96	96.10	109.10	307.04
<i>Number of Countries</i>	67	13	58	23
<i>[t-statistic]</i>		<i>[1.51]</i>		<i>[1.36]</i>
Average size bank (\$mil)	3,047.03	2,722.05	1,728.07	5,857.63
<i>Number of Countries</i>	69	14	59	25
<i>[t-statistic]</i>		<i>[0.24]</i>		<i>[1.88]*</i>
Banks per 100,000 population	17.27	6.02	15.75	14.23
<i>Number of Countries</i>	89	17	79	28
<i>[t-statistic]</i>		<i>[0.80]</i>		<i>[-0.10]</i>
Percent of banks owned by government	9.89	9.81	11.72	5.27
<i>Number of Countries</i>	71	15	61	26
<i>[t-statistic]</i>		<i>[0.02]</i>		<i>[-2.30]**</i>
Percent of bank assets owned by government	20.65	18.94	25.49	7.26
<i>Number of Countries</i>	85	17	75	28
<i>[t-statistic]</i>		<i>[0.34]</i>		<i>[-5.30]***</i>

***, **, * denote significance at 1%, 5%, and 10% level, respectively.

**Table 7. The Structure of Supervision, Concentration, and Entry:
Difference of Mean Tests**

Industry Structure	Single Supervisor	Multiple Supervisor	Central Bank Is a Supervisor	Central Bank Is Not a Supervisor
3-bank concentration ratio (% of banking system assets)	59.77	49.47	58.94	55.02
<i>Number of Countries</i>	68	13	59	23
<i>[t-statistic]</i>		<i>[1.47]</i>		<i>[-0.67]</i>
New banks-to-total banks (%)	28.33	19.77	26.26	28.15
<i>Number of Countries</i>	69	15	60	24
<i>[t-statistic]</i>		<i>[1.20]</i>		<i>[0.28]</i>
Percent of entry application denied	25.35	11.70	28.95	8.29
<i>Number of Countries</i>	63	12	54	21
<i>[t-statistic]</i>		<i>[1.45]</i>		<i>[-3.55]***</i>
Percent of bank foreign owned	42.09	42.67	37.10	52.02
<i>Number of Countries</i>	69	14	58	26
<i>[t-statistic]</i>		<i>[-0.07]</i>		<i>[2.13]**</i>
Percent of bank assets foreign owned	33.09	35.51	34.58	29.79
<i>Number of Countries</i>	84	16	73	28
<i>[t-statistic]</i>		<i>[-0.26]</i>		<i>[-0.62]</i>

***, **, * denote significance at 1%, 5%, and 10% level, respectively.

**Table 8. The Structure of Banking Supervision
and Permissible Powers and Ownership:
Difference of Means Tests**

Banking Powers	Single Supervisor	Multiple Supervisor	Central Bank Is a Supervisor	Central Bank Is Not a Supervisor
Securities activities	1.84	2.06	1.91	1.75
<i>Number of Countries</i>	89	17	79	28
<i>[t-statistic]</i>		<i>[-0.91]</i>		<i>[-0.88]</i>
Insurance activities	2.73	2.65	2.86	2.36
<i>Number of Countries</i>	89	17	79	28
<i>[t-statistic]</i>		<i>[0.33]</i>		<i>[-2.60]**</i>
Real estate activities	2.93	2.82	2.57	3.01
<i>Number of Countries</i>	89	17	79	28
<i>[t-statistic]</i>		<i>[0.45]</i>		<i>[-1.84]*</i>
Composite index of banking powers	7.51	7.53	7.78	6.68
<i>Number of Countries</i>	89	17	79	28
<i>[t-statistic]</i>		<i>[-0.04]</i>		<i>[-2.24]**</i>
Bank Owning Nonfinancial Firms	2.42	2.65	2.44	2.46
<i>Number of Countries</i>	89	17	79	28
<i>[t-statistic]</i>		<i>[-1.21]</i>		<i>[0.12]</i>
Nonfinancial Firm Owning Banks	2.03	2.12	2.04	2.04
<i>Number of Countries</i>	89	17	79	28
<i>[t-statistic]</i>		<i>[-0.34]</i>		<i>[-0.01]</i>
Composite Index of Mixing Banking and Commerce	4.45	4.76	4.48	4.50
<i>Number of Countries</i>	89	17	79	28
<i>[t-statistic]</i>		<i>[-0.89]</i>		<i>[0.07]</i>

***, **, * denote significance at 1%, 5%, and 10% level, respectively.

**Table 9. The Structure and Implementation of Supervision:
Difference of Means Tests**

Supervision Measures	Single Supervisor	Multiple Supervisor	Central Bank Is a Supervisor	Central Bank Is Not a Supervisor
Independence of supervisory authorities	1.70	1.81	1.67	1.81
<i>Number of Countries</i>	86	16	76	27
<i>[t-statistic]</i>		<i>[-0.44]</i>		<i>[0.77]</i>
Overall supervisory power	11.13	11.18	11.13	11.04
<i>Number of Countries</i>	87	17	78	27
<i>[t-statistic]</i>		<i>[-0.06]</i>		<i>[-0.15]</i>
Professional supervisors per bank	2.44	3.83	2.60	2.93
<i>Number of Countries</i>	75	16	70	22
<i>[t-statistic]</i>		<i>[-1.17]</i>		<i>[0.40]</i>
Private sector monitoring	6.88	5.94	6.65	6.86
<i>Number of Countries</i>	88	17	78	28
<i>[t-statistic]</i>		<i>[1.63]</i>		<i>[0.59]</i>
Sub-debt as a component of capital	0.85	0.94	0.83	0.96
<i>Number of Countries</i>	88	17	78	28
<i>[t-statistic]</i>		<i>[-1.27]</i>		<i>[2.36]**</i>
Explicit Deposit Insurance	0.59	0.71	0.54	0.77
<i>Number of Countries</i>	87	17	78	27
<i>[t-statistic]</i>		<i>[-0.95]</i>		<i>[2.41]**</i>

***, **, * denote significance at 1%, 5%, and 10% level, respectively.