

Integrated Financial Supervision and its Implications for
Banking Sector Stability

by

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1. Abstract

Over the past two decades, there has been a clear trend in many countries toward integrating the prudential regulation and supervision of banks, nonbank financial institutions, and securities markets in a single national agency. A systemic banking crisis in the UK cast doubts on the ability of integrated supervisory bodies to effectively monitor the banking sector. This paper attempts to assess the impact of integrated supervisory agencies on banking sector stability, using a comprehensive dataset on cross-country banking sector regulation and supervision. This paper starts with a review of the arguments in favor and against integration in financial sector supervision, as well as a summary of the advantages and disadvantages of separating central banking from supervisory responsibilities. This study finds that countries with single supervisors share common traits such as a high level of economic development, sophisticated and expansive banking sectors, and very low frequencies of systemic banking sector crises. These commonalities are proven to be statistically different from those observed in countries with multiple supervisors. This study also finds that the presence of a single supervisor does not impact banking sector performance, although there is some evidence that the level of integration affects banking sector performance. Central bank involvement is found to be detrimental to the performance of the banking sector, controlling for economic growth and inflation.

2. Introduction

The current economic crisis has seen experts from a wide range of specialties cite many different factors that were responsible for the ensuing failures of the financial system. Several explanations revolve around inconsistent regulation and supervision of the financial sector, and particular loopholes that allowed financial intermediaries to exploit regulatory arbitrage opportunities. Less often discussed is the overarching structure of financial supervision and the role this might play, if any, in promoting or exacerbating a financial crisis.

Here, financial supervisory structure refers to the number of regulators a country employs to monitor the three most important components of its financial system, the banking, securities and insurance sectors¹. For example, the United States has five institutional regulators that are responsible for supervising bank and non-bank financial intermediaries at a federal level, while the insurance sector is monitored by individual state governments². Contrast this setup with that of the United Kingdom's Financial Services Authority (FSA). The FSA is a single institution charged with supervising the United Kingdom's securities, banking and insurance sectors, and was created in 1997 by consolidating the responsibilities of eight different supervisory and regulatory agencies. Supervisory structures in the US and UK are on opposite ends of the integration spectrum, the US representing the lowest level of integration while the UK

¹ Masciandaro (2006a), Group of Ten (2001), Zalm (2005)

² The Office of the Comptroller of the Currency (OCC), an agency within the US Treasury Department, supervises national banks and federally licensed branches of foreign banks. The Federal Reserve Board (FRB) and the State Governments supervise state chartered banks which are members of the Federal Reserve System. State chartered, non-member banks are supervised by the State Governments. The FRB has the authority to supervise all bank holding companies and their subsidiaries. In addition, the autonomous Federal Deposit Insurance Corporation (FDIC) has some supervisory responsibilities (Goodhart and Schoenmaker, 1995.) Brokerage houses and securities dealers are supervised by the Securities and Exchange Commission (SEC) and the market for financial derivatives is regulated by the Commodities Futures Trading Commission (CFTC). Insurance companies are monitored at the state-level, but a self-regulating organization, the National Association of Registered Agents and Brokers, charged with establishing uniform licensing requirements for insurance agents and brokers operating on a multistate level.

demonstrates the highest level of integration in financial sector supervision. Do these structural differences correspond to, or occur in tandem with, a worsening of the banking sector?

A *prima facie* answer would be in the affirmative, as the presence of an “incoherent set of overlapping regulators” would likely increase the potential for various intermediaries to be regulated according to different standards (Roubini, 2008). By the same logic, having a single regulator would likely reduce the chance of inconsistencies arising in the standards different intermediaries are held to. The counter argument says that differing standards of regulation for different financial intermediaries does *not always* imply a regulatory failure. A single regulatory agency may fail to respond to situations where a particular type of intermediary requires unique regulation and supervision, whereas an individual supervisory body in a multiple supervisory framework can specialize in regulating a particular type of financial service. A more detailed discussion of the merits and drawbacks of integrated versus multiple supervisory regimes follows in the next section.

However, the purpose of this paper is not to discredit multiple supervisory regimes in favor of integrated supervisory regimes. The current literature goes to great lengths to downplay the alleged superiority of one regime over another (Di Noia and Di Giorgio, 1999; Masciandaro, 2006b; Goodhart, 2001). Rather, the motivation of this study is to determine whether the supervisory structure actually affects the stability of a country’s banking sector, and whether integrated financial supervisory structures might be suited to some countries over others. Specifically, is there a statistically significant relationship between the level of integration of a country’s financial supervisors and banking sector performance? Are there commonalities between countries that have integrated financial supervisory structures versus those do not? This study finds that there is a statistically significant relationship, albeit weak, between higher levels

of integration in supervisory regimes and better banking sector performance as measured by lower nonperforming loans (NPL) ratios³.

The nature of financial intermediaries is changing due to a breakdown of strict divisions between banking, securities and insurance industries, the blurring effect⁴, and the subsequent integration across intermediaries to create financial conglomerates⁵. Supervisors can no longer delineate regulatory jurisdiction between intermediaries based on function alone as financial conglomerates are engaging in the full range of banking, securities and insurance related businesses. Partly in response to the cross-border and cross-sector blurring effect, financial supervision around the world has gradually shifted away from multiple regulatory agencies for the securities, banking and insurance sectors to a model of ‘unified’ supervision for oversight of the three sectors. According to the World Bank, there were at least forty-four countries that had a single regulatory authority for their respective financial systems⁶ as of June 2008. This number is set to increase, as Bulgaria, Indonesia and Slovenia are the latest countries reportedly considering the establishment of a unified regulator.

3. Integration of Financial Supervision

Cihak and Podpiera (2007) categorize the general framework of financial supervision as concerning (micro)prudential supervision and business conduct, each of which addresses a type of market failure (asymmetric information and market misconduct, respectively). Within financial supervision itself, there remain a multitude of possible structural arrangements with regard to the extent of integration:

³ Defined as total nonperforming loans as a proportion of total banking sector assets

⁴ Masciandaro (2006a).

⁵ Defined as a group which undertakes at least two major financial services activities

⁶ Defined to include insurance companies, contractual savings institutions, and savings banks by Barth, Caprio and Levine (2006).

- 1) *Full integration*: an institution responsible for regulation and supervision of all the major types of financial institutions and markets. This model can be found in a wide range of financial systems, from very small (e.g., some offshore financial systems) to large and complex (e.g., Japan), from very concentrated (e.g., Estonia) to relatively dispersed (e.g., the UK) and from countries where a prior systemic banking crisis has occurred (e.g., Norway) to countries with no history of systemic banking crises. Within this model there are three sub-categories:
 - a) *Full sectoral and functional integration*: where the regulator is responsible for prudential supervision of all components of the financial system, and also for business conduct supervision (e.g., deposit insurance). The United Kingdom's FSA is one such authority;
 - b) *Twin peaks*: a model where one institution is in charge of prudential supervision in all sectors of the financial system and another institution is responsible for consumer protection, market conduct and corporate governance throughout the financial system, hence the title 'twin peaks'. The Australian Prudential Regulation Authority and the Australian Securities and Investment Commission are an example of the twin peaks framework;
 - c) *Full sectoral and partial functional integration*: this structure comprises a fully integrated supervisory agency, which shares some of the functions of supervision with other agencies, most commonly with the central bank. The German central bank, Deutsche Bundesbank, is closely involved with the German Financial Supervisory Authority, BaFin, in administering banking supervision;
- 2) *Partial sector integration*: this framework includes authorities that supervise two of the three main components of the financial system. There are three main sub-categories – integration

of banking and securities, banking and insurance, and securities and insurance supervisory bodies – which can be further split on the basis of the central bank’s involvement in supervisory activities

- 3) *No sectoral integration*: this is the most common arrangement with supervisory responsibilities shared by multiple authorities. Several larger economies such as Brazil, China, France, Russia and the United States adopt this kind of regime

There are several benefits to the integrated financial supervision approach, just as there are disadvantages.

i. Advantages of Unifying Financial Sector Supervision

As mentioned earlier, the blurring of divisions between financial intermediaries and the emergence of financial conglomerates meant that supervision has had to evolve as well. The solution proposed by academics has been to entrust one institution with the responsibility for supervising all financial intermediaries⁷. Disparate supervision raises concerns about the ability of financial supervisory authorities to “form an overall risk assessment of the institution on a consolidated basis, as well as their ability to ensure that supervision is seamless and free of gaps” (Abrams and Taylor, 2000). In particular, group-wide risks, such as overall capital adequacy and risk management protocols, may not be picked up or handled adequately by specialist supervisors. Even when a potential weakness is detected in a conglomerate, multiple supervisors may not be able to respond on a group-wide basis. The possibility for information and task sharing between separate supervisors that monitor a diverse financial services company does exist in theory. With prompt transfer of relevant information and the establishment of a ‘lead regulator’ that is given the power and responsibility of spearheading a coordinated response

⁷ Borio and Filosa (1994), Abrams and Taylor (2000)

should a crisis arise, a fragmented supervisory regime might be able to offer the holistic approach to the supervision of large, diversified intermediaries that an integrated supervisor does. It is argued, however, that the clear management structure of an integrated supervisor will be more effective in making sure conglomerates do not fall through regulatory gaps or are subject to regulatory overlap⁸.

A point was made earlier about the inconsistency of regulation when multiple supervisory agencies monitor a rapidly advancing financial sector. Some of the traditional distinctions between product lines are no longer as clear. Credit derivatives, for example, bear many of the characteristics of an insurance product. More importantly, the trend of securitizing traditional forms of credit and the proliferation of increasingly sophisticated ways of building, repackaging, and trading risks have weakened the distinction between equity, debt, and loans⁹. Thus, the situation may arise where financial intermediaries offering similar services are supervised by different authorities. If supervisory attitudes are not consistent, the risk that financial intermediaries will engage in regulatory arbitrage arises. In such a case, Abrams and Taylor (2000) note a new financial product or service will be located strategically in the part of a conglomerate such that regulatory compliance costs are minimized and/or where supervision is the least intrusive. On a larger scale, the design of whole institutions may revolve around the minimization of regulatory oversight. This opens up a potentially hazardous issue of regulatory bodies ‘competing’ for more ‘clients’ by lowering their standards of regulation. Abrams and Taylor do not suggest that complete consistency across regulators is entirely desirable either. A systemically important intermediary, such as a participant in the payments system, may warrant greater attention than a pension fund. Similarly, supervisors may want to monitor a bank’s

⁸ Abrams and Taylor (2000)

⁹ See Briault (1999) for a detailed account on the blurring of distinctions between financial services

activities in historically risky markets such as stock market derivatives more closely than that of a mutual fund, even though both engage in the same practices. As a result, the authors tentatively encourage regulatory arbitrage “insofar as it involves locating riskier operations in subsidiaries that are outside of the systemically important part of the conglomerate” (Abrams and Taylor, 2000).

Thus, it would appear that integrated supervision is more suited to managing the risks posed by the rapid pace of financial innovation, than a system with multiple supervisors. Countries that have recently liberalized their financial systems are most susceptible to rapid growth of nonbank financial intermediaries that have the potential to endanger macroeconomic stability. The presence of a regulatory agency that has the authority to extend its jurisdiction over intermediaries that may lie beyond the scope of a specialized regulator in a multiple regulatory framework is a major benefit of an appropriately constituted unified supervisor (Abrams and Taylor, 2000). An inherent risk however, is giving the unified regulator *carte blanche* over the entire financial system and the fear that the regulator will extend its reach inappropriately¹⁰.

Other arguments in favor of integrating financial sector supervision in a single authority, such as achieving scale economies (Abrams and Taylor, 2000), improved supervisory efficiency (Bernanke, 2001) and greater accountability (Rose and Martinez, 2003), have been aired by scholars and policymakers alike. Unifying financial supervision under a single entity may result in cost savings due to shared infrastructure, administration and support services¹¹. An ancillary benefit of creating an integrated financial supervisor is that it becomes solely responsible for its statutory objectives. In the event of supervisory failure, blame cannot be passed on to partner

¹⁰ See Taylor (1997) for elaboration on this point

¹¹ Taylor and Fleming (1999) find that the Scandinavian experience with a unified regulator has resulted in significant economies of scale. Abrams and Taylor (2000) note that the FSA has also reported substantial savings from the unification of support services.

agencies. On the other hand, the objectives of the unified regulator could be poorly specified, in which case specialist supervisors in a multiple supervisory regime could be held to higher standards of accountability as they have clearly defined jurisdictions and responsibilities (Rose and Martinez, 2003).

ii. Disadvantages of Unifying Financial Sector Supervision

The list of arguments against unifying financial supervision is as long, if not longer than the arguments favoring integration. Continuing from the problem of unclear objectives mentioned directly above, it will be difficult for the unified supervisor to strike a functional balance between the various objectives. Given that these objectives involve macro concerns, such as guarding against systemic risk, to micro issues, such as administering consumer protection programs; it is possible that a single regulator may not have a clear idea of its role and responsibility. When different objectives come into conflict with each other, problems may arise.

This leads to the danger of moral hazard arising through regulation, a problem that is also witnessed when monetary policy and supervisory objectives are conducted by the same institution¹². The premise is that the public will tend to assume that all creditors of institutions supervised by a given supervisor will receive equal protection. If depositors are protected from loss in the event of a bank failure, then the customers and creditors of other financial institutions supervised by the same regulatory body will expect to be treated in a similar manner. This again alludes to the supervisor being saddled with unclear objectives, but can be resolved by specifying the standards by which supervision will proceed at the unified supervisor's inception rather than midway through a crisis.

¹² Bernanke (2001)

Problems of division within the unified regulator along traditional lines – i.e., separate departments for banking, securities and insurance – are apparent. This is almost inevitable as the functional approaches to supervision differ across intermediaries. Banking supervisors, for example, are likened to “doctors examining the health of the patient” while securities regulators “are more like policemen trying to catch the miscreant securities dealers” (Abrams and Taylor, 2000). In this sense, the synergies to be gained from the unification of specialized regulators are limited, and if present, are difficult to measure. The traditional approaches are changing, albeit slowly, with the growing role played by diversified financial conglomerates in developing and developed economies. The FSA for example, has experimented with matrix-based sub-groups such as the Complex Groups division which specializes in monitoring conglomerates¹³.

The points made above though, are apparent flaws of an integrated financial supervisory body, and it is equally fruitful to consider the arguments made in favor of multiple supervisory authorities. Competition between supervisors, a hallmark of multiple supervisory frameworks, will be eliminated by unifying the various agencies to the detriment of the financial system, believe some academics. Greenspan (1994) argued that a single regulator entrusted with micro, but not macro responsibilities, would be more likely to over-regulate the financial sector, thereby stifling innovation. Moreover, it is said to limit the regulatory choice available to banks, which in the past has often enhanced market competition and enhanced innovation¹⁴. This line of reasoning envisages healthy competition amongst regulators on supervisory performance, establishing an environment where the regulators will each be able to learn from the best practices of others and thereby stimulating a ‘race to the top’. There are fundamental flaws with this logic which have been addressed earlier in this paper, namely that competition between

¹³ Abrams and Taylor (2000)

¹⁴ Shadow Financial Regulatory Committee (1993)

regulators may spark a lowering of supervisory standards, and an eventual ‘race to the bottom’ rather than the top. Further, the setting in which this argument was conceived is in stark contrast to the current financial environment, where divisions between traditional businesses have been blurred and cross-sector consolidation has created giant financial conglomerates.

4. Central Bank involvement in Financial Supervision

As Masciandaro (2006b) points out, there are two possible approaches to unifying regulatory and supervisory bodies that a country can consider:

1. Integrating all supervisory powers within the central bank, or
2. Unifying powers in a different supervisory entity.

This is possible through four types of supervisory regimes; unified supervision without central bank involvement, unified supervision with central bank involvement, specialized supervision without central bank involvement, and specialized supervision with central bank involvement. Of the four, the first and last are the most popular (Masciandaro 2004 and 2006a, Cihak and Podpiera 2007). In most countries, the central bank is the guarantor of systemic macroeconomic stability, and consequently of systemic financial stability which leads one to ask why financial sector supervision is not the responsibility of the central bank. This is an important question and has been the subject of a considerable amount of scholarly attention.

iii. Arguments for Separation

The case put forth for separation of the supervisory function from the central bank states that there is a fundamental conflict of interest between administering monetary policy and the act of financial supervision. A conflict of interest “could arise between the monetary authorities, who wish for higher interest rates, and the regulatory authorities, who are frightened about the

adverse effects such higher rates might have upon the profitability and solvency of the banking system” (Goodhart and Schoenmaker, 1995). The alternative situation, albeit a more unlikely one, in which monetary policy is conducted with excessive regard for the health of one or more financial institutions, is potentially even more dangerous. It could lead to inappropriate monetary policy that might, in the long run, worsen the problems a country faces¹⁵.

The cyclical effects of regulatory (micro) and monetary (macro) policy tend to conflict. Monetary policy is counter-cyclical, while the effect of regulation, such as capital adequacy requirements, tends to be pro-cyclical¹⁶. For example, in a period of economic slowdown, in which the banking sector’s non-performing assets are likely to increase, the banking supervisor will require higher provisions for possible loan losses and put pressure on banks to improve the quality of their portfolios. The banks’ implementation of these supervisory recommendations would hence result in tighter credit in the course of a recession¹⁷. Monetary policy should instead be expansionary, and would call for a temporary reduction in the minimum capital asset ratios, so as to provide more funds to the economy and speed up its recovery. On the other hand, a tight monetary policy may have an undesired impact on bank solvency, as higher interest rates increase the risk of loan defaults in the banking system.

The conflict of interest rationale is of particular relevance for monetary authorities that are concerned with external objectives such as the maintenance of the exchange rate. In the Exchange Rate Mechanism crisis of 1992-93 in Europe¹⁸ and the Asian crisis of 1997, the

15 Heller, 1991

16 Goodhart and Schoenmaker, 1993

17 Tuya and Zamalloa 1994

¹⁸ The European Monetary System (EMS) was founded in 1979 and twelve countries took part in the system: The Netherlands, Germany, Belgium, Luxembourg, Greece, Denmark, France, Ireland, Italy, Spain (since 1989), UK (since 1990) and Portugal (since 1992). Within the EMS existed the Exchange Rate Mechanism (ERM), which contained ten currencies (Greece is not a member of the ERM, while the Luxembourg franc is set at par to the Belgian franc). The crisis in 1992-93 created a huge

interest rate that was needed to maintain a stable and credible exchange rate threatened internal financial stability¹⁹. Even in the absence of fixed-exchange rate or managed float exchange-rate regimes, the conflict arises due to the assumption that high short-term rates are hazardous to the banking system. Goodhart and Schoenmaker (1995) explain that the damage high short-term rates causes depends on how long such rates last. More crucially, they make clear that the structure of the prevailing banking system plays a telling role. Banking systems which are primarily financed by a retail deposit base, whose interest rates are unlikely to follow (large) changes in money market wholesale rates, would be in a better position to cope with (temporarily) tight monetary conditions. Also, systems where bank loans and mortgages are made on a fixed-rate basis will be less sensitive, economically and politically to temporary periods of high rates, than those systems where loans are made on a variable-rate basis. This shows that the potential for conflict between regulatory and monetary objectives depends to a large degree on the structure of the financial system, and the composition of its assets and liabilities. The more such a system involves intermediaries financing maturity mismatched positions through competitive wholesale markets, the greater the potential for conflicts of interest to arise.

Concurrently, the combination of functions might also lead the private sector to develop expectations that “the central bank might be influenced by financial system stability considerations when determining monetary policy” or vice versa (Goodhart and Schoenmaker, 1995). The influence of regulatory agencies on monetary policy brings the credibility of the central bank to implement the most appropriate policy for systemic macro stability into question,

economic and political strain between countries in the E.U. Some of the contributing factors included competitiveness problems, German unification, inevitable policy shifts and the occurrence of self-fulfilling speculative attacks.

¹⁹ Goodhart (2001)

which further restricts the central bank to administer its monetary objectives. The notion that the reputation costs for a central bank are perceived to be very high in the case of bank failures is another contributing factor²⁰. Being involved in resolving a bank crisis under its control may hurt the central bank's global credibility, thereby negatively affecting its ability to control inflation. Reduced credibility could in fact induce higher inflation expectations, which in turn might increase inflation itself.

iv. Arguments against Separation

The primary argument against the separation of financial supervision from the central bank, that is combining the functions of monetary and supervisory policy, is the central bank's concern for the systemic stability of the financial system. The central bank, as the guarantor of systemic macroeconomic stability, has the ability to lend to a cash-strapped commercial bank via its lender-of-last-resort (LOLR) facility. The debate focuses on whether the central bank knows when it is appropriate to provide LOLR facilities to an ailing bank, and whether the combination of the two responsibilities leads to moral hazard. The prevailing literature finds that having banking supervision combined with monetary policy within the central bank is useful, as this solution facilitates merging of relevant information on both macro (monetary) and microeconomic (regulatory and supervisory) variables²¹.

Combining both tasks, allows the central bank to acquire valuable insights into the overall state of the economy by being involved in the supervision and regulation of financial

²⁰ Di Noia and Di Giorgio (1999)

²¹ As we shall see, this poses a problem for the central bank that wants only to retain control of the systemically important task of supervising banks. The central bank would ideally want to monitor the institutions it typically provides the LOLR function to, but it would not be able to do so without undertaking responsibility for the supervision of *all* intermediaries, regardless of their systemic importance, due to the creation of a single supervisor for the financial sector. Thus, the central bank would have to decide between assuming responsibility for supervising activities that are outside its historical sphere of expertise (such as customer protection issues and deposit insurance) or to leave all supervisory related activities with the single regulator. See Goodhart (2001) for a detailed account of the central bank's history in financial supervision.

institutions. A study on the US economy by Peek et al. (1999) showed that confidential supervisory information on bank ratings allows the Federal Reserve to significantly improve the accuracy of forecasts of macroeconomic variables such as inflation and unemployment rates, thus allowing more precise conduct of monetary policy objectives. Skeptics, however, challenge the value of the extra information at the central bank's disposal. Their claim is that financial supervision will undoubtedly play 'second fiddle' to the conduct of monetary policy and macro concerns in times when the financial industry is reasonably healthy, earning steady profits, and has comfortable capital cushions (Goodhart, 2000). However, they do concede that on rare occasions, information on the financial sector gained from supervision is very important²². Indeed, the rare occasions, instances of bank failure for example, are too significant to ignore. In the case of financial crises, the micro-information advantage suggests that the combination of monetary and regulatory objectives is particularly needed, when only direct supervision can deliver essential information on time (Haubrich, 1996). In fact, a central bank, acting in the LOLR capacity and supervising the banking system might know more precisely if a bank asking for funds is insolvent or just illiquid, thereby affecting the decision to lend.

This supposes that information would not flow as smoothly when financial supervision lay outside of the central bank, to which there is no definite answer. Separation increases the risk of a communication lapse occurring between institutions due to organizational inefficiencies. "Internal control mechanisms give way to Memoranda of Understanding [as was between the Bank of England and the FSA], and internal meetings give way to [less frequent] inter-agency committee meetings" (Goodhart, 2000). But if the agency charged with supervision fails to provide adequate information to the monetary authority or if the monetary authority does not act

²² See Alan Blinder's speech at the ECB Conference on December 3-4, 1999, reprinted in *Monetary Policy-Making Under Uncertainty*, (ECB, 2000). Also, a comment by Bernanke (2001) merits special mention.

on relevant information provided by the supervisory institution, a crisis is exacerbated no matter where supervisory and monetary responsibilities lie²³.

5. Methodology

This study relies heavily on a unique dataset on bank regulation and supervision put together by Barth, Caprio and Levine²⁴. Surveying central bankers and financial sector supervisors in over one hundred and fifty countries in matters relating to supervisory standards and best practices, they have constructed the “first, comprehensive, cross-country assessment of the impact of bank regulatory and supervisory practices on bank development, efficiency and stability” (Barth, Caprio, & Levine, 2006). The database has been crucial for empirically testing a highly qualitative subject, but its limitations augment the shortcomings of this analysis. The authors of the dataset note that “the regulatory and supervisory variables are measured primarily in 2005, but the crises, if any, occur at some point over the past twenty years” (Barth, Caprio, & Levine, 2006). Thus the explanatory variables are being measured *after* the dependent variable. The opposite is true in this case; the dynamic performance of regulation is being assessed by the static condition of the banking system in 2005. Nonetheless, this study is conducted, as was Barth et. al’s., on the key premise that bank regulation and supervision has not changed much over time. Barth, Caprio and Levine (2001a) show that regulatory restrictions on bank activities have remained more or less unchanged across countries in the last ten years, even though the overarching structure of financial sector supervision might have changed. This may lead one to question the usefulness of the proposed study as the structure of financial supervision seems not

²³ See Blei’s (2008) account of the collapse of Northern Rock for an example

²⁴ Available at:

<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20345037~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html>

to affect the standards by which the banking sector is regulated. This proves to be an unexpected virtue, as in the absence of more information the sole effect of supervisory structure on banking sector health can be captured.

The empirical approach used to observe common traits between countries with similar supervisory structures is an analysis of means, which compares averages of banking sector variables across supervisory regimes and checks for statistically significant differences. The null hypothesis is that averages of macroeconomic variables and banking sector variables do not vary in single versus multiple supervisory regimes.

$$H_0: \mu_{MS} = \mu_{SS}^{25}$$

The null will be rejected in favor of the alternate hypothesis, that there are statistically significant differences between average macroeconomic and banking conditions in countries of different levels of integration.

$$H_1: \mu_{MS} \neq \mu_{SS}$$

The variables²⁶ used in the comparison are:

- *GDP growth*: average of annual gross domestic product growth from 2001 to 2005.
- *Real GNI per capita*: average of annual real gross national income per person from 2001 to 2005
- *Market capitalization as a proportion of GDP*: the total market capitalization of all public-listed companies in 2005 using the World Bank's Atlas method

²⁵ MS denotes multiple supervisors and SS denotes a single supervisor for the financial sector. MS will also be tested against BI, BS, SI, (single supervisor for the banking and insurance sectors, banking and securities sectors, and securities and insurance sectors, respectively). The classifications for the countries and their respective supervisory structures are taken from Cihak and Podpiera (2007). The full list is in Table 1 on page 22.

²⁶ Data is sourced from the World Bank, IMF except where mentioned

- *Average market capitalization growth*: average growth of the market capitalization of public-listed companies over the period 2001 to 2005
- *Private sector claims as a proportion of GDP*: is used in an attempt to capture the size of the banking sector relative to the economy at yearend 2005. Here, private sector claims comprise of private corporations', households' and non-profit institutions' serving households (NPISHs) liabilities to the banking sector.
- *Average private sector claims growth*: average growth of private sector claims over the period 2001 to 2005
- *Concentration*: defined as the fraction of total deposits held by the top five banks at yearend 2005. This is obtained from the surveys conducted by Barth, et. al. (2006).
- *Crisis*: this study makes use of a crisis dataset constructed by Laeven and Valenica (2008) that charts the frequency of systemic banking crises around the world from 1970 to 2007. Their definition of systemic banking crisis is applied in this study²⁷.
 - *D.Crisis*: a dummy variable indicating whether a country has experienced a systemic banking sector crisis since 1970 (0=none, 1= at least one)
 - *F.Crisis*: denotes the frequency of systemic banking crises in a country
- *NPL/Total Assets*: nonperforming loans as a proportion of total banking sector assets at yearend 2005 from Barth, et. al. (2006).
- *Capital Ratio*: the actual risk-adjusted capital ratio in banks as of yearend 2005, using the 1988 Basle Accord definitions. Taken from Barth, et. al. (2006).

²⁷ In a systemic banking crisis, a country's corporate and financial sectors experience a large number of defaults face great difficulties repaying contracts on time. As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted. This situation may be accompanied by depressed asset prices on the heels of run-ups before the crisis, sharp increases in real interest rates, and a slowdown or reversal in capital flows. In some cases, the crisis is triggered by depositor runs on banks, though in most cases it is a general realization that systemically important financial institutions are in distress. (Laeven and Valencia, 2008)

- *Tier 1/Assets*: actual ratio between shareholders' equity (Tier 1 regulatory capital) and total risk-weighted assets of banks as of yearend 2005 from Barth, et. al. (2006).
- *D.CB*: a dummy variable indicating central bank involvement in banking sector regulation and supervision (0=no, 1=yes) taken from Barth, et. al. (2006).

Table 1 lists the countries included in the sample in categorical order of their supervisory regime.

The
involves a
analysis aiming
the level of
sector
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Table 1: Economies with single, semi-integrated, and specialized prudential supervisory agencies

Single prudential supervisor for the financial system (year of establishment)	Agency supervising two types of financial intermediaries			Multiple supervisors (at least one for banks, one for securities firms, and one for insurers)
	Banks and securities firms	Banks and insurers	Securities firms and insurers	
Australia (1998)	Finland	Canada	Bolivia	Italy*
Austria (2002)	Luxembourg	Colombia	Bulgaria *	Jordan*
Bahrain* (2002)	Mexico	Ecuador	Chile	Lithuania*
Belgium (2004)	Switzerland	El Salvador	Jamaica *	New Zealand*
Bermuda* (2002)	Uruguay	Guatemala	Mauritius *	Panama
Cayman Isl.* (1997)		Malaysia *	Ukraine *	Philippines*
Czech Rep.* (2006)		Peru		Portugal*
Denmark (1988)		Venezuela, Rep.		Russia*
Estonia (1999)				Slovenia*
Germany +(2002)				Sri Lanka*
Hungary (2000)				Spain*
Iceland (1988)				Thailand*
Ireland* (2002)				Turkey*
Japan (2001)				Uganda*
Kazakhstan* (1998)				United States*
Korea, Rep. (1999)				
	As share of all countries in the sample (percent)			
	38%	6%	10%	8%
				39%

Sources: Based on data in central banking publications (2006), and on websites of supervisory agencies.

* Banking supervision is conducted by the central bank. + Supervision integrated outside central bank, but the central bank retains a substantial role in banking supervision

second stage
regression
to explain
banking
health as a
supervisory
and banking

characteristics, holding constant macro variables such as economic growth and inflation.

The relation between the nonperforming loans ratio and the explanatory variables will be estimated using ordinary least squares (OLS):

$$\frac{NPL}{Total\ Assets} = \beta_0 + \beta_1 Claims + \beta_2 Concentration + \beta_3 Banks + \beta_4 FAC + \beta_5 D.CB + \beta_6 D.SS + \beta_7 AvgGDPgrowth + \beta_8 AvgInflation + a_i$$

Metrics that gauge the size and the scope of the banking sector are controlled for, such as private sector claims as a proportion of GDP and banking sector concentration information used in the analysis of means. In addition, the variable ‘*Banks*’ which denotes the number of banks operating in the economy at yearend 2005, is also included and is obtained from the surveys conducted by Barth, et. al. The motivation for including these variables in the regression analysis is purely to control for differences arising in the characteristics of banking sectors across countries.

The degree of supervisory integration will be measured by the Financial Authorities Concentration (FAC) developed by Masciandaro (2006b). A numerical value is assigned to each type of supervisory framework ranging from 0, where specialized authorities regulate each sector of the financial system with the central bank’s involvement in banking supervision, to 7, a single authority responsible for the entire financial system without central bank involvement²⁸. The FAC indices were taken from the latest version of the Barth et. al. bank regulation and supervision dataset in which 67 countries were rated to maintain consistency.

²⁸ See Masciandaro (2006b) for a detailed description of how the index is constructed

Past studies that have used the FAC index (Cihak & Podpiera, 2007; Masciandaro, 2006) cite the weakness in the ordinal nature of the variable. A unit increment from 5 to 6 does not necessarily have the same meaning as an increment from 0 to 1; hence the interpretation of the coefficient on *FAC* is not entirely clear. To correct the situation, the regression will also be carried out with a binary variable for a single supervisor, *D.SS*, and one for the central bank's involvement in banking supervision, *D.CB*. In both cases, 0 signifies absence, and 1 signifies presence, respectively.

6. Results

i. Analysis of Means

Table 2 reports the results from the analysis of means test. The comparison between single supervisory and multiple supervisory regimes is most noteworthy as it consists of more than three quarters of the sampled countries and bears the most significance. Indeed, the means of real GNI per capita, private sector claims as a proportion of GDP, bank sector concentration, and both crisis variables in single supervisory regimes are statistically different from the means of the same variables in multiple supervisory regimes. The null hypothesis is hence rejected in favor of the alternate hypothesis.

a. Comparison of Single and Multiple Supervisory Regimes

On average, countries that have single supervisors for the financial sector tend to have nearly twice the gross national income per capita of countries with specialized supervisors for the financial sector. Since the variable is simply the gross national income divided by the population of the country, it can be inferred that countries that have a single supervisor have smaller populations, have significantly larger economies, or exhibit both with respect to countries with

multiple supervisors. The presence of Austria, Belgium, Norway, Sweden and Singapore in the sample of single supervisory nations testifies to this observation.

The more developed economies of single supervisory countries also require sophisticated and expansive banking sectors, a presumption that is empirically proven by the statistically significant difference between the proportions of private sector claims to GDP in both types of supervisory frameworks. Indeed, banks in countries with a single financial supervisor, on average, have close to forty percent more claims on the private sector than their counterparts in countries with multiple supervisors. Apart from their higher average level of development, this observation can also be attributed to the fact that many of the single supervisory states in the sample serve as regional financial hubs (e.g., Germany, Singapore, Korea and the U.A.E.) and as offshore banking centers (e.g., Bermuda, Cayman Islands and Malta). It is tempting to entertain the notion that integrated supervisors may not monitor the banking sector as stringently as a specialized supervisor might do, which could contribute to the immense size of the banking sector relative to the country's economy. Alas this thought is easily rejected as there is only a marginal difference in the growth of private sector claims in the years between 2001 and 2005, and the difference is not statistically significant.

Partly for this reason, the banking industry in countries with a single financial supervisory agency is more concentrated (i.e., the top five banks dominate the market for deposits in single supervisory countries more than in multiple supervisory countries). Although the difference is statistically significant, it is not particularly large at close to eleven percent.

From the point of view of this study, the most important variables in the analysis are the crises variables. The difference between both the incidence and frequency of crises in single and multiple supervisory frameworks are significant at the one percent level, and are in stark contrast

to each other. Countries with specialized supervisors for the various financial intermediaries are more prone and have suffered more banking crises than countries where there is a single supervisor. This is not to say that banking crises in multiple supervisory regimes are caused by regulatory failure. In some cases bank failure may fairly be ascribed to supervisory failure, but almost by definition, it can never be the sole cause because there must first be some shortcoming in the bank which escaped the proper supervisory attention (Latter, 1997). Moreover, integrated supervisory structures are a relatively recent phenomenon. Norway was the first country to institute a unified regulator in 1986 (it suffered a crisis soon after in 1991), so some might argue that the system has not been in place long enough for it to be labeled bullet-proof. Indeed, opponents of integration point out that the poster child of the integrated approach, the FSA, has failed miserably in its first real test, the Northern Rock collapse.

However, contrary to Cihak & Podpiera (2007) this finding does indeed suggest a lower frequency of systemic crises in countries with integrated supervisory agencies, if only as an introductory observation. The growing number of countries adopting a unified approach to financial sector supervision means that there are benefits to be gained from a holistic approach to regulation.

Table 2: Analysis of Means results

Comparison	FAC Index	GDP growth	Real GNI per capita (\$)	M/CAP (%GDP)	M/CAP growth (%)	CLAIMS (%GDP)	CLAIMS growth (%)	Concentration	D.CRISIS	F.Crisis	NPL/Total Assets	CAP Ratio	TIER1 Ratio	D.CB
SS (n=30)	6 - 7	4.82	26367.20	95.21	0.3105	1.1261	0.2295	0.7550	0.1724	0.1724	0.0277	0.1407	0.1115	0.4074
MS (n=31)	0 - 1	5.95	13912.07	110.46	0.3323	0.7587	0.1954	0.6399	0.6774	0.9355	0.0280	0.1342	0.1092	0.8571
p-value		0.1200	0.0026 ***	0.5544	0.7077	0.0408 **	0.3140	0.0428 **	0.000029 ***	0.000086 ***	0.9849	0.6298	0.8519	0.0004 ***
BS (n=5)	4 - 5	4.56	30227.50	165.33	0.2495	0.9875	0.1625	0.7384	0.6000	1.0000	0.0147	0.1475	0.1372	0.2000
MS (n=31)	0 - 1	5.95	13912.07	110.46	0.3323	0.7587	0.1954	0.6399	0.6774	0.9355	0.0280	0.1342	0.1092	0.8571
p-value		0.1639	0.3104	0.4724	0.1665	0.5760	0.4823	0.4123	0.7773	0.8972	0.1462	0.3266	0.0086 ***	0.0268 **
BI (n=8)	2 - 3	3.59	16883.83	80.41	0.3498	0.4206	0.2632	0.6371	0.5809	0.7881	0.2049	0.2522	0.2638	0.5804
MS (n=31)	0 - 1	5.95	13912.07	110.46	0.3323	0.7587	0.1954	0.6399	0.6774	0.9355	0.0280	0.1342	0.1092	0.8571
p-value		0.9289	0.3287	0.5381	0.5700	0.2121	0.7463	0.2051	0.7016	0.8393	0.2121	0.1929	0.5867	0.0015 ***
SI (n=6)	2 - 3	3.48	4250.00	78.80	0.4470	0.6376	0.2764	0.7090	0.8333	1.1667	0.0242	0.1433	0.1284	0.5000
MS (n=31)	0 - 1	5.95	13912.07	110.46	0.3323	0.7587	0.1954	0.6399	0.6774	0.9355	0.0280	0.1342	0.1092	0.8571
p-value		0.3180	0.0011 ***	0.2377	0.5058	0.3395	0.4418	0.3585	0.4296	0.5235	0.7853	0.3971	0.1926	0.3068

*/**/** denotes significance of 10/5/1 percent

ii. Regression Analysis

a. Test for Heteroskedasticity

The Breusch-Pagan test for the presence of heteroskedasticity fails to produce a reasonable test statistic (F-statistic = 1.45, p -value = 0.219) hence the null is not rejected in the current specification, and standard errors are homoskedastic-consistent.

b. Regression results

The regression analysis is conducted on supervisory data from forty-nine countries²⁹ and the results are presented in Table 3. When estimated against the NPL ratio in an economy, private sector claims as a share of GDP yields a highly significant effect on the dependent variable. A ten percent increase in private sector claims as a share of GDP is associated with a 0.11 percent (11 bps³⁰) decrease in the NPL ratio. This is a logical observation, as a greater development of banking sector assets will result in a more efficient allocation of capital in the economy. A greater supply of banking sector assets increases competition between banks for viable projects, lowering the cost of capital, and making previously unprofitable projects profitable in the process. A similar rationale can be extended to the number of banks in the economy to explain its significance.

The integrated supervision variables are only significant when taken in the form of the FAC index. A unit increase in the FAC index corresponds to a 0.235 percent (23.5 bps) reduction in the NPL ratio, other factors held constant. On its own, this is not an entirely sizable reduction. But as the FAC index increases from 0 (specialized supervisors with central bank involvement) to 7 (single supervisor with no central bank involvement), the NPL ratio falls by 1.645 percent

²⁹ The entire sixty-seven countries rated on the FAC index could not be tested because corresponding NPL ratios for these countries were missing from the Barth et. al. dataset

³⁰ Bps, or basis point, is defined as 0.01%

(164.5 bps). This is not a trivial amount, considering the range of the NPL ratio variable is 8.59 percent (859 bps). Hence, the change alone from a multiple supervisory regime to a fully integrated one results in a 19.15 percent reduction in the percentage NPL ratio, *ceteris paribus*.

Surprisingly, the integrated supervisor dummy is not individually significant when the FAC index is replaced with dummy variables for central bank involvement and a single financial sector supervisor, respectively. The involvement of the central bank in financial sector supervision, on the other hand, is highly significant and appreciably large. All else constant, central bank participation in central banking leads to a 1.55 percent (155 bps) *increase* in the NPL ratio when the integrated supervisor dummy variable is included and a 1.42 percent (142 bps) *increase* when the integrated supervisory dummy variable was dropped. Thus the presence of a single supervisory body for the financial sector does not necessarily signify an *improvement* in the performance of the banking sector, while central bank participation in supervision proves *detrimental* to banking sector health. Again, this finding contradicts Cihak & Podpiera's suggestion that the presence of an integrated financial sector supervisor is associated with a lower NPL ratio (2007) and also contradicts earlier findings that find support for the central bank's involvement in financial sector regulation (Peek, et. al., 1999).

Significance of the bank concentration variable and its inverse relationship with the NPL ratio was anticipated. A concentrated banking sector, typified by the dominance of a few, large banks in the market for deposits, can benefit from internal scale economies and offer lower interest rates than banks in a dispersed market that do not have a large deposit base. On the other hand, banks in concentrated markets could act as monopolists in setting the price for capital, while participants in a dispersed banking sector more closely resemble participants in a

competitive market in which the price of capital is taken as a given. In this case, the effect of the former seems to outweigh the latter.

As expected, the controls for macroeconomic conditions are significant and point in the right direction. Higher levels of average economic growth reflect greater economic opportunities, and higher inflation reduces the real interest rate, thereby reducing the real cost of capital.

Table 3: Regression Results

	(1)	(2)	(3)
Constant	6.97 *** (1.178)	5.532 *** (1.192)	5.615 *** (1.173)
Claims	-1.10 *** (0.3936)	-1.1253 *** (0.3728)	-1.1350 *** (0.3693)
Concentration	-0.0271 ** (0.01215)	-0.02952 ** (0.01171)	-0.02851 ** (0.01148)
Banks	-0.000557 ** (0.0002136)	-0.0005412 ** (0.0002044)	-0.0005425 ** (0.0002028)
FAC	-0.235 ** (0.1022)
D.SS	...	0.2960 (0.5223)	...
D.CB	...	1.5544 *** (0.5161)	1.4218 *** (0.4562)
Avg Inflation	-0.115 * (0.05968)	-0.11171 * (0.05826)	-0.11703 ** (0.05704)
Avg GDP growth	-0.183 (0.1157)	-0.2410 ** (0.1166)	-0.2245 * (0.1120)
n	49	49	49
R²	40.0	45.6	45.2

*/**/*** denotes significance of 10/5/1 percent. Standard errors are in parentheses.
 OLS estimation with homoskedasticity in error terms

7. Conclusion

The empirical results of this study suggest several conclusions:

- Integrated supervisory regimes are more suited to developed, high income per capita countries with expansive and sophisticated banking sectors. This could be due to the propensity of these types of countries to house financial sector conglomerates that have considerably blurred distinctions between their service lines and activities, than countries with multiple specialized supervisors. An integrated supervisor could improve regulatory performance in such an environment by taking a holistic approach to financial sector supervision
- Countries with integrated financial sector supervisors have experienced less banking crises than countries with multiple supervisors. While this author is hesitant in interpreting the said observation in a causal manner and is also wary of unjustly writing off the effectiveness of specialized supervisors, the finding speaks for itself. The fact that several countries that experienced a systemic banking crisis in the late 1990's and chose to adopt a unified supervisory structure shortly after (e.g. Korea) speaks volumes about the direction financial sector supervision is heading toward in the years to come.
- While the level of integration does seem to be valuable in improving banking sector stability by way of a lower NPL ratio, the presence of a single supervisor bears no significant effect. Disappointing as it may be, it is nonetheless reasonable given the fact that the integrated supervisor does not necessarily *change* the way banking sector supervision is conducted. A more appropriate analysis would resemble that conducted by Cihak & Podpiera (2007). They determine the effect of integration on bank regulatory and supervisory standards, which in turn affects the performance of the banking sector.

- The involvement of the central bank in financial sector regulation worsens the condition of the banking sector. Evidence have been cited in this paper of the disadvantages of involving the central bank in financial sector regulation, but the root cause of this observation cannot clearly be likened to any one of those arguments. In reality, a combination of the arguments against central bank participation in supervision might provide the best insight. A conflict could indeed arise between the conduct of monetary policy and banking supervision in a recessionary environment, which could undermine the effectiveness of the central bank's ability to influence expectations, the central banker's key tool.
- The idea that financial supervision may take a backseat to the conduct of monetary policy when the financial sector is reasonably healthy, could certainly be another factor. There were no instances of systemic banking crises observed in 2005, the duration in which the NPL ratio was observed, so central bankers involved in banking supervision may have been more concerned with maintaining price stability than with the soundness of the banking sector.
- In addition, the central bank has the ability to engage in regulatory forbearance, a temporary relief granted to a bank by a regulatory agency from compliance with minimum capital requirements or other banking regulations. This practice, while necessary at times, has been noted to increase the level of nonperforming assets in an economy (Dekle & Kletzer, 2004).
- A developed banking sector, represented by a high private sector claims to GDP ratio, high concentration ratios and a large number of commercial banks, has a positive effect on banking sector stability as it lowers the NPL ratio. The reasons are more or less intuitive; increased supply of banking sector assets lowers the cost of capital and makes previously unprofitable projects profitable in the process. A concentrated banking sector benefits from internal scale economies and can offer low cost capital as a result

8. Further Areas of Research

The limitations of this study are numerous, and have been expressed throughout this paper. The FAC index is a major step forward in quantifying the degree of supervisory integration, but as recognized by several authors (Masciandaro, 2006; Cihak & Podpiera, 2007), there are several qualitative characteristics of supervisory regimes that have not been reflected in constructing this index, in particular:

- a) the legal nature of the supervisory agencies and their relationship to the political system
- b) allocation of antitrust powers
- c) management of the deposit protection schemes
- d) supervision of other parts of the financial sector than banking, securities and insurance markets
- e) degree of functional integration in the regulatory and supervisory area

An elaboration of this index would be invaluable to future research in this subject area (Cihak & Podpiera, 2007).

Another major restriction was the lack of a cross-country, time-series database on banking sector regulation, supervision, performance and stability. This would help build a more indicative model that predicts the effect of integration in financial sector supervision on banking sector performance.

Given that a greater importance of conglomerates has been one of the key stated reasons for integration, it would be useful to explore directly whether integrated supervisors are more successful in creating and implementing a consistent framework for the supervision of conglomerates.

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