A Cross-Country Analysis of the Bank Supervisory Framework and Bank Performance

James R. Barth
Auburn University and Milken Institute
jbarth@business.auburn.edu

Daniel E. Nolle
Office of the Comptroller of the Currency
daniel.nolle@occ.treas.gov

Triphon Phumiwasana
Milken Institute
ephumiwasana@milkeninstitute.org

Glenn Yago
Milken Institute
gyago@milkeninstitute.org

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Abstract: Ongoing changes in the structure and nature of banking, as well as banking crises across the globe have focused the attention of policy makers on the appropriate structure, scope, and degree of independence of banking supervision. Key issues for banking supervision structure are whether there should be one or multiple supervisory authorities, and whether the central bank should be involved in bank supervision. The issue pertaining to the scope of supervision is whether bank supervisory authorities should supervise other financial service industries, including in particular securities and insurance. Finally, the issue regarding the independence of supervisory authorities is the degree to which bank supervisors should be subject to political and economic policy pressure and influence. How these issues are addressed is important, because policies that fail to provide for an appropriate bank supervisory framework may undermine bank performance and even lead to full-scale banking crises.

The intense interest policy makers have shown in these issues has not been matched, however, by researchers. In particular, there is very little systematic empirical evidence on how, or indeed whether, the structure, scope, or independence of bank supervision affects the banking industry. This paper addresses this gap in three respects. First, drawing on the existing literature, we discuss the various policy issues surrounding the structure, scope, and degree of independence of bank supervision. Second, we provide comparative information on the actual choices that have been made regarding these three aspects of supervision across a wide range of developed and emerging market economies. Third, using both country-specific data for 55 countries in all parts of the world, and data for over 2,300 individual banks in those countries, we examine the relationship between the structure, scope, and independence of bank supervision and one key dimension of the banking industry - bank profitability. Our results indicate, at most, a weak influence for the structure of supervision on bank performance. In particular, we find some evidence that a single-supervisor system enhances bank performance. However, following our discussion of the caution one must use in interpreting data on the supervisory framework, our re-estimates using an alternative source of data on the structure of supervision failed to duplicate this result.

Our results have a bearing on a key dimension of the policy debate on how to structure supervision. In particular, given the dearth of empirical evidence on the issues, advocates of one form or another of supervisory structure have asserted that a particular change is likely to affect (favorably or adversely, as the advocate sees fit) the performance of banks. Our results provide little support at best to the belief that any particular bank supervisory structure will greatly affect bank performance. This is significant, because it suggests that the on-going debate might more

broadly focus on the impact of the supervisory structure on other aspects of the health of the banking system, including individual bank safety and soundness, systemic stability, and the development of the banking system.

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Please address correspondence to Daniel E. Nolle, Senior Financial Economist, Policy Analysis Division, Office of the Comptroller of the Currency, 250 E. Street, SW, Washington, DC 20219 (phone: 202-874-4442; e-mail: daniel.nolle@occ.treas.gov).

I. Introduction

Many countries around the world have experienced banking crises in the past two decades, and all countries are witnessing substantial changes in the structure and nature of banking.[1] These developments have led national and multilateral policy makers to focus increased attention on the crucial role of banking supervision. This focus is reinforced by the fact that "…one of the important [international] trends has been, and continues to be, a move away from regulation and towards supervision."[2] Policy discussions specifically focus on several issues that must be addressed in establishing and maintaining effective supervision, including the structure, scope, and independence of bank supervision. Should banks be subject to one or multiple supervisory authorities? Should the central bank be involved in bank supervision? Should bank supervisory authorities supervise other financial service industries, including in particular securities and insurance? To what degree should bank supervisors be subject to political and economic policy pressure and influence? How these issues are addressed is important because policies that fail to provide for an appropriate bank supervisory framework may undermine bank performance and even lead to full-scale banking crises.

Researchers have begun to take advantage of the recent availability of wide-ranging cross-country data on banking to explore aspects of banking that were traditionally taken as

[1] See, for example, Caprio and Klingebiel (2002) for a comprehensive cataloging of 113 systemic banking crises in 93 countries since the late 1970s, and Kaufman (2000) for a wide-ranging description of banking crises around the world. See Group of Ten (2001) for an exhaustive study of consolidation and structural change in banking and finance in the eleven G-10 countries, as well as Australia and Spain.

[2] Crockett (2001). "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, for example, Spong (2001) and Jordan (2001). For an explanation of how supervision, regulation, market discipline, and corporate governance can be integrated into a "regulatory regime," see Llewellyn (2001) and related comments by Estrella (2001).

given in single-country studies of banking structure and performance.[3] For example, a small but growing body of research has begun to examine the impact of differences in permissible banking activities on bank performance and banking stability.[4] To date, however, there has been relatively little systematic cross-country research on the structure, scope, and independence of banking supervision.[5] Indeed, as Abrams and Taylor (2001) state, ". . . the subject of regulatory structure has . . . been under-researched."[6]

This paper addresses these gaps in three respects. First, drawing on the existing literature, we discuss the various policy issues surrounding the structure, scope, and degree of independence of bank supervision. Second, we provide comparative information on the actual choices that have been made regarding these three aspects of supervision across a wide range of developed and emerging market economies. Third, given the greater significance being attached to the provision of bank supervision, it is important to know how, and indeed whether, bank supervision affects the banking industry. Using both country-specific data for 55 countries in all parts of the world, and data for over 2,300 individual banks in those countries, we examine the relationship between the structure, scope, and independence of bank supervision and one key dimension of the banking industry -- bank profitability. We only find limited evidence that the

[3] See Barth, Caprio, and Levine (2001) for a detailed explanation of one set of recently available cross-country data.

[4] See, for example, Barth, Nolle, and Rice (2000), and Barth, Caprio, and Levine (2002).

[5] Barth, Dopico, Nolle, and Wilcox (2002b) summarize the relatively small amount of recent literature on the structure of supervision, noting that it is largely conceptual, as compared to empirical, in nature.

[6] Abrams and Taylor (2001, p. 10). Taylor and Fleming (1999, p.2) 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." In addition, Quintyn and Taylor (2002) note that there is relatively little research on the impact of regulatory and supervisory independence on banking industry performance, the key focus of the empirical analysis in the current paper. An exception is the recent study by Barth, Caprio, and Levine (2002), which considers the relationship between the number of supervisory authorities and the degree of independence of those authorities and bank development, performance, and stability.

structure of bank supervision is systematically related to bank profitability. However, we also discuss difficulties inherent in characterizing the nature of bank supervisory structure, and demonstrate that alternative judgments about that characterization can alter one's conclusions.

The paper is structured as follows. Section II discusses the issues regarding the structure, scope, and independence of bank supervision in the context of the previous literature. Section III describes the dataset used in the empirical analysis, and highlights cross-country differences in the structure, scope, and independence of bank supervisory authorities. Section IV explains our empirical model to analyze the relationship between supervision and bank profitability. Section V presents our empirical results. Section VI contains our summary and conclusions.

II. The Structure, Scope, and Independence of Bank Supervision: Issues and Previous Literature

Regardless of the differing degrees to which countries emphasize reliance on market forces or government intervention, and regardless of whether countries emphasizes regulation and supervision of many industries or a few, every country regulates and supervises banks.[7] Among the bank supervision issues with which policy makers must deal, but which have received relatively little attention from banking researchers, are the appropriate structure of bank supervision, the appropriate scope of financial activities to be supervised, and the degree of independence of supervisory authorities from political and economic policy pressure and influence. This section considers each of these issues in turn, drawing where possible on the existing literature.

[7] For a discussion of the issue of why banks are regulated and supervised, see Benston and Kaufman (1996), Goodhart, Hartman, Llewellyn, Rojas-Suarez, and Weisbrod (1998), and Llewellyn (1999a). Dowd (1996) considers the issue of why banks should be regulated at all.

II.A. The Structure of Bank Supervision

There are two key questions about the structure of bank supervision: 1) should there be a single bank supervisory authority, or is a system of multiple supervisory authorities preferable?; and 2) should the central bank be involved in bank supervision? These issues have received a good deal of attention from policy makers in a number of countries over the recent past, but systematic research on the issues is relatively thin.[8] Furthermore, that which does exist is largely conceptual, as compared to empirical, in nature.[9] A review of this literature helps identify arguments both for and against having a single bank supervisory authority, and for and against placing responsibility for bank supervision within the central bank.

II.A.1. A Single Bank Supervisory Authority or Multiple Authorities?[10]

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

Key arguments for having a single bank supervisory authority can be grouped into three categories: safety and soundness, costs to supervisory authorities, and costs to market participants. Each of these is discussed in turn.

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[8] As noted below, the United Kingdom, Japan, several Scandinavian countries, and Germany, among other countries, have removed supervision from the central bank or otherwise greatly altered the structure of bank supervision over the past decade. In the United States, the debate over the appropriate structure of bank supervision has ebbed and flowed for decades. Recently, senior federal-level bank supervisors raised aspects of the issue in public statements; see Hawke (2002) and Powell (2002), and a related press account in Blackwell (2002). See Mote (2002) for a history of the debate over the structure of bank supervision in the United States, and for a summary of legislative proposals to modify the structure of banking supervision.

[9] Kahn and Santos (2001, p.14) provide a recent and important theoretical analysis of "several alternative institutional allocations of regulations, including a unified regulator, a single regulator with private lending, multiple regulators with specialized powers and multiple regulators that compete for last resort lending."

[10] This subsection and the next draw heavily on Barth, Dopico, Nolle, and Wilcox (2002b). Some of the studies cited in the single-vs.-multiple bank supervisor(s) debate concern themselves with the issue of unifying all financial services supervision within a single agency in a country. Beyond this, Briault (1999, pp. 15-16) briefly discusses the issue of a transnational financial services supervisor. See also the discussion in the Economist (2002). Transnational issues also come into play in the debate over financial supervision in the European Union. See, for example, Green and Lannoo (2000), International Monetary Fund (2001), and Goodhart (2002a).

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 (1999b), Goodhart (2002b)].

- *Regulatory arbitrage*: In the case of multiple supervisory authorities, financial institutions may engage in regulatory arbitrage, propelling multiple supervisory authorities into a "competition in laxity." [Llewellyn (1999b), 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 (1999b), 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 (1999b), 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 (1999b), 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," a point also emphasized by Goodhart (2002b).

- *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 (1999b), 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 market economies.

- *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 (1999b)].

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 (1999b), Abrams and Taylor (2001)].

- *Transparency*: A system with a single regulator may be simpler for banks and consumers to understand. [Llewellyn (1999b)].

II.A.1.b. Arguments Against a Single Banking Supervisor

Arguments against having a single banking supervisory system also address safety and soundness, costs to supervisory authorities, and costs to market participants.

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 (1999b)].

Costs to Supervisory Authorities

- *Diseconomies of scale*: A single large supervisory authority could become excessively bureaucratic and inefficient. [Llewellyn (1999b), 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.][11]

- *Excessive power*: A single large regulator would be extremely powerful and this power might become excessive. [Taylor (1995), Kane (1996), Briault (1999), Llewellyn (1999b)].

II.A.2. Should the Central Bank be a Bank Supervisor?

The second important structural issue with which policy makers have wrestled is whether the central bank should be responsible, solely or in part, for banking supervision. As with the question of single or multiple supervisors, there are reasonable arguments on both sides of this issue, but relatively little empirical analysis.

II.A.2.a. Arguments for the Central Bank Supervising Banks

Arguments for assigning at least some, if not all, supervisory responsibility to the central bank emphasize safety and soundness concerns but also point to potential resource advantages.

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 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).

- *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 bank supervision promotes the kind of independent action necessary for successful banking system supervision. [Giddy (1994), Abrams and Taylor (2001)]. Abrams

[11] 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.

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. [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."

II.A.2.b. Arguments Against the Central Bank Supervising Banks

Arguments against assigning any or sole supervision to the central bank focus on safety and soundness concerns.

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.

There has been little empirical examination of these arguments for and against the central bank supervising banks, but that which does exist generally seems to support the benefits of a

narrower focus for the central bank that does not include bank supervision. Using cross-country data, Goodhart and Schoenmaker (1995), and Di Noia and Di Giorgio (1999) find a positive correlation between the rate of inflation and the central bank having responsibility for both monetary policy and supervision. Goodhart and Schoenmaker (1995) point out that independent central banks, which are much better at fighting inflation, are also more likely not to have responsibility for banking supervision.[12] Ioannidou (2002) focuses more narrowly on the United States, where the central bank is one of three federal-level bank supervisors. Using data on formal actions federal bank supervisors take against banks, she presents evidence that the Federal Reserve monetary policy responsibilities affect its supervisory behavior. In particular, Ioannidou finds that when the Federal Reserve increases the federal funds rate its supervisory posture eases somewhat. This could be interpreted as the Federal Reserve's attempt to compensate banks for the extra pressure it puts on them when it increases the funds rate. Finally, Feldman, Kim, Miller, and Schmidt (2002) use data for the U.S. banking system to test the hypothesis that a central bank with direct access to confidential supervisory data can enhance its macroeconomic forecasting ability, and thereby bolster its monetary policy efforts. As they point out, their primary aim is to re-examine the Peek, Rosengren, and Tootle (1999) results. They conclude that there is no empirical support for this variant of the "access to information" argument.

Offering positive but qualified support for the central-bank-as-a-banking-supervisor position, Peek, Rosengren, and Tootle (1999) find that timely access to confidential bank supervisory information enhances the accuracy of the central bank's macroeconomic forecasting ability. They add that "(w)hile the timely sharing of information between other bank supervisors and the central bank is certainly possible, the difficulties in sharing highly confidential

[12] Briault (1999, p.28) mentions the converse of this in observing that "less independent central banks tend to combine monetary policy and regulatory functions."

information, much of which may not be easily quantifiable, might make such arrangements difficult at best."[13] In addition, Goodhart and Schoenmaker (1995) use data for 104 bank failures in 24 countries during the 1980s and find that there were fewer bank failures in countries in which banking supervision and monetary policy were combined in the central bank. They note, however, that "the regime with the smallest number of bank failures is not necessarily the most efficient one in welfare terms."[14]

II.B. The Scope of Supervision

Policy makers have also grappled with the issue of whether bank supervisory authorities should be responsible for supervision of nonbank financial service industries in addition to banking. Impetus for the debate over the scope of supervisors' responsibilities comes from the ongoing blurring of distinctions between different types of financial activities, the growing complexity and size of financial services firms, and the increasing globalization of financial services. In general, the debate has been cast in terms of whether or not it is best to have a single "consolidated" or "unified" supervisor of all financial services.[15]

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[13] Peek, Rosengren, and Tootle (1999, p. 652).

[14] 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."

[15] Generally the discussion focuses on banks, securities firms, and insurance companies. Abrams and Taylor (2000) include a discussion of a "unified" supervisor also having supervisory responsibility for pension funds, finance houses, and leasing companies. They also note that the case for consolidating the supervision of banking and securities firms may be stronger than for including insurance firms as well. This is due to the fact that for banking and securities firms "risks tend to arise on the assets side of the balance sheet" whereas for insurance firms "the main financial risks occur on the liabilities side of the balance sheet (i.e., the primary risk is unanticipated claims by policyholders)" [Abrams and Taylor (2000, p. 9)].

In the debate over unified supervision, more attention generally has been given to a discussion of consolidation of "prudential" supervision (i.e., safety and soundness), as compared to "conduct of business" supervision (i.e., consumer and investor protection). Nevertheless, both issues have played a prominent part in policy debates in the United Kingdom, where the Financial Services Authority (FSA) became the first consolidated supervisor to have wide responsibility for both of these main aspects of supervision, and in Australia, where a "twin peaks" supervisory

As in the case of the structure of banking supervision, the literature on the scope of supervision has been primarily conceptual as compared to empirical. Nevertheless, a review of that literature helps identify arguments both "for" and "against" consolidating supervision under a single supervisory authority. A number of these arguments cover the same conceptual ground outlined in the previous section for the single-vs.-multiple bank supervisors debate, and indeed the primary focus of several of the studies cited therein is on the issue of whether there should be a single supervisory authority not just for banking, but for all financial services. However, some of the points receive added emphasis under the "consolidated supervisor" debate, and several new points arise.

II.B.1. Arguments for a Supervisor with Broad Scope Encompassing Banking and Other Financial Services

Much of the discussion about consolidating financial services supervision takes as its starting point the observation that financial service companies are growing increasingly complex. Financial conglomerates that operate in the banking, securities, and insurance industries are among the most powerful corporations in many countries. In order to supervise such entities effectively, and in particular to insure that supervisory oversight of risk management by such conglomerates is not fragmented, uncoordinated, or incomplete, some have argued that a supervisor with broad scope to cover all financial services is necessary [Abrams and Taylor (2000), Whalen (2001)].

In addition to providing coordinated, consolidated oversight of such complex financial service companies, assigning broader scope to the supervisory authority may be able to realize

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structure was constructed which gives prudential supervision responsibility to the Australian Prudential Regulation Authority and conduct of business supervision responsibility to the Australian Securities and Investments Commission (although note that, while the latter has responsibility across banking, insurance, and securities firms, the former has responsibility over banking and insurance firms, but not securities firms). Abrams and Taylor (2000)

cost savings for both governments and market participants. First, a supervisory authority with broader scope may be able to achieve economies of scale in the utilization of supervisory resources not available to separate, smaller agencies focused on one dimension of the financial services industry. Such an authority may also be able to realize economies of scope as it uses its personnel and other resources to perform similar supervisory oversight tasks across different sectors of the financial services industry [Briault (1999) and Llewellyn (1999b)]. This argument may be particularly important for small, emerging market economies in which separate supervisory agencies may, individually, be too small to realize economies of scale [Abrams and Taylor (2001)]. For such countries, there may also be an advantage to having a supervisor with broader scope so as to be better able to attract, develop, and retain expertise than smaller, separate supervisory agencies would be able to do [Goodhart (2002b)]. From the financial services industry's point of view, this type of supervisory authority may represent a reduction in the regulatory burdens resulting from having to deal with multiple separate agencies, each specializing in a separate component of the overall financial services industry [Briault (1999), Llewellyn (1999b), and Abrams and Taylor (2001)].

A final set of arguments for unified supervision of all financial services focuses on systemic risks. The growing interconnectedness between financial markets heightens the chances that a systemic crisis could arise outside the banking industry, and yet quickly and directly affect the banking industry. A supervisory authority with broad scope may be better positioned to respond to incipient contagion across financial services [International Monetary Fund (2002)]. In a related vein, some have argued that a single supervisory authority may be able to more rapidly and flexibly respond to emerging financial problems than would be the case

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discuss the issue of an even wider scope for a unified supervisory authority, which could include the setting of accounting standards and competition (antitrust) policy.

where explicit coordination across separate supervisory agencies has to be worked out [Abrams and Taylor (2001)]. Finally, a supervisory agency with broad scope gives supervisory authorities in other countries a single point of contact in situations where financial problems threaten not only to cross financial service sectors, but national borders as well [Abrams and Taylor (2001)].[16]

II.B.2. Arguments Against a Consolidated Supervisor

The most significant argument against a supervisory authority with broad scope is that it would result in an undue concentration of power that would otherwise be somewhat dispersed among several agencies. This argument may appeal especially to policy makers in democratic societies. Other arguments against having a single supervisory authority for all financial services are also grounded to some extent in practical considerations. One argument holds that such a supervisory authority may be more subject to excessive bureaucracy and mismanagement than would separate, possibly more nimble organizations. In addition, a supervisory authority with broad scope may give undue attention to one particular sector of the financial services industry at the expense of other sectors. Abrams and Taylor (2000) argue that, because most countries now have regulators with broader scope for different financial service industries, there is a danger that the process of changing over to a single supervisory authority could be mismanaged, and as a result there could be a critical reduction in supervisory oversight.

A variation on some of these themes involves the case where the single supervisory authority is the central bank. In such a case, the excessive concentration of power would be exacerbated by the fact that in addition to the supervision of all financial services, the central bank would continue to be responsible for monetary policy [Briault (1999), Llewellyn (1999b),

[16] These arguments, of course, also pertain to the issue of whether there should be one or more transnational supervisory authorities.

International Monetary Fund (2002), and Goodhart (2002b)]. Beyond this, the conflicts of interest that arise when the central bank has both monetary policy and bank supervision to balance would be more extensive for a central bank supervising all other financial services industries in addition to banking. Finally, Whalen (2001) points out that there is a danger that the "safety net" underpinned by the lender of last resort function embodied in the central bank might be wrongly seen to extend across all financial service industries. Such a perception could increase moral hazard behavior and dilute incentives for the exercise of market discipline.

Despite the lack of empirical analysis on the effects on the banking industry of widening or narrowing the scope of bank supervisory authorities' responsibilities, and in the face of persuasive but conflicting arguments over consolidating banking and other financial services supervision under a single authority, policy makers in a number of countries have nevertheless felt compelled to act. For example, in the United Kingdom, financial services supervision has been consolidated under the Financial Services Authority (FSA).[17] The FSA's purview includes banking supervision, which had traditionally been the responsibility of the Bank of England. A similar move was undertaken in Japan in 1998, and in Germany in 2002. Sweden in 1991 unified all financial sector supervision under the Finansinspektionen. In the mid-to-late-1980s, Denmark and Norway unified the supervision of banking, securities, and insurance, and recently Korea and Iceland consolidated supervisory authorities.[18] Tables 1 and 4, and the related discussion in Section III, give information for a range of countries in which bank supervision

[17] Initial, major steps were taken in 1997, and the process was completed in 2002. See Taylor and Fleming (1999) for a detailed explanation.

[18] Taylor and Fleming (1999) give detailed descriptions of the supervisory restructuring in Norway, Denmark, and Sweden.

authorities also have supervisory responsibilities for firms in nonbank financial service industries.

II.C. Supervisory Independence

A third bank supervision issue has begun to receive far greater attention from researchers in the wake of numerous recent and costly banking and currency crises. There is an emerging consensus, arising out of the burgeoning research on the causes of banking and currency crises, that independence for supervisory authorities is crucial for well-functioning banks and, more generally, for financial system stability.[19] Supervisors are "independent" to the extent they are insulated from, or able to resist, pressure and influence to modify supervisory practices in order to advance a policy agenda that is at odds with the maintenance of a safe and sound banking system. Supervisory independence allows bank supervisors to monitor the financial condition of banks in a strictly professional and consistent fashion. In addition, it allows them to elicit the appropriate level of responsiveness to the guidance, constructive criticism, and direction they give to banks. In essence, supervisory independence makes it possible for supervisors to "call it like they see it" and to have their advice and orders heeded.

One perspective that research on the importance of supervisory independence has taken is to identify policies that can undermine supervisory independence. Three policies in particular have been identified that undermine supervisory independence and in so doing create and/or

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[19] See Claessens, Klingebiel, and Laeven (2002) for a selected summary of recent banking crisis literature. The issue of independence for supervisory authorities has also attracted increasing attention among policy makers. In particular, the Basel Committee's 1997 *Core Principles for Effective Banking Supervision* highlights supervisory independence. The *Core Principles* comprise twenty-five basic principles that need to be in place for a supervisory system to be effective. The principles cover licensing, prudential regulations and requirements, methods of supervision, information requirements, formal powers of supervisory authorities, and cross-border banking. Importantly, the first principle outlines necessary "preconditions for effective banking supervision," and chief among these fundamental preconditions is that agencies responsible for banking supervision "should possess operational independence." See Basel Committee (1997, p. 4).

exacerbate banking system problems.[20] The first is the protection of weak regulations, and in the extreme, forbearance. Many of the countries that were part of the East Asian banking crisis of the late 1990s had supervisory systems with serious deficiencies, including lax prudential rules and/or lax application of existing rules. As Lindgren *et al*. (1999) point out, such practices were protected and even encouraged by the government. Lindgren *et al*. (1999) details such supervisory system weaknesses in Korea and Thailand, in particular. Quintyn and Taylor (2002) point to Indonesia as an example of a case where the government actively undermined restructuring efforts of the agency charged with addressing the ongoing banking crisis. De Krivoy (2000) examines the role of weak supervision and political interference in the Venezuelan banking crisis of 1994. In addition, observers agree that government-encouraged forbearance has exacerbated the banking crisis in Japan, and that forbearance of a similar

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[20] The "common causes of banking crises" of a "microeconomic" nature identified in Bank for International Settlements (BIS) (2001, p. 33) include the following. 1) "Excessive optimism about lending to rapidly expanding manufacturing firms and speculative property developers, whose booming output and rapidly rising collateral (i.e., property) values gave banks a false sense of security and allowed firms to become highly leveraged." 2) "Insufficiently diversified loan books made specialist banks over dependent on the particular region or sector served." 3) "Credit assessment by banks was often very poor, and banks often made loans to related companies or state-owned enterprises, frequently at the behest of governments." 4) "Management incentives were often inappropriate: top management was unduly concerned with increasing the banks' overall size, and loan officers typically were rewarded for the volume of loans made rather than loans repaid." 5) "The risks from excessive maturity and currency mismatches were not fully appreciated. While banks' direct exposure to foreign exchange risk was limited by prudential regulations, banks neglected the exposure of their customers to such risks. As a result, when large devaluations occurred and weakened the ability of the corporate sector to service foreign currency loans, banks were suddenly faced with enormous credit risk." Note that each of these could be eliminated or curtailed by widely accepted risk management "best practices" encouraged and enforced by proper banking supervision. Kaminsky and Reinhart (1999), Kaufman (2000), and others have identified financial liberalization -- eliminating or easing geographic and product restrictions under which banks have operated -- as a cause of banking system crises, in cases where such liberalization of banking activities has not been matched by an upgrade in supervision. Also, see Lindgren *et al*. (1999).

Exploitative macroeconomic policies that use banks in defiance of sound banking practices, and that therefore create banking system problems that the supervisory authorities cannot address properly, also undermine supervisory independence. Government policies that greatly damage the macroeconomy eventually cripple the banking system, which in turn magnifies macroeconomic weaknesses. Such a vicious circle can be beyond the powers of bank supervisors to address. Therefore, indirectly, such ill-conceived or poorly implemented policies undermine the ability of banking supervisors to ensure a safe and sound banking system. Elements of Mexico's 1994/95 "peso crisis," and the current crisis in Argentina are examples where exploitative macroeconomic policy undermined banks, thereby undermining effective banking supervision.

(though relatively less profound) nature contributed to the U.S. banking crisis of the late 1980s and early 1990s.[21]

"Directed lending" is a second policy that can undermine supervisory independence. Directed lending involves credit extension to specific borrowers, when the criteria for lending may be based on the furtherance of governmental policy objectives rather than on risk-based evaluations of creditworthiness and market-based judgments about expected profitability. Directed lending could be based on such goals as the development of infant industries, protection of mature but declining industries, or industries whose growth is expected to raise the living standards of certain populations within a country. Such loans might not be justified under safe and sound banking standards because they have a greater likelihood of becoming impaired. It is possible for banks to be encouraged to make so many of these types of loans that the solvency of the entire banking system is threatened. It is also possible that other potential borrowers will be crowded out, or be presented with obstacles to credit extension that have nothing to do with the creditworthiness of their potential projects. This situation can undermine the development of a sound and growing loan base for all banks, and thereby restrict economic growth.[22] There is widespread agreement that government directed lending contributed to banking sector problems in Japan, Korea, Indonesia, Turkey, China and other countries over the past decade.[23]

Government ownership and operation of banks is a third policy that can undermine supervisory authority, for many of the same reasons as directed lending. Governments may

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[21] See, for example, Quintyn and Taylor (2002) on Japan, and Kaufman (1995), Barth (1991), and Kane (1989) on the United States.

[22] For an excellent review of the literature on the linkages between finance and growth, see Levine (1997).

[23] See, for example, Quintyn and Taylor (2002), and Lindgren *et al*. (1999). China's banking sector problems are analyzed in OECD (2002). For Korea, directed lending was in effect institutionalized under the "chaebol" system. See, for example, Huh and Kim (1993).

themselves own and operate banks that extend credit on an unsafe and unsound basis. Supervisors may not be allowed to apply standard supervisory evaluation criteria to government-owned banks, and such banks may not even be subject to examination by supervisory authorities. Hence, the credibility of supervisors could be jeopardized. In addition, solvency problems at poorly run government banks could lead to liquidity problems, if depositors withdraw funds. This in turn could spill over into a general liquidity crisis for private-sector banks, in spite of supervisors' efforts to promote their safety and soundness. Finally, as with directed lending, government-owned banks' decisions to allocate funds to politically desirable borrowers could result in the crowding out of other, more creditworthy, borrowers.

Clearly, the structure, scope, and independence of supervision are important policy issues. However, as pointed out, relatively few studies have empirically explored how, and even if, these aspects of bank supervision affect the banking industry. In order to begin to fill this gap in the existing research, we construct an empirical model to assess the relationship between these aspects of supervision and bank profitability. As a prelude, we discuss our data as well as examine the nature of cross-country differences in the structure, scope, and independence of bank supervision.

III. Cross-Country Data

The World Bank and the Office of the Comptroller of the Currency (OCC) each recently conducted surveys of the national banking supervisors in over 100 countries. The World Bank obtained information from 107 countries primarily for 1999, as described in Barth, Caprio, and Levine (2001).[24] The survey concentrated on bank regulation and supervisory practices,

[24] This data is available at http://www.worldbank.org/research/projects/bank_regulation.htm.

including the independence of the banking authorities. It also included measures of the market structure of banking. The OCC survey obtained information from 110 countries for each of the years 1996 through 1999.[25] It focused on data for banking market structure and performance as well as the structure of banking supervision. These two datasets provide much of the underlying data for our empirical work.

In conducting our empirical analysis, we supplemented this country-specific data with data for individual banks in selected countries. Bank-specific data is useful because we are focusing on the effect of the structure, scope, and independence of supervision on bank profitability, and we want to explain variation in this variable both within as well as across countries. The individual bank data were obtained from BankScope (IBCA). We were able to construct a complete set of country-specific and bank-specific variables for 55 countries.[26]

An important data issue for us (and others) to address is the degree of precision that can be brought to bear on the construction of a dataset on the structure of bank supervision across countries. A key difficulty in characterizing the structure of supervision is being able to ascertain "where to draw the line" in deciding if an agency has supervisory power. For example in France, central bank officials contribute to deliberations conducted by the bank supervisory authority but do not themselves have direct responsibility for bank supervision. Is the central bank a bank supervisory authority? It is possible for reasonable people to disagree on the answer.

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[25] Unless otherwise noted, we use the data that pertain to 1999.

[26] As explained in the text, because we wish to examine the sensitivity of our results using an alternative but slightly less comprehensive set of information on bank supervisory structure, our "secondary" dataset includes only 53 countries.

In view of these considerations, and although our "primary" data on supervisory structure were drawn directly from the responses of national supervisory authorities to the World Bank and OCC surveys, we consulted a "secondary" source of information on the structure of bank supervision across countries. Specifically, Courtis (1999) compiled detailed information on financial system supervision in 137 countries, and information from that study has been used by a number of previous researchers.[27] We compared information on the structure of bank supervision from Courtis with information in our primary dataset, drawn from the World Bank and OCC surveys, to ascertain if there are any differences in the categorization of the structure of bank supervision across our sample countries.[28] As indicated by footnotes 4 through 7 in Table 1, we found discrepancies between the two sets of information on the structure of bank supervision for 9 countries.[29] For these countries (Argentina, Canada, Czech Republic, France, Japan, Korea, Poland, Thailand, and Turkey) there are discrepancies between the two datasets in whether there is a single bank supervisor or multiple bank supervisors. In addition, for one of the countries (France) there is a discrepancy in the supervisory role played by the central bank. As explained in the Section V of the paper, we examine whether these differences in the characterization of the structure of supervision affect the empirical results, and find that in fact they do have an impact on the statistical significance of the structure variables. Thus, caution must be exercised in interpreting empirical results related to the structure of supervision.

[27] See, for example, Llewellyn (1999), and Quintyn and Taylor (2002).

[28] Courtis (1999) does not contain information for Moldova and Morocco so we were able to compare data for 53 of our 55 countries. Note also that Courtis does not include the Federal Deposit Insurance Corporation (FDIC) as a bank supervisor for the United States, although the FDIC does in fact have direct supervisory authority for state "nonmember" banks *(i.e.*, state-chartered banks which have chosen not to become members of the Federal Reserve System) .

[29]The simple correlations for the two datasets with respect to the number of supervisory authorities, and whether the central bank is a supervisory authority, are 0.31 and 0.96, respectively. The latter high correlation reflects the fact that the two sources differ in the way they characterize the role of the central bank for only one country.

Table 1 provides a summary of basic information on supervision for each of the 55 countries in our dataset, covering (a) the structure of bank supervision, including whether countries have a single bank supervisory authority or multiple bank supervisory authorities, and the supervisory role of the central bank; (b) the scope of the bank supervisory authority; and (c) the degree of independence of the bank supervisory authority. Tables 2-5 and the ensuing discussion focus on each of these dimensions in turn.

III.A. The Structure of Bank Supervision

III.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 geographical regions in Table 1 and income levels in Table 2. Those tables show that most countries have a single bank supervisory authority. For both single-supervisor and multiple-supervisors systems there is no obvious pattern according to income level (Table 2), with the exception of the lowest income level, where all five countries have a single bank supervisor system. The simple correlation between countries having a single supervisory authority and real per capita GNP is negative but only 0.02. The only obvious regional pattern (Table 1) is that in all five African countries the central bank is the single bank supervisory authority.

III.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. Table 3 groups countries into three categories, stratified by income level. The left-hand column shows that 28 out of our total of 55 countries have the central bank as the sole banking supervisor. The middle column shows that 7 countries assign banking supervision

responsibilities to the central bank, but that the central bank shares these responsibilities with at least one other supervisory authority.[30] Adding both of these groups together, just under two-thirds of the countries in our sample have the central bank as a banking supervisor. For the 36 percent (20) of the countries that do not assign banking supervision to the central bank, Table 3 reveals that slightly more than half fall into a single income level – the highest. The simple correlation between the central bank being a supervisor and real per capita GNP is a negative 0.39. Also, the correlation between the central bank being a supervisor and there being a single supervisory authority is negative but only 0.13.

III.B. Scope of the Supervisory Authority

Information on the scope of supervision was obtained from Courtis (1999) for 53 of our 55 countries. Courtis describes in varying degrees of detail the supervisory responsibilities of all financial regulators in 137 countries. From this information, we ascertained if a given supervisory authority has responsibility for just banks, or if its responsibilities include also securities firms and/or insurance firms, as indicated in Table 4. In almost two-thirds (32) of the 53 countries, the bank supervisory authority is responsible only for banks. In 7 countries the bank supervisory authority also supervises securities firms, and in 6 the bank supervisory authority supervises insurance companies in addition to banks. In 15 percent (8) of the countries, the bank supervisor also supervises both securities and insurance.

The simple correlation between the scope of the bank supervisory authority(ies) and real per capita GNP is a positive and highly significant 0.46, indicating that the greater the level of economic development, the wider supervisory authorities' scope tends to be. The correlation between scope and a single supervisor is positive but only 0.16. Finally, the correlation between

[30] Table 1 indicates who the bank supervisory authorities are in each of the countries.

scope and the central bank as supervisor is a negative and highly significant 0.72, indicating that central bank systems tend to be accorded narrower supervisory scope.

III.C. Degree of Independence of the Supervisory Authority

The World Bank dataset includes the responses of national supervisory authorities to a series of questions dealing with supervisory independence.[31] We construct an index of the degree to which a bank supervisory authority is independent from the rest of the government, based upon our evaluation of the responses to these questions.[32] The resultant composite measure of supervisory independence ranges in value from 1 ("low" supervisory independence) to 3 ("high" supervisory independence).[33]

Table 5 shows the degree of supervisory independence for our 55 countries. Twenty-four countries are classified as having low supervisory independence, 14 countries as having medium independence, and the remaining 17 countries as having high supervisory independence. The simple correlation between the degree of independence of supervisory authorities and real per capita GNP is a positive 0.33, suggesting that the higher is a country's level of economic development, the greater independence accorded supervisory authorities. The correlations between independence and the other dimensions of supervision -- structure and scope -- are relatively low.

[31] See Barth, Caprio, and Levine (2001) and (2002) for detailed explanations of the nature of these questions.

[32] Barth, Caprio, and Levine (2002) follow a similar procedure in constructing measures of supervisory independence.

[33] Barth, Caprio and Levine (2002) note that a broader index of independence can be constructed by also taking into account the degree to which the supervisory authority is independent from lawsuits from banks and other parties. We constructed a similar second index of independence and found that our empirical results were unaffected.

IV. Empirical Model

In the previous sections we have shown that there are substantial differences in the structure, scope, and independence of bank supervision in countries at all income levels and in all parts of the world. We also summarized the multifaceted debate among researchers about the possible impacts of a given supervisory framework on the banking system. Further, we pointed out the growing number of countries where policy makers have recently chosen to make substantial changes in the supervisory framework. Yet, in the face of both the importance of the issue and real-world policy actions, there is very little empirical evidence on what impact the supervisory framework has on the health of the banking industry, in particular on bank performance.[34] It is the aim of this section to investigate whether key aspects of the supervisory framework have any relationship to bank profitability.

To conduct this analysis we need to specify a model that both incorporates variables measuring the supervisory framework and that controls for other important determinants of bank profitability. For this latter set of variables we draw mainly on Demirgüç-Kunt and Huizinga (1999) and (2000). In these two studies, both country-level and bank-level data are employed for a sample of countries to evaluate various determinants of bank performance, as measured by net interest margin and profitability. In their studies, Demirgüç-Kunt and Huizinga control for differences in individual bank characteristics, the national macroeconomic environment, and several other country-specific variables. We incorporate the same key control variables as Demirgüç-Kunt and Huizinga.[35] Importantly, however, we extend their work in two directions:

[34]As discussed in the concluding section of this paper, an important focus of any agenda for future research should include the investigation of the impact of the supervisory framework on other significant aspects of the "health" of the banking system, including individual bank safety and soundness, systemic stability, and the development of the banking system.

[35] Our model is in effect a "composite" version of Demirgüç-Kunt and Huizinga (1999 and 2000); that is, we do not focus on a single empirical model (of the many) included in these two studies. Instead, we include the conceptually

first, by including new regulatory and supervisory practice variables, and second, by including new supervisory framework variables.

Our empirical model takes the following form:

$$P_{ij} = constant + \alpha' B_{ij} + \beta' M_j + \gamma' O_j + \varphi' R_j + \delta' S_j + \varepsilon_{ij}$$

where P_{ij} is pre-tax profits divided by total assets for bank i in country j; B_{ij} are bank variables for bank i in country j; M_j are macroeconomic variables for country j; and O_j are other control variables for country j. We extend this basic model in two dimensions: R_j are regulatory and supervisory practice variables; and, the main focus of our analysis, S_j are the supervisory structure, scope, and independence variables for country j; ε_{ij} is an error term. We estimate several specifications of this equation, highlighting the different individual supervisory framework variables, as well as selected interactive combinations of the supervisory framework variables. In addition, for the relevant specifications, we re-estimate the model using the alternative, secondary source of supervisory data to assess the robustness of our results.

IV.A. Control Variables

The bank-level variables (B_{ij}), used as controls by Demirgüç-Kunt and Huizinga as well as by us, are equity divided by total assets lagged one period (ETA_1); total loans divided by total assets (LTA); non-interest earning assets divided by total assets (NIETA); deposits and other short-term funding divided by total assets (CSFTA); overhead expenses divided by total assets (OHTAR); and taxes paid by a bank divided by its pretax profits (TXR). The definitions of these and the other model variables and their data source are provided in Table 6. Descriptive statistics for all model variables are presented in Table 7.

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important determinants consistent across both studies. We also draw on Demirgüç-Kunt, Levine and Min (1998), Claessens, Demirgüç-Kunt and Huizinga (1998), and Barth, Caprio and Levine (2001) and (2002) for guidance on our control variables.

In addition to these variables, we include three macroeconomic control variables. The variables are real GDP per capita (GNPP); the growth rate of real GDP per capita (GRO); and the percentage change in the GDP deflator (INF). These variables control for the overall environment in which banks operate in different countries. All of these variables are also used in Demirgüç-Kunt and Huizinga (1999 and 2000).

The other control variables (O_j) are also country-specific variables but focus on financial structure, banking industry structure, and deposit insurance. More specially, we include credit to the private sector by deposit money banks divided by GDP (BCGDP); the total value of stocks traded divided by GDP (TVGDP); the percentage of total bank assets controlled by the three largest banks (BACON3); the percentage of total bank assets that are government owned (GOVOBA); and the percentage of total bank assets that are foreign owned (FOROBA). In one study Demirgüç-Kunt and Huizinga (2000) include BCGDP and TVGDP, while in the other they (1999) include BACON3.[36] In neither of these two studies do they include FOROBA. However, a similar measure of foreign ownership is included in Claessens, Demirgüç-Kunt, and Huizinga (1998). We also include a variable indicating whether there is an explicit deposit insurance scheme (DI). This same deposit insurance variable is used in the work by Demirgüç-Kunt and Huizinga.

IV.B. Regulatory and Supervisory Practices Variables

As additional control variables, we extend Demirgüç-Kunt and Huizinga (1999 and 2000) to include regulatory and supervisory practice variables (R_j). First, we include variables capturing the range of permissible activities for banks, and the restrictions on ownership between banks and nonfinancial firms. Barth, Caprio, and Levine (2001) assign values for each of three

[36] The 3-bank concentration measure used by Demirgüç-Kunt and Huizinga (1999) was constructed using data from BankScope, whereas ours is from the OCC survey.

financial activities -- securities, insurance, and real estate -- based on whether banking regulations place no restrictions on banks engaging in the particular activity (a value of 1), through progressively greater degrees of restrictiveness, including banking regulations which prohibit banks from engaging in the particular activity (a value of 4). Combining the variable values for each of the three possible banking activities, we construct POWER, a composite index of regulatory restrictiveness across securities, insurance, and real estate activities. *A priori*, our sign expectation for this variable is ambiguous. It is possible that the wider the range of activities *(i.e.*, the fewer the restrictions, and therefore the lower the value of POWER), the greater will be profit opportunities for banks. However, banks may systematically fail to manage well a diverse set of financial activities beyond traditional banking, and hence profitability would be lower.

In a similar vein, we construct a composite index of the restrictiveness of regulations on the ability of banks and nonfinancial firms to own each other. We use values for two variables from Barth, Caprio, and Levine (2001): the degree of restrictiveness on banks owning nonfinancial firms (variable values ranging from 1 = no restrictions, to 4 = ownership is prohibited), and the degree of restrictiveness of nonfinancial firms owning banks (variable values ranging in the same fashion). Our composite variable MIXBC is an index therefore of the degree to which banking and commerce can be mixed via bank-nonfinancial firm ownership.[37] For reasons similar to the POWER variable, our sign expectation on this variable is ambiguous.

We also include two variables on "supervisory practices," both of which proxy important dimensions of the environment in which banks operate. SUPFORB measures the degree of

[37] Barth, Caprio, and Levine (2002) do not use POWER and MIXBC separately in their work. Instead, they focus on a variable that is composed of POWER plus the degree of restrictions placed on bank ownership of nonfinancial firms.

supervisory forbearance discretion supervisory authorities have at their disposal in a given banking system. Our expectation is that the greater is this discretion, the greater the likelihood that overall credit quality problems of banks will be allowed to grow, and hence the lower will be banking profitability. A second dimension of supervisory practice is the degree to which market discipline is relied on versus supervisory control. One instrument for applying market discipline to banks' behavior is to allow subordinated debt to count as part of bank capital.[38] To the extent it is counted, a bank's creditors have incentives to monitor how well run is the bank. Such oversight could be expected to result in better bank performance. Our variable SUBDEBT takes a value of 1 if subordinated debt is allowable as a component of regulatory capital, and 0 if it is not.

IV.C. Supervisory Framework Variables

Our final extension of previous cross-country empirical analyses of bank performance, and the main focus of our estimation, is to examine whether the banking supervisory system affects bank profitability. Following the descriptions in section III above, we include variables capturing the structure, scope, and independence dimensions of bank supervision. SINGLE takes a value of 1 if there is a single bank supervisory authority and 0 if there is more than one bank supervisor. CBANK takes a value of 1 if the central bank is a bank supervisory and 0 if it is not. SCOPE takes on a value of 1 if the bank supervisor has supervisory responsibilities beyond the banking industry (*i.e.*, for securities firms, insurance firms, or both) and a value of 0 otherwise. INDPSUP takes values of 1 through 3 for low, medium, and high independence, respectively.

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[38] For discussions of the issue of counting subordinated debt as part of bank capital, see, for example, Lang and Robertson (2002), DeYoung, Flannery, Lang, and Sorescu (2001), Flannery (2001) and Evanoff and Wall (2000).

As we noted at the outset of the study, there is little guidance from previous empirical work as to what to expect for the impact of these important dimensions of supervision on bank performance. Hence, our main goal is to determine *if* there is any evidence that the bank supervisory framework is significantly related to bank profitability. Drawing on our discussion of the debates surrounding three important dimensions of bank supervision, we can identify two possible interrelated channels of influence on bank profitability, both of which have, *a priori*, an ambiguous impact. The first is related to the fact that bank supervision is intended to influence the way in which banks manage risks. The better banks manage risks, the higher will be their credit quality, and hence the better their profitability. But supervision may enhance or impede the ability of banks to manage risk. The second relates to the fact that bank supervision may affect the degree of innovation in the banking industry. Innovation may indeed result in lower costs and/or improvements in revenue, and thereby enhance profitability. However, the converse may also occur through innovation, so that banks end up with poorer performance in the event the innovative behavior does not pay off. We consider, in turn, how the structure, scope, and independence of supervisors could affect, through these broad channels, bank profitability.

There are several ways a single-supervisor versus a multiple-supervisors system could affect bank profitability. A single supervisor may be better able to ensure sound risk management because it can take action more decisively and in a more coordinated manner than can multiple, competing supervisors. If so, one could expect a positive relationship between SINGLE and bank profitability. In addition, if bank risk management is superior in the absence of a competition in laxity that could occur under a multiple-supervisors system, one might also expect a positive sign on SINGLE. Further, if a single supervisor is able to attract expertise, and

reduce costs to the banking system relative to a fragmented, multiple-supervisor system, one could expect a positive relationship between SINGLE and bank profitability.

Alternatively, as the conceptual debate over the structure of supervision indicates, multiple supervisors may foster a competition in ideas among supervisors, leading to a greater receptivity to innovations by banks, and hence higher profitability.[39] In addition, if a multiple-supervisors system allows an economy to avoid an excessive concentration of power in the hands of a single supervisor, and possible attendant supervisory burdens and abuses this might impose on banks, banks' efficiency could be higher and profitability also higher under a multiple-supervisors system. For these reasons, one might expect a negative sign on SINGLE. Overall, however, in view of both sets of arguments, the sign expectation on this aspect of supervisory structure is ambiguous.

There are at least two possible routes for the central-bank-as-supervisor to affect bank profitability. First, if the central bank is better able to attract expertise to supervision than a non-central bank supervisor, it is possible that the quality of supervision banks face will be better, which in turn could improve their risk management performance and their profitability. A second route for an impact on profitability is through the inherent conflict of interest between bank supervision and monetary policymaking that the central bank faces, but the possible impact is ambiguous, *a priori*. On the one hand, if, during an economic downturn, the central bank as a bank supervisor eases up on banks, this may allow banks to grow out of credit quality problems that a non-conflicted supervisor would have made them write off. But it is also possible that, in the event the central bank as supervisor is too easy on banks under such circumstances, banks will face even larger credit quality problems further down the road, and hence have lower

[39] But, as pointed out above, greater innovation may be something of a two-edged sword with respect to its impact on bank performance.

profitability than otherwise. Consequently, as with the single-vs.-multiple aspect of banking structure, our sign expectation on CBANK is ambiguous.

Our SCOPE variable captures whether the bank supervisor(s) have responsibility for only banks or for other financial service firms as well. As in the case of the structure of supervision variables, the sign expectation on this variable is ambiguous. On the one hand, the wider the purview of the supervisory authorities, the more comprehensive its risk management oversight could be, resulting in better risk management and hence higher profitability. On the other hand, a broad-based supervisory authority might not have the same incentives to develop banking industry-specific insights to supervision that a banking industry-only supervisor would have. In consequence, receptivity to innovation in the banking industry might be less, and bank profitability lower.

There is a strong argument that greater independence for bank supervisory authorities should lead to better bank performance; namely, that banks will more likely make decisions on the basis of market forces rather than political factors. Bank profitability, therefore, should be higher in supervisory systems with greater independence. In contrast, in those systems with weak supervisory independence and hence greater opportunity for unsound practices, profits for banks are likely to be lower.

To summarize, the possible relationships between bank supervisory structure, scope and bank profitability do not lead to clear *a priori* sign expectations. Beyond this, and in view of the lack of empirical evidence, we are also agnostic about the expected statistical significance for these two aspects of the supervisory framework. As noted at the outset of this study, we conduct our empirical analysis not just to see *how* the supervisory framework affects bank performance

but, more fundamentally, to determine *if* the supervisory framework has any systematic relationship to bank performance.

V. Empirical Estimation and Results

V.A. Methodology

We have ten basic specifications which we test using ordinary least squares regression analysis. All of the specifications include the same control variables, with the supervisory structure, scope, and independence variables added sequentially in different specifications. Eight of the specifications are re-estimated using our alternative supervisory structure datasets. To distinguish between the two datasets, we add a P or an S to the two supervisory structure variables to denote primary and secondary data sources, respectively, in Tables 8-11.

We proceed sequentially as follows. First, we include only the number of supervisory authorities. Second, we only include whether the central bank is a supervisory authority or not. Third, we include both of these variables. Fourth, we include only the scope variable. Fifth, we include only the independence variable. Sixth, we include all of these variables. Seventh, we include an interactive term to examine the effect of a single authority and whether the central bank enhances or diminishes this effect. The eighth specification includes both the scope and independence variables in this previous specification. Ninth, we include an interactive term to examine the effect of the central bank being a supervisory authority and whether this effect is enhanced or diminished when it is the sole authority. The tenth specification includes both the scope and independence variables in this previous specification. In other words, these latter four specifications use interactive terms to allow us to determine both whether the effect of a single authority is enhanced or diminished when the central bank is that authority, and whether the

effect of the central bank as a supervisory authority is enhanced or diminished when it is the sole authority.

The empirical results reported in Tables 8-11 are based on heteroskedasticity-consistent standard errors from ordinary least squares regressions. We first discuss the results using the primary supervisory data (Tables 8 and 9), and then those using the secondary supervisory data (Tables 10 and 11).

V.B. Control Variables

The bank-level and macroeconomic environment control variables are the same in all four tables. In Tables 8 and 9 we find that ETA_1 is positive and significant in all specifications. In the profitability regressions in both of the studies by Demirgüç-Kunt and Huizinga this variable was also found to be positive, but not always significant at even the 10 percent level. We find both NIETA and CSFTA to be negative and highly significant. Although expecting these results, Demirgüç-Kunt and Huizinga generally found mixed signs and relatively little significance for either of these two variables. For the two other bank-level control variables, LTA and OHTAR, we find that neither variable is significant in any of our specifications. Demirgüç-Kunt and Huizinga (1999) obtained the same result for these variables; however, Demirgüç-Kunt and Huizinga 2000) found LTA to be negative and significant, whereas OHTAR was found to be generally insignificant.[40] We find the last bank-level control variable, TXR, to always be positive and highly significant. This was also the case in Demirgüç-Kunt and Huizinga (1999). In Demirgüç-Kunt and Huizinga (2000) this variable was positive but generally insignificant.

[40] In one of their studies, Demirgüç-Kunt and Huizinga (1999) also interact their bank-level control variables with real GDP per capita. In our comparisons, we only focus on the non-interactive variables.

As regards the macroeconomic control variables, we always find GNPP to be positive and highly significant. Although always positive in Demirgüç-Kunt and Huizinga (1999) and (2000), it was not always significant at the 10 percent level or better. The other two macroeconomic variables, GRO and INF, are not significant in any of our specifications. In the studies by Demirgüç-Kunt and Huizinga, GRO is positive and significant in only one of eleven specifications. INF is positive and significant in all but two of these same specifications, but generally only at either the 5 or 10 percent levels.

Two other variables in common with Demirgüç-Kunt and Huizinga (1999) and (2000) are BCGDP and TVGDP. We find that BCGDP is always negative and significant, while Demirgüç-Kunt and Huizinga find this variable to be negative and significant in two of their three specifications. We find TVGDP to be significantly positive in half of our specifications, while they find it significantly positive in all three of their specifications. As regards our measure of concentration (BACON3), we find it to be always insignificant. Claessens, Demirgüç-Kunt and Huizinga (1998) also find this measure to be negative and insignificant.

Turning next to our control variables for bank ownership, permissible bank activities, and supervisory practice variables, the results are somewhat mixed. We find no significant relationship between profitability and government ownership (GOVOBA), and some evidence of a positive relationship between profitability and foreign ownership (FOROBA).[41] Demirgüç-Kunt and Huizinga (1999) found their measure of foreign ownership to have a significantly positive relationship to profitability.[42] We also find that in most of our specifications, tighter

[41] Levine (2001) argues that any positive relationship between foreign-ownership share and profitability may be due to reverse causality. Specifically, he points out that in countries where profits are high due to an inefficient domestic banking industry, a foreign banking presence is likely to be greater.

[42] Their measure is a dummy variable that equals 1 if at least 50 percent of the bank's stocks is in foreign hands and equals 0 otherwise.

restrictions on bank activities (POWER) are not related to bank profitability. However, we do find strong evidence of a relationship between profitability and mixing banking and commerce (MIXBC). More specifically, we find a significantly negative relationship between tighter cross-ownership restrictions and profitability in all of our specifications. Of the two supervisory practice variables, SUPFORB and SUBDEBT, only the latter one is significant.[43] Indeed, it is both positive and highly significant in all of our specifications. This result is consistent, both with subordinated debt being a less expensive way to leverage than with equity, and with a greater reliance on market discipline enhancing bank performance.

The last control variable included in all our specifications is the deposit insurance variable, DI. As noted earlier, this variable is the same one used by Demirgüç-Kunt and Huizinga in their work. We find that this variable always has a negative and significant relationship with bank profitability, while they find it also to be negative but not significant.

V.C. Supervisory Framework Variables

The primary focus of our regression analysis is on the variables measuring the structure, scope, and independence of supervision. Tables 8 and 9 show that only the structure of supervision matters. PSINGLE is both positive and significant in all specifications in Tables 8 and 9. However, the central bank (PCBANK) being a supervisory authority neither enhances nor diminishes the relationship between a single supervisory authority and bank profitability. Furthermore, we find a negative and significant (though only at the ten percent level) relationship between PCBANK and profitability. This negative relationship is more than offset, however, when the central bank is the only supervisory authority. In other words, it is the number of supervisory authoritities, not whether the central bank is such an authority that

[43] Although these two variables are used in work by Barth, Caprio and Levine (2002), they do not examine their relationship to bank profitability.

actually matters for bank profitability. Neither SCOPE nor INDPSUP ever enter significantly in any of our specifications.

As indicated above, we subjected our empirical results to a robustness check, using our secondary set of data on the structure of supervision based Courtis (1999). We re-estimated all the regression equations based upon this secondary source of data; the results are reported in Tables 10 and 11.

These two tables are quite revealing. The results for all the control variables are generally the same. However, with the secondary supervisory data we find that supervisory structure no longer matters. Neither the number of authorities nor whether the central bank is an authority has a significant relationship with bank profitability. This clearly means that one must be cautious in drawing any firm conclusions about the relationship between supervisory structure and bank profitability unless one has strong *a priori* beliefs about which dataset is the more accurate one.

We also decided to perform an additional robustness check on our results using the primary source of information for the structure of supervision. This check involved taking into account the fact that in those countries in which there is an explicit deposit insurance scheme, the insurer may also be a supervisory authority, as is the case, for example, in the United States. Yet, neither our primary nor our secondary supervisory data sources give systematic and detailed information on the exact supervisory status of the deposit insurance authority. For those countries with an explicit deposit insurance scheme, we therefore re-categorized those with a single-supervisor system as having a multiple-supervisor system. Subsequently, we re-estimated

all those specifications in which SINGLE was included.[44] Although not reported here, the results of this re-categorization indicate that the structure of supervision no longer has a significant relationship to profitability. Thus, the source of information about supervisory structure may not be the only reason to be cautions about drawing any firm conclusions. Whether or not the deposit insurer is a bank supervisory authority in those countries with an explicit insurance scheme is another unresolved issue. [45]

VI. Summary and Conclusions

In a recent address, Edgar Meister, Member of the Directorate of the Deutsche Bundesbank, pointed out that "[the] design of regulatory and supervisory responsibilities is one of the most important matters affecting the future course of financial market policy. There is, however, no universally valid answer to the question of *how* this should be done."[46] He went on to observe that "[the] best way of organizing supervision cannot be derived from theory."[47] It is both the importance of this issue, and the need for empirical information bearing on it, that underlies the three aims of our study.

First, we sought to sort out the conceptual issues on the importance of the supervisory framework for banking. Drawing on previous literature, we summarized arguments for and against specific variations in supervisory structure, including assigning bank supervision to a

[44] This exercise resulted in the re-classification of 37 countries from single to multiple supervisory systems. Also, the simple correlation between the original measure of single and this alternative measure is only 0.20 and not significant.

[45] We also included a corruption variable obtained from Transparency International. This variable, however, was neither significant nor did its inclusion affect any of our results.

[46] Meister (2001).

[47] Ibid.

single authority or multiple authorities, and to the central bank; we investigated the issue of the scope of supervision, reviewing arguments for and against "consolidating" bank supervision with the supervision of other financial services; and we summarized reasoning about the importance of independence for supervisory authorities. We noted the relative paucity of empirical evidence on these issues, a gap that motivated our second and third aims.

Our second aim was to describe the bank supervision landscape across the globe. Using information from surveys by the World Bank and the OCC, we summarized the supervisory structure, scope, and degree of supervisory independence for 55 countries in all regions of the world and across all income levels. Our data show that there are wide differences in these key aspects of supervision, and that, broadly speaking, these variations are unrelated to geographical location or income level. We also pointed out difficulties in characterizing supervisory structure, and introduced data from an alternate source to demonstrate this fact. Our review of this information is consistent with another observation made by Meister: "... there is no ready-made solution as to how [supervisory] responsibilities should be assigned in order to put in place an effective and efficient supervisory structure."[48]

Nevertheless, policy makers in a growing number of countries not only continue to debate supervisory framework issues, but a growing number have acted to radically change supervision within their countries. Hence, our third goal was to investigate if there are any systematic connections between the supervisory framework of banking and the health of the banking system. We chose a key aspect of the health of the banking system -- bank performance, as measured by bank profitability -- and relied on previous empirical models to specify our own model in which to investigate the possible influence of the supervisory framework on this variable. Using both country-level and bank-level data, our model extended

previous empirical investigations of the determinants of bank profitability by including most importantly variables measuring the structure, scope, and independence of bank supervision.

Our results indicate, at most, a weak influence for the structure of supervision on bank performance. In particular, we found some evidence that a single-supervisor system enhances bank performance. However, following our discussion of the caution one must use in interpreting data on the supervisory framework, our re-estimates using an alternative source of data on the structure of supervision failed to duplicate this result. This finding was re-enforced when we took into account the fact that in those countries with an explicit deposit insurance scheme, the insurer may also be a bank supervisory authority.

Our results have a bearing on a key dimension of the policy debate on how to structure supervision. In particular, given the dearth of empirical evidence on the issues, advocates of one form or another of supervisory structure have asserted that a particular change is likely to affect (favorably or adversely, as the advocate sees fit) the performance of banks. Our results provide little support at best to the belief that any particular bank supervisory structure will greatly affect bank performance. This is significant, because it suggests that the on-going debate might more broadly focus on the impact of the supervisory structure on other aspects of the health of the banking system, including individual bank safety and soundness, systemic stability, and the development of the banking system.

[48] Ibid.

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Table 1.
The Structure, Scope, and Independence of Bank Supervision in Selected Countries

Country	Bank Supervisory Authority	Structure		Scope of Supervisory Authority[2]	Degree of Supervisory Independence[3]
		Single Supervisor or Multiple Supervisors	Role of Central Bank[1]		
Africa					
Botswana	Bank of Botswana	Single	CB	B	Low
Kenya	Central Bank of Kenya	Single	CB	B	Low
Mauritius	Bank of Mauritius	Single	CB	B	Low
Morocco	Bank Al-Maghrib	Single	CB	N/A	Low
South Africa	South African Reserve Bank	Single	CB	B	Low
Americas					
Argentina[4]	Central Bank of Argentina, Superintendency of Financial and Foreign Exchange Institutions	Multiple	CB	B	Low
Bolivia	Superintendency of Banks	Single	NCB	BSI	Medium
Brazil	Central Bank of Brazil	Single	CB	B	Low
Canada[5]	Office of the Superintendent of Financial Institutions	Single	NCB	B&I	High
Chile	Superintendency of Banks	Single	NCB	B	Low
El Salvador	Superintendence of the Financial System	Single	NCB	B&I	Low
Guatemala	Superintendency of Banks	Single	NCB	B&I	Low
Jamaica	Bank of Jamaica	Single	CB	B	High
Mexico	National Banking and Securities Commission	Single	NCB	B&S	Low
Panama	Sperintendency of Banks	Single	NCB	B	High
Peru	Superintendencia de Banca y Seguros	Single	NCB	B&I	High
United States	Office of the Comptroller of the Currency, Federal Reserve System, Federal Deposit Insurance Corporation, and each state's bank supervisory authority	Multiple	CB	B[7]	High
Venezuela	Superintendent of Banks and Other Financial Institutions	Single	NCB	B	Medium
Asia/Pacific					
Australia	Australian Prudential Regulation Authority (prudential supervision), Australian Securities and Investments Commission (conduct of business supervision)	Multiple	NCB	BSI[8]	High
India	Reserve Bank of India	Single	CB	B	Medium

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Country	Bank Supervisory Authority	Structure		Scope of Supervisory Authority[2]	Degree of Supervisory Independence[3]
		Single Supervisor or Multiple Supervisors	Role of Central Bank[1]		
Indonesia	Bank of Indonesia (Starting in 2002, supervisory function will be transferred to a new institution)	Single	CB	B	Medium
Israel	Bank of Israel	Single	CB	B	Low
Japan[5]	Financial Supervisory Agency	Single	NCB	BSI	Medium
Jordan	Central Bank of Jordan	Single	CB	B	Medium
Korea[4]	Financial Supervisory Commission, Ministry of Finance and Economy	Multiple	NCB	BSI	Low
Malaysia	Central Bank of Malaysia	Single	CB	B&I	Medium
Nepal	Inspection and Supervision Department, Nepal Rastra Bank	Single	CB	B	Low
New Zealand	Reserve Bank of New Zealand	Single	CB	B	Low
Philippines	Central Bank of Philippines	Single	CB	B	Low
Saudi Arabia	Saudi Arabian Monetary Authority	Single	CB	B&I	High
Singapore	Monetary Authority of Singapore	Single	CB	BSI	Medium
Thailand[4]	Ministry of Finance and Bank of Thailand	Multiple	CB	B	Medium
Europe					
Belgium	Banking and Finance Commission	Single	NCB	B&S	Medium
Cyprus	Central Bank of Cyprus	Single	CB	B&S	Medium
Czech Republic[4]	Czech National Bank, Committee for Securities	Multiple	CB	B	Low
Denmark	Danish Financial Supervisory Authority	Single	NCB	BSI	Low
Estonia	Bank of Estonia	Single	CB	B	Low
Finland	Financial Supervision Authority	Single	NCB	B&S	Low
France[5,6]	Commission Bancaire	Single	NCB	B&S	High
Germany	Federal Banking Supervision Office, Deutsche Bundesbank	Multiple	CB	B	High
Greece	Bank of Greece	Single	CB	B	Low
Italy	Bank of Italy	Single	CB	B	Medium
Lithuania	Bank of Lithuania	Single	CB	B	Low
Luxembourg	Commission de Surveillance du Secteur Financier	Single	NCB	B&S	High

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The Structure, Scope, and Independence of Bank Supervision in Selected Countries

Country	Bank Supervisory Authority	Structure		Scope of Supervisory Authority[2]	Degree of Supervisory Independence[3]
		Single Supervisor or Multiple Supervisors	Role of Central Bank[1]		
Moldova	National Bank of Moldova	Single	CB	N/A	Low
Netherlands	Bank of Netherlands	Single	CB	B	High
Poland[4]	National Bank of Poland, Commission for Banking Supervision	Multiple	CB	B	High
Portugal	Bank of Portugal	Single	CB	B	High
Romania	National Bank of Romania	Single	CB	B	Low
Slovenia	Bank of Slovenia	Single	CB	B	High
Spain	Bank of Spain	Single	CB	B	High
Sweden	Sweden Financial Supervisory Authority	Single	NCB	BSI	Medium
Switzerland	Federal Commission of Banks	Single	NCB	B&S	Medium
Turkey[4]	Central Bank of Turkey, Treasury (The Regulatory and Supervisory Agency began operations in September 2000)	Multiple	CB	B	High
United Kingdom	Financial Services Authority	Single	NCB	BSI	High

Sources: Primary sources are Barth, Caprio, and Levine (2001 and 2002), and Office of the Comptroller of the Currency using information from national supervisory authorities; secondary source is Courtis (1999). Also, see Institute of International Bankers, various issues. Unless otherwise indicated, information is for 1999.
Notes:
[1] "CB" indicates that the central bank is a banking supervisory authority; "NCB" indicates that the central bank in not a banking supervisory authority.
[2] "B" indicates that the supervisory authority(ies) has(have) responsibility only for the banking industry; "B&S" indicates that the supervisory authority(ies) has (have) responsibility for the securities industry as well as for the banking industry; "B&I" indicates that the supervisory authority(ies) has (have) responsibility for the insurance industry as well as for the banking industry; "BSI" indicates that the supervisory authority(ies) has (have) responsibility for the banking, securities, and insurance industries.
[3] See the text for an explanation of the categorization of the degree of supervisory independence.
[4] According to Courtis (1999), these countries have a single bank supervisory authority.
[5] According to Courtis (1999), these countries have multiple bank supervisory authorities.
[6] According to Courtis (1999), the central bank is one of multiple bank supervisory authorities.
[7] Bank supervisory authorities in some states are also responsible for the supervision of other financial service industries. See Courtis (1999) and Conference of State Bank Supervisors (2000). Since the passage of the Gramm-Leach-Bliley Act (GLBA) in November 1999, the Federal Reserve has served as the "umbrella regulator" of financial holding companies which can own subsidiary commercial banks, securities firms, insurance companies, merchant banks, and other financial affiliates. See Barth, Brumbaugh, and Wilcox (2000) for a discussion of the major components of the GLBA. Our 1999 data for the United States is pre-GLBA.
[8] The Australian Prudential Regulation Authority has responsibility for the banking and insurance industries, while the Australian Securities and Investments Commission has responsibility for banking, insurance, and securities firms.

Table 2.
Countries with Single vs. Multiple Supervisory Authorities

Income Level[1]	Single Bank Supervisory Authority				Multiple Bank Supervisory Authority		
High Income	Belgium	France[2]	Luxembourg	Slovenia	Australia	Germany	United States
	Canada[2]	Greece	Netherlands	Spain			
	Cyprus	Israel	New Zealand	Sweden			
	Denmark	Italy	Portugal	Switzerland			
	Finland	Japan[2]	Singapore	United Kingdom			
Upper Middle Income	Botswana	Estonia	Mexico	South Africa	Argentina[3]	Korea[3]	Poland[3]
	Brazil	Malaysia	Panama	Venezuela	Czech Republic[3]		
	Chile	Mauritius	Saudi Arabia				
Lower Middle Income	Bolivia	Jamaica	Morocco	Philippines	Thailand[3]	Turkey[3]	
	El Salvador	Jordan	Peru	Romania			
	Guatemala	Lithuania					
Low Income	India	Kenya	Moldova	Nepal			
	Indonesia						

Sources: Barth, Caprio, Levine (2001 and 2002), W*orld Bank Development Indicators*, and Courtis (1999). Unless otherwise indicated, information is for 1999.
Notes:
[1] Economies are classified into income groups according to 1999 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income = $755 or less; lower middle income = $756–2,995; upper middle income = $2,996–9,265; and high income = $9,266 or more.
[2] According to Courtis (1999), these countries have multiple bank supervisory authorities.
[3] According to Courtis (1999), these countries have a single bank supervisory authority.

Table 3.
Countries with the Central Bank as a Supervisory Authority

Income Level[1]	Central Bank Only			Central Bank Among Multiple Supervisors		Central Bank Not a Supervisory Authority		
High Income	Cyprus	Netherlands	Singapore	Germany	United States	Australia	Finland	Sweden
	Greece	New Zealand	Slovenia			Belgium	France[2]	Switzerland
	Israel	Portugal	Spain			Canada	Japan	United Kingdom
	Italy					Denmark	Luxembourg	
Upper Middle Income	Botswana	Malaysia	Saudi Arabia	Argentina	Poland	Chile	Mexico	Venezuela
	Brazil	Mauritius	South Africa	Czech Republic		Korea	Panama	
	Estonia							
Lower Middle Income	Jamaica	Lithuania	Philippines	Thailand	Turkey	Bolivia	Guatemala	Peru
	Jordan	Morocco	Romania			El Salvador		
Low Income	India	Kenya	Nepal					
	Indonesia	Moldova						

Sources: Barth, Caprio, Levine (2001 and 2002), W*orld Bank Development Indicators*, and Courtis (1999). Unless otherwise indicated, information is for 1999.
Notes:
[1] Economies are classified into income groups according to 1999 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income = $755 or less; lower middle income = $756–2,995; upper middle income = $2,996–9,265; and high income = $9,266 or more.
[2] According to Courtis (1999), the central bank is one of multiple bank supervisors.

Table 4.
Scope of Supervisory Authority for Countries[1]

Income Level[2]	Only Banks			Banks, Insurance Firms and Security Firms			
				Banks and Insurance	Banks and Securities	All Three	
High Income	Germany	Netherlands	Slovenia	Canada	Belgium	Australia	Singapore
	Greece	New Zealand	Spain		Cyprus	Denmark	Sweden
	Israel	Portugal	United States		Finland	Japan	United Kingdom
	Italy				France		
					Luxembourg		
					Switzerland		
Upper Middle Income	Argentina	Czech Republic	Poland	Malaysia	Mexico	Korea	
	Botswana	Estonia	South Africa	Saudi Arabia			
	Brazil	Mauritius	Venezuela				
	Chile	Panama					
Lower Middle Income	Jamaica	Philippines	Thailand	El Salvador		Bolivia	
	Jordan	Romania	Turkey	Guatemala			
	Lithuania			Peru			
Low Income	India	Kenya	Nepal				
	Indonesia						

Sources: W*orld Bank Development Indicators*, and Courtis (1999). Also, see Institute of International Bankers, various issues. Unless otherwise indicated, information is for 1999.

Notes

[1] Courtis (1999) does not report data for Moldova and Morocco.

[2] Economies are classified into income groups according to 1999 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income = $755 or less; lower middle income = $756–2,995; upper middle income = $2,996–9,265; and high income = $9,266 or more.

Table 5.
Degree of Supervisory Independence for Countries

Income Level[1]	Low Independence			Medium Independence		High Independence		
High Income	Denmark	Greece	New Zealand	Belgium	Singapore	Australia	Luxembourg	Spain
	Finland	Israel		Cyprus	Sweden	Canada	Netherlands	United Kingdom
				Italy	Switzerland	France	Portugal	United States
				Japan		Germany	Slovenia	
Upper Middle Income	Argentina	Czech Republic	Mauritius	Malaysia	Venezuela	Panama	Poland	Saudi Arabia
	Botswana	Estonia	Mexico					
	Brazil	Korea	South Africa					
	Chile							
Lower Middle Income	El Salvador	Lithuania	Philippines	Bolivia	Thailand	Jamaica	Peru	Turkey
	Guatemala	Morocco	Romania	Jordan				
Low Income	Kenya	Moldova	Nepal	India	Indonesia			

Sources: Barth, Caprio, Levine (2001 and 2002), and W*orld Bank Development Indicators.* Unless otherwise indicated, information is for 1999.
Note:
[1] Economies are classified into income groups according to 1999 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income = $755 or less; lower middle income = $756–2,995; upper middle income = $2,996–9,265; and high income = $9,266 or more.

Table 6.
Variables, Definitions and Sources

Code	Definition	Source
PTA	Before tax profit to total assets	IBCA - Bankscope 137.1, December 2001
ETA_1	Equity to total assets	IBCA - Bankscope 137.1, December 2001
LTA	Total loans to total assets	IBCA - Bankscope 137.1, December 2001
NIETA	Cash, non-interest earning deposits at other banks and other non-interest earning assets to total assets	IBCA - Bankscope 137.1, December 2001
CSFTA	All short term and long term deposits plus other non-deposit short term funding to total assets	IBCA - Bankscope 137.1, December 2001
OHTAR	Personnel expenses and some other non-interest expense to total assets (restricted to be non-negative)	IBCA - Bankscope 137.1, December 2001
TXR	Total taxes paid divided by before tax profits of each bank. Tax rate is restricted to not exceed 100% of profits before taxes	IBCA - Bankscope 137.1, December 2001
GNPP	Real GNP Per Capita (US$)	World Development Indicators (2001)
GRO	Annual real growth rate of GDP (percent)	World Development Indicators (2001)
INF	Annual inflation rate from the GDP deflator (percent)	World Development Indicators (2001)
BACON3	Percent of total bank assets of the three largest banks	Office of the Comptroller of the Currency (OCC)
BCGDP	Credit to private sector by deposit money banks divided by GDP	International Financial Statistics (December 2001); lines 22d and 99b
TVGDP	Total value of domestic equities traded divided by GDP	International Financial Statistics (December 2001), Standard and Poor's Emerging Stock Market Factbook (2001)
GOVOBA	Government-owned bank assets divided by total bank assets	Barth, Caprio and Levine (2001) and (2002); OCC
FOROBA	Foreign-owned bank assets divided by total bank assets	Barth, Caprio and Levine (2001) and (2002); OCC
POWER	Average of regulatory restrictions of bank activities in securities, insurance and real estate. Rated from 1 to 4, with 4 being prohibited and 1 being unrestricted	Barth, Caprio and Levine (2001) and (2002); OCC
MIXBC	Average of regulatory restrictions of bank ownership of firms and firm ownership of banks. Rated from 1 to 4, with 4 being prohibited and 1 being unrestricted	Barth, Caprio and Levine (2001) and (2002); OCC
SUPFORB	Supervisory forbearance discretion, ranges from 0-4, with higher values indicating greater discretion	Barth, Caprio and Levine (2001) and (2002)
SUBDEBT	Is subordinated debt allowable (required) as part of capital? Yes=1, No=0.	Barth, Caprio and Levine (2001) and (2002)
DI	Is there an explicit deposit insurance scheme or were depositors wholly compensated the last time a bank failed? Yes=1, No=0	Barth, Caprio and Levine (2001) and (2002)

Code	Definition	Source
PSINGLE	Is there more than one supervisory body? Yes=0, No=1	Barth, Caprio and Levine (2001) and (2002); OCC
PCBANK	Is central bank one of the supervisory body? Yes=1, No=0	Barth, Caprio and Levine (2001) and (2002); OCC
SSINGLE	Is there more than one supervisory body? Yes=0, No=1	Courtis (1999)
SCBANK	Is central bank one of the supervisory body? Yes=1, No=0	Courtis (1999)
SCOPE	Does the banking regulator regulate insurance or securities firms? Yes=1, No=0	Courtis (1999)
INDPSUP	Independence of Supervisory Authority, ranges from 1-3, with higher value indicating greater independence	Barth, Caprio and Levine (2001) and (2002)

Table 7
Descriptive Statistics for Variables

	Mean	Median	Maximum	Minimum	Standard Observations	Number of Observations	Number of Countries
PTA	0.02	0.01	0.86	-1.45	0.06	2,368	55
ETA_1	0.12	0.08	2.96	-1.17	0.16	2,368	55
LTA	0.51	0.54	1.00	-0.01	0.24	2,368	55
NIETA	0.08	0.05	1.00	0.00	0.09	2,368	55
CSFTA	0.76	0.81	2.20	0.00	0.19	2,368	55
OHTAR	0.04	0.03	0.96	0.00	0.04	2,368	55
TXR	0.23	0.31	1.00	-15.40	0.67	2,368	55
GNPP	23.04	29.11	50.73	0.23	15.65	2,368	55
GRO	2.50	2.92	10.66	-7.17	2.42	2,368	55
INF	3.36	1.55	56.20	-2.60	7.14	2,368	55
BACON3	38.37	37.10	97.17	16.20	18.56	2,368	55
TVGDP	0.78	0.45	2.08	0.00	0.75	2,368	55
BCGDP	0.76	0.71	1.74	0.08	0.43	2,368	55
GOVOBA	17.45	8.66	93.94	0.00	22.05	2,368	55
FOROBA	20.29	11.57	100.00	0.00	23.27	2,368	55
POWER	2.15	2.33	3.67	1.00	0.81	2,368	55
MIXBC	2.19	2.00	3.50	1.00	0.68	2,368	55
SUPFORB	1.79	2.00	4.00	0.00	1.00	2,368	55
SUBDEBT	0.97	1.00	1.00	0.00	0.18	2,368	55
DI	0.93	1.00	1.00	0.00	0.26	2,368	55
PSINGLE	0.71	1.00	1.00	0.00	0.46	2,368	55
PCBANK	0.59	1.00	1.00	0.00	0.49	2,368	55
SSINGLE	0.62	1.00	1.00	0.00	0.49	2,354	53
SCBANK	0.65	1.00	1.00	0.00	0.48	2,354	53
SCOPE	0.42	0.00	1.00	0.00	0.49	2,354	53
INDPSUP	2.30	3.00	3.00	1.00	0.80	2,368	55

Table 8
OLS Regression Results – Primary Supervisory Data
Dependent Variable: Before Tax Profits to Total Assets

	(1)	(2)	(3)	(4)	(5)	(6)
CONSTANT	0.077***	0.0829***	0.0743***	0.0767***	0.0833***	0.078***
	(0.0016)	(0.0024)	(0.0042)	(0.0014)	(0.0014)	(0.0028)
ETA_1	0.062**	0.0614**	0.0621**	0.0613*	0.0615**	0.0618**
	(0.0482)	(0.0489)	(0.0477)	(0.05)	(0.0491)	(0.0488)
LTA	-0.0075	-0.0085	-0.0072	-0.0081	-0.0079	-0.0071
	(0.2766)	(0.2078)	(0.295)	(0.2348)	(0.2464)	(0.3022)
NIETA	-0.0577***	-0.0585***	-0.0569***	-0.0566***	-0.0567***	-0.056***
	(0.0015)	(0.0015)	(0.0019)	(0.0019)	(0.0018)	(0.0022)
CSFTA	-0.0947***	-0.0959***	-0.0944***	-0.0958***	-0.095***	-0.0936***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
OHTAR	0.1507	0.1505	0.1511	0.1554	0.1502	0.1563
	(0.3016)	(0.3025)	(0.3009)	(0.2903)	(0.3035)	(0.2879)
TXR	0.005***	0.005***	0.005***	0.0049***	0.005***	0.0049***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
GNPP	0.0005***	0.0004***	0.0005***	0.0005***	0.0005***	0.0005***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
GRO	-0.0003	0.0000	-0.0003	0.0000	0.0003	0.0002
	(0.6222)	(0.9749)	(0.6193)	(0.9369)	(0.5839)	(0.8111)
INF	-0.0001	0.0000	-0.0001	-0.0001	0.0000	0.0000
	(0.9414)	(0.9728)	(0.9436)	(0.9233)	(0.9464)	(0.9706)
BACON3	-0.0001	0.0000	-0.0001	0.0000	0.0000	-0.0001
	(0.2271)	(0.8353)	(0.235)	(0.7196)	(0.7855)	(0.1741)
BCGDP	-0.0149**	-0.0106**	-0.0149**	-0.0097**	-0.0103**	-0.0144***
	(0.0102)	(0.0198)	(0.0101)	(0.021)	(0.0165)	(0.0092)
TVGDP	0.0038*	0.0015	0.0036*	0.0011	0.0016	0.0036*
	(0.0605)	(0.4758)	(0.0635)	(0.6269)	(0.4915)	(0.0742)
GOVOBA	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.1216)	(0.1313)	(0.1294)	(0.1437)	(0.2479)	(0.265)
FOROBA	0.0001*	0.0001*	0.0001*	0.0001*	0.0001	0.0001
	(0.075)	(0.0754)	(0.0688)	(0.0772)	(0.116)	(0.1713)
POWER	0.0028	0.0039*	0.0027	0.0045*	0.0034	0.0027
	(0.1633)	(0.0586)	(0.1777)	(0.0541)	(0.1269)	(0.2411)
MIXBC	-0.0063***	-0.007***	-0.0062***	-0.0071***	-0.0068***	-0.0063***
	(0.0044)	(0.0033)	(0.0047)	(0.0035)	(0.0041)	(0.0053)
SUPFORB	-0.0007	-0.0014	-0.0005	-0.0012	-0.0005	0.0002
	(0.7147)	(0.484)	(0.7568)	(0.5205)	(0.7912)	(0.898)
SUBDEBT	0.0205***	0.0179***	0.0208***	0.0191***	0.0201***	0.024***
	(0.0016)	(0.0066)	(0.0018)	(0.0021)	(0.0023)	(0.0003)
DI	-0.0172***	-0.0157***	-0.0171***	-0.0148***	-0.015***	-0.0165***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
PSINGLE	0.0083**		0.009**			0.009**
	(0.028)		(0.0282)			(0.0313)
PCBANK		-0.002	0.0014			-0.0021
		(0.3659)	(0.5504)			(0.5605)
SCOPE				0.0009		-0.0051
				(0.6503)		(0.1766)
INDPSUP					-0.0027	-0.0025
					(0.1985)	(0.2623)
Adjusted R^2	0.1922	0.1906	0.1923	0.191	0.191	0.1933
F-Statistics	27.9234	27.64	26.59	27.5448	27.7023	24.27
Number of Observations	2368	2368	2368	2354	2368	2354
Number of Countries	55	55	55	53	55	53

***, ** and * denote significant level at 1%, 5% and 10% respectively; p-values are in parentheses.

Table 9
OLS Regression Results – Primary Supervisory Data:
Single Supervisor, and the Central Bank as the Single Supervisor
Dependent Variable: Before Tax Profits to Total Assets

	(7)	(8)	(9)	(10)
CONSTANT	0.0751***	0.0754***	0.0833***	0.0863***
	(0.0024)	(0.0022)	(0.0023)	(0.0014)
ETA_1	0.0622**	0.0618**	0.0625**	0.0622**
	(0.0476)	(0.0489)	(0.0474)	(0.0486)
LTA	-0.0071	-0.0069	-0.007	-0.0069
	(0.3095)	(0.3183)	(0.3156)	(0.3191)
NIETA	-0.0565***	-0.0555***	-0.0567***	-0.056***
	(0.002)	(0.0022)	(0.002)	(0.0022)
CSFTA	-0.0942***	-0.0936***	-0.094***	-0.0933***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
OHTAR	0.1512	0.1562	0.1509	0.1562
	(0.3003)	(0.2884)	(0.3019)	(0.2886)
TXR	0.005***	0.0049***	0.005***	0.0049***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
GNPP	0.0005***	0.0005***	0.0005***	0.0006***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
GRO	-0.0003	0.0001	-0.0005	0.0000
	(0.5825)	(0.861)	(0.4835)	(0.9449)
INF	-0.0001	0.0000	-0.0001	-0.0001
	(0.9405)	(0.9697)	(0.9271)	(0.9457)
BACON3	-0.0001	-0.0001	-0.0001	-0.0001
	(0.2183)	(0.184)	(0.1574)	(0.1307)
BCGDP	-0.0152**	-0.0143**	-0.0156**	-0.015**
	(0.0101)	(0.0103)	(0.0139)	(0.0141)
TVGDP	0.0036*	0.0036*	0.0037*	0.0036*
	(0.0647)	(0.0779)	(0.0638)	(0.0798)
GOVOBA	0.0001	0.0001	0.0001	0.0001
	(0.1237)	(0.2748)	(0.1261)	(0.2497)
FOROBA	0.0001*	0.0001	0.0001*	0.0001
	(0.0688)	(0.187)	(0.0624)	(0.1471)
POWER	0.0026	0.0026	0.0026	0.0028
	(0.186)	(0.2419)	(0.1787)	(0.2191)
MIXBC	-0.0062***	-0.0062***	-0.0066***	-0.0067***
	(0.0043)	(0.0061)	(0.0033)	(0.0038)
SUPFORB	-0.0005	0.0003	-0.0007	0.0000
	(0.7624)	(0.8842)	(0.6989)	(0.9969)
SUBDEBT	0.021***	0.024***	0.0209***	0.0237***
	(0.0018)	(0.0003)	(0.0019)	(0.0003)
DI	-0.0169***	-0.0164***	-0.0162***	-0.0156***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
PSINGLE	0.0076**	0.0098**		
	(0.0332)	(0.02)		
PCBANK			-0.0079*	-0.011*
			(0.061)	(0.0591)
PCBANK*PSINGLE	0.0021	-0.0008	0.0106*	0.0103*
	(0.466)	(0.851)	(0.0577)	(0.0736)
SCOPE		-0.0039		-0.0048
		(0.2487)		(0.1978)
INDPSUP		-0.0024		-0.0021
		(0.2831)		(0.3486)
Adjusted R^2	0.1851	0.1853	0.1851	0.1852
F-Statistics	26.6	24.2617	26.6003	24.2608
Number of Observations	2368	2354	2368	2354
Number of Countries	55	53	55	53

***, ** and * denote significant level at 1%, 5% and 10% respectively; p-values are in parentheses.

Table 10
OLS Regression Results – Secondary Supervisory Data
Dependent Variable: Before Tax Profits to Total Assets

	(11)	(12)	(13)	(14)
CONSTANT	0.077***	0.0791***	0.0815***	0.0901***
	(0.0011)	(0.0026)	(0.0028)	(0.0026)
ETA_1	0.0612*	0.0612**	0.061*	0.0607*
	(0.0501)	(0.0499)	(0.05)	(0.0505)
LTA	-0.0085	-0.0082	-0.0089	-0.0092
	(0.2121)	(0.2244)	(0.1861)	(0.1766)
NIETA	-0.0571***	-0.0569***	-0.058***	-0.0577***
	(0.0018)	(0.0018)	(0.0017)	(0.0017)
CSFTA	-0.0958***	-0.0958***	-0.0962***	-0.0952***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
OHTAR	0.1557	0.1555	0.1552	0.1544
	(0.2873)	(0.2891)	(0.2899)	(0.2941)
TXR	0.0048***	0.0049***	0.0048***	0.005***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
GNPP	0.0004***	0.0005***	0.0004***	0.0003***
	(0.0000)	(0.0000)	(0.0001)	(0.0015)
GRO	0.0002	0.0001	0.0002	0.0008
	(0.7687)	(0.873)	(0.7627)	(0.2867)
INF	0.0000	-0.0001	0.0000	0.0001
	(0.9563)	(0.9221)	(0.9537)	(0.8716)
BACON3	0.0001	0.0000	0.0001	0.0000
	(0.4396)	(0.7407)	(0.4696)	(0.6226)
BCGDP	-0.0078**	-0.0102**	-0.0086**	-0.0064
	(0.0491)	(0.0272)	(0.0479)	(0.1334)
TVGDP	0.0006	0.001	0.0009	0.0012
	(0.798)	(0.628)	(0.6717)	(0.5886)
GOVOBA	0.0001	0.0001	0.0001	0.0001
	(0.1498)	(0.1438)	(0.1472)	(0.458)
FOROBA	0.0001*	0.0001*	0.0001*	0.0001*
	(0.0601)	(0.0872)	(0.0634)	(0.059)
POWER	0.0045*	0.0043*	0.0043*	0.0034
	(0.0531)	(0.0594)	(0.0602)	(0.1736)
MIXBC	-0.0072***	-0.0072***	-0.0074***	-0.0075***
	(0.0033)	(0.0033)	(0.003)	(0.0027)
SUPFORB	-0.0016	-0.0012	-0.0016	-0.0008
	(0.4315)	(0.5526)	(0.436)	(0.7156)
SUBDEBT	0.0189***	0.0192***	0.0187***	0.0217***
	(0.0024)	(0.0021)	(0.003)	(0.0006)
DI	-0.0141***	-0.0149***	-0.0142***	-0.0125***
	(0.0000)	(0.0000)	(0.0000)	(0.0005)
SSINGLE	-0.0026		-0.0032	-0.0075
	(0.3042)		(0.258)	(0.1044)
SCBANK		-0.0013	-0.0018	-0.0027
		(0.5827)	(0.4576)	(0.4511)
SCOPE				-0.0024
				(0.4655)
INDPSUP				-0.0045
				(0.1218)
Adjusted R^2	0.1911	0.191	0.1912	0.1922
F-Statistics	27.5635	27.5491	26.2578	24.1091
Number of Observations	2354	2354	2354	2354
Number of Countries	53	53	53	53

***, ** and * denote significant level at 1%, 5% and 10% respectively; p-values are in parentheses.

Table 11
OLS Regression Results – Secondary Supervisory Data:
Single Supervisor, and the Central Bank as the Single Supervisor
Dependent Variable: Before Tax Profits to Total Assets

	(15)	(16)	(17)	(18)
CONSTANT	0.0791***	0.0858***	0.0768***	0.079***
	(0.0017)	(0.0016)	(0.0023)	(0.0021)
ETA_1	0.061**	0.0608**	0.0611**	0.0611**
	(0.0494)	(0.0498)	(0.0495)	(0.0493)
LTA	-0.0089	-0.009	-0.0087	-0.0085
	(0.1785)	(0.1727)	(0.1832)	(0.1969)
NIETA	-0.0584***	-0.0579***	-0.0584***	-0.0579***
	(0.0018)	(0.0019)	(0.0019)	(0.0019)
CSFTA	-0.0962***	-0.0952***	-0.0962***	-0.0953***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
OHTAR	0.155	0.1542	0.155	0.154
	(0.2916)	(0.2955)	(0.2916)	(0.2966)
TXR	0.0048***	0.0049***	0.0048***	0.0049***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
GNPP	0.0004***	0.0003***	0.0004***	0.0004***
	(0.0001)	(0.0011)	(0.0000)	(0.0001)
GRO	0.0001	0.0007	0.0001	0.0005
	(0.7976)	(0.2902)	(0.8269)	(0.4114)
INF	-0.0001	0.0001	-0.0001	0.0000
	(0.9444)	(0.89)	(0.9346)	(0.9552)
BACON3	0.0001	0.0000	0.0001	0.0000
	(0.4398)	(0.6131)	(0.5386)	(0.7409)
BCGDP	-0.008**	-0.0056	-0.0077*	-0.006
	(0.0489)	(0.1783)	(0.067)	(0.1384)
TVGDP	0.0006	0.0009	0.0004	0.0005
	(0.7884)	(0.7297)	(0.8701)	(0.8448)
GOVOBA	0.0001	0.0001	0.0001	0.0001
	(0.1436)	(0.3723)	(0.1408)	(0.2762)
FOROBA	0.0001*	0.0001**	0.0001	0.0001
	(0.0538)	(0.0391)	(0.1058)	(0.1319)
POWER	0.0047*	0.0039	0.005*	0.0047*
	(0.0562)	(0.1414)	(0.07)	(0.0904)
MIXBC	-0.0073***	-0.0072***	-0.0071***	-0.0069***
	(0.0033)	(0.0037)	(0.0033)	(0.0043)
SUPFORB	-0.0016	-0.0008	-0.0015	-0.0007
	(0.4386)	(0.7009)	(0.4704)	(0.759)
SUBDEBT	0.0184***	0.0213***	0.0183***	0.0207***
	(0.0045)	(0.0011)	(0.0051)	(0.0014)
DI	-0.0144***	-0.0128***	-0.0146***	-0.0138***
	(0.0000)	(0.0002)	(0.0000)	(0.0001)
SSINGLE	-0.0014	-0.0052		
	(0.5845)	(0.1881)		
SCBANK			0.0013	0.0033
			(0.669)	(0.3793)
SCBANK*SSINGLE	-0.0027	-0.0029	-0.0042	-0.0066
	(0.4825)	(0.5302)	(0.399)	(0.2274)
SCOPE		-0.0019		-0.0012
		(0.4655)		(0.6898)
INDPSUP		-0.0044		-0.0036
		(0.1234)		(0.1252)
Adjusted R^2	0.1913	0.1922	0.1913	0.192
F-Statistics	26.2677	24.1109	26.2671	24.0783
Number of Observations	2354	2354	2354	2354
Number of Countries	53	53	53	53

***, ** and * denote significant level at 1%, 5% and 10% respectively; p-values are in parentheses.