REGULATORY IMPLICATIONS OF

2007 FINANCIAL CRISIS AND THE EFFECT OF

FINANCIAL REGULATION STRUCTURES ON THE

SOUNDNESS OF BANKING SECTOR: A CROSS-COUNTRY PERSPECTIVE

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Thesis Abstract

Nihat Gümüş, "Regulatory Implications of
2007 Financial Crisis and the Effect of Financial Regulation
Structures on the Soundness of Banking Sector: A Cross-Country Perspective"

This study is related to the regulatory implications of 2007 Financial Crisis and the effect of financial regulation structures on the soundness of banking sector.

Depending on qualitative analysis of reports published by international and national authorities, the study extracts seven broad regulatory issues that are highlighted by 2007 Financial Crisis.

Moreover, the study includes an empirical analysis using financial data of 486 banks from 7 counties, namely the USA, the UK, Germany, France, Italy, the Netherlands, and Australia, to explore the effect of financial regulation structures on banking sector soundness. The data covers the period from 2002 to 2009. ANOVA and Logistic regression results suggest that regulation structures have an impact on the soundness of the banking sector. The governments should also consider the diversity of services provided by financial institutions and country-specific factors when designing regulatory structures.

Main contribution of the study is twofold. Firstly, it presents a composite picture of regulatory issues discussed at global level after 2007 Financial Crisis. Secondly, it provides empirical evidence related to the relationship between financial regulation structures and the soundness of financial system.

Tez Özeti

Nihat Gümüş, "2007 Finansal Krizinin Düzenlemelere
İlişkin Sonuçları ve Finansal Düzenleme Yapılarının Bankacılık
Sektörünün Sağlamlığına Etkisi: Ülkeler Arası Karşılaştırmalı Bir Yaklaşım

Bu çalışmanın konusu 2007 finansal krizinin piyasaların düzenlenmesine ilişkin sonuçları ve finansal düzenleme yapılarının bankacılık sektörünün sağlamlığına olan etkisidir.

Uluslararası ve ulusal kuruluşlar tarafından yayınlanmış raporların niteliksel çözümlemesine dayanan sonuçlara göre 2007 finansal krizinin piyasaların düzenlenmesine ilişkin sonuçları yedi ana başlık altında özetlenmiştir.

Çalışma ayrıca, finansal düzenleme yapılarının bankacılık sektörünün sağlamlığına etkisini incelemek amacıyla ABD, Birleşik Krallık, Almanya, Fransa, İtalya, Hollanda ve Avustralya orijinli 486 bankaya ait finansal veriler kullanılarak yapılmış niceliksel çözümlemeyi de içermektedir. Veriler 2002 ile 2009 yılları arasındaki dönemi kapsamaktadır. Yapılan ANOVA ve Lojistik Regresyon analizleri sonucunda finansal düzenleme yapılarının bankacılık sektörünün sağlamlığını etkilediği gözlemlenmiştir. Hükümetler, finansal düzenleme yapılarını oluştururken finansal sektörün sunduğu hizmetlerin çeşitliliğini ve ülkelere özgü faktörleri de göz önünde bulundurmalıdır.

Çalışmanın iki temel katkısı bulunmaktadır. İlk olarak, çalışma 2007 finansal krizi sonrasında piyasaların düzenlenmesine yönelik olarak küresel düzeyde yapılmış tartışmaların bütüncül bir resmini sunmaktadır. İkinci olarak ise, çalışma, finansal düzenleme yapıları ile finansal sistemin dayanıklılığı arasındaki ilişkiye yönelik ampirik kanıt sağlamaktadır.

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ABBREVIATIONS

ABSs: Asset-backed Securities
ACAM: French Insurance and Mutual Societies Supervisory Authority
AFM: Netherlands Authority for the Financial Markets (Autoriteit Financiële Markten)
AMF: French Financial Markets Authority
ASIC: Australian Securities and Investment Commission
APRA: Australian Prudential Regulation Authority
BaFin: Bundesanstalt für Finanzdienstleistungsaufsicht
BHCs. Bank Holding Companies
BIS: Bank for International Settlements
BOE: Bank of England
BOF: Banque de France
BOI: Bank of Italy
CACESF: French Board of Financial Sector Authorities
CCLRF: French Advisory Committee on Legislation and Financial Regulation
CCPs: Central Counter-parties
CDOs: Collateralized Debt Obligations
CDSs: Credit Default Swaps
CFPB: The Consumer Financial Protection Bureau in the USA
CFR: The Council of Federal Regulators in Australia
CFTC: Commodity Futures Trading Commission, USA
CIVAP: Italian Pension Fund Regulatory Authority
CONSOB: Commissione Nazionale per le Società e la Borsa, Italy
CPIC: Coalition of Private Investment Companies
CRAs: Credit Rating Agencies
CRMPG III: Counter Risk Management Policy Group III
CSDs: Central Securities Depositories
DNB: Dutch Central Bank
ECB: European Central Bank
EU: European Union
FDIC: Federal Deposit Insurance Corporation in the USA
FED: Board of Governors of the Federal Reserve System, USA
FHCs: Financial Holding Companies
FSA: Financial Services Authority
FSB: Financial Stability Board
FSC: Italian Financial Stability Committee
G20: Group of Twenty
G30: Group of Thirty
GOA: United States Government Accountability Office
HMT: Her Majesty's Treasury in the UK
IAASB: The International Auditing and Assurance Standards Board
IASB: The International Accounting Standards Board
IASC: The International Accounting Standards Committee
IFIAR: The International Forum of Independent Audit Regulators
IFRS: International Financial Regulation Standards
IMF: International Monetary Fund

IOSCO: International Organization of Securities Commissions
ISVAP: Institute for the Supervision of Insurance, Italy
NCUA: The National Credit Union Association in the USA
OCC: The Office of the Comptroller in the USA
OECD: Organization for Economic Cooperation and Development
OTC: Over-the-Counter Markets
OTS: The Office of Thrift Supervision in the USA
PIOB: The Public Interest Oversight Board
PWG: The President's Working Group on Financial Markets in the USA
RBA: The Reserve Bank of Australia
SEC: Securities and Exchange Commission, USA
SIFMA: Securities Industry and Financial Markets Association
SIVs: Structured Investment Vehicles

Let finance be primarily national

J. M. Keynes

CHAPTER 1: INTRODUCTION

It was the serious times of Great Depression when John Maynard Keynes realized the rather domestic character of financial markets and institutions. Remarkable developments have occurred regarding the globalization of financial activities since that time. The advancements in gathering, retrieving, and processing information together with the state-of-art innovations introduced by financial engineering practices have accelerated that globalization process. After the cease of Cold War the world has entered a new phase of economic development where international trade and international financial activities have reached at their historically highest levels. Those events have created an environment where even the capabilities of sovereign nation states to control their own monetary and fiscal systems are questioned.

However, the outbreak of 2007 financial crisis stopped the process of global expansion of financial markets.[1] Despite all the efforts at both national and international levels, through platforms such as Group of Twenty (G20), the impact of the crisis could not be mitigated. The crisis has spread to the other parts of the economies resulting in one of the biggest recessions of the history and even created sovereign debt problems at country-level.

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[1] You may refer to http://news.bbc.co.uk/2/hi/7521250.stm for a detailed chronology of the 2007 financial crisis.

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One of the most remarkable lessons taken from 2007 Financial Crisis is the importance of regulation and supervision concerning the actions of market participants. In fact, this issue is the main motivation underlying this study. The deregulation process that began at the end of 1990s played a significant role on the creation of the financial architecture prevailing throughout the most developed financial centers of the World. Strong commitment to the premises that the market by itself regulate and supervise the behavior of financial system actors through competition mechanism and that the risk management tools provided by financial engineering would appropriately diversify the risks inherent within the financial system turned to be a great disappointment. (Krugman, 2009; DeLong, 2009). The effective and efficient regulation of financial institutions and markets has taken its places as a major concern in the agendas of both national governing bodies and international organizations. What the 2007 Financial Crisis does suggest in terms of regulatory failures, therefore, became a hot issue among academicians as well as practitioners.

Starting with the works of Michael Taylor on Twin-Peaks regulatory structures in mid-1990s and the discussions made at the period when the UK has adopted the integrated regulatory structure at the ends of 1990s, the design of regulatory agencies has been also a debatable issue. However as confessed by Schooner and Taylor (2010), despite some works such as Llewellyn (1999, 2006), Briault (1999), Čihák, et al. (2006), Yokoi-Arai (2006), little theoretical and empirical studies are intended to discover the relationship between the structure of regulation and regulatory effectiveness. This lack of empirical evidence on the relation between financial regulation structures and the soundness of the financial sector is the other motivation of this study.

The study is organized as follows. The second chapter of the study does briefly summarize the background and literature on the regulation of financial markets. First of all, the main theories trying to explain the underlying rationale for financial regulation are explained. Afterwards, some of the main studies focusing on the relation of regulatory activities with financial markets are handled. Finally, as a background to the third chapter of the study, main definitions and literature on financial regulation structures are introduced.

Third chapter is an attempt to investigate main regulatory and supervisory implications of the 2007 financial crisis. For this purpose, reports published by international as well as national regulatory bodies are analyzed to investigate the common issues highlighted by the crisis process. It is found out that main regulatory and supervisory issues can be categorized under seven broad headings. The need for macro-prudential regulation and the ongoing surveillance of systemic risk is the foremost lesson taken from the turmoil. Secondly, there appears an obvious need for a reconfiguration of micro-prudential framework of Basel II to mitigate pro-cyclic behavior of financial institutions. Third regulatory conclusion derived form the 2007 Financial Crisis is related to the securitization, unregulated financial products, centralization of clearing mechanisms, and short selling. Configuration of a new regulatory framework for CRAs to improve the quality and transparency in rating process is the fourth remarkable regulatory conclusion. The fifth regulatory course that should be considered is that new regulatory and supervisory arrangements are required for all kinds of private capital pools including hedge funds. The crisis brought up the need for increased international coordination between national states and their regulatory bodies for the control of cross- border financial transactions and to develop global

regulatory and supervisory standards. The 2007 financial crisis has highlighted some problems related to financial regulation structures as well. The analysis shows that there is a global trend towards objective-based regulatory structures with enhanced transparency, accountability, independence, coordination, and effectiveness.

Finally, the fourth chapter analyzes the effect of financial regulation structures on soundness of banks. A sample of 486 banks from seven countries, namely the US, the UK, Germany, France, Italy, Netherlands, and Australia, is used. The data covers the period from 2002 to 2009. The soundness of the banks is measured via referring to stability of performance, capital adequacy, liquidity, and asset quality variables. Empirical results display that regulatory structures have significant impact on the soundness of banking sector. The objective-based regulatory structure is found out to be more effective than and in some cases as effective as other kinds of financial regulation structures. However, as the country and area of specialization dummies enter into the model, it is realized that the effects of regulatory structures do disappear. This implies that country-specific factors and areas in which banks engage are key variables to assess the relative soundness of the banking sector. This result is in compliance with the Keynesian perspective that financial systems cannot be considered without referring to the national specialties.

Despite its obvious limitations and given the fact that the regulation of financial markets is subject to remarkable debate and ongoing developments in international arena, the contribution of this study is twofold. First of all, it presents a composite picture of regulatory issues discussed at global level after the crisis. Secondly, it contributes to the discussions on financial regulation structures. In addition, the study can be regarded as a contribution to new institutional theory of regulation highlighting

the importance of institutional design on the regulatory effectiveness. After all, the study points out to the importance of political aspects of handling financial issues. Although there are significant efforts to develop universal standards of financial regulation via mechanisms, the results show that there is still a long way to go for global regulation and supervision of financial markets and institutions. In fact, the results are in compliance with the view that unless a global leadership mechanism is set up to which the national states delegate at least some part of their power in conducting monetary and fiscal policies, it will be too difficult to exploit potential advantages and to avoid the threats of globalization process in the course of finance.

CHAPTER 2: BACKGROUND AND LITERATURE REVIEW

The second chapter of the study includes a literature review on financial regulation. In order to present a composite picture of the main studies conducted within the area, the chapter is divided into three broad headings. The first heading covers the underlying rationale of economic and financial regulation together with a summary of main theories on the subject. The second block of literature is related to the studies on the relationship between financial regulation and the economy. The final part of the chapter summarizes basic definition, examples of and the studies made on financial regulation structures.

Review of the Literature on Financial Regulation Theories

There are various definitions for the concept of regulation. The Webster's Dictionary describes it as a "rule or order prescribed for management or government" and as "the act of regulating". According to Moran (1986), regulation is related to the process of imposing rules to restrict the discretion of individuals and institutions.

Baldwin and Cave (1999) introduces a broader understanding of regulation by referring to various levels of control. At the very first level, the term regulation refers to the promulgation of a binding set of rules to be applied by a body devoted to this purpose. Rules concerning the protection of investors are examples for that kind of regulation. At the second level, regulation relates to deliberate state interventions to influence industrial or social behavior. That kind of regulation may employ tools such as taxes, subsidies, licenses, and franchises to encourage or deter certain kind of behavior.

Finally, in its broadest sense the concept of regulation might mean "all forms of social control or influence where all mechanisms affecting behavior, whether state-derived or from other sources, are deemed regulatory".

Ogus (2004) provides another way of approaching the concept of regulation by configuring the term as restrictive or facilitative. A restrictive regulatory action that aims the prevention of certain undesirable activities can be categorized under the "red-light" concept while a facilitative regulatory action that targets to facilitate the occurrence of certain types of activities can be illustrated under the "green-light" concept. On the other hand, the concept of economic regulation refers to any kind of legislative and supervisory activities regarding the effective functioning of market economy that may be failed due to lack of competition, asymmetric information, moral hazard, and agency problems (Posner, 2007; Ogus, 2004).

The need for economic and financial regulation and supervision arises due to fact that markets cannot by themselves achieve and/or have not enough incentive to find equilibrating solutions to some problems. The reasons for legitimate regulatory intervention with the markets can be categorized under three broad headings. The first reason is the probability of monopolistic behavior and lack of competition. The second one is related to information asymmetries between various parts of economic interactions. The final reason is possible negative externalities that might arise through economic interactions of market participants whose costs to the society cannot be compensated unless the public authority takes corrective measures (Brunnermeier, et al. 2009; Baldwin and Cave, 1999; and Stiglitz, et al. 1993).

The probability of monopolistic behavior and lack of competition exists because of the nature of an industry and/or barriers set to deter new entrants. The existence of

monopolies and lack of competition will result in the transfer of economic surplus from the society to the monopolistic firms in the form of windfall profits creating adverse social costs. In such kind of situations, public authority is assumed o have the authority of regulating such organizations. The public authority should take measures that will forbid the firms to engage in anti-competitive behaviors and predatory pricing through group behavior to dominate the market place provided that the costs of such actions to society exceeds the costs of setting and implementing regulations.

The second reason for legitimate government intervention with markets is the availability of information asymmetries among various participants and the costs associated with gathering and processing information. The lack of information may lead to the need of monitoring and controlling the decision of agents who are supposed to behave in compliance with the interests of the principles. If those costs are high enough the economic interaction would be interrupted creating inefficiencies within the market place. Furthermore, lack of enough information might also lead to problems such as adverse selection, moral hazard, and credit rationing resulting in inefficient allocation of resources. In the case of financial markets, protection of investors against possible abuses by parties with more information is another issue that requires the public authority intervention. The public authority is supposed to involve as a regulator and supervisor within the market place to reduce the costs of gathering and processing information so that the information asymmetries among various parties of economic interactions diminishes. Storing the registrations and credit histories of institutions and borrowers, requiring managers to disclose timely and relevant information related to the activities of their organizations, making the issuers of securities to prepare a prospectus explaining possible risks and returns, and training of investors as respect with various

investment opportunities are examples of regulations intended to mitigate information asymmetry problems.

The final reason for regulating and supervising the markets is the emergence of negative externalities due to self-interest maximizing behaviors of individuals. If the costs of those negative externalities to the society are high enough so that no individual would have an incentive to take corrective actions, the public authority would have the responsibility to eliminate those costs. In the case of financial markets, the failure of a systemically important institution may create systemic externalities via leading to the perception that similar institutions would face similar difficulties as well. This situation may result in the contagion of the difficulties throughout the whole financial system via bank runs and fire sale of the assets to deal with liquidity problems. Regulators have the responsibility of closely monitoring the financial system and take proactive measures to prevent the occurrence of systemically important failures. In addition, the establishment mechanisms such as deposit insurance schemes and resolution regimes for failed institutions are examples of tools for mitigating the systemic impacts of failures.

The loss of information and experience after the failure of financial institutions is another externality. The information related to the products, investments, and customers of a financial institution will be lost when a financial institution collapse. Given the fact institutions that do not have any investment in those products and markets and that do not have any relation with those customers would face difficulties in their decisions. The regulatory bodies have the responsibility to keep information related to the products, markets, customers of the financial system to reduce the risk of loosing information.

To sum up, factors such as the probability of monopolistic behavior and lack of competition, availability of information asymmetries, and the existence of negative

externalities provide the underlying reasons for legitimate governmental intervention with the markets. On the other hand, there are some regulation theories within the literature that explain the nature of regulatory and supervisory activities. Issues such as the overall objectives of the economic regulation and factors that effect the efficiency and effectiveness of regulatory activities are major themes of those theories. The following part briefly summarizes those theories on economic regulation and supervision.

<u>Main Theories of Economic Regulation</u>

The literature includes various categorizations of the theories on regulation and supervision (Moran, 1986; Baldwin and Cave, 1999; Ogus, 2004). Moran (1986) categorizes the regulation theories into four broad headings, namely teleological, cultural, instrumental, and administrative. Teleological theories describe the regulatory activities by referring to long-term social goals. Cultural theories point out to the effects of cultural differences on regulatory and supervisory policies. The basic premise of instrumental theories is that regulations are designed and implemented to serve the interests of small social groups. Finally, administrative theories consider regulation as a composition of administrative tools utilized by bureaucratic organizations to solve administrative problems. The quality of regulation depends on the administrative success of those institutions.

Baldwin and Cave (1999) analyze the economic regulation theories in five separate groups. Those groups are public interest theory, interest group theory, the "so-

called power of ideas" theory, economic theory of regulation, and institutional theory of regulation.

The public interest theory states that the regulatory practices have an underlying goal of maximizing the interests of the public. According to this theory regulation and supervision are generally prepared and conducted by technocrats who are experts on the issue for which regulation is needed. They usually do not care the particular interests of various groups and/or individuals and focus on the general utility that can be derived form the regulation. It is a matter of fact that some regulatory policies applied by governmental institutions serve the interests of the whole society. Especially the regulatory arrangements conducted after huge economic crisis seem to focus on the welfare of the society as a whole. However, there are obvious shortcomings related to public interest theory. First, the concept of public interest, by itself, cannot be easily defined and measured. Second, the theory does not clarify the mechanisms that would guarantee that policy makers would behave in compliance with the interests of the society. In addition, there is plenty of evidence that some interest groups might influence the design and implementation of regulations. The theory does not consider that evidence, as well.

Second theory to explain regulatory behavior is the interest group theory. According to this theory regulations are the result of the relations between various interest groups and the authorities. The purpose of regulatory actions is to maximize the interests of those groups and reflect the struggle of those groups for power. There is a lot of empirical evidence supporting this hypothesis especially given the lobbying activities by interest groups before the legislations to affect the regulatory process. However, this

theory does not consider the role of private power in shaping the regulation and supervision process.

Another theory of regulation is provided by Christopher Hood in 1990s to explain policy reversals in regulation process. This theory is classified as "force of ideas" theory of regulation by Baldwin and Cave (1999). It is similar to the "cultural theories of regulation" classification made by Moran (1986). In this theory, regulation is considered as the product of dominant ideas prevailing within the economic course.

The economic theory of regulation represents the main stream perspectives of neo-classical economic thought on regulation. It is also called as private interest theory, public choice theory, public choice theory of regulation, "Chicago theory of regulation", and capture theory. This theory was first developed by Stigler (1971). In this article Stigler configures the regulation process as an economic product for which there is a demand and supply. The regulation mechanism is explained by referring to the operation of markets where individuals try to maximize their private interest. Stigler supports his theoretical framework through examples of legislations related to various industries. Another important piece of work contributing to the economic theory of regulation is Peltzman (1976). Peltzman constructs a theoretical framework to analyze demand and supply for regulation by referring costs and benefits of regulatory process. People who attach value to a certain regulation as compared to its costs compose the demand for regulatory arrangements. Lobbying activities of various groups and/or individuals for regulation reflect the objective of those individuals to get the rents that would be generated when regulation is shaped to serve their private interests. To support the arguments of economic theory of regulation Peltzman et al., (1989) refer to the trends of deregulation in 1980s. According to their point of view, the deregulation process is the

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result of cost and benefit analyses conducted by all stakeholders of regulations. Whenever expected costs of regulation exceed potential benefits, the interested parties may prefer deregulation. The economic theory of regulation is transferred by Richard Posner to the courses of private and economic law (Posner, 1974).

The economic theory of regulation derives its robustness in explaining regulation and supervision activity from the classical microeconomic theory. However it has some drawbacks as well. First of all, the theory assumes that parties in regulation are rational-maximizers of their interests. However, this assumption might not hold as pointed out by the literature of behavioral economics. In addition, the process for identifying the preferences of individual parties is not clear. The theory totally ignores the probable altruism and public-spiritedness that might be assumed by the regulatory authorities. Moreover, individuals might not have required information to define their self-interests, the costs and benefits of any regulatory action. Finally, the theory does not provide any explanations for the interaction between institutional structures and regulatory processes.

The final theory to be considered is the institutional theory of regulation. This theory takes its roots from institutional theories of economics. Coase (1937) has explained the evolution of institutions through transaction cost mechanism. The theory has evolved to new institutional economics thanks to the works of Douglas North (1971, 1989, and 1991). North explained economic developments and changes as a result of the developments of institutions and governance-related reasons. The institutional theory of regulation focuses on the importance of organizational structures on regulation. Organizations and social environments affect the preferences and actions of individuals, including the regulatory decisions. Issues such as organizational effectiveness, democratic decision making mechanisms, and the effective governance of possible

principle-agent problems contribute to the design and implementation of regulations. Despite its contribution to the explanation of regulation, the institutional theory cannot integrate the effects of individual interest and cultural factors on the shaping of regulatory practices.

Review of the Literature on the Relationship between Financial Regulation and Financial Markets

The second block of the literature on financial regulation is composed of studies on the relationship between various types of financial regulation and their effects on the functioning and development of financial markets. The Appendix A includes tabulated summaries of some papers analyzed to introduce a composite picture of the empirical evidence on regulation and financial development.

1980s and 1990s have been periods of deregulation in nearly all sectors of the economies including the financial markets. The effect of deregulation process can be observed in studies on securities, derivatives, and international markets (Figlewski, 1984; Fischel and Grossman, 1984; Peltzman et al. 1989; Mailender, 1998; Brunet and Shafe, 2007). These studies focus on the merits of self-regulatory mechanisms of the market place and recommend that regulation should focus just on some externalities that might arise due to information asymmetries and lack of competition to prevent stability and confidence in the markets. Detailed regulations to control the behaviors of actors would not be able to produce results better than the self-controlling mechanisms of the markets. The price and quality choices of rational individuals together with the

opportunities provided by financial innovation would eliminate the ones who could not offer services with high-quality at reasonable prices compared to their competitors.

A second group of studies analyze the relationship between regulatory practices and the level of financial development. Demirguc-Kunt and Maksimovic (1998) are interested in the relation between legal practice and financial development concluding that strong protection of property rights and better institutional practices are positively related with firms' ability to generate resources. Barth, et al, (1998) suggest countries with weak governmental and bureaucratic practices tend to set strict regulations for banking sectors. However, whether those regulations decrease the risk of crisis in those countries is not clear. In fact those countries are more prone to risks. La Porta, et al (2002) conclude that firms in countries with better property right practices are valued more as compared to their counterparts from other countries. Walter (2002) explains the relationship between financial and economic development. The study asserts that regulatory practices should establish between financial stability and financial innovation in order no hinder this development process. Glaser, et al. (2004) relates the quality of institutions to financial and economic development. Das, et al. (2004) find that better governance practices have positive impact on the stability of financial systems. Demirguc-Kunt, Karacaovali, and Leaven (2005) analyze the deposit insurance practices across countries. Serres, et al. (2006) present the effect of regulatory practices on productivity and output growth by scrutinizing the regulatory differences among the OECD countries. The study states that the protection of financial stability is not a legitimate reason for raising barriers of entry in banking sector given enough prudent practices within the financial sector. Demirguc-Kunt and Detragiache (2010) ask the

question whether the compliance with Basel II principles has an impact on financial sector stability. The study does not find any significant relation.

The impact of legal traditions of countries on their financial development has been another issue of debate within the literature. Starting with La Porta, et al. (1997 and 1998), many studies investigate the availability of any significant relation between legal origins, such as common law tradition, civil law tradition, and German law tradition on firms' ability to access external finance (Demirguc-Kunt, and Levine, 1999, Beck, Demirguc-Kunt, and Levine, 2005; La Porta, et al. 2007). The findings of these studies suggest that firms from countries with common law tradition have more opportunities to access external finance while the opposite is true for firms from countries with civil law tradition. While common law countries have strong emphasis on the protection of private ownership, the common law countries have promulgations to restrict the behavior of individuals and firms. Capital markets are the main driving force of financial development in countries with common law tradition, while the banking sectors dominate the financial intermediation services in civil law countries.

Another important aspect of the relation between regulation and financial development is related to the globalization of financial activities. Some studies have pointed out to the trend of convergence in countries' regulatory practices to make use of the advantages provided by the globalization process. Deeg and Perez (2000) are concerned with international capital mobility between and governance practices in Germany, France, Spain, and Italy. The study concludes that there is convergence in eliminating entry barriers in banking sector. But there are still country-based differences in governance practices. Malaguti (2000) is related to the private- and public-law instruments used in international markets. It suggests that self-regulation by private

parties together with derivative instruments and standards set by international organizations can achieve stability in international markets. Wymeersch (2005) investigates the convergence in regulatory practices in Europe. Although there is a tendency to develop joint regulation regarding financial markets, the supervisory activities are still conducted on national level. Kerwer (2005a) notifies that international and national regulators should develop standards for the valuation and forecasting processes followed by CRAs to mitigate accountability gap and over-dependency on credit ratings. On the other hand Kerwer (2006a) highlights the increasing adoption of global standards and best-practices by sovereign states. Marcelo, et al. (2008) describe the common approaches employed by countries in stress tests and develop some set of guidelines. Pearson and Pearson (2008) emphasize on setting global standards for hedge funds to reduce the risks of manipulation, fraud, conflict of interest, and inadequate risk management practices and increase the transparency, international coordination, and investor protection.

To sum up, the literature on the relationship between regulatory practices suggest that the regulatory bodies should mainly establish better legal and institutional infrastructures, better protection of private rights, better governance practices and adopt broad global standards rather than setting detailed rules for financial sector. Inspired of the well-known efficient market school, those studies rely mainly on the market based self-regulation. The market mechanisms together with risk management tools provided by financial innovation can produce better results in controlling the decisions of individuals and institution to enhance stability and confidence in the financial system.

Review of the Literature on Financial Regulation Structures

The subject of institutional structure of financial regulation has been an issue of debate especially since the late 1990s (Schooner and Taylor, 2010). The changes realized in the financial markets and institutions during 1990s have led to the questions regarding the most effective and efficient ways of organizing regulatory agencies so that the main goals of financial regulation could be achieved.

Llewellyn (2006) provides a description of some basic issues related to the structure of financial regulation and supervision. The study defines financial regulation structure as *"the number and structure of agencies responsible for the regulation and supervision of financial institutions and markets."*

The regulation structure has an impact on the overall efficiency of the regulatory activities. In addition to contributing to the development of the regulatory culture, the regulation structure defines the responsibilities of each regulatory body so that no significant conflicts or overlaps exist in their objectives. This is of crucial importance to reduce the costs of regulation. The coverage of the regulation and the availability of regulatory arbitrage are strongly related to the design of regulation structures, as well.

Some Examples of Financial Regulation Structures

The literature classifies the regulatory structures in the world among four categories. Although there are obvious country-specific differences, this categorization provides a composite picture to comprehend various systems to regulate financial markets and institutions.

The first category is the institutional regulation and supervision structures. In these structures, financial institutions are regulated and supervised based on their legal status. For instance institutions which are defined as bank in their status are regulated and supervised by a specific agency while the ones whose corporate prospectuses specify them as security broker, investment adviser or insurance company are subject to different regulatory bodies. This type of regulatory structure is common in relatively less developed financial markets where the differences between the main activities of financial firms are clear. Chinese and Mexican regulatory structures are examples of institutional regulation structure.

The advancements in the financial sector led to the elimination of the boundaries between services provided by financial firms. Therefore, most of the countries organized their financial regulation structures according to functional approach. In functional approach, firms and markets are regulated based on the services provided to the customers. Banking activities, securities activities, and insurance activities are regulated and supervised by different agencies. Under this system, the same company can be subject to the regulation and supervision of different authorities if it provides different financial services to its customers. Countries such as Italy, Spain, and France have countries with functional regulation structures.

During 1990s, a trend towards integrated structures has emerged. Under this system one agency is responsible for the oversight of financial markets and institutions. Countries such as Canada, Japan, Switzerland, Germany, and United Kingdom selected this approach for the sake of improving the effectiveness and efficiency in regulating and supervising financial institutions.

The fourth approach is the objective-based financial regulation structure which is also called as the twin-peaks approach. Under this system, neither the type of institutions nor the financial functions provided are the main determinant of financial regulation and supervision. Rather what is mostly considered is the objective that is tried to be achieved. Two main objectives of prudential and conduct of business regulation are conducted by separate agencies. While the prudential regulator has a focus on the financial soundness and sustainability of firms, the conduct-of-business regulator focuses on governance issues to protect the rights of sophisticated and unsophisticated investors. Two distinct examples of this approach are the Australian and Netherland regulatory structures.

The third chapter of this study includes an empirical analysis about the impact of regulation structures on the soundness of banks from seven countries before and after the 2007 financial turmoil. These countries are France, Italy, UK, Germany, Australia, Netherlands, and USA. As a background, it would be useful to make a brief description of the financial regulation structures prevailing in those countries.

France and Italy as Examples Functional Regulation Structures

The financial regulation structures in France and Italy are examples of functional regulatory structures where special agencies are responsible for the regulation and supervision of various financial services. Those organizations and the interaction among them are depicted in Figure 1 and Figure 2.
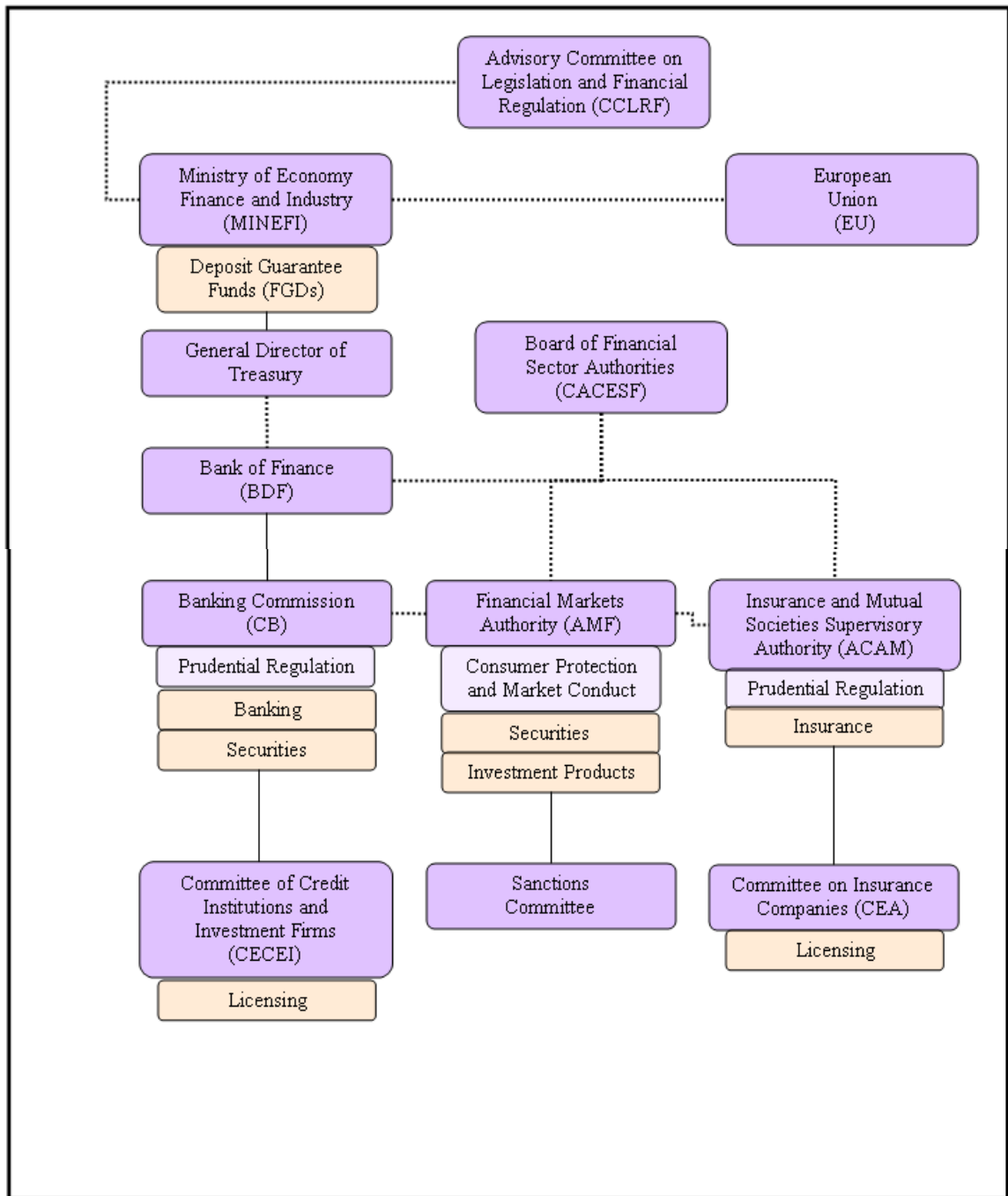
Figure 1: French financial regulation structure
Source: G30 Report 2008

In both countries the central banks, namely the Bank of France (BOF) and Bank of Italy

(BOI) are responsible for the regulation and oversight of the banking sector. The

regulation and supervision of securities markets are implemented by Financial Markets

Authority (AMF) in France, and by Companies and Stock Exchange Commission

(CONSOB) in Italy. The insurance sectors in both countries are subject to the

arrangements and supervisions made by Insurance and Mutual Societies Supervisory

Authority (ACAM) and Insurance Industry Regulatory Authority (ISVAP) respectively.

In Italy, there is a separate Pension Fund Regulatory Authority (CIVAP) for the

regulation and supervision of pension funds industry.

Authorities responsible for the political aspects of the financial sector regulation

are the Ministries of Economy and Finance. The coordination among financial regulators

and European Union are directed by those ministries.
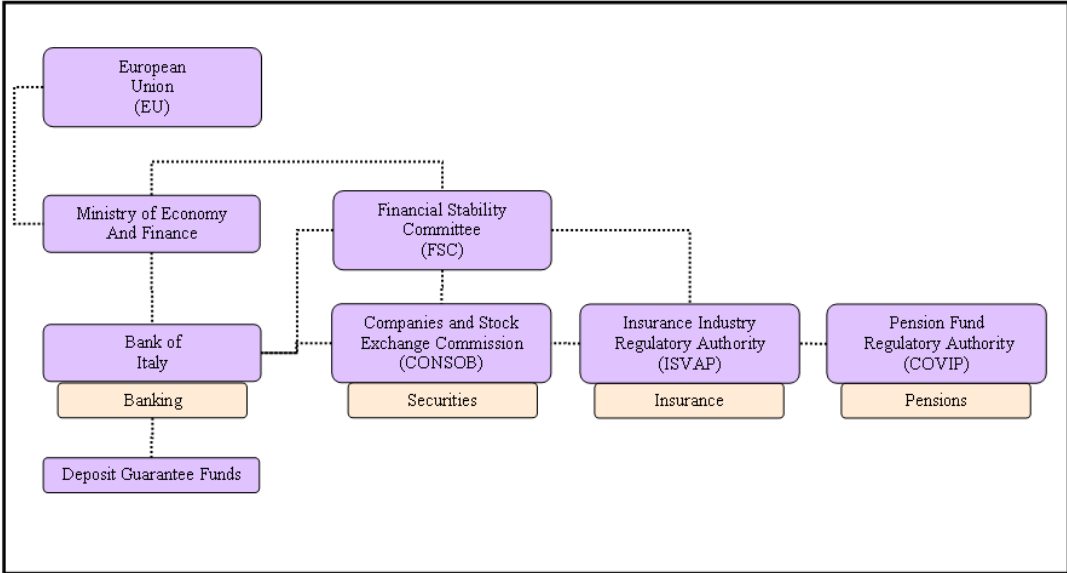
Figure 2: Italian financial regulation structure
Source: G30 Report 2008

There are establishments in both countries chaired by political authority to facilitate the

coordination and information sharing between the regulatory agencies. Board of

Financial Sector Authorities (CACESF) in France and the Financial Stability Committee

(FSC) in Italy provides a platform of discussion and coordination among the regulatory

bodies. There is one more organization in France that works together with Ministry of

Economy and Finance: The Advisory Committee on Legislation and Financial

Regulation (CCLRF) provides legal consultancy on legislative proposals.

UK and Germany as Examples of Integrated Regulation Structures

There are obvious differences among the financial systems of the UK and Germany.

However, the regulation structures of both countries are organized according to the

integrated approach. Figure 3 and Figure 4 summarize the regulation structures of the
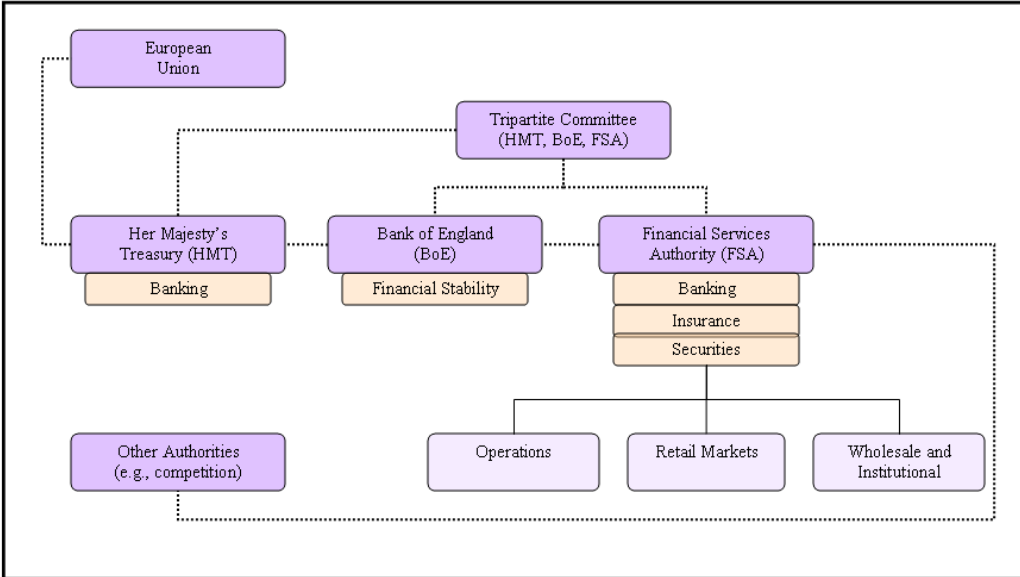
UK and Germany.

Figure 3: UK financial regulation structure
Source: G30 Report, 2008

The Financial Services Authority (FSA) in the UK and the Federal Financial Supervision Authority (Baffin) in Germany are the agencies responsible for the regulation and supervision of banking, securities, and insurance businesses. While the internal structures of both organizations are divided on functional basis, there is a further division in FSA on the basis of retail versus wholesale markets.
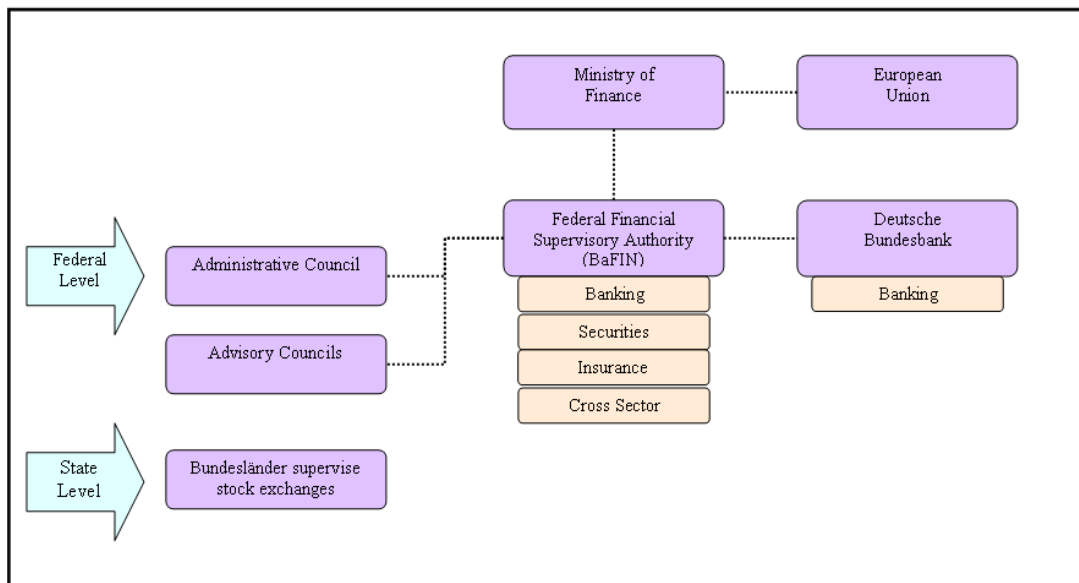
Figure 4: German financial regulation structure
Source: G30 Report 2008

In both countries, the central banks namely the Bank of England (BOE) and Deutsche Bank have the duty of systemic oversight of financial markets and institutions in coordination with integrated regulators. Her Majesty's Treasury (HMT) in the UK and the Ministry of Finance in Germany are the political authorities responsible for the regulation and supervision of financial system. Furthermore, those entities are the main representative bodies in conducting the relations with their counterparties in European Union.

There is a coordination mechanism in the UK between regulatory and supervisory bodies that is called as Tripartite Committee. The Committee includes the representatives of HMT, BOE, and FSA. Via this mechanism, those institutions organize formal and informal meetings to share their information and experience about the financial system and institute. They conduct joint training programs and seminars among their staff to improve the understanding financial markets.

There are state-level regulatory and supervisory bodies in Germany that engage in the supervision of stock exchanges. Furthermore, the internal organization of the BaFin includes an administrative council and advisory councils providing consultation for any proposed changes in regulations.

Australia and the Netherlands as Examples of Objective-Based (Twin-Peaks) Regulation Structures:

Under objective-based financial regulatory systems the regulatory bodies are organized based on specific objectives. Those objectives include sustaining systemic stability, maintaining individual prudence and soundness of financial institutions, and protecting investors. Australia and Netherlands are two major examples of this system. Figure 5 and Figure 6 describe the regulatory structures of both countries.
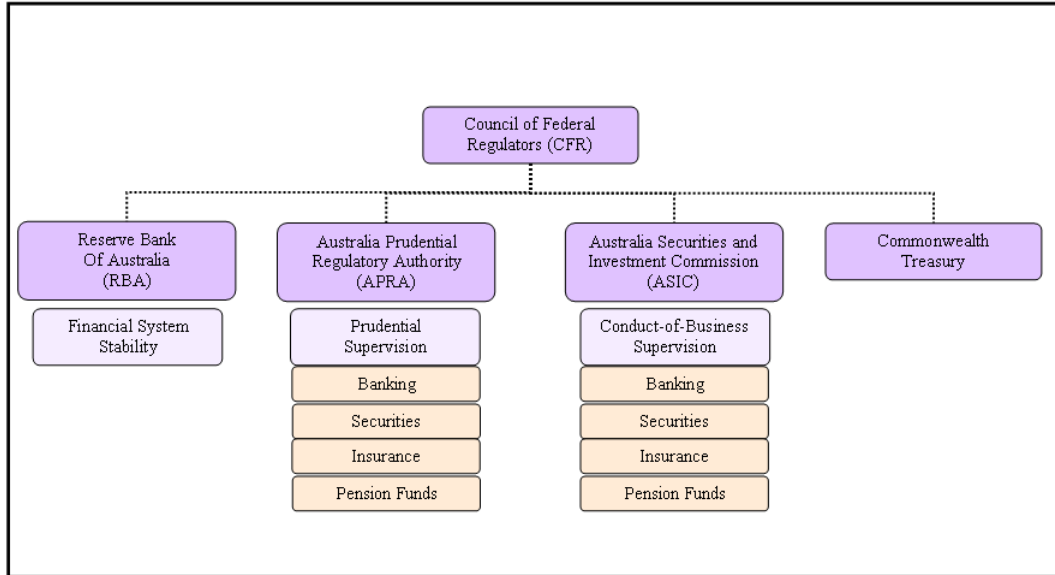
Figure 5: Australian financial regulation structure
Source: G30 Report 2008

The Australian Prudential Regulatory Authority (APRA) and the Nederlandsche Bank (DNB) in the Netherlands are responsible for the prudential regulation and supervision of the institutions engaging in banking, securities, insurance, and pension fund activities. Australian Securities and Investment Commission (ASIC) in Australia and the Netherlands Authority for Financial Markets (AFM) carry out the conduct-of business regulation and supervision.

Unlike the Dutch regulatory structure, the Reserve Bank of Australia (RBA) has the duty of macro-prudential supervision of financial institutions and markets for systemic stability purposes. In the Netherlands, furthermore, the Ministry of Finance is the final responsible for the political aspect of the financial regulation and supervision. On the other hand, this duty is assigned to the Commonwealth Treasury in Australia. The Netherlands is a part of European framework for financial regulations, as well. While there is not a formal coordination platform among regulatory bodies in the Netherlands, the Council of Federal Regulators (CFR) fulfills this function in Australia.

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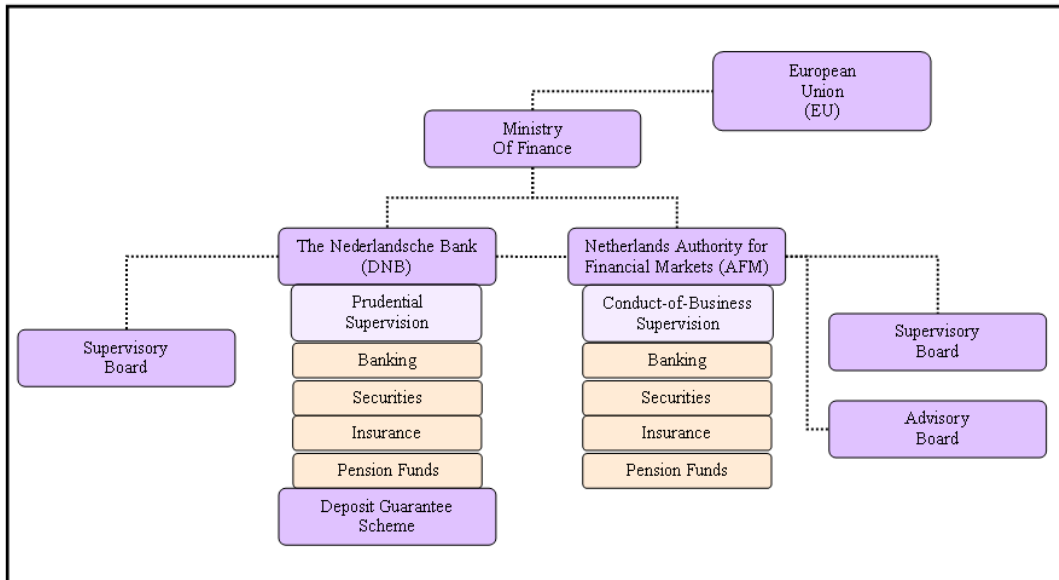
Figure 6: Dutch financial regulation structure
Source: G30 Report 2008

USA as a Special Example of Regulatory Competition
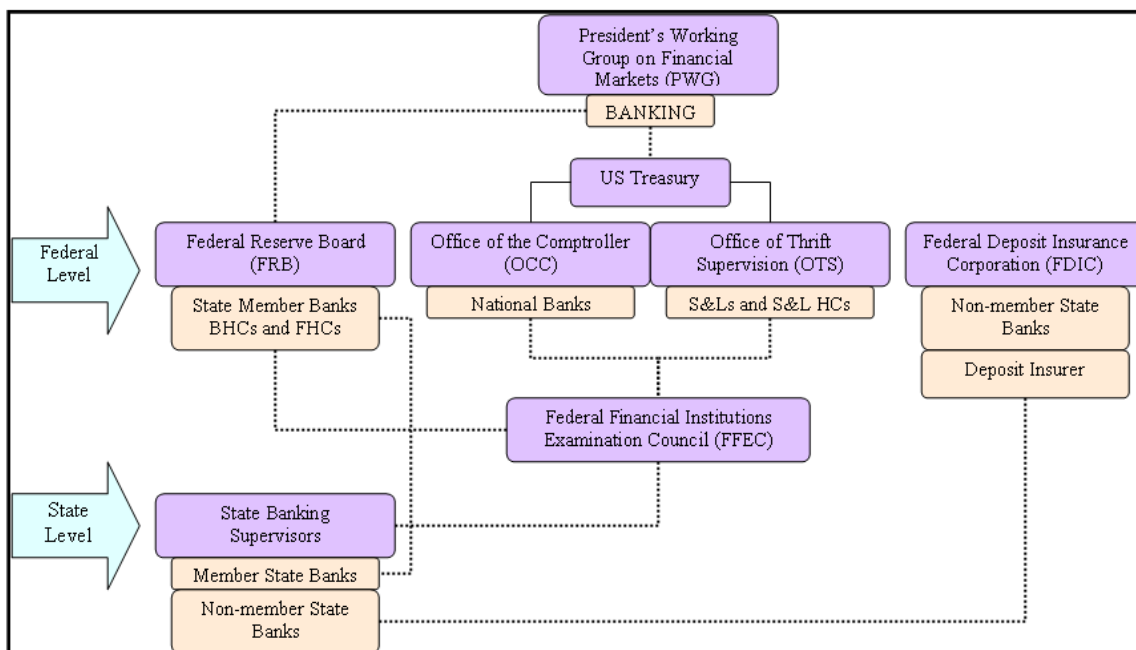
Figure 7: US financial regulation structure
Source: G30 Report 2008

One of the most peculiar financial regulation structures available throughout the world is the one in the USA that is summarized in Figure 7 and Figure 8. In fact, the US regulation structure can be categorized as a functional one. However, the system has a competitive nature in the sense that financial institutions can select among various regulatory agencies on both state and federal levels. This competitive regulatory structure is sad to be one of the underlying causes for the leading position of the USA in terms efficiency, effectiveness, and innovativeness of the financial sector prior to the 2007 Financial Crisis.
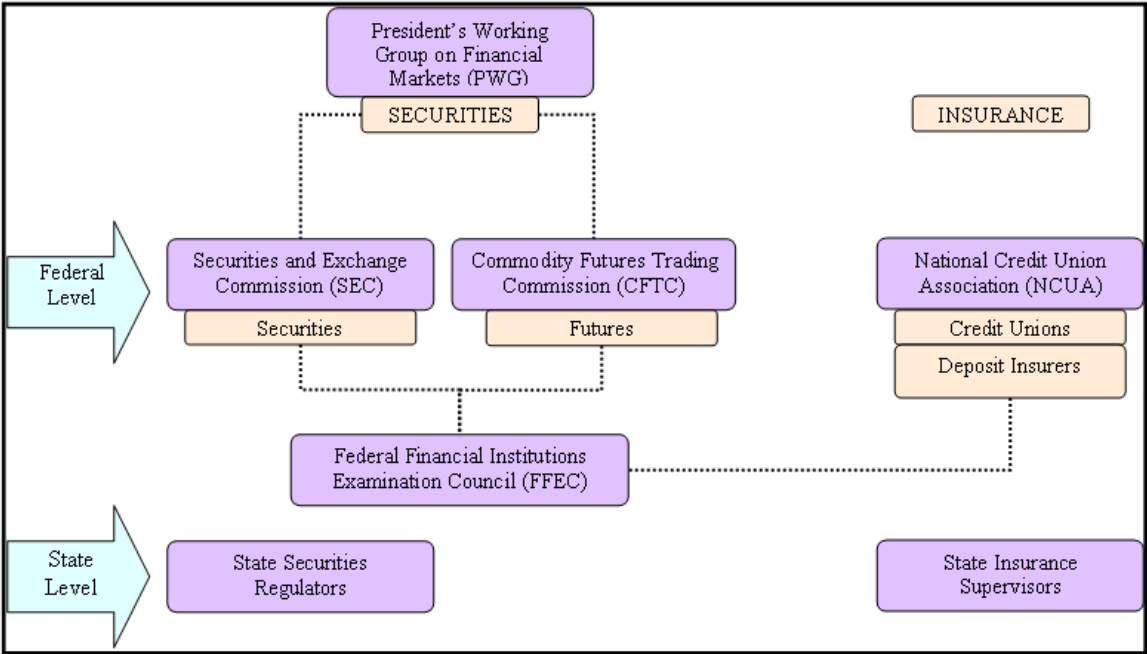
Figure 8: US financial regulation structure (cont.)
Source: G30 Report 2008

The US regulatory structure includes functional regulators and supervisors organized at both federal and state levels. The banking services are regulated and supervised depending on whether a bank is a member of Federal Reserve System or not and whether the bank is a state-chartered or federally-chartered one. A bank that is a member

of Federal Reserve System is subject to the supervision and regulation of the FED regardless of whether it is chartered at state or federal level. The Office of the Comptroller (OCC) under the Department of Treasury is responsible for the supervision of federally-chartered banks that are not a member of the Federal Reserve System. The Federal Deposit Insurance Corporation (FDIC) oversees state-chartered banks that are under federal deposit guarantee. In addition, all state-banks are subject to regulations specified by the regulators of their states. The Office of Thrift Supervision (OTS) operating under the Department of Treasury is responsible for the oversight of saving and loan associations and saving and loan holding companies.

Two main authorities regulate and supervise securities activities at the federal level. The Securities and Exchange Commission (SEC) is the authority to supervise securitization and exchanges. On the other hand, the Commodity Futures Trading Commission (CFTC) oversees the futures transactions. Moreover, there are state level regulators as well to monitor exchanges and brokerage firms that are chartered at state level.

The insurance business is regulated and supervised mainly at state-level. On the other hand, the National Credit Union Association (NCUA) stands for the harmonization of the activities of state-based insurance regulators.

Another important component of the US financial regulation structure is the Consumer Financial Protection Bureau (CFPB) that is established through Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. The mission of the CFPB is to ensure that customers of financial markets gather clear, understandable, comparable information about financial products, associated risks, and prices to prevent unfair and abusive practices. It engages in organizing training programs for customers, supervising

and enforcing the financial institutions in terms of the rule prescribed by federal

financial customer laws.

The Federal Financial Institutions Examination Council is the platform to

harmonize the activities of various regulatory agencies. It enforces uniform principles

for financial regulation and uniform reporting formats for federal regulatory agencies. It

organized joint training programs for the staff of federal regulatory agencies and

develops reporting requirements for federally-regulated and supervised financial

institutions.

The President's Working Group on Financial Markets (PWG) is the highest level

coordination mechanism for federal regulatory bodies. It is chaired by the Secretary of

State Treasury and consists of the chairmen or designees of the Board of Governors of

the Federal Reserve System, the Securities and Exchange Commission, or his designee;

and the Commodity Futures Trading Commission. The main responsibility of the group

is to discuss issues related to financial markets and to develop policy recommendations

for the Executive to enhance the rather stable, effective, efficient, competitive and

prudent operation of US financial markets.

The rather scattered structure of financial regulation and supervision of US has

been an issue of debate especially after the outbreak of the 2007 financial turmoil as a

reason intensifying the results of the crisis. Comprehensive reform plans are prepared

and put into action to decrease the complexity, opaqueness, and the number of agencies

existing within the above-described system.

The subject of financial regulation structure is a relatively new issue of debate in

the literature. There is an obvious lack of empirical studies on the relation between

financial regulation structures and financial system (Llewellyn, 2006). The adoption of

integrated regulation structure by the UK has accelerated the discussions made on the optimal way of organizing regulatory agencies. Briault (1999) explains the underlying rationale for integrated financial structure by referring to the concepts of effectiveness and efficiency of regulation. A single body can create economies of scale by centralizing the resources and decreasing the inefficiencies due to the overlaps in supervisory operations. In this way, it can reduce the cost of regulation and supervision. Integrated structures enhance the coordination of regulatory and supervisory activities. Finally, the accountability of the regulatory and supervisory process will increase under single regulator regime.

Giorgio and Noia (2001) present a four-peak regulatory structure for Euro area. The model includes three separate agencies that would be responsible for micro-prudential stability, investor protection, and competition within the European financial system. On the other hand, the European Central Banking System would engage in macro-prudential supervision of the systemic stability. Each of the three agencies should be organized in the same manner as the European Central Bank and focus on the specific objective to which it is assigned, and maintain close coordination with other regulators.

Čihák and Podpiera (2006) is the sole empirical study on regulation structures during literature search. The study empirically tests the question whether integrated regulation structures can achieve the objectives of regulation in more efficient way as compared to other financial regulation structures. The study concludes that fully integrating regulatory activities increase the quality of supervision for insurance and securities market and enhance the consistency of supervision even after controlling for the development of the countries analyzed. However, the study does not find any

significant reduction in staff employed for supervision after the adoption of integrated structures.

Carnaghan and Gunz (2007) summarize the changes occurred in Canadian financial regulation environment after 2000. The study underlines the need for a single securities regulator that would integrate the regulatory efforts of federal and provincial regulatory bodies and eliminate the overlaps and inefficiencies.

Black and Jacobson (2009) compares the US, UK, Canadian, Australian, and France financial regulation structures in terms of their compliance with OECD principles for effective regulation. The study investigates the degree of independence, accountability, regulatory and supervisory power of regulatory agencies. Furthermore, the quality of regulation is evaluated by checking the availability of ex ante and ex posts regulatory impact analyses, transparency and coordination mechanisms. Whether those countries have dynamic approaches to improve regulatory quality over time and take necessary measures to solve conflict of interest are other aspects considered.

It is found out that to a large extent all of the analyzed regulators have strong operational independence when evaluated in terms of licensing and approving the financial institutions. Most of the regulators are financially independent, as well. As respect with rule making power, all of the agencies are subject to cost-benefit analysis of a supra-agency of executive or the consent of legislature. The decisions related to intervention and sanctions are reviewed by national courts in all of the analyzed countries.

As respect with accountability, all regulators have an obligation to report the results of their regulatory and supervisory operations to the executive and/or to the legislature. In addition, the decisions of the regulators can be appealed to courts. The

financial budgets and performances of all regulators are audited by a national audit office.

Regulators such as ASIC form Australia and OSFI from Canada have no powers to set binding rules. On the other hand, regulators such as FSA from UK, SEC and CFTC from US have comprehensive rule making powers independent of the executive. All regulators have investigation and enforcement powers.

Australia and Office of the Comptroller of Currency (OCC) in the USA have centralized mechanisms to conduct ex-ante regulatory assessments to measure the probable effects of regulatory changes in terms of predicted benefits and costs of those changes. The CFTC in the US, the OSC in Canada and the FSA in UK have responsibility to make necessary cost benefit analyses of proposed changes. However, those regulatory impact analyses lack a macro-prudential point of view to figure out the effects of proposed regulatory changes on the whole of the financial system. On the other hand, the ex post analyses of regulation is less systematic in all countries.

The transparency of regulation and supervision is tried to be achieved by formal consultations related to proposed rules or guidance by all countries under consideration. All regulatory bodies issue annual reports and strategic plans. In addition, advisory and consultative panels where regulators meet with industry representatives and investors are another tool for enhanced transparency.

The coordination among regulatory bodies is appreciated as one of the key ingredients for the success of financial regulation. All of the countries have coordination bodies composed of the representatives of regulatory agencies. However, there is an obvious discrepancy in the case of international coordination.

The development of regulation over time is another consideration for the quality of regulation and supervision process. Australian and Canadian regulatory bodies have statutory provisions arranging regular reviews of regulatory and supervisory policies. All regulators seem to have statutory provisions and/or guidance to manage conflict of interest problems and the maintenance of

Black and Jacobson (2009) conclude that the application of internationally set principles for financial regulation and supervision takes significant amount time at the level of national bodies. There are significant deficiencies in terms of coordination, information sharing, determination of regulatory boundaries, incentives that would prevent financial institutions to circumvent regulatory requirements. In addition, regulatory agencies should develop their risk management practices and should not rely overly on self-regulation of the markets.

To sum up, there is an obvious need for research on financial regulation structures and their association with the achievement of regulatory goals. The studies until 2007 Financial Crisis focus mainly on efficiency concern suggesting that the trend towards integrated regulation structures will enhance the regulatory environment. Only, Giorgio and Noia (2001) are related to the objective-based financial systems. 2007 Financial Crisis challenged the view on financial regulation structures as well. The results of Black and Jacobson (2009) suggest that one-size does not fit for all and financial regulation is still affected by country-based differences. The adoption of global standards is still difficult to be implemented.

The second chapter provides a background for third and fourth chapters. The findings of those chapters are evaluated under the basic premises of the literature. For instance, the results of the third chapter indicate that the 2007 Financial Crisis has

challenged the fundamental notion of economic regulation. Economic theory of regulation has primarily asserted that formal regulation in principle should be delegated to the market forces unless a legitimate reason for intervention emerges. Until the financial crisis, studies on the relationship between financial regulation and economic development have usually suggested that market-based financial regulation and rather liberal markets would produce the most efficient results in terms of economic development. However, challenging those propositions, the 2007 financial crisis has brought about significant regulatory concerns. The third chapter includes the analysis of those regulatory implications based on studies conducted by international and national organizations.

The fourth chapter is an attempt to fill a significant gap existing in the course of financial regulation structures. The literature research displays that there is lack of empirical studies related to the interrelationship between financial regulation structures and financial system. The results of the empirical study present the existence of a significant relationship between the structure of financial regulation and the soundness of banking sector.

CHAPTER 3: REGULATORY IMPLICATIONS OF 2007 FINANCIAL CRISIS

Regulatory and supervisory policies relied mainly upon the basic premises of the so-called "Efficient Market School" of economics until 2007 Financial Crisis. Leading point of view was that the markets would by themselves determine the true economic value of the services provided by financial markets and institutions. The institutions with low quality of services as compared to their relative prices would be eliminated by the competitive forces. Strong commitment to those tenets led to the delegation of the regulation and supervision to the market (FSA, 2009a). The risk distribution opportunities provided by derivative products supported this relative confidence in market-based mechanisms. Self-regulation of financial markets has been the dominant policy preference especially in developed parts of the world since the early 1980s.

2007 Financial Crisis brought up a need to reconsider the underlying framework of financial regulation and supervision prevailing in global and national financial systems. The pre-crisis period included evidences related to lack of financial prudence, excessive risk taking, inadequate capital and liquidity management, herding behavior, overconfidence. Those evidences indicated that the behaviors of economic agents can be far away from being rational (FSA, 2009a). The interest maximizing behaviors of individuals would not necessarily maximize the interest of the whole at the same time. For instance, the excessive risk taking with relatively less liquidity of individual banks resulted in the dried-up liquidity within the market place creating significant negative externalities for the whole financial systems. Therefore, the crisis pointed out to the

necessity of legitimate regulatory and supervisory intervention within the financial institutions and markets.

The purpose of this chapter is to investigate major regulatory implications of 2007 Financial Crisis. Thirty reports, blueprints, works, and policy papers published by international and national regulatory bodies, sectoral associations, and standard setters are analyzed to determine the trends in financial regulation and supervision. The summaries of the reports used for the analysis are presented in Appendix B.

The analysis indicates that major regulatory implications of 2007 Financial Crisis can be accumulated under seven broad headings. The need for macro-prudential regulation and the ongoing surveillance of systemic risk is the foremost lesson taken from the turmoil. Secondly, there appears an obvious need for a reconfiguration of micro-prudential framework of Basel II to mitigate pro-cyclic behavior of financial institutions. Third regulatory conclusion derived form the 2007 Financial Crisis is related to the securitization, unregulated financial products, centralization of clearing mechanisms, and short selling. Configuration of a new regulatory framework for CRAs to improve the quality and transparency in rating process is the fourth remarkable regulatory conclusion. The fifth regulatory course that should be considered is that new regulatory and supervisory arrangements are required for all kinds of private capital pools including hedge funds. The crisis brought up the need for increased international coordination between national states and their regulatory bodies for the control of cross-border financial transactions and to develop global regulatory and supervisory standards. The 2007 Financial Crisis has highlighted some problems related to financial regulation structures as well. The analysis shows that there is a global trend towards objective-based regulatory structures with enhanced transparency, accountability, independence,

coordination, and effectiveness. The following parts of this chapter explain the findings concerning those seven major regulatory implications of 2007 Financial Crisis.

Macro-prudential Regulation and Ongoing Surveillance of Systemic Risk

The most significant regulatory and supervisory implication of 2007 financial crisis is the need for a rather macro-prudential perspective in the regulation and supervision for the sake of systemic stability. The crisis indicated that the transfer of individual risks to other parties via various vehicles does not necessarily mean that the risk inherent within a financial system is reduced. Indeed, systemic risk is an important externality sourcing from the individual actions of market participants. Therefore, it should be managed via regulatory and supervisory intervention.

Schwarcz (2008) defines systemic risk as the probability that *"(i) an economic shock such as market or institutional failure triggers (through a panic or otherwise) either (x) the failure of a chain of markets or institutions or (y) a chain of significant losses to financial institutions, (ii) resulting in increases in the cost of capital or decreases in its availability, often evidenced by substantial financial-market price volatility."* In other words, the main source of systemic risk is the possible deterioration in market confidence within the financial system due to the lack of proper regulation and supervision. In addition, the definition suggests that systemic risk is associated not just with bunk runs but it is also related to the interactions between all significant institutions and markets regardless of their legal or business forms.

Following the 2007 financial turmoil, a remarkable conscious has spread on international arena regarding the importance of appropriate regulation and surveillance

of systemic risk. The regulatory framework to manage systemic risk should consider both direct and indirect costs of regulation to balance them with the benefits of regulatory intervention. In other words, the efficiency objective of regulation should always be one of major concerns. Direct costs of regulation include the overheads of regulatory and supervisory bodies. On the other hand, the indirect costs might be possible moral hazard problems, reduction in the volumes of transactions and innovations, and possible decrease in efficiency (Schwarcz, 2008).

As a first step of effective and efficient surveillance of systemic risk, the financial institutions and markets should be categorized according to their relative systemic importance. Brunnermeier, et al. (2009), the US Department of Treasury (2009), and the G30 (2009) suggest some alternative classifications. The first category might include the financial institutions which are systemically important by themselves. The behavior and interaction of those institutions are of remarkable significance for the sustainability of the financial system. The failures of those institutions would trigger spillovers spreading to other parts of the system as well as the overall economy. The regulatory agencies should implement the requirements of both macro-and micro-prudential supervision to those institutions.

Another category of financial institutions involves the ones which are not by themselves systemic, but whose collective behavior might pose significant risk to the overall system. Hedge funds could be categorized within this group. Although, the idiosyncratic risk of each individual hedge fund has little to do with the overall financial system, the common behavior of them would impact financial markets. Limited micro-prudential regulation would suffice for those institutions. However, the regulatory bodies should conduct macro-prudential oversight of them as a whole. Other categories

of financial institutions would include the ones which have no significant systemic influence in the case of their failures. Limited micro-prudential and conduct-of-business regulations would suffice to control their financial decisions and relations with investors.

The second step to enhance macro-prudential oversight is the determination of tools that would be used for macro-prudential purposes. The tools selected to control systemic risk should mitigate the procyclicality within the behaviors of financial institutions. It is realized during the crisis period that Basel II (Basel, 2006, 2009, and 2011) framework has significant drawbacks that induce financial institutions to behave in a pro-cyclical manner. Financial institutions used to underestimate market risk and intended to keep low levels of capital through using the opportunities provided by derivatives instruments economic enlargement times. The regulatory bodies should employ countercyclical capital adequacy measures that would make systemically important financial institutions to hold more capital in relatively positive economic conditions. The institutions can use those capital buffers in times of economic downturns. (Brunnermeier, et al. 2009; Joint Forum, 2010; G30, 2009; the US Department of Treasury, 2009; FSA, 2009a) Selected capital adequacy measures should be arranged depending on the liquidity levels hold by the institutions and the maturity mismatches between their assets and liabilities.

When designing capital adequacy measures, the regulators should consider the shortcomings associated with mark-to-market approach to value the assets. This valuation approach contributed to the spreading of the crisis by decreasing the asset values of institutions without any difficulty and inducing them to join the wave of asset sales which further decreased the market values of assets (Larosière, 2009; Brunnermeier, et al. 2009). Brunnermeier, et al. (2009) proposes a new mark-to-funding

approach to deal with this problem. This new method assumes that two institutions holding the same assets should value them differently depending of the maturity of resources used to fund those assets. In this way, the institutions with relatively short maturity funding should hold more capital.

Selected measures to supervise systemic risk should consider not just the value at risk (VAR) of individual financial institutions but also the covariance risks between systemically important ones. The regulatory authorities should consider the expected value of the losses that would occur within the whole system in the case that a systemically important institution fails. In addition, tools such as ongoing stress testing, and scenario analyses can be utilized to calculate each financial firm's contribution to systemic risk. In compliance with those analyses, the regulators should make the firms to pay for their relative contributions to the overall risk.

Another consideration is related to financial conglomerates. Whether the group companies should be taken into account separately or in a consolidated manner is a key issue regarding the control of systemic risk. Intra-group transactions can add to the deepening and widening of the difficulties faced by systemically important institutions. Moreover, as in the case of the US, group companies which are either subject to different regulatory and supervisory regimes or even do not subject to any regulation and supervision can be used as ways of circumventing and escaping from supervision. Therefore, the macro-prudential regulators should treat financial groups as a whole including all activities in which they are engaged and all risks they are exposed to (The Joint Forum, 2010; and US Department of Treasury, 2009).

Deposit insurance is a commonly used instrument to control systemic risk. However, the design of deposit insurance schemes should ensure the prevention of moral

hazard problems. In addition, the schemes should enable the participation of non-traditional banking groups within the insurance.

The extension of the lender-of-the-last resort role of local central banks is another debated issue to deal with systemic risk. As a liquidity-provider-of-the-last resort, the central banks should be given the authority to provide liquidity to both depository and non-depository institutions with systemic importance. The central banks should determine the list of systemically important institutions without disclosing it publicly and determine the criteria against which it would make liquidity provisions to them. An accountability regime which will control the decisions of central banks is also a complementary element for this framework. A consistent and clear regime for the resolution of financial institutions is another supplementary element of the new role proposed for macro-prudential regulatory bodies (Schwarcz, 2008).

Who would be responsible for macro-prudential regulation and supervision? This question is another significant issue debated in international arena. The common view is that the IMF should be restructured and given the authority to audit the global financial stability. It is proposed that, the IMF should be able to make recommendations to member countries regarding the risks associated with their markets. Furthermore, it is also pointed out that the local central banks should assume the responsibility of observing the financial system and institutions to manage the systemic risks (Brunnermeier, et al. 2009; the G30, 2009; the US Department of Treasury, 2009; FSA, 2009a).

Micro-Prudential and Conduct-of-Business Regulation

The analysis presented above assumed a macro-prudential regulation perspective and listed the regulatory implications of 2007 Financial Crisis from that aspect. A complementary part of those requirements are the changes that should be implemented in the courses of micro-prudential and conduct-of-business regulation and supervision.

2007 financial turmoil has highlighted significant failures in prudential regulation and supervision of banking sector. The Basel II framework enabled the financial firms to excessively rely upon the market based measures of credit risk assessments. This opportunity has induced financial institutions to engage in shadow banking activities. The firms tended to hide their true risk exposures via special investment vehicles and other off-balance sheet items (Schooner and Taylor, 2010). As a result, they have been able to reduce their required capital amounts. They used to take excess leverage at pre-crisis period of economic expansion. Lack of proper micro-prudential oversight contributed the emergence of that pre-crisis environment. Seeing those drawbacks in the Basel II standards (Basel, 2006), the Committee launched new work to revise the existing framework. The focus of those revisions is related to more detailed evaluation of market and credit risks together with the determination of more robust capital adequacy measures (Basel, 2009 and 2011).

Another crucial issue is the application of those standards to relatively unregulated parts of the financial sector. There is an obvious need of arrangements targeting the systemically significant non-deposit-taking institutions. Included in those institutions are some international insurance companies, investment banks, brokers, and dealers. Special supervisor and/or supervisors should be assigned for the supervision of

those entities. In addition, traditional banks should be prevented from engaging in risky activities conducted by non-regulated institutions (FSA, 2009a; G30, 2009).

Besides the need for micro-prudential regulation, the crisis brought up the weaknesses in conduct-of-business regulation and supervision, as well. In this context, the first issue is the compensation schemes designed for the managers of financial institutions. The compensation schemes used to assume a rather short-term perspective prior to the financial crisis. This short-term viewpoint induced the managers to take excessive amounts of risks to boost the short term earnings of their companies. The structures of compensation schemes should be rearranged considering the long-run sustainability of the performance. Designed compensations schemes should motivate managers to behave in line with long term interests of the investors by assuming a multi-year perspective. Supervisory bodies should oversee the compensation schemes of companies and take necessary measures such as requiring more capital for the ones who do not consider the long-run interests of shareholders.

Another concern regarding conduct of business regulation is the independency of risk management functions. Regulators should require the firms not to rely overly on credit rating agencies and to review the internal control mechanisms regularly. Firms should improve their risk management practices by specifying risk limits fro managers. The boards of directors should include members with experience on risk management and risk management function should submit periodical reports directly to the board (Larosière, 2009; IOSCO, 2009a; G30, 2009).

A final arrangement related to conduct of business regulation is the establishment of clear and well-shaped resolution regimes for failed financial institutions. The G30 (2009) specifies that the regulatory and supervisory bodies should have a responsibility

to set up early warning mechanism before a financial entity goes to bankrupt. They should take necessary corrective actions beforehand. Whether depository or non-depository, a systemically important financial firm should be subject to the specified resolution regime.

<center>Unregulated Financial Products and Short Selling</center>

Securitization played an undeniable role within the financial architecture prevailing in major markets of the globe before the 2007 crisis. The relatively loose monetary policies of major central banks triggered a liquidity glut. This macroeconomic environment induced major loan originators to target even the subprime segments of their markets to exploit possible higher returns. Securitization enabled those originators to pass away the risks to other participants of the financial system such as investment banks and hedge funds. Those buyers of securities further securitized those initial claims and sold within global market places. This process cancelled out and transferred associated credit risks from their balance sheets.

Main problems related to securitization arise due to unregulated products that are traded via over-the-counter markets among sophisticated institutional investors. That kind of products includes asset-backed securities (ABSs), asset-backed commercial papers (ABCPs), collateralized Debt Obligations (CDOs), synthetic CDOs, collateralized loan obligations (CLOs) and credit default swaps (CDSs). They have opaque natures which usually increase rather than decreasing overall systemic risk in both national and international financial markets. Therefore, after the 2007 financial turmoil, regulatory standard setters have launched studies on the ways to regulate those

unregulated financial products without harming the merits of financial innovation (IOSCO, 2009a; 2009e; Acharya, et.al, 2009).

The International Organization of Securities Commissions is the organization that is assigned by the G20 (2009) initiative with developing standards for the regulation and supervision of securitization process. The organization conducts its duty in coordination with other members of Financial Stability Board (FSB) and corresponding agencies of member states.

IOSCO (2008a) defines 30 broad principles to be used in regulating and supervising securitization. Main goals of securities regulation are defined as protecting investors, sustaining fair, efficient and transparent operation of markets, and reducing systemic risk. First group of principles is related to regulators. Regulators should have clearly defined goals with enough power and resources to implement their policies. They could inspect, investigate, oversee the actions taken by financial institutions and enforce required measures in an efficient and credible way. Correspondingly, they should be accountable of efficient and effective regulation and supervision.

Second set of principles are related to the role of self-regulation. IOSCO (2008a) suggests that self-regulatory organizations (SROs) should be integrated into the regulation processes implemented by statutory agencies. The third issue is the enforcement of regulation and supervision. In this respect, regulatory and supervisory provisions should have enough deterrence.

Fourth group of broad principles recommended by IOSCO is related to the need for both domestic and international coordination. For effective regulation, regulators should share public or non-public information regarding their policies and practices with their domestic and foreign counterparts. In addition, joint investigation programs should

be developed among regulatory agencies from different countries to investigate cross border financial transactions.

The issuers of securities should keep the track of information related to the products introduced by them and publicize timely and accurate disclosure of financial results. Accounting and auditing processes related to those products should abode with internationally acceptable and high level standards.

Regulatory bodies should define rules that will guide the structuring and legal forms of collective investment schemes. Those rules should ensure the appropriate valuation of assets hold by the scheme. Furthermore, investment schemes should be subject to similar transparency standards as other kind of financial institutions. They should periodically share the results of their operations with all kinds of stakeholders.

IOSCO specifies broad guidelines for the regulation of market intermediaries, as well. Regulators should establish some entry requirements for intermediation. Eligible market intermediaries should be subject to ongoing capital and prudential regulation standards that are in congruence with their risk preferences. Intermediaries should abide with required conduct-of-business and risk management standards. Furthermore, the regulators should prescribe procedures to be followed in the case of the failures of market intermediaries.

In order to enhance integrity in trading process in secondary market operations regulators should define authorization and supervision processes. Regulations should enable the authorities to detect and prevent any manipulative and unfair trading practices. In addition, required mechanisms should be set up to ensure fair, efficient, and effective oversight of clearing processes.

In addition to those general principles specified by IOSCO, there are some acute recommendations suggested for securities regulation and supervision. Especially, the regulation of OTC derivatives such as CDSs and ABSs needs to be enhanced. Main problems related to those products are inadequate incentives and underwriting standards, lack of transparency during the whole lives of the products, and conflict of interest problems between various parties. In addition, there are issues concerning the eligibility of investors, standardization of OTC derivatives products, and the establishment of central clearing mechanisms (IOSCO, 2008b; 2009e).

First of all, regulators should implement arrangements to restore wrong incentives underlying the originate-to-distribute model of securitization. In traditional originate-to-hold-model security issuers hold as significant part of their issued securities. However, originate-to-distribute model enables the issuers to transfer the risks associated with securities to other parties of the financial system. This opportunity led to the deterioration of credit underwriting standards prior to the 2007 Financial Crisis. The firms tended to originate loans even to the subprime segments of the customers. Therefore, those incentives sourced from the opportunities provided by originate-to-distribute model should be eliminated. Regulatory bodies should require the issuers to retain a remarkable part of interest within their securitized assets during the full life of the products. Charging extra capital requirements for the institutions engaging in OTC derivatives trading is another alternative tool for controlling the behaviors of issuers and investors.

The improvement of credit underwriting standards is another acute point in securities regulation, especially in mortgage markets. Credit originators should develop their measures used in evaluating the ability-to-repay of borrowers. The incomes of

borrowers should be verified effectively. Debt-to-income and income-to loan ratios should be rearranged. Standards used in the determination of collateral values and minimum down payment amounts need to be enhanced. The repayment and/or refinancing capabilities of borrowers are to be checked regularly depending on the changes in asset prices backing the underwritten loans. Finally, regulatory agencies should continuously inspect mortgage markets and mortgage originators in terms of their degree of compliance with specified standards (IOSCO, 2008b; 2009e; G30, 2009; The Joint Forum, 2010; Larosière, 2009; The US Department of Treasury, 2009; FSA, 2009b).

Another notified problem related to the OTC derivatives is lack of transparency and enough disclosure mechanisms. Originators should disclose timely and relevant information related to the basic fundamentals of and associated risks with issued products. In addition, they should keep the track of those products not just at the first stage of origination but also during the whole life-cycles of the products. In coordination with investors, regulatory and supervisory bodies should determine the types of relevant information, time and standards of reporting. Accounting principles for reporting off-balance sheet items need also to be enhanced (IOSCO, 2008b, 2009e; G30, 2009; the Joint Forum, 2010; Larosière, 2009; the US Department of Treasury, 2009; FSA, 2009b).

A third issue regarding the securitization is the possibility of some conflict-of-problems between various parties. To deal with those issues regulatory agencies can take precautions to ensure the independencies of the parties involved in securitization process. Furthermore, investor suitability standards might be established for ones who

want to engage in transactions of complex and opaque securities. In this way, possible problems associated with asymmetric information might be overcome.

Standardizing OTC derivatives and encouragement of their trading through organized exchanges are alternative ways to build confidence and stability in those markets IOSCO, 2009e; 2009e; G30, 2009; the Joint Forum, 2010; Larosière, 2009; the US Department of Treasury, 2009; FSA, 2009b).

The reduction of counterparty risk is the final issue regarding the regulation of securitization through OTC markets. The establishment of central clearing mechanism can facilitate the solution of problems associated with the risk of default. Regulators should determine the eligibility criteria for the products to be traded via centralized clearing houses. Bilateral collateralization and capital requirements can be applied to the parties of the transaction. The employment of central clearing mechanisms could mitigate information costs and default risk for parties engaging in the transaction. Transparency, liquidity and the information base related to CDS and other OTC markets will increase. In addition, encouragement of investors to trade via those central mechanisms will enhance the acceptance of industry-best practices thereby increasing the operational efficiency. The standardization of OTC derivatives will be easier. Finally, the usage of central counterparties can contribute to the review of OTC markets from a systemic perspective (IOSCO, 2008b, 2009e; G30, 2009; the Joint Forum, 2010; the US Department of Treasury, 2009; FSA, 2009b, Brunnermeier, et al. 2009).

Another important regulatory implication of 2007 financial crisis is related to the short selling activities. The increased volume of those transactions posed remarkable amount of systemic risk prior and after the outbreak of the crisis. Therefore the regulation and supervision of those activities appears to be a necessity at global and

domestic level. IOSCO (2009c and 2009d) proposes four basic principles for the regulation of short selling.

The first principle is concerned with the proper control of short selling activities to mitigate their adverse impacts on systemic risk. Secondly, a specific information disclosure regime should be established by regulatory agencies to promote the disclosure of timely and relevant information on short selling activities. Furthermore, an affective compliance and enforcement regime should be developed specific for short selling activities. Finally, the regulation of short selling should provide exemptions for certain activities in order to not disturb the efficient functioning and development of the market.

There are various tools to be used in controlling short selling. For instance, some jurisdiction does only allow the short selling of certain eligible stocks. In addition, tools such as price restriction rules, flagging of short selling transaction at the time the order is given to the exchanges, margin requirements, and some forms of compulsory buy-in or close-out requirements and monetary penalties for failed delivery of short-sold stocks together with shorter settlement cycles are also used depending on the special characteristics of national markets (IOSCO, 2009c and 2009d).

Enhanced transparency is another major concern for the regulation of short selling activities. However, selected disclosure regime should not harm the benefits derived from short selling such as the price correction mechanisms. Regulatory agencies should clearly define the reporting requirements for selling activities so that short selling does not totally become impossible to implement. Proposed reporting regimes should enhance the understanding of market dynamics, preventing market abuse and aggressive usage of short selling. In general, there are two basic reporting regimes for short selling activities employed worldwide. Under the first kind of reporting regime short positions

hold by market participants are reported. Regulators might require the disclosure of net or gross net short position in all kinds of financial assets including OTC derivatives. On the other hand, the second type of reporting regime includes the flagging of short sales. Under this approach, each short selling order sent to an exchange or an alternative trading facility is recorded. Flagging approach provides real time information to regulatory bodies about short selling transactions so that any abusive behavior is traced more easily. However this approach does not provide any information about total net or gross positions held by investors. Therefore, it seems reasonable that a consistent usage of short sales reporting approach together with the flagging would be much more appropriate.

The third broad principle related to the regulation of short selling activities is the establishment of an effective compliance and enforcement regime. Regulators should require timely monitoring of failed trades and apply consistent sanctions to ensure settlement discipline. The brokers and investors engaged in short selling operations should hold records of transactions for a specific period of time. The impacts of possible failures of short selling transactions on systemic stability should be overseen. Finally, regulators from different countries should share information regarding cross-border short selling activities to prevent abusive usage of short selling, manipulations, and other fraud.

IOSCO's fourth and final principle of short selling regulation is about the exemption of some activities from the regulation for the sake of effective market functioning and development. Those may include the hedging, market making, and arbitrage activities which when executed in good-will contribute to the effective functioning and price discovery. However, to avoid the abusive usage of those

exemptions, regulatory bodies should clearly define the activities for which flexibility is provided.

Credit Rating Agencies

Credit rating agencies (CRAs) are important elements of global financial architecture. They provide basis for the valuation of structured and unstructured financial products. These products are usually written on various loan pools with differentiated risk configurations and have opaque natures. Investors face computational problems when they evaluate the risks associated with those products and the assets on which those products are written. Historical data about these products is usually unavailable given rather inactive secondary markets. In addition, there are no universally accepted valuation practices for those products. For these reasons, investors relied overly upon the opinions and grades of CRAs when shaping their investment decisions before the 2007 financial crisis (IOSCO, 2008b, 2008c; G30, 2009; Larosière, 2009; the US Department of Treasury, 2009; FSA, 2009a).

Regulatory implications of 2007 financial crisis that are related to CRAs can be handled under three main headings. The first issue is quality, integrity, and transparency problems exiting within the credit rating process. Independency of credit rating agencies and possible conflict-of-interest problems that might arise between various parties related to the rating process seems to be another major area of scrutiny. Finally, lack of competition existing in credit rating market poses significant threat to the overall reliability of the ratings (IOSCO, 2008c).

The first regulatory concern for CRAs is related to the overall quality, integrity, and transparency of the rating process. There some fundamental problems associated with the rating methodologies employed by CRAs. Before the crisis, the ratings of CRAs are usually based upon the assumption that there is continuity between the past and the future. However, 2007 financial crisis crumbled this point of vies showing that the events with lower past probability of occurrence might happen. In addition, CRAs have not publicized the underlying assumptions and models for their ratings both before and after the crisis. They have been to slow to rearrange their ratings given the changes in market conditions. For these reasons, regulatory intervention is necessary to increase consistency and objectivity in the rating process. CRAs should be required to regularly declare to the changes made in rating methodologies together with their reasons. The disclosure process should also include information related to historical performances of ratings. CRAs should treat traditional securities and structured products differently when making disclosures regarding the default risks of those products. In this way, the differences between those products in terms of liquidity and volatility can be properly reflected (IOSCO, 2008b, 2008c; G30, 2009; Larosière, 2009; the US Department of Treasury, 2009; FSA, 2009a).

Second regulatory concern is the independency of CRAs and possible conflict of interest problems. CRAs generate most of their revenues of CRAs from the issuer firms whose securities they rate. Additionally, credit rating is not the only service provided by CRAs to their customers. Advisory services constitute another important item in their income statements. That nature of credit rating business augments the risk that CRAs would not assume the required due-diligence when rating structured financial products in order not to harm their relationships with important issuers. In order to deal with

possible conflict of interest problems, rating and analysis businesses should be separated. CRAs should disclose information about the contribution of specific customers to their total revenues. They should demand all relevant information related to products to be rated from the issuers. A monitoring mechanism should be established that will detect probable conflict interest problems. The objectivity of rating process should be empowered with regular and periodical reviews of analysts in terms of their compliance with principles and procedures. To decrease the possibility of rating shopping, procedures should be developed to review the records kept by analysts. CRAs should regularly check those records to investigate whether there are possible conflict of interest issues such as trying to guarantee a future position within the rated firm

Final regulatory issue related to CRAs is the lack of enough competition in the credit rating industry. The industry is dominated by three largest CRAs, namely the Moody's Investment Services, Standard & Poor's, Inc. and Fitch, Inc. Total market shares of those three CRAs correspond to nearly 85 percent of the industry. Lack of competition might be attributed to the nature of the industry. The nature of the business requires long-lasting experience and reputation. The construction and maintenance of such a respect is a remarkable barrier to entry. The effects of this lack of competition on the credibility of the ratings are not obvious. Although there are some advantages associated with lack of competition, there are some important drawbacks especially in the case of structured products.

Lack of competition in credit rating business has some advantages in the case of conventional financial instruments for which there exists a broad market. Small number major CRAs can deter the issuers of securities from urging a CRA directly or indirectly

to make favorable assessments about a security or a company. Issuers have a small set of alternative CRAs on whose opinions the investors usually rely.

However, the lack of competition may pose threats for the credit rating industry. It can hinder development of new rating methodologies and innovations that will enhance rating process quality. It can create an oligopolistic or monopolistic pricing behavior among major CRAs. Most obvious drawback appears in the case of structured financial products for which the market is relatively less transparent and narrow. The possibility of loosing an important customer may induce major CRAs to enter into a rating competition harming the quality of ratings made about a particular instrument.

Hedge Funds and Private Pools of Capital

The role of hedge funds in broadening of national and international markets cannot be negated. They provide ways of diversification and flexibility in returns. In addition, they play significant role within securitization through originate-to-distribute model. However, the events occurred before and after 2007 financial crisis displayed that hedge funds pose significant amount risks to the overall financial system. In coincidence with those risks, regulatory requirements that will enhance the management of those risks are also debated. Briefly, the regulatory concerns regarding the hedge funds can be compiled under two broad headings. The first heading is the transparency and disclosure problems. The second category includes possible prudential regulatory, conflict-of-interest, and conduct-of-business issues that might arise between hedge funds and their stakeholders.

The first regulatory concern is the lack of transparency in hedge funds operations. Hedge funds conduct most of their transactions through over-the-counter markets. In addition, hiding strategic information might be perceived by fund managers as a key factor determining the overall success of the hedge funds. Those arguments lead to inappropriate disclosure of information in hedge funds industry. However, lack of adequate information disclosure increases the threats of market abuse, misconduct, and fraud. An asymmetry of information emerges between the managers of funds and its investors leading to risks of deteriorated investor protection and market confidence.

To overcome transparency problems, hedge funds should be required to disclose information on their strategies, associated risks, audited financial statements, conditions and limits for redemption. Disclosure standards should also be extended to the counterparties of hedge funds such as prime brokers and banks. Those counterparties should disclose information on their exposures to hedge funds via OTC derivatives transactions and secured lending operations on a market-to-market basis. Provided information to regulators and investors should also include potential future exposures, market or product concentrations, and hedge fund managers with whom the institution has its main relationships. Correspondingly, hedge funds deliver information about their prime brokers, custodians, and staff responsible for the management of assets (IOSCO, 2009a, 2009b; Joint Forum, 2010; Larosière 2009; G30, 2009).

Other regulatory issues related to hedge funds involve possible prudential, conflict-of-interest, and conduct-of-business problems. In order to deal with those prudential regulatory problems regulatory agencies might require the hedge funds to abide with capital adequacy arrangements. As respect with possible conflict-of-interest and conduct-of-business concerns hedge funds and their managers should be subject to

formal registration process. Funds should register through providing information on their backgrounds, managers, ownership structures. In addition, total amount of assets under management, basic strategy preferences, investor segments, and compensation schemes should also be provided. Finally, hedge funds should define and report specific processes and tools to manage possible conflict of interest problems that might emerge between funds' managers and their stakeholders (IOSCO, 2009a, 2009b; Joint Forum, 2010; Larosière 2009; G30, 2009).

Regulators should set organizational and operational standards to ensure ongoing supervision of hedge funds. Included in those standards are appropriate risk management policies and techniques. The risk management functions should be independent. Periodical stress tests should be conducted to manage liquidity risks. Regulatory bodies should employ various tools to control the hedge funds' contribution to systemic risk. Those tools compose of haircut, margin, and risk- independent or risk-based leverage requirements. Timely delivery of short-sold financial instruments should be guaranteed. In addition, hedge funds might be organized as closed-end funds to deal with liquidity mismatch problems. Valuation methodologies followed by hedge funds should be subject to continuous oversight by regulatory bodies. Usage of independent custodians, properly keeping the records of transactions, and independent audit of business records are other instruments would improve the protection of investors (IOSCO, 2009a, 2009b; Joint Forum, 2010; Larosière 2009; G30, 2009).

Other types of private capital pools should be subject to similar arrangements depending on their systemic importance. For instance, money market funds engaging in bank-like activities should be reorganized, regulated, and supervised as original deposit taking institutions. Funds that prefer to remain as money market funds should be

allowed to invest in less risky assets issued either by governmental institutions or governmentally-insured banks. They should be forbidden to guarantee their customers a stable amount of return on demand.

International Coordination

Another regulatory implication of 2007 financial crisis is the need for increased coordination and information sharing among international and national regulatory agencies. The existence of global financial institutions that can engage in cross-border financial activities brings about the need for monitoring the risks arising in global financial markets. The failure of globally significant institutions could lead contagious difficulties across national financial systems regardless the home country of the failed institution. For this reason, the determination of global standards for and coordinated supervision of those institutions appears to be a necessity to protect global financial stability (G20, 2009a; FSA, 2009a; The US Department of Treasury, 2009; G30, 2009).

After 2007 Financial Crisis, international initiatives accelerated the efforts to harmonize standards and practices applied by national governments. Figure 9 summarizes international bodies that are responsible for developing universal standards in different areas of financial regulation and supervision. At the top of the chart are international organizations such as G20 and OECD. The member states of those platforms determine the broad goals for global standard setters working under their umbrella. Financial Stability Board (FSA) coordinates the activities of functional organizations that stand for the regulations in banking, securities, and insurance businesses. The Bank for International Settlements, the GIO of Central Banks, and the

Basel Committee works mainly on banking regulation. Those bodies engage in

establishing global standards for macro- and micro-prudential regulation of banks. The

control of off-shore banking centers, compensation schemes for bank managers, the

usage of credit ratings in risk management processes are other major issues that are in

the agenda of those international organizations. The duty of the IOSCO is the

determination of standards for securities markets and institutions. Initiatives such as On

IASB, IASC, IAASB, PIOB, and IFIAR focus on accounting, auditing, and valuation

standards. The IAIS is the global authority to establish universal standards for insurance

sectors. The BIS, IOSCO, and IAIS constitute the Joint Forum to harmonize the

standards developed for each separate sector.
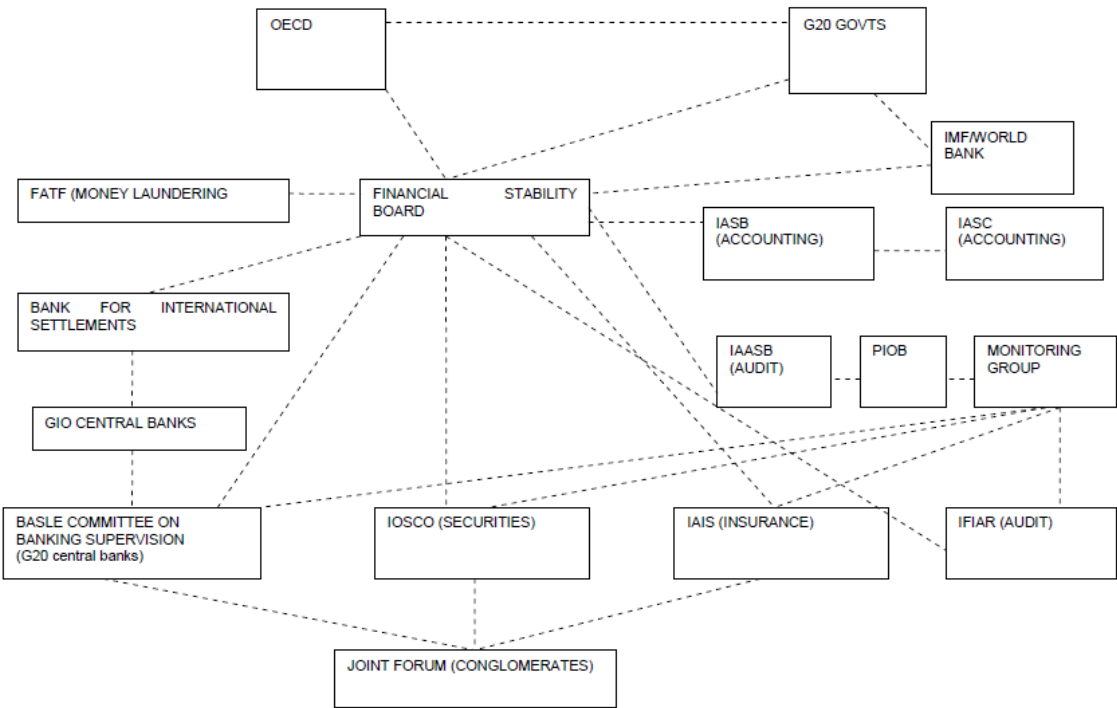
Figure 9: Institutions responsible for global financial regulation and their interrelations
Source: Black, J. Jacobson, S. (2009)

One remarkable proposal for the enhancement of global regulatory and supervisory activities is the assignment of an international body with the oversight of global risks. The role of IMF as a global supervisor of global financial markets is discussed at international platforms (G20, 2009a). It is supposed that the IMF should oversight the developments related to global systemic risks and make necessary recommendations to local agencies to take required actions in order to manage global systemic risks. International and national platforms and organizations provided various recommendations for setting up a global regulatory framework and coordinating the supervisory activities of national regulatory agencies.

Besides those international bodies, the European Union tries to standardize the regulatory and supervisory activities throughout the European Region. The crisis highlighted the drawbacks in regulation of cross-border activities in member countries. Therefore, recommendations are suggested to integrate the standards applied by national agencies, especially in macro-prudential regulation of systemically important financial holding companies. National agencies should be enforced to apply more stringent passport right and prudential requirements for financial conglomerates operating in their countries (Larosière, 2009 and FSA, 2009).

Despite the efforts to draw a global framework for the regulation and supervision of financial markets, there are obvious challenges related to the applicability of that global framework. National government and regulatory agencies face the need of considering the peculiarities of their own countries. Therefore, there is a still long way for a totally global regulation and supervision of financial sector. The final decision making authority regarding the application of global standards still remains with national regulators.

The Trend towards Objective-Based Regulatory Structures with Increased Transparency, Accountability, Coordination, Effectiveness, and Efficiency

The developments in financial sector blurred the boundaries between services and products provided by the financial institutions during 1980s. These developments led to the emergence of functional regulation structures where separate authorities conduct the regulation and supervision of different services. During 1990s, efficiency concern and market-based self regulation concept dominated the underlying logic of regulation and supervision in developed financial markets of the world. The transformation towards integrated regulation structures in UK, Germany, and some other countries reflected those considerations. 2007 Financial Crisis highlighted remarkable deficiencies in functional and integrated regulation structures. A trend emerged towards rather objective-based regulation structures where regulatory bodies are assigned according to a specific goal to be achieved.

The crisis of 2007 has highlighted some shortcomings related to the regulatory structures prevailing in major financial markets of the world. Six main studies are of special importance regarding the main discussions on the subject of regulatory structures. The first one is the blueprint of the US Department of Treasury (2008) that proposes short, medium, and long term design for US financial regulation structure. FSA (2009a) and Sassoon (2009) introduce main problems associated with the existing integrated regulatory structure of the UK. Larosière (2009) develops a reform framework for the structure of regulation throughout the European Region. Besides those studies, The G30 (2009), GAO (2009), and Black and S. Jacobzone (2009) list the

principles that should guide the regulatory activities. Those principles include transparency, accountability, coordination, effectiveness, and efficiency.

The adverse impacts of the shortcomings in financial regulation structures on the outbreak of the crisis are most remarkable in the USA case. The US financial regulation structure is composed of agencies organized at both federal and state level. The US regulatory structure includes authorities each of which is responsible for the regulation and supervision of a specific financial function. During the crisis period, it has been realized that even if the FED's role as a systemic supervisor, no one of the regulatory bodies have enough organization and information to manage the systemic risk. In addition, the crisis has highlighted that there are legal inconsistencies, managerial conflicts, and duplication of regulatory and supervisory activities within the US financial regulation system. Seeing those flaws, the Department of Treasury (2008) presented a plan for reforming US financial regulation structure. The plan introduces some short-term, intermediate-term, and long-term recommendations.

The US Department of Treasury (2008) proposes the establishment of an objective-based regulatory structure in the long-run. The regulatory bodies are supposed to be organized according to three main objectives. Those objectives are the management of systemic risk, the soundness of financial institutions, and the protection of investors through proper conduct-of-business regulation. In addition, there would be two more institution, namely a federal insurance guarantor and a corporate finance regulator. The new regime would categorize the financial institutions under three main divisions. The first ones would be federal insured depository institutions (FIDIs), the second category would include federal insurance institutions (FIIs), and the final division would represent federal financial services providers (FFSPs).

The Federal Reserve would take the responsibility of macro-prudential regulation and supervision of federally-chartered financial instituions under the new framework. The proposed authority includes the power to collect and publicize information, setting rules and taking necessary measures. Under new structure the FED would be to demand any information from prudential and conduct-of-business regulators for systemic risk concerns. A new reporting regime would be designed that would enable financial firms to provide information on both consolidated and subsidiary basis. The FED would have the authority to restrict the risk positions of financial institutions in certain asset classes and put liquidity requirements. The liquidity-provider role of the FED would be extended. The FED would use its discount window applications to not federally insured but systemically important financial institutions in times of significant financial stress.

A new prudential financial regulation authority (PFRA) would take the responsibility to regulate and supervise the soundness of financial institutions. A new charter system would be set up for federally insured depository institutions (FIDIs). The new charter would define all types of ownership structures, such as stock, mutual, or cooperative, in financial sector. There would be an upper limit for the deposit insurance guaranteed to depository institutions. The new PFRA would have the authority to set activity, liquidity, capital limitations to preserve the assets of insured financial institutions.

The conduct of business regulation and supervision authority (CBRA) would determine chartering and licensing requirements for all kinds of federal financial instituions. Those requirements would involve financial capacity, experience, education, etc. The CBRA would set disclosure, selling, marketing, fair trade, operational ability, and professional conduct standards for investor protection purposes. It is suggested that

the CBRA should work in coordination with self-regulatory organization, especially in the case of securities and derivatives regulation.

The US Department of Treasury (2008) offers the establishment of two supportive organizations. The first one would be the Federal Insurance Guarantee Cooperation that would set risk premiums for FIDIs and FIIs. The second is the Corporate Financial Regulator. It would conduct the supervision of companies quoted in exchanges in terms of disclosure, corporate governance, and accounting practices.

In compliance with the recommendations of the blueprint published in 2008, the 2009-dated reform plan of the Department of Treasury suggested the establishment of a new single federal agency for investor protection. It would have the responsibility of making and enforcing rules on all depository and other financial institutions which previously were not subject to federal oversight. The agency would collect data related to company practices and consumer complaints to enhance transparency, simplicity, and access to financial services. The information provided would include probable benefits, costs, and risks associated with financial products. Standards would be developed to simplify the structure and pricing of the products. The organization would organize education programs to increase customer awareness about financial services and markets. The reform plan of 2009 includes the establishment of Financial Consumer Coordinating Council under the leadership of Financial Services Oversight Council. The council would be composed of the representatives form both federal and state consumer protection agencies. In fact, those aspects of that reform plan were legislated within the Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010.

The USA is not the sole country whose financial regulation structure contributed to the outbreak of the crisis. Sassoon's Tripartite Review (2009) put light onto the

existing shortcomings within the UK financial regulation structure. The existing

financial regulation structure of the UK is composed of HM treasury, Bank of England,

and the Financial Services Authority (FSA). Before and after the financial crisis those

instituions have failed to preserve the stability within the financial system and the

soundness of financial institutions. The regulatory system lacked sufficient crisis

handling mechanisms. Another problem was the rather focus of FSA on conduct of

business regulation. It failed to develop and apply necessary prudential instruments to

ensure the soundness of financial institutions. In addition, the crisis highlighted the

drawbacks in the coordination mechanisms among tripartite authorities. Sassoon (2009)

alleges that a transformation of the UK financial regulation structure towards a more

objective-based one would be more appropriate.

The Bank of England (BoE) should assume the responsibility of macro-

prudential regulator. It should extent its operations and instruments to manage systemic

risk. Unregulated financial activities and products should be included within regulatory

and supervisory activities of the BoE. The Bank should share its views on the systemic

risk with the public through periodical reports. The structure of the FSA should be

enhanced so that prudential regulation becomes its primary concern. Another alternative

is to replace the FSA with two separate organizations. One of those would be

responsible for prudential regulation and the other would carry out conduct of business

regulation. The coordination and information sharing between regulatory bodies need to

be improved through regular meetings and joint training programs among their staffs.

Sassoon's points of views about the FSA are also supported by the FSA (2009a) report.

FSA should focus on business models, strategies, risk, and outcomes rather than

institutions and processes. In addition, it should augment its competencies and techniques as a prudential supervisor of the financial sector.

Larosière (2009) specified the establishment of a European System of Financial Supervisors. The existing system is a rather decentralized network which hinders the region-based management of systemic risk. The proposed new structure is based on macro-prudential and micro-prudential regulation throughout the whole Euro zone. At the top of the proposed European macro-prudential regime would be the European Systemic Risk Council. This proposed council then evolved into the European Systemic Risk Board (ESRB). The chair of the board is the president of the European Central Bank (ECB). The Council would involve the chairpersons of the European Banking Authority (EBA), European Insurance Authority (EIA), and European Securities Authority (ESA). The main responsibility of the European Systemic Risk Council would be the gathering of all relevant information to make comprehensive macro-prudential analysis for the whole Euro zone. The organization would develop early warning systems in coordination with Economic and Financial Committee (EFC). It would determine and prioritize systemically important threats. It would inform the EFC in the case of any need for action. The EFC together with European Commission (EC) would implement the measure

The micro-prudential regulatory structure of European Region would be organized under the European System of Financial Supervision (ESFS). The structure includes functional supervisors called as European Banking Authority (EBA), European Insurance Authority (EIA), and European Securities Authority (ESA). Those authorities would work in coordination with their national counterparts. They would have binding powers to develop broad technical standards to be applied by national supervisors. Those

agencies would have the authority to oversee, mediate, and coordinate the activities of national supervisors. In addition, they would license instituions such as CRAs operating throughout the Euro zone. Those entities started their operations as separate agencies as of 2011.

After the 2007 Financial Crisis, another set of studies suggested some basic principles that should surround the financial regulation structure. The G30 (2009), GAO (2009), and Black and S. Jacobzone (2009) emphasize the importance of defining the goals of regulatory agencies clearly. The agencies should be given necessary independency and resources to implement their policies under an enhanced accountability regime. The regulatory system should reduce the complexity, overlaps, gaps, and arbitrage opportunities in regulation and supervision. The structures of the agencies should enable a flexible environment where the required changes can be adopted easily. The regulatory structure should be designed in a way so that coordination between various agencies at both domestic and international level is improved.
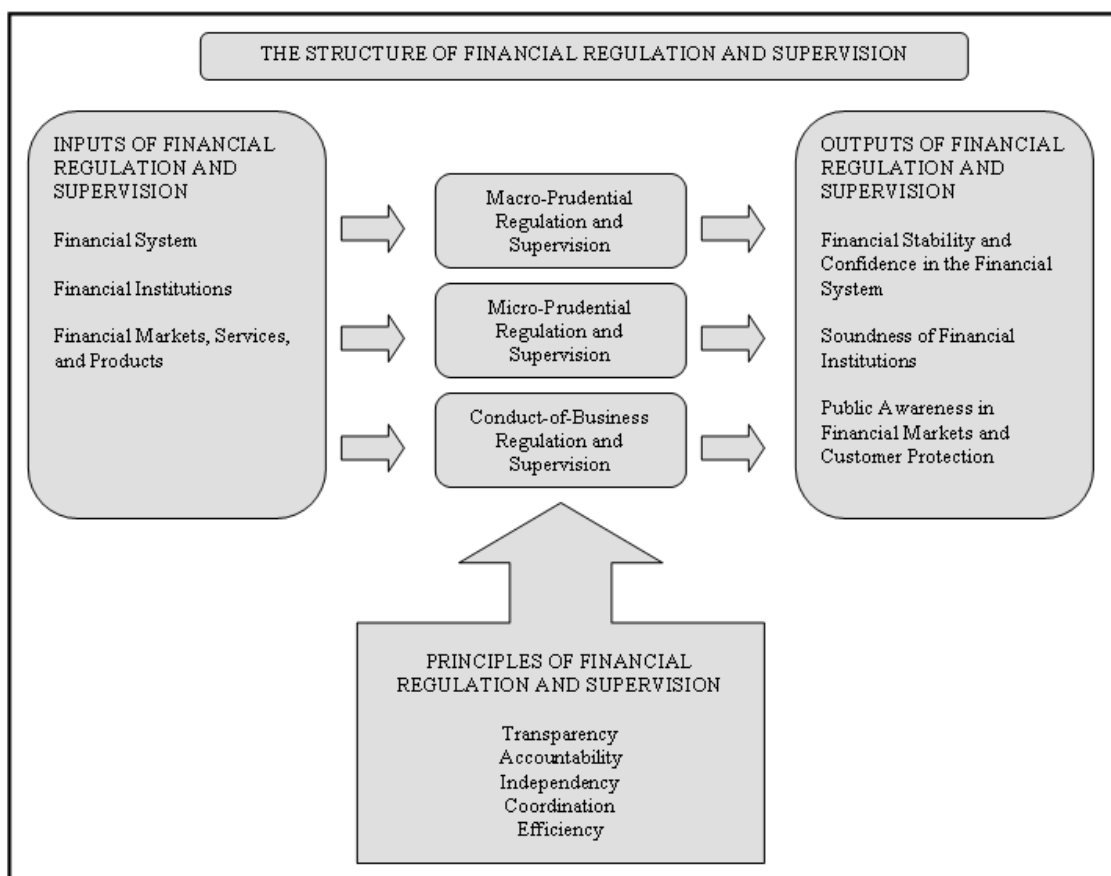
Figure 10: A Proposal for the structure of financial regulation and supervision after 2007 Financial Crisis

Depending on the evidence provided above, it can be concluded that there is a tendency towards more objective-based financial regulation structures. An exemplary depiction of this structure is introduced on Figure 9.

This structure assumes a clear and specific goal for each separate regulatory agency. The one which is responsible with the objective of systemic stability is thought to oversee the financial system as a whole, to make regular systemic analysis, stress tests, to develop early signal mechanisms for emergency situations, to determine systemically important institutions, to set and enforce standards for those institutions, and to behave a liquidity-provider-of-the-last-resort in crisis situation for all financial institutions regardless of their formal charter. Furthermore, it should handle the

resolution of systemically important institutions in the case of any bankruptcy which would adversely affect the whole financial system unless there is proper government intervention.

On the other hand, the regulatory agency which is going to be charged with the responsibility of prudential regulation of financial institutions should establish capital adequacy, liquidity, leverage, loan-to-value ratios, valuation and other prudential standards that are in abide with international criteria but in compliance with the realities of domestic financial systems as well. That regulatory body should make periodical on- and off-site reviews of financial institutions and make necessary recommendations in the case of any breach of determined standards. Furthermore, prudential regulatory bodies should be provided with enough resources and staff that would enable them to enforce the rules prescribed.

Finally, one regulatory body should assume the responsibility of conduct-of-business to increase the awareness of investors in financial markets and to protect especially the rights of unsophisticated investors. For this purpose, it should determine industry-wide practices and procedure that will reduce any possible conflict-of-interest, moral hazard, and adverse selection problems that will be brought about by the asymmetric information between investors and managers. Design of compensation schemes for managers that are in coincidence with the long run interests of investors, design of uncomplicated product prospectus which would enable the investors to easily understand probable risks associated with investing in those products are some crucial duties of conduct-of-business regulators. In addition, establishment of resolution regimes for financial institutions is also the duty of conduct-of-business regulators. However, in the case of systemically important institutions this duty should be conducted together

with the macro- and micro-prudential regulators. The conduct-of-business regulator should work in close coordination with self-regulatory-organizations such as industrial associations to determine sector-wide best practices and encourage the adoption of those best practices by other companies.

Besides having clearly-defined goals, the regulatory agencies should follow some broad principle. First of all, each regulatory body should establish transparency mechanisms such as publicizing regular reports regarding their activities. In addition, regulatory bodies should possess enough independency when conducting their operations. However, they should be politically held accountable because of their decisions and activities against political authority as well. They should regularly report to the political authority and/or the parliaments regarding the degree of efficiency and effectiveness of their regulatory and supervisory activities. Finally, close coordination and information sharing among regulatory agencies is also crucial for achieving the goals of financial regulation and supervision.

The following chapter builds upon this regulatory implication of 2007 Financial Crisis by providing empirical evidence on the effects of financial regulation structures on banking sector soundness.

CHAPTER 4: THE EFFECT OF FINANCIAL REGULATION STRUCTURES ON THE SOUNDNESS OF BANKING SECTOR: A CROSS-COUNTRY PERSPECTIVE

This part of the study investigates whether the financial regulation structure prevailing within a country has an effect on the before and after crisis soundness of the banking sector.

The financial regulation structures worldwide can be categorized under four basic models, namely the institutional, functional, integrated, and objective-based (twin-peaks) structures (Llewellyn, 2006). The US financial regulation structure, where financial institutions can select the regulatory regime and body to which they will be subject to and which is usually described as "regulatory competition" can be added to those four categories of financial regulation structures (G30, 2008).

The degree of efficiency and effectiveness of a financial regulation structure is a major ingredient for the overall quality of regulatory environment surrounding a financial system. The design of regulatory structure impacts the degree of success in achieving primary goals of regulation. Those goals are stability of financial system, soundness of financial institutions, protection of investors, and protection of financial fraud and crime. Seeing the impact of financial regulation on capital formation, efficient allocation of capital, and confidence in the operationing of the overall financial system, it is reasonable to conclude that the design of financial regulation structure does also influence economic performance of a country.

There is a relative consensus on the objectives of financial regulation. However, the design of an optimal financial regulation and supervision system has been a controversial issue. A unique model would not fit all financial systems given the national differences with historical background prevailing among each country's own financial system. Moreover, issues like the roles of central banks, independence of regulatory and supervision agencies from political interference, optimal number of agencies to achieve the objectives of financial regulation and supervision have also been debated throughout academic circles as well as among practitioners.

In fact, the underlying motive of this chapter arises from those debates. Given the lack of enough empirical research, this study aims to contribute to the literature by analyzing the impact of financial regulation structure on before and after crisis soundness of banking sectors from seven countries.

Data and Methodology of the Analysis

To explore the hypothesis that whether regulation structure has an impact on bank soundness and the nature of the relationship, data related to banks from seven countries with five types of financial regulation structures is gathered via BANKSCOPE database. The data set includes yearly financial information related to 513 banks from seven countries, namely the United Stated of America (USA), United Kingdom (UK), Germany (GER), France (FR), Italy (IT), the Netherlands (NL), and Australia (AUS). The sample covers the period from 2002 to 2009 and initially involves 185 commercial banks, 125 bank holding companies, 80 real estate and mortgage banks, 57 savings banks, 53 cooperative banks, and 13 investment banks.

The financial information of sample banks is extracted from financial statements for selected time periods. The statements covering the periods from 2004 to 2009 are prepared according to International Financial Reporting Standards (IFRS). For the years of 2004 and 2005, statements that are prepared according to local accounting standards are also available. On the other hand, for 2002 and 2003 the statements included within the database are submitted just according to local accounting principles for some banks. In order to make sure that there are no inconsistencies among the financial information provided, the statements related to the years 2004 and 2005 are compared. It is realized that there are no remarkable differences between the statements based on local and international standards in context of the variables considered within the analysis. Therefore, it is legitimate to conclude that the data used within the analysis does not include any deficiencies as respect with accounting principles employed.

First of all, fundamental ratios of sample banks related to performance stability, capital adequacy, liquidity, and asset quality are analyzed via ANOVA methodology. Afterwards, hypotheses related to the relationship between regulatory structures and the soundness of banking sector is tested through Logistic Regression methodology. In logistic regression models, banks` probability of having above average performance stability, capital adequacy, liquidity, and asset quality models are proxies for soundness. All of the analyses cover not only the period from 2002 to 2009, but also two sub-periods, namely periods from 2002 to 2006 and 2007 to 2009.

Assessing the Assumptions for the Logistic Regression Model and the Final Sample

Logistic regression analysis, unlike the multiple regression technique, does not require the strict assumption of multivariate normality to be satisfied for the variables. However, the detection of any multicollinearity between variables and elimination of possible effects of extreme values are required for logistic regression models as well.

Existence of any extreme values and multicollinearity is checked through stepwise multiple regression analyses. Average ROAA, Equity to Assets, Liquid Assets to Total Debt and Borrowing, and Loan Loss Provision to Net Interest Revenue ratios for periods from 2002 to 2009, 2002 to 2006, and 2007 to 2009 are selected as dependent variables. Influential observations are found based on case wise diagnostics and 27 banks are excluded from the analysis. In addition, to control for multicollinearity, some of the independent variables that are defined below are not included within logistic regression models constructed for each dependent variable based on the VIF, Tolerance, and Condition Index criteria.

Table 1: Distribution of Sample Banks by Area of Specialization and Country of Origin

	USA	UK	Germany	France	Italy	Netherlands	Australia	Total
BHC	108	6	0	0	1	6	0	121
Commercial	3	30	42	48	17	18	13	171
Cooperative	2	0	27	10	14	0	0	53
RE&Mortgage	12	32	23	3	0	1	5	76
Savings	0	0	45	4	7	0	0	56
Investment	0	3	0	0	3	0	3	9
Total	125	71	137	65	42	25	21	486

Table 2: Distribution of Sample Banks by Area of Specialization and Regulation Structure

	USA	Integrated	Functional	Twin-Peaks	Total
BHC	108	6	1	6	121
Commercial	3	72	65	31	171
Cooperative	2	27	24	0	53
RE&Mortgage	12	55	3	6	76
Savings	0	45	11	0	56
Investment	0	3	3	3	9
Total	125	208	107	46	486

After filtering for extreme values and multicollinearity, final sample consists of 486 banks from seven countries. Table 1 and Table 2 indicate the distribution of final sample depending on country of origin, area of specialization, and regulation structure.

The final sample consists of 121 Bank Holding Companies (BHCs), 171 Commercial Banks, 53 Cooperative Banks, 76 Real Estate and Mortgage Banks, 56 Savings Banks, and 9 Investment Banks. Main building blocks of the sample are BHCs and commercial banks. Nearly of BHCs are from USA. However, most of commercial banks originate from European countries and Australia. The low number of commercial banks from USA is a result of privileges provided to BHCs by American regulatory structure especially after 1999. The sample includes 53 cooperative banks and nearly all of them are from Germany, France, and Italy. There are 76 banks specialized in Real Estate and Mortgage funding in the sample; 12 from USA, 32 from UK, 23 from Germany, 3 from France, 1 and 5 from Netherlands and Australia. The Real Estate and Mortgage banks in UK and Australia are mostly building societies reflecting the commonwealth tradition. Of 56 savings banks, 45 are from Germany. Finally, due to data availability considerations there are just 9 investment banks within the final sample.

Table 2 displays the distribution of final sample by regulation structures. The bulk of the banks are under the regime of integrated regulation structure (208 banks).

The banks under the regularity competition and functional regimes are the followers. One tenth of the banks are governed under the twin-peak regime.

Variables, Model, and Hypotheses of the Analysis

The review of literature indicates that there is a lack of empirical studies on regulation structures. However, the relation between financial regulation, banking sector soundness, and macroeconomic development has been of remarkable concern. The variables of this study are selected by mainly referring to Demirgüç-Kunt and Detragiache (2010), IMF (2000), and Čihák and Podpiera (2006). The hypothesized impacts of financial regulation structures and other independent variables on banking sector soundness are configured accordingly.

Dependent Variables of the Analysis

Four proxies are used to measure the soundness of banks.

Z-Score: Those are calculated for the periods of 2002-2009, 2002-2006 and 2007-2009 via the formulas that

$$z-score_{2002-2009} = \frac{(Average\,ROAA_{2002-2009} + Average\,Equity\,/\,Assets_{2002-2009})}{STD(ROAA)_{2002-2009}}$$

$$z-score_{2002-2006} = \frac{(Average\,ROAA_{2002-2006} + Average\,Equity\,/\,Assets_{2002-2006})}{STD(ROAA)_{2002-2006}}$$

$$z - score_{2007-2009} = \frac{(Average\,ROAA_{2007-2009} + Average\,Equity\,/\,Assets_{2007-2009})}{STD(ROAA)_{2007-2009}}$$

Z-score is measure of the soundness and stability of a bank. It displays how much the income of bank can fluctuate until the income and equity deplete. High z-scores are the sign of more financially sound banks (Demirgüç-Kunt and Detragiache, 2010)

Equity to Assets: It is selected as a measure of capital adequacy. High amounts of this ratio indicate that banks allocate more capital to fund their operation implying more security in the case of any downturn in times of defaults on the loans side.

Liquid Assets to Total Debt and Borrowing: It is selected as the main measure of bank liquidity. High amounts of this ratio correspond to more sound banks.

Net Loan Loss Provisions to Net Interest Revenue: It is employed to measure asset quality. High amounts of this ration are the sign of deteriorated asset quality and bank soundness. An alternative measure for asset quality would be the direct write-offs of the banks. However, due to data availability conditions, loans loss provisions are employed within the analysis. Given the fact that, nearly all of financial statements are in compliance with IFRS, it is reasonable to use loan loss provision as a proxy of asset quality.

In order to conduct logistic regression analysis the average values of those variables are calculated for periods from 2002 to 2009, 2002 to 2006, and 2007 to 2009.

Afterwards, for each time period, the variables are converted into binary variables. The banks with above average value concerning a dependent variable are valued as 1 and 0, otherwise. Following variables are created in this manner.

Above Average Z-Score for 2002-2009, 2002-2006, and 2007-2009

Above Average Equity to Assets for 2002-2009, 2002-2006, and 2007-2009

Above Average Liquid Assets to Total Debt and Borrowing for 2002-2009, 2002-2006, and 2007-2009

Above Average Loan Loss Provisions to Net Interest Revenue for 2002-2009, 2002-2006, and 2007-2009

<u>Independent Variables of the Analysis</u>

<u>Bank – Specific Variables:</u>

Area of Specialization: It is dummy variable representing the main area of specialization of sample banks taking values from 1 to 6. 1: Bank Holding Company, 2: Commercial Banks, 3: Cooperative Banks, 4: Real Estate and Mortgage Banks, 5: Savings Banks, 6: Investment Banks. It is hypothesized that more traditional banks are safer than those engaging more innovative financial activities.

Return on Average Assets (ROAA): Net Income / Average Assets over the Accounting Period. ROAA is expected to be positively related to bank soundness.

Standard Deviation of ROAA: Standard Deviation of ROAA is calculated using the data covering the periods from 2002 to 2009, 2002 to 2006, 2007 to 2009. Standard deviation of ROAA is expected to be negatively related to soundness of the banks.

Net Interest Revenue to Total Assets: Ratio displaying the proportion of operating income generated through interest bearing assets. It is hypothesized to positively affect bank soundness.

Other Operating Income to Total Assets: Ratio displaying the proportion of operating income generated on the non-interest bearing assets. It is hypothesized to positively affect bank soundness.

Net Loans to Total Assets: It represents the second measure of bank liquidity. It can be suggested that there is an adverse relation between the proportion of assets tied up to the loans and the overall liquidity o a bank.

The Logarithm of Total Assets and Total Deposits: Those are variables selected to control for the effect of bank size. Size is hypothesized to be negatively related with bank soundness since as banks get larger they become more complex.

Country – Specific Variables:

Country-of-Origin: This variable is a dummy one representing the countries where the headquarters of sample banks are located and to whose legislation those banks are exposed to. There are seven countries in our analysis sample, namely 1: United States of America (USA), 2: United Kingdom (UK), 3: Germany, 4: France, 5: Italy, 6: Netherlands, and 7: Australia.

Financial Regulation Structure: It is dummy variable representing the financial regulation structure of each seven country. It takes values from 1 to 4. 1: USA Regulatory Competition Structure, 2: Integrated regulation structure including UK and Germany, 3: Functional Regulation Structure represented by France and Italy, 4: Twin-Peaks (Objective-Based) Financial Regulation Structure prevailing in Netherlands and Australia. It is expected that financial regulation structures have an impact on the soundness of banking sector. Twin-peak structures are supposed to dominate other ones.

The Real Growth Rate of GDP: The annual real growth rate of GDP between 2002 and 2009 are taken from World Bank's World Development Indicators (WDI) database for each of seven countries. Real growth is expected to positively impact banking sector soundness.

GDP per Capita: The annual PPP GDP per capita between 2002 and 2009 are taken from World Bank's World Development Indicators (WDI) database for each of the seven countries. It is hypothesized to positively affect banking sector soundness.

GDP Deflator: The annual percent change in GDP deflator to measure inflation between 2002 and 2009 are taken from World Bank's World Development Indicators (WDI) database for each 7 country. High and volatile rates of inflation are supposed to be negatively related to banking sector soundness.

Market Capitalization of Listed Companies to GDP: The annual market capitalization of listed companies in domestic exchanges as the percent of GDP. This variable is selected to measure the size of financial sector between 2002 and 2009. Related data is taken from World Bank's World Development Indicators (WDI) database for each country. As a measure of financial development, it is supposed that market capitalization to GDP affects banking sector soundness positively.

Total Stocks Traded to GDP: The annual amount of stocks traded as a proportion of GDP is determined as a second measure of financial market size between 2002 and 2009. Related data are taken from World Bank's World Development Indicators (WDI) database for each country. It is hypothesized to have a positive impact on banking sector soundness.

Economic Freedom Index: The economic freedom index is a composite measure developed by Heritage Foundation which indicates the macroeconomic climate of

country as respect with freedom of doing business, trade freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption, and labor freedom. The overall index is a weighted average of the grades given to the countries as respect with those sub-dimensions. The data related to seven sample countries are gathered from the website of the foundation. Economic freedom is expected to positively affect banking sector soundness.

Governance Index Variables: This group of variables is taken from the Governance Index of World Bank Working Group leaded by Kaufman, et.al (2008). The index includes country ratings as respect with some sub-dimensions namely; voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. For each six governance index data related to seven countries is taken from the related web site covering the years between 2002 and 2009. Better governance practices are positively related to banking sector soundness.

For each variable except financial regulation structure, area of specialization, and country of origin, averages are taken from 2002 to 2009, 2002 to 2006, and 2007 to 2009 in the same manner as Demirgüç-Kunt, et.al (2010). In this way, the panel data collected across banks is converted into a cross-sectional structure. Two logistic regression models are constructed for each dependent variable and for each time period based on the following formula and hypotheses. The first models include just the regulation structure as categorical variable while the second ones involve area of specialization and country of origin as well.

$$Logit\hat{}(Y_{it} = 1) = \ln\left[\frac{P_{it}}{1 - P_{it}}\right] = \beta_0 + \sum \beta_{jt} X_{jt}$$

$H_A = \beta_{jt} \neq 0$ [The average value of independent variable j has an impact on the banks`

probability of having above average dependent variable i for the time period t]

In this formula i refer to the binary dependent variables for each proxy of soundness

j stands for independent variable whose effects on the dependent variables are tested

t includes the time period from 2002 to 2009, 2002 to 2006, and 2007 to 2009.

SPSS program is utilized to run the analyses. The variables are added into the models via Forward Wald approach. The forward Wald process starts with the construction of a base model where all analysis variables are excluded from the model except the constant. Afterwards the stepwise process starts and each variable is added to or excluded from the model according to its contribution. The contribution of added variables is observed through the decrease in the -2LL value. The step at which the -2LL value reaches its lowest value is used for prediction purposes (Hair, et.al, 2005).

Table 3: Percentages of Correct Classification for Logistic Regression Models

Percentages of Correct Classification for Logistic Regression Models				
Name of Dependent Variable		2002-2009	2002-2006	2007-2009
Average Z-Scores	Model 1	79.2	73.2	81.6
	Model 2	80.1	74.5	85.3
Average Equity to Total Assets	Model 1	81.3	80.0	80.9
	Model 2	82.0	81.7	82.8
Average Liquid Assets to Total Debt and Borrowing	Model 1	87.3	85.4	87.2
	Model 2	87.3	87.5	88.9
Average Loan Loss Provisions to Net Interet Revenue	Model 1	75.2	83.6	74.5
	Model 2	77.3	83.2	75.1

Before going on with the results, it is worth referring to Table 3 to comment about the reliability and validity of the analysis. The table indicates that the models, on average, have correct classification percentages around 80% supporting the overall reliability and validity of the results.

Results of the Analysis

Analysis of the Stability

Comparison of Mean Z-Scores:

The stability of sample banks is measured by the averages of Z-Scores for the periods from 2002 to 2009, 2002 to 2006, and 2007 to 2009.

Table 4: Mean Z-Scores by Country-of-Origin

	Mean Z-Scores of Banks by Country-of-Origin		
	2002-2009	2002-2006	2007-2009
USA	32.63	86.95	56.57
UK	33.98	75.36	37.65
Germany	119.81	149.31	228.34
France	35.88	59.55	58.36
Italy	34.92	53.14	39.96
Netherlands	29.63	64.25	33.12
Australia	35.62	57.72	57.75

Table 4 indicates the mean of Z-scores calculated by country-of-origin. German banks appear to be the most stable ones since their average Z-scores are the highest. The mean Z-Scores of the banks from other countries decrease after the 2007 financial crisis, but that of German Banks goes up. The overall stabilities of Australian and French banks do not change significantly after the crisis. The stabilities of sample UK banks are the one that are mostly affected by the financial crisis. The average Z-score calculated from 2007 to 2009 is nearly half of the mean Z-Score for the before-crisis period. Average Z-

Score of Nederlandsche banks decreases by nearly 48% as compared to before-crisis period. For US and Italian banks, the average z-scores decline by nearly 34% and 24% after the crisis.

Table 5 and Table 6 include the ANOVA and t-test results conducted by taking country-of-origin as categorical variable. The ANOVA results suggest that there are significant differences among the average Z-Scores of banks for all time periods.

Table 5: ANOVA for Average Z-Scores by Country-of-Origin

ANOVA for Average Z-Scores by Country-of-Origin						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	714186.036	6	119031.006	4.939	.000
	Within Groups	11448577.382	475	24102.268		
	Total	12162763.418	481			
2002_2006	Between Groups	634600.126	6	105766.688	3.343	.003
	Within Groups	15026950.214	475	31635.685		
	Total	15661550.340	481			
2007_2009	Between Groups	2977282.722	6	496213.787	17.939	.000
	Within Groups	12890285.522	466	27661.557		
	Total	15867568.244	472			

Table 6: t-Test Comparisons of Z-Scores by Country-of-Origin

Z-Scores for (2002-2009) (2002-2006) (2007-2009)						
Country	USA	UK	Germany	France	Italy	Netherlands
UK	[-1.344] (0.795) [11.59] (0.348) [18.92] (0.054)					
Germany	[-87.17] (0.001) [-62.36] (0.030) [-171.8] (0.000)	[-85.83] (0.001) [-73.95] (0.010) [-190.7] (0.000)				
France	[-3.248] (0.577) [27.40] (0.026) [-1.786] (0.908)	[-1.904] (0.720) [15.81] (0.188) [-20.70] (0.129)	[83.93] (0.001) [89.76] (0.002) [169.9] (0.000)			
Italy	[-2.28] (0.670) [33.81] (0.002) [16.61] (0.127)	[-0.94] (0.845) [22.23] (0.034) [-2.307] (0.765)	[84.89] (0.001) [96.17] (0.001) [188.4] (0.000)	[0.963] (0.861) [6.412] (0.531) [18.40] (0.201)		
Netherlands	[3.002] (0.746) [22.69] (0.231) [23.49] (0.072)	[4.346] (0.628) [11.11] (0.551) [4.531] (0.664)	[90.18] (0.001) [85.06] (0.008) [195.2] (0.000)	[6.250] (0.861) [-4.70] (0.800) [25.24] (0.115)	[5.287] (0.561) [-11.1] (0.528) [6.838] (0.550)	
Australia	[-2.99] (0.664) [29.23] (0.016) [-1.18] (0.936)	[-1.64] (0.799) [17.64] (0.134) [-20.09] (0.117)	[84.19] (0.001) [91.59] (0.001) [170.6] (0.000)	[0.261] (0.970) [1.829] (0.874) [0.606] (0.972)	[-0.70] (0.915) [-4.58] (0.643) [-17.8] (0.188)	[-5.99] (0.551) [6.530] (0.722) [-24.6] (0.107)

In Table 6, each cell includes three rows. First numbers (numbers in brackets) in the first rows are mean differences between Z-scores of column countries and row countries

between 2002 and 2009. The second numbers (numbers in parentheses) are the associated p-values for differences. Accordingly, numbers in the second and third rows correspond to the mean differences and p-values for periods from 2002 to 2006 and from 2007 to 2009. For instance, the difference between the mean z-scores of US and UK banks between 2002 and 2009 is -1.344. This shows that US banks' mean z-score is less than that of UK banks for the period from 2002 to 2009. However, the difference is not significant at 5% level given the p-value of 0.795. For the sake of simplicity, the cells containing at least one significant difference between means for periods from 2002 to 2009, from 2002 to 2006, and from 2007 to 2009 are highlighted.

Germany originated banks seem to dominate all other banks from remaining six countries as respect with z-scores. German banks have average z-scores that are significantly higher from those of other countries for all three sub-periods. US banks have significantly higher z-scores than French, Italian, and Australian banks from 2002 to 2006 time period at 5% level. However, this difference turns out to be insignificant after the 2007 financial crisis. There are no other significant differences between the mean z-scores of banks as respect with country of origin.

Table 7 includes the mean z-scores of banks by financial regulation structure. Banks operating under integrated regulation structures appear to have the highest z-scores. The Germany and UK are categorized as integrated financial regulation structure. So, the relative low stability levels of UK banks are compensated by the relative high stability levels of German banks. This is why integrated regulation structure category of banks has the highest mean z-score for three periods selected for analysis. In addition, the relative low z-cores of Nederlandsche banks decreased the mean z-score of twin-peaks category for after-crisis period since the mean z-scores of Australian banks are

relatively stable for both before- and after-crisis period. Mean z-scores of banks that are

subject to functional regulation structures did not changed significantly after the crisis.

The mean-scores of US banks decreased more than those of banks operating under other

financial regulation structures.

Table 7: Mean Z-Scores by Financial Regulation Structures

	Mean Z-Scores of Banks by Financial Regulation Structure		
	2002-2009	2002-2006	2007-2009
USA	32.63	86.95	56.57
Integrated	89.94	123.57	159.27
Functional	35.50	57.03	51.07
Twin-Peaks	32.37	61.27	44.37

Table 8 displays the ANOVA results for the differences between z-cores of banks when

categorized on the basis of financial regulation structures. The differences among

sample banks' z-scores are significant for three sub-periods of time.

Table 8: ANOVA for Z-Scores by Financial Regulation Structures

ANOVA for Average Z-Scores by Financial Regulation Structure						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	372748.138	3	124249.379	5.037	.002
	Within Groups	11790015.279	478	24665.304		
	Total	12162763.418	481			
2002_2006	Between Groups	379942.750	3	126647.583	3.961	.008
	Within Groups	15281607.590	478	31969.890		
	Total	15661550.340	481			
2007_2009	Between Groups	1315258.058	3	438419.353	14.130	.000
	Within Groups	14552310.186	469	31028.380		
	Total	15867568.244	472			

Table 9: t-Test Comparisons of Z-Scores by Financial Regulation Structures

Z- Scores for (2002-2009) (2002-2006) (2007-2009)				
Regulation Structure	American	Integrated	Functional	Twin-Peaks
Integrated	[-57.30] (0.001) [-36.62] (0.070) [-102.7] (0.000)			
Functional	[-2.869] (0.563) [-29.92] (0.005) [-5.503] (0.646)	[54.43] (0.001) [66.54] (0.001) [108.2] (0.000)		
Twin-Peaks	[0.268] (0.967) [25.68] (0.051) [12.20] (0.291)	[57.57] (0.001) [62.30] (0.003) [114.9] (0.000)	[3.137] (0.595) [-4.237] (0.702) [6.702] (0.546)	

Results summarized on the Table 9 tell that banks operating under integrated regulation structures have significantly higher z-core as compared to banks from other regulation structures for period from 2002 to 2009, from 2002 to 2006 and from 2007 to 2009. One exception is the difference of integrated structure category from US regulation structure. The difference is not significant for before-crisis period at 5% level. Banks from functional regulation structures have significant higher mean z-scores as compared to US counterparts for before-crisis period. The differences between mean z-scores of banks that are subject to twin-peaks financial regulation structures and banks from US and functional regulation structures are insignificant for all periods.

Final comparison of mean z-scores of sample banks is made on area of specialization basis. The results are summarized in Tables 10, 11 and 12. Overall ANOVA results are significant. Saving banks appear to be the most stable bank type as compared to others. Mean z-scores for saving banks are significantly higher than those of other bank types at 5% level of significance for all time periods selected for the analysis. One exception is cooperative banks. The difference between mean z-scores of saving and cooperative banks is not significant for before-crisis period at 5% level. This

result reflects the relatively conservative nature of savings banks whose operations

mainly depend on regular deposit taking and relatively less risky investments.

Table 10: Mean Z-Scores by Area of Specialization

	Mean Z-Scores of Banks by Area of Specialization Basis		
	2002-2009	2002-2006	2007-2009
BHCs	25.43	79.33	47.69
Commercial	49.30	66.71	39.01
Cooperative	75.48	116.62	143.34
RE&Mortgage	57.05	101.12	112.47
Savings	141.80	182.49	319.42
Investment	15.70	26.87	19.29

Table 11: ANOVA for Z-Scores by Area of Specialization

ANOVA for Average Z-Scores by Area of Specialization						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	566623.038	5	113324.608	4.652	.000
	Within Groups	11596140.379	476	24361.639		
	Total	12162763.418	481			
2002_2006	Between Groups	661651.058	5	132330.212	4.199	.001
	Within Groups	14999899.282	476	31512.393		
	Total	15661550.340	481			
2007_2009	Between Groups	3796126.247	5	759225.249	29.372	.000
	Within Groups	12071441.997	467	25848.912		
	Total	15867568.244	472			

Cooperative banks are the second most stable banks before and after the 2007 financial

crisis. Although the difference between mean z-scores of cooperative banks and those of

remaining bank groups are not significant for before-crisis period, they are still positive.

Table 12: t-Test Comparisons of Z-Scores Based on Area of Specialization

Z-Scores for (2002-2009) (2002-2006) (2007-2009)					
Specialization	BHC	Commercial	Cooperative	RE&Mortgage	Savings
Commercial	[-23.87] (0.198) [12.61] (0.514) [8.686] (0.338)				
Cooperative	[-50.05] (0.000) [-37.30] (0.124) [-95.65] (0.001)	[-26.18] (0.243) [-49.91] (0.089) [-104.3] (0.000)			
RE&Mortgage	[-61.61] (0.000) [-21.79] (0.084) [-64.78] (0.003)	[-7.74] (0.684) [-34.41] (0.098) [-73.47] (0.000)	[18.43] (0.190) [15.50] (0.539) [30.87] (0.359)		
Savings	[-116.4] (0.000) [-103.2] (0.002) [-271.7] (0.000)	[-92.5] (0.001) [-115.8] (0.002) [-280.4] (0.000)	[-66.31] (0.010) [-65.87] (0.095) [-176.1] (0.000)	[-84.75] (0.000) [-81.37] (0.017) [-206.9] (0.000)	
Investment	[9.735] (0.048) [52.46] (0.000) [28.40] (0.008)	[33.61] (0.073) [39.85] (0.032) [19.71] (0.014)	[59.79] (0.000) [89.76] (0.000) [124.01] (0.000)	[41.35] (0.000) [74.25] (0.000) [93.18] (0.000)	[126.1] (0.000) [155.6] (0.000) [300.1] (0.000)

Banks that are mainly focused on providing real estate and mortgage loans have z-scores higher than those of commercial banks, BHCs, and investment banks for the period from 2007 to 2009. The differences between mean z-scores of commercial banks and bank BHCs within the sample are insignificant at 5% level for three time period groups. Finally, the investment banks turn to be the most unstable bank group. This is due to their more volatile income structures that depend on relatively innovative and more risky investment types.

Binary Logistic Regression Models for Predicting the Probability of Above Average Z-Scores:

Table 13 and Table 14 describe the results of two logistic regression models constructed to predict banks' probability of having above average z-scores during the periods from 2002 to 2009, from 2002 to 2006, and from 2007 to 2009. While the first model includes

just the regulation structure as categorical variable, the second one includes area of specialization and country of origin as well. Appendix C contains some of SPSS outputs related to the logistic regression analyses.

The variable of regulation structure does contribute to the first model for all time periods selected for the analysis. In this model, the banks that are subject to twin-peaks regulation structures are selected as the criterion group to which the banks from other regulation structures are compared. Although the regulation structure variable contributes to the model, the coefficients of first and second comparisons are not significant for three time periods. This means that there are no significant differences between twin-peaks, US, and integrated regulation structures regarding banks' probability of having above-average z-scores. The coefficients of the comparisons between twin-peaks and functional regulation structures are significant for before- and after-crisis periods. The sign of the coefficient is negative indicating that banks' probability of getting above average z-scores is lower under functional regulation structure as compared to twin-peaks regulation structure. As it would be expected, positive coefficients correspond to exponential beta figures that are above one. On the other hand, negative coefficients are represented by exponential beta coefficients between zero and one.

As respect with bank-specific variables, the average liquid assets to total debt and borrowing ratio seem to significantly contribute to the model for all selected time periods. The signs of the coefficients are negative indicating that the probability of having above average z-score is negatively related to the amount of liquidity. The coefficients of average other operating income to total assets ratio are significant and negative from 2002 to 2009, and from 2002 to 2006. As the banks generate more of their

revenues from instruments which are not interest-bearing, they become more unstable. The amount of average loan loss provisions to net interest revenue is negatively related to stability of banks for the periods from 2002 to 2009 and from 2007 to 2009. For the same time periods, logarithm of total deposits is another variable that significantly contributes to the model with a negative relationship.

Table 13: Results of Binary Logistic Regression Model for Above-Average Z-Scores – Model I

Results of Binary Logistic Regression Model for Above Average Z-Scores - Model 1							
	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
2002-2009	regulation structure			18.163	3	0.000	
	us regulation structure	0.179	0.547	0.107	1	0.744	1.196
	integrated regulation structure	-1.256	0.663	3.592	1	0.058	0.285
	functional regulation structure	-1.080	0.685	2.486	1	0.115	0.340
	av_oth_opt_inc_assets_2002_2009	-0.560	0.196	8.194	1	0.004	0.571
	av_liq_assets_tot_debt_2002_2009	-0.022	0.008	6.872	1	0.009	0.979
	av_lloss_prov_net_int_rev_2002_2009	-0.023	0.011	4.128	1	0.042	0.977
	log_deposits_2002_2009	-0.540	0.185	8.521	1	0.004	0.583
	total_stock_traded_gdp_2002_2009	-0.015	0.003	20.374	1	0.000	0.985
	Constant	4.173	1.084	14.835	1	0.000	64.929
2002-2006	regulation structure			17.294	3	0.001	
	us regulation structure	0.411	0.268	2.358	1	0.125	1.509
	integrated regulation structure	-0.723	0.377	3.683	1	0.055	0.485
	functional regulation structure	-1.094	0.521	4.419	1	0.036	0.335
	av_oth_opt_inc_assets_2002_2006	-0.252	0.121	4.367	1	0.037	0.777
	av_liq_assets_tot_debt_2002_2006	-0.017	0.007	6.454	1	0.011	0.983
	Constant	-0.361	0.250	2.092	1	0.148	0.697
2007-2009	regulation structure			15.639	3	0.001	
	us regulation structure	-0.932	0.640	2.122	1	0.145	0.394
	integrated regulation structure	-0.511	0.478	1.144	1	0.285	0.600
	functional regulation structure	-2.734	0.787	12.075	1	0.001	0.065
	av_liq_assets_tot_debt_2007_2009	-0.043	0.010	16.740	1	0.000	0.958
	av_lloss_prov_net_int_rev_2007_2009	-0.047	0.011	18.511	1	0.000	0.955
	log_deposits_2007_2009	-0.426	0.199	4.584	1	0.032	0.653
	pol_stability_no_violance_2007_2009	6.645	1.231	29.119	1	0.000	769.083
	Constant	-1.935	0.761	6.467	1	0.011	0.144

Concerning country-specific variables, total amount of stocks traded to GDP is negatively associated with the probability of having above average z-score for the whole time period from 2002 to 2009. In addition, political stability and absence of violence

index is found to be positively related to higher stability within banking sector for the crisis period.

Table 14 summarizes the results of the second model constructed to explain the probability of above average z-scores. This model includes the categorical variables of country of origin and area of specialization, as well. In this case, the effect of financial regulation structures disappears. Stability is found to be highly associated with the main areas of services provided by the banks. The country of origin turns does not enter into logistic regression variate implying the convergence of banking services and financial instruments across seven countries selected for the analysis. Although, the area-of-specialization variable is significant in general, the paired comparisons of sample banks with investment banks are insignificant.

Table 14: Results of Binary Logistic Regression Model for Above-Average Z-Scores – Model II

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
	area of specialization			28.579	5	0.000	
	bank holding companies	19.474	15098.000	0.000	1	0.999	286704593.937
	commercial banks	19.459	15098.000	0.000	1	0.999	282426144.285
	cooperative banks	20.600	15098.000	0.000	1	0.999	883839211.723
2002-2009	re&mortgage banks	19.938	15098.000	0.000	1	0.999	455852578.065
	saving banks	21.355	15098.000	0.000	1	0.999	1880829449.466
	av_oth_opt_inc_assets_2002_2009	-0.636	0.215	8.762	1	0.003	0.530
	log_assets_2002_2009	-0.676	0.164	16.941	1	0.000	0.509
	pol_stability_no_violance_2002_2009	1.916	0.689	7.725	1	0.005	6.795
	Constant	-19.311	15098.000	0.000	1	0.999	0.000
	area of specialization			42.492	5	0.000	
	bank holding companies	19.711	15814.225	0.000	1	0.999	363219044.061
	commercial banks	18.806	15814.225	0.000	1	0.999	147050078.257
	cooperative banks	20.547	15814.225	0.000	1	0.999	838489079.239
2002-2006	re&mortgage banks	19.913	15814.225	0.000	1	0.999	444869455.121
	saving banks	21.197	15814.225	0.000	1	0.999	1605913083.353
	log_assets_2002_2006	-0.296	0.127	5.451	1	0.020	0.744
	reg_quality_2002_2006	2.236	0.738	9.190	1	0.002	9.359
	Constant	-23.066	15814.225	0.000	1	0.999	0.000
	area of specialization			41.114	5	0.000	
	bank holding companies	18.362	14140.654	0.000	1	0.999	94293492.217
	commercial banks	18.380	14140.654	0.000	1	0.999	96057110.933
	cooperative banks	20.647	14140.654	0.000	1	0.999	926367516.399
	re&mortgage banks	19.699	14140.654	0.000	1	0.999	358950298.964
	saving banks	21.105	14140.654	0.000	1	0.999	1465411818.434
2007-2009	av_net_int_rev_assets_2007_2009	0.641	0.190	11.453	1	0.001	1.899
	av_net_loans_assets_2007_2009	0.020	0.010	4.225	1	0.040	1.020
	av_lloss_prov_net_int_rev_2007_2009	-0.057	0.013	20.428	1	0.000	0.945
	av_gdp_per_capita_2007_2009	0.000	0.000	7.359	1	0.007	1.000
	pol_stability_no_violance_2007_2009	4.819	0.823	34.264	1	0.000	123.884
	Constant	-29.171	14140.655	0.000	1	0.998	0.000

Average other operating income to assets is negatively related to the probability of above average stability as in the case of first model. Average net interest revenue to total assets and average net loans to total assets ratios are positively related to banks stability for the crisis period. On the other hand, higher average loan loss provisions as respect with net interest revenue corresponds to lower probability of above average stability. The logarithm of total assets is negatively related with probability of above average stability for the period form 2002 to 2009 and from 2002 to 2006.

As a country-specific variable, the political stability and absence of violence index is positively related to the banks' probability of having above average z-scores for

the periods from 2002 to 2009 and from 2007 to 2009. Regulatory quality index seems to be positively related to probability of high level stability during before-crisis period. GDP per capita enters the model for the crisis-period but its coefficient is almost zero.

Analysis of Capital Adequacy

Comparisons of Mean Equity to Total Assets Ratios:

Table 15: Mean Equity to Asset Ratios by Country-of-Origin

	Mean Equity / Assets of Banks by Country-of-Origin		
	2002-2009	2002-2006	2007-2009
USA	9.07	9.23	8.81
UK	7.50	7.72	7.12
Germany	5.66	5.62	5.72
France	6.25	6.11	6.47
Italy	9.02	9.01	9.04
Netherlands	5.73	5.73	5.73
Australia	7.08	7.45	6.45

Table 15 includes the mean equity to total assets ratios of sample banks for three time intervals by country of origin. Banks from US and Italy have the highest average equity to assets ratios which are around 9% between 2002 and 2009. German and Dutch banks appear to hold lowest levels of capital as compared to their total assets. For the same period, UK and Australian banks have average equity to total assets ratios of 7.50% and 7.08% respectively. Finally, the average equity to total assets ratio of French banks is 6.25%. The crisis did not change the capital ratios of sample banks significantly. One exception is the nearly 13% decrease in the mean equity to total assets ratios of Australian banks.

Table 16: ANOVA for Equity to Asset Ratios by Country-of-Origin

ANOVA for Average Equity / Assets by Country-of-Origin						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	1020.843	6	170.141	13.056	.000
	Within Groups	6242.078	479	13.031		
	Total	7262.921	485			
2002_2006	Between Groups	1140.518	6	190.086	13.215	.000
	Within Groups	6889.751	479	14.384		
	Total	8030.269	485			
2007_2009	Between Groups	863.288	6	143.881	9.933	.000
	Within Groups	6938.538	479	14.485		
	Total	7801.826	485			

Table 17: t-Test Comparisons of Equity to Asset Ratios by Country-of-Origin

Equity / Assets for (2002-2009) (2002-2006) (2007-2009)						
Country	USA	UK	Germany	France	Italy	Netherlands
UK	[1.574] (0.037) [1.508] (0.059) [1.688] (0.030)					
Germany	[3.411] (0.000) [3.607] (0.000) [3.086] (0.008)	[1.837] (0.014) [2.099] (0.009) [1.398] (0.068)				
France	[2.823] (0.000) [3.115] (0.000) [2.337] (0.000)	[1.249] (0.115) [1.608] (0.053) [0.649] (0.434)	[-0.59] (0.115) [-0.40] (0.275) [-0.75] (0.114)			
Italy	[0.048] (0.943) [0.216] (0.729) [-0.23] (0.787)	[-1.53] (0.103) [-1.29] (0.163) [-1.92] (0.079)	[-3.36] (0.000) [-3.39] (0.000) [-3.31] (0.000)	[-2.77] (0.000) [-2.90] (0.000) [-2.56] (0.006)		
Netherlands	[3.339] (0.000) [3.498] (0.000) [3.077] (0.000)	[1.765] (0.039) [1.990] (0.029) [1.389] (0.148)	[-0.07] (0.895) [-0.11] (0.849) [-0.01] (0.990)	[0.516] (0.402) [0.382] (0.544) [0.740] (0.325)	[3.291] (0.000) [3.282] (0.000) [3.308] (0.002)	
Australia	[1.993] (0.036) [1.779] (0.104) [2.352] (0.003)	[0.419] (0.705) [0.271] (0.830) [0.663] (0.505)	[-1.42] (0.123) [-1.83] (0.094) [-0.73] (0.317)	[-0.83] (0.381) [-1.34] (0.225) [0.015] (0.985)	[1.945] (0.073) [1.563] (0.185) [2.583] (0.017)	[-1.35] (0.180) [-1.72] (0.140) [-0.73] (0.436)

Overall ANOVA results are displayed in Table 16 and they are significant. On the other hand, Table 17 includes t-test results for cross-country differences. US banks have significantly higher mean equity to total assets ratios than their counterparts from other countries for three time periods. There are two exceptions. The differences between US and Italian banks are insignificant. In addition, the difference between mean equity to total asset ratios of US and Australian banks are insignificant for before-crisis period. The capital ratios of Italian and UK banks are significantly higher than those of German

and Nederlandsche banks. Another result to be emphasized is that except for US banks, there are no significant differences between mean capital ratios of Australian banks and banks from other countries.

Table 18: Mean Equity to Asset Ratios by Financial Regulation Structures

	Mean Equity / Assets of Banks by Financial Regulation Structure		
	2002-2009	2002-2006	2007-2009
USA	9.07	9.23	8.81
Integrated	6.29	6.34	6.20
Functional	7.34	7.25	7.48
Twin-Peaks	6.34	6.51	6.06

Table 18 shows the mean equity to total ratios of sample banks when categorized on the basis of regulation structures. Bank from US regulation structure have the highest equity to assets ratios. Banks operating under functional regulation structures have the second highest level of capital ratios. The mean equity to assets rations of banks from integrated and twin-peaks regulation structures are nearly the same and around 6%.

Table 19: ANOVA for Equity to Asset Ratios by Financial Regulation Structures

ANOVA for Average Equity / Assets by Financial Regulation Structure						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	645.852	3	215.284	15.682	.000
	Within Groups	6617.069	482	13.728		
	Total	7262.921	485			
2002_2006	Between Groups	686.053	3	228.684	15.009	.000
	Within Groups	7344.216	482	15.237		
	Total	8030.269	485			
2007_2009	Between Groups	597.682	3	199.227	13.329	.000
	Within Groups	7204.144	482	14.946		
	Total	7801.826	485			

Table 20: t-Test Comparisons of Equity to Asset Ratios by Financial Regulation Structures

Equity / Assets for (2002-2009) (2002-2006) (2007-2009)				
Regulation Structure	American	Integrated	Functional	Twin-Peaks
Integrated	[2.784] (0.000) [2.891] (0.000) [2.609] (0.000)			
Functional	[1.734] (0.000) [1.978] (0.000) [1.329] (0.008)	[-1.050] (0.023) [-0.913] (0.048) [-1.280] (0.013)		
Twin-Peaks	[2.725] (0.000) [2.713] (0.000) [2.746] (0.000)	[-0.060] (0.915) [-0.178] (0.779) [0.137] (0.801)	[0.991] (0.098) [0.736] (0.256) [1.417] (0.024)	

On the other hand Table 19 and Table 20 include the ANOVA and t-test results. The
ANOVA is significant. The difference between US banks and banks that are subject to
other regulation structures are significant at 5% level of significance for three selected
time periods. While the differences between banks from twin-peaks and integrated
structures are insignificant, banks from functional regulation structure have significantly
grater mean equity to assets ratios than their counterparts from twin-peaks and integrated
structures.

Table 21: Mean Equity to Asset Ratios by Area of Specialization

	Mean Equity / Assets of Banks by Area of Specialization		
	2002-2009	2002-2006	2007-2009
BHCs	8.97	9.09	8.78
Commercial	7.67	7.82	7.42
Cooperative	6.70	6.57	6.93
RE&Mortgage	4.89	5.01	4.69
Savings	5.79	5.63	6.06
Investment	7.72	7.28	8.45

Table 21 shows mean equity to total assets ratios by area of specialization. BHCs are the
ones for all time periods. Investment and commercial banks have mean ratios that are

7.72% and 7.67% respectively from 2002 to 2009. The mean ratio of investment banks

increases after the crisis, there is a slight decrease in the mean ratio of commercial

banks. Cooperative banks have mean equity to assets ratio of 6.70% between 2002 and

2009. While the mean ratio of saving banks is within 5-6% interval before and after the

crisis, banks that are concentrated on real estate and mortgage funding have the lowest

capital compared to assets which is 4.89% from 2002 to 2009.

Table 22: ANOVA for Equity to Asset Ratios by Area of Specialization

ANOVA for Average Equity / Assets by Area of Specialization						
		Sum of Squares	df	Mean Square	F	Sig.
	Between Groups	948.792	5	189.758	14.425	.000
2002_2009	Within Groups	6314.129	480	13.154		
	Total	7262.921	485			
	Between Groups	1017.250	5	203.450	13.925	.000
2002_2006	Within Groups	7013.019	480	14.610		
	Total	8030.269	485			
	Between Groups	875.932	5	175.186	12.141	.000
2007_2009	Within Groups	6925.894	480	14.429		
	Total	7801.826	485			

Table 23: t-Test Comparisons of Equity to Asset Ratios by Area of Specialization

Equity / Assets for (2002-2009) (2002-2006) (2007-2009)					
Specialization	BHC	Commercial	Cooperative	RE&Mortgage	Savings
Commercial	[1.302] (0.005) [1.266] (0.010) [1.362] (0.005)				
Cooperative	[2.270] (0.000) [2.523] (0.000) [1.850] (0.000)	[0.968] (0.085) [1.256] (0.031) [0.488] (0.396)			
RE&Mortgage	[4.081] (0.000) [4.079] (0.000) [4.085] (0.000)	[2.779] (0.000) [2.813] (0.000) [2.723] (0.000)	[1.811] (0.000) [1.557] (0.000) [2.235] (0.000)		
Savings	[3.180] (0.000) [3.458] (0.000) [2.719] (0.000)	[1.878] (0.000) [2.191] (0.000) [1.358] (0.002)	[0.910] (0.049) [0.935] (0.050) [0.869] (0.058)	[-0.90] (0.003) [-0.62] (0.057) [-1.36] (0.000)	
Investment	[1.251] (0.453) [1.805] (0.303) [0.331] (0.902)	[-0.05] (0.976) [0.538] (0.755) [-1.03] (0.703)	[-1.02] (0.545) [-0.72] (0.678) [-1.52] (0.577)	[-2.83] (0.111) [-2.28] (0.201) [-3.75] (0.185)	[-1.93] (0.257) [-1.65] (0.342) [-2.39] (0.383)

According to Table 22 the overall ANOVA indicates significant differences on area of specialization basis. Table 23 suggests that the differences between equity to assets ratios of investment banks and other bank types are insignificant. The BHCs have significantly highest ratios among all bank types during selected time periods. The differences between commercial and cooperative banks' equity to total asset ratios are not significant for the periods fro 2002 to 2009 and from 2007 to 2009. However, during before-crisis period, commercial banks operated with higher equity ratios relative to commercial banks. The ratio of commercial banks is significantly more than those of real estate and mortgage banks and savings banks. The difference between the ratios of cooperative banks and savings banks is significant between 2002 and 2009. Finally, real estate and mortgage banks appear to be ones that has operated with significantly lowest level of mean equity to assets ratios for three selected time periods.

Binary Logistic Regression Models for Predicting the Probability of Above Average Equity to Total Assets Ratio

Table 24 shows the results of the first logistic model constructed to predict banks' probability of having above-average equity to total assets ratios. Regulation structure significantly affects the probability of having above-average equity ratio. The twin-peaks regulation structure is determined as the criterion group towards which other regulation structures are compared. Between 2002 and 2009, it is more probable for banks that are subject to twin-peaks to have above-average equity to assets ratios than banks from other regulation structures. For before-crisis period, the coefficients are not significant. For crisis-period, the coefficients are significant and negative for US, and

integrated regulation structures meaning that during the crisis period it is more like to find banks with above-average equity ratios in twin-peaks regulation structures.

As respect with bank-specific variables, logarithm of assets is positively associated with lower equity to total assets levels for all time ranges. The average other operating income to total assets and average liquid assets to total debt and borrowing ratios are two other variables that are positively associated with above-average equity for the periods from 2002 to 2009 and from 2002 to 2006. The probability of holding above-average equity relative to total assets is positively associated with net interest revenue to total assets ratio before and after the crisis. The logarithm of deposit has significant positive coefficients for periods from 2002 to 2009 and from 2007 to 2009. Average net loans to total assets ratio is also positively related to the probability of above-average equity ratio between 2002 and 2009.

Table 24: Results of Binary Logistic Regression Model for Above Average Equity to Asset Ratios – Model I

Results of Binary Logistic Regression Model for Above Average Equity to Total Assets Ratio - Model 1							
	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
	regulation structure			87.040	3	0.000	
	us regulation structure	-3.421	0.386	78.683	1	0.000	0.033
	integrated regulation structure	-3.567	0.520	47.039	1	0.000	0.028
	functional regulation structure	-2.089	0.488	18.294	1	0.000	0.124
2002-2009	av_oth_opt_inc_assets_2002_2009	0.385	0.102	14.263	1	0.000	1.470
	av_liq_assets_tot_debt_2002_2009	0.042	0.011	13.659	1	0.000	1.043
	av_net_loans_assets_2002_2009	0.027	0.012	5.268	1	0.022	1.027
	log_assets_2002_2009	-2.686	0.535	25.178	1	0.000	0.068
	log_deposits_2002_2009	1.744	0.567	9.451	1	0.002	5.719
	rule_of_law_2002_2009	-3.033	0.597	25.818	1	0.000	0.048
	Constant	7.318	1.553	22.203	1	0.000	1507.551
	regulation structure			12.690	3	0.005	
	us regulation structure	0.441	1.514	0.085	1	0.771	1.555
	integrated regulation structure	0.450	1.693	0.071	1	0.790	1.568
	functional regulation structure	2.119	1.686	1.579	1	0.209	8.325
	av_net_int_rev_assets_2002_2006	0.074	0.047	2.556	1	0.110	1.077
2002-2006	av_oth_opt_inc_assets_2002_2006	0.447	0.108	17.123	1	0.000	1.563
	av_liq_assets_tot_debt_2002_2006	0.017	0.006	7.761	1	0.005	1.017
	log_assets_2002_2006	-1.097	0.156	49.715	1	0.000	0.334
	av_gdp_per_capita_2002_2006	0.000	0.000	4.678	1	0.031	1.000
	rule_of_law_2002_2006	-4.030	0.822	24.023	1	0.000	0.018
	Constant	0.848	3.907	0.047	1	0.828	2.336
	regulation structure			90.265	3	0.000	
	us regulation structure	-3.735	0.414	81.219	1	0.000	0.024
	integrated regulation structure	-2.083	0.410	25.772	1	0.000	0.124
	functional regulation structure	0.026	0.600	0.002	1	0.965	1.027
2007-2009	av_net_int_rev_assets_2007_2009	0.636	0.132	23.362	1	0.000	1.890
	av_lloss_prov_net_int_rev_2007_2009	-0.014	0.005	9.000	1	0.003	0.986
	log_assets_2007_2009	-1.883	0.525	12.892	1	0.000	0.152
	log_deposits_2007_2009	1.224	0.533	5.280	1	0.022	3.402
	av_growth_2007_2009	-0.956	0.218	19.160	1	0.000	0.384
	Constant	3.206	0.845	14.409	1	0.000	24.682

Regarding country-specific variables, rule of law index positively affects the probability of holding low levels of equity for the periods from 2002 to 2009 and from 2002 to 2006. The probability of holding above-average equity decreases together with the increases in the average rule of law index score. Average growth enters the regression variate for after-crisis period with a negative coefficient. GDP per capita variable turns to be significant for before-crisis period. However, its coefficient is nearly zero.

The results of the second model are summarized on Table 25. The effect of regulation structures disappear. Country of origin and area of specialization turn to be significant for all time periods.

The banks from Australia are the category that is selected for the purpose of inter-country comparisons. For all time periods, the coefficients of banks from the USA are significant and positive leading to the conclusion that the probabilities of holding above-average equity to total assets ratios is higher for US and Italian banks than they are for Australian banks.

Another significant component of the second model is the area-of-specialization. The probability of holding above-average equity as respect with total assets is lower for real estate and mortgage banks than it is for investment banks. The coefficient of remaining bank types are insignificant so the probability of having above average equity ratios are the same for investment banks and other bank types.

Table 25: Results of Binary Logistic Regression Model for Above Average Equity to Asset Ratios – Model II

	Results of Binary Logistic Regression Model for Above Average Equity to Total Assets Ratio - Model 2						
	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
2002-2009	country			52.296	6	0.000	
	usa	2.946	0.933	9.979	1	0.002	19.033
	uk	0.739	0.760	0.946	1	0.331	2.094
	germany	-0.549	0.719	0.583	1	0.445	0.577
	france	0.170	0.715	0.056	1	0.812	1.185
	italy	2.503	0.750	11.149	1	0.001	12.219
	netherlands	0.895	0.822	1.186	1	0.276	2.447
	area of specialization			25.130	5	0.000	
	bank holding companies	-0.502	1.229	0.167	1	0.683	0.606
	commercial banks	0.072	1.029	0.005	1	0.945	1.074
	cooperative banks	-0.080	1.075	0.005	1	0.941	0.924
	re&mortgage banks	-2.705	1.166	5.378	1	0.020	0.067
	saving banks	-0.914	1.107	0.682	1	0.409	0.401
	av_oth_opt_inc_assets_2002_2009	0.234	0.103	5.120	1	0.024	1.263
	log_assets_2002_2009	-1.125	0.160	49.554	1	0.000	0.325
	Constant	3.103	1.205	6.626	1	0.010	22.254
2002-2006	country			49.587	6	0.000	
	usa	2.402	0.875	7.545	1	0.006	11.048
	uk	0.526	0.695	0.573	1	0.449	1.692
	germany	-1.029	0.663	2.409	1	0.121	0.357
	france	-0.586	0.663	0.780	1	0.377	0.557
	italy	1.775	0.694	6.533	1	0.011	5.901
	netherlands	0.170	0.779	0.048	1	0.827	1.185
	area of specialization			24.109	5	0.000	
	bank holding companies	-0.322	1.171	0.076	1	0.783	0.724
	commercial banks	0.291	0.974	0.089	1	0.765	1.338
	cooperative banks	-0.129	1.029	0.016	1	0.901	0.879
	re&mortgage banks	-2.291	1.099	4.345	1	0.037	0.101
	saving banks	-0.736	1.065	0.477	1	0.490	0.479
	av_oth_opt_inc_assets_2002_2006	0.322	0.107	9.022	1	0.003	1.380
	log_assets_2002_2006	-1.080	0.157	47.127	1	0.000	0.340
	Constant	2.961	1.142	6.719	1	0.010	19.322
2007-2009	country			43.987	6	0.000	
	usa	2.287	0.868	6.941	1	0.008	9.844
	uk	-0.011	0.719	0.000	1	0.988	0.989
	germany	-1.245	0.688	3.276	1	0.070	0.288
	france	-0.241	0.681	0.126	1	0.723	0.786
	italy	1.477	0.703	4.409	1	0.036	4.379
	netherlands	1.117	0.783	2.037	1	0.154	3.057
	area of specialization			24.455	5	0.000	
	bank holding companies	-0.535	1.166	0.210	1	0.647	0.586
	commercial banks	-0.459	0.974	0.222	1	0.638	0.632
	cooperative banks	0.015	1.017	0.000	1	0.988	1.015
	re&mortgage banks	-2.651	1.084	5.978	1	0.014	0.071
	saving banks	-1.414	1.054	1.799	1	0.180	0.243
	av_net_int_rev_assets_2007_2009	0.562	0.138	16.584	1	0.000	1.754
	av_lloss_prov_net_int_rev_2007_2009	-0.015	0.005	10.882	1	0.001	0.985
	log_assets_2007_2009	-0.801	0.169	22.544	1	0.000	0.449
	Constant	2.321	1.233	3.539	1	0.060	10.181

Average net interest revenue to total assets ratio and the logarithm of total assets enter

the logistic regression variate in all selected time ranges. The coefficient of the former is

positive while the coefficient of the latter turns to be negative. Furthermore, average

loan loss provision to net interest revenue ratio is included in the model, as well. It

negatively affects the probability of holding above average equity relative to total assets.

<center>Analysis of Liquidity</center>

Comparisons of Mean Liquid Assets to Total Debt and Borrowing Ratios

The ratio of liquid assets to total debt and borrowing represents the liquidity conditions

of sample banks. The mean liquidity ratios of sample banks on country-of-origin basis

are displayed on Table 26.

Table 26: Mean Liquid Assets to Total Debt & Borrowing Ratios by Country-of-Origin

	Mean Liquid Asstes / Total Debt & Borrowing of Banks by Country-of-Origin		
	2002-2009	2002-2006	2007-2009
USA	10.73	11.46	9.52
UK	29.56	30.45	28.08
Germany	21.07	21.10	21.02
France	31.62	34.09	29.00
Italy	26.43	30.64	19.43
Netherlands	25.31	25.28	25.13
Australia	13.37	14.04	12.34

French and UK banks have carried highest liquidity between 2002 and 2009 with ratios

of 31.62% and 29.56%. The US and Australian banks have the lowest levels of liquidity.

Their mean ratios are 10.73% and 13.37% respectively. For the same period, Italian and

Dutch banks appear to carry nearly the same amount of liquidity, around 25-26%.

Average liquidity ratio of German banks is 21.07% between 2002 and 2009.

During the crisis period, mean liquidity of banks decreases for each country. The highest decrease is observed in liquidity conditions of Italian banks. Their mean ratios dropped by 36%. The mean liquidity ratio of UK banks decreased from 30.45% to 28%. The liquidity levels of German and Dutch banks remains relatively stable. The liquidity ratios of US and Australian banks have dropped as well after the crisis.

Table 27: ANOVA for Liquid Assets to Total Debt & Borrowing Ratios by Country-of-Origin

ANOVA for Average Liquid Assets / Total Debt & Borrowing by Country-of-Origin						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	28562.196	6	4760.366	12.845	.000
	Within Groups	177518.220	479	370.602		
	Total	206080.416	485			
2002_2006	Between Groups	33195.683	6	5532.614	11.831	.000
	Within Groups	223992.163	479	467.625		
	Total	257187.846	485			
2007_2009	Between Groups	25682.189	6	4280.365	12.747	.000
	Within Groups	160839.057	479	335.781		
	Total	186521.246	485			

There are significant differences among the mean liquidity ratios of sample banks as displayed on Table 27. Referring to Table 28, the mean liquidity ratios of US banks are significantly lower than those of banks from other in all time periods. One exception is Australian banks. The differences between US and Australian banks are insignificant. Liquidity levels of Australian banks have significantly lower than those of banks from other five countries.

Table 28: t-Test Comparisons of Liquid Assets to Total Debt & Borrowing Ratios by Country-of-Origin

Liquid Assets / Total Debt & Borrowing for (2002-2009) (2002-2006) (2007-2009)						
Country	USA	UK	Germany	France	Italy	Netherlands
UK	[-18.83] (0.000) [-18.99] (0.000) [-18.58] (0.000)					
Germany	[-10.33] (0.000) [-9.635] (0.000) [-11.51] (0.000)	[8.493] (0.015) [9.356] (0.015) [7.062] (0.032)				
France	[-20.9] (0.000) [-22.7] (0.000) [-19.5] (0.000)	[-2.06] (0.614) [-3.63] (0.448) [-0.92] (0.815)	[-10.6] (0.001) [-12.9] (0.001) [-7.98] (0.010)			
Italy	[-15.7] (0.000) [-19.2] (0.000) [-9.91] (0.001)	[3.129] (0.457) [-0.19] (0.969) [8.657] (0.025)	[-5.36] (0.107) [-9.54] (0.012) [1.594] (0.584)	[5.188] (0.192) [3.449] (0.466) [9.574] (0.010)		
Netherlands	[-14.6] (0.003) [-13.8] (0.006) [-15.6] (0.002)	[4.255] (0.425) [5.172] (0.353) [2.957] (0.581)	[-4.24] (0.364) [-4.18] (0.381) [-4.11] (0.392)	[6.314] (0.222) [8.807] (0.118) [3.875] (0.461)	[1.125] (0.830) [5.357] (0.332) [-5.70] (0.273)	
Australia	[-2.64] (0.283) [-2.58] (0.340) [-2.82] (0.278)	[16.19] (0.000) [16.41] (0.000) [15.75] (0.000)	[7.697] (0.004) [7.053] (0.016) [8.684] (0.002)	[18.25] (0.000) [20.04] (0.000) [16.66] (0.000)	[13.06] (0.000) [16.59] (0.000) [7.089] (0.038)	[11.93] (0.017) [11.24] (0.029) [12.79] (0.015)

German banks have carried significantly lower liquidity on average than their French and UK counterparts in all time periods. Italian banks seem to have significantly lower mean liquidity ratios than French banks for the crisis period. Remaining differences between mean liquidity levels of banks are insignificant.

Table 29 includes mean liquid assets to total debt and borrowing ratios by financial regulation structures. US banks seem to carry least level of liquidity on average. The banks from function regulation structures have highest mean liquidity ratios in all time periods. The banks which are subject to twin-peaks regulation structure have the second lowest level of mean liquidity ratios

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Table 29: Mean Liquid Assets to Total Debt & Borrowing Ratios by Financial Regulation Structures

	Mean Liquid Asstes / Total Debt & Borrowing of Banks by Financial Regulation Structure		
	2002-2009	2002-2006	2007-2009
USA	10.73	11.46	9.52
Integrated	23.97	24.29	23.43
Functional	29.59	32.73	25.24
Twin-Peaks	19.86	20.15	19.29

Table 30: ANOVA for Liquid Assets to Total Debt & Borrowing Ratios by Financial Regulation Structures

ANOVA for Average Liquid Assets / Total Debt & Borrowing by Financial Regulation Structure						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	22876.056	3	7625.352	20.062	.000
	Within Groups	183204.360	482	380.092		
	Total	206080.416	485			
2002_2006	Between Groups	27357.486	3	9119.162	19.125	.000
	Within Groups	229830.360	482	476.826		
	Total	257187.846	485			
2007_2009	Between Groups	19143.896	3	6381.299	18.376	.000
	Within Groups	167377.350	482	347.256		
	Total	186521.246	485			

Table 30 displays that the overall ANOVA of mean liquidity ratios by financial regulation structures is significant for all time periods.

According to Table 31, the differences between the mean liquidity levels of US banks and banks from other financial regulation structures are negative and significant for all time ranges. Banks from twin-peaks and integrated regulation structures have carried significantly less liquidity than their counterparts that are subject to functional regulation structures for the periods from 2002 to 2009 and from 2002 to 2006. The differences between the liquidity levels of banks that are subject to integrated, functional, and twin-peaks regulatory structures becomes insignificant after the 2007 financial crisis.

Table 31: t-Test Comparisons of Liquid Assets to Total Debt & Borrowing Ratios by Financial Regulation Structures

Liquid Assets / Total Debt & Borrowing for (2002-2009) (2002-2006) (2007-2009)				
Regulation Structure	American	Integrated	Functional	Twin-Peaks
Integrated	[-13.24] (0.000) [-12.82] (0.000) [-13.92] (0.000)			
Functional	[-18.85] (0.000) [-21.27] (0.000) [-15.73] (0.000)	[-5.617] (0.025) [-8.443] (0.004) [-1.812] (0.449)		
Twin-Peaks	[-9.127] (0.003) [-8.690] (0.006) [-9.772] (0.002)	[4.109] (0.181) [4.140] (0.193) [4.144] (0.183)	[9.726] (0.004) [12.58] (0.001) [5.955] (0.082)	

Table 32 includes mean liquid assets to total debt and borrowing ratios of banks on area of specialization basis. BHCs have the lowest level of liquidity during three selected time periods. On the other hand, commercial banks, with their average ratio of 33.67%, seem to have the highest liquidity level from 2002 to 2009.

Table 32: Mean Liquid Assets to Total Debt & Borrowing Ratios by Area of Specialization

	Mean Liquid Asstes / Total Debt & Borrowing of Banks by Area of Specialization		
	2002-2009	2002-2006	2007-2009
BHCs	9.67	9.94	9.22
Commercial	33.67	35.92	30.43
Cooperative	19.60	20.51	18.08
RE&Mortgage	17.17	17.93	15.92
Savings	16.54	16.37	16.82
Investment	23.38	22.54	24.77

On the other hand, saving banks seem to carry less liquidity than other bank types. Real estate and mortgage banks, cooperative banks, and investment banks follow saving banks in terms of liquidity. On important conclusion is that the mean liquidity levels of

banks decrease after the crisis except saving and investment banks. However, the

proportions of changes are not significant.

Table 33: ANOVA for Liquid Assets to Total Debt & Borrowing Ratios by Area of Specialization

ANOVA for Average Liquid Assets / Total Debt & Borrowing by Area of Specialization						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	45256.332	5	9051.266	27.015	.000
	Within Groups	160824.084	480	335.050		
	Total	206080.416	485			
2002_2006	Between Groups	53805.008	5	10761.002	25.397	.000
	Within Groups	203382.838	480	423.714		
	Total	257187.846	485			
2007_2009	Between Groups	34912.182	5	6982.436	22.107	.000
	Within Groups	151609.064	480	315.852		
	Total	186521.246	485			

Table 34: t-Test Comparisons of Liquid Assets to Total Debt & Borrowing by Area of Specialization

Liquid Assets / Total Debt & Borrowing for (2002-2009) (2002-2006) (2007-2009)					
Specialization	BHC	Commercial	Cooperative	RE&Mortgage	Savings
Commercial	[-23.99] (0.000) [-25.98] (0.000) [-21.22] (0.000)				
Cooperative	[-9.93] (0.000) [-10.57] (0.000) [-8.86] (0.000)	[14.07] (0.000) [15.41] (0.000) [12.36] (0.000)			
RE&Mortgage	[-7.50] (0.000) [-7.99] (0.000) [-6.70] (0.000)	[16.49] (0.000) [17.99] (0.000) [14.52] (0.000)	[2.425] (0.255) [2.582] (0.280) [2.157] (0.305)		
Savings	[-6.87] (0.000) [-6.43] (0.001) [-7.61] (0.000)	[17.12] (0.000) [19.55] (0.000) [13.61] (0.000)	[3.056] (0.150) [4.137] (0.069) [1.254] (0.565)	[0.631] (0.755) [1.556] (0.499) [-0.90] (0.638)	
Investment	[-13.71] (0.019) [-12.61] (0.080) [-15.56] (0.007)	[10.28] (0.067) [13.38] (0.071) [5.662] (0.257)	[-3.78] (0.460) [-2.03] (0.759) [-6.70] (0.178)	[-6.21] (0.234) [-4.62] (0.493) [-8.85] (0.081)	[-6.84] (0.193) [-6.17] (0.361) [-7.95] (0.113)

Table 33 reveal that ANOVA between mean liquidity ratios based on the area of

specialization category is significant for all time ranges. Table 34 suggests that BHCs

have significantly less mean liquidity levels than other banks types during all periods.

One exception is that the mean liquidity level of BHCs is not significantly different from

that of investment banks for before-crisis period. Commercial banks appear to hold

significantly highest liquidity levels as compared to other banks except investment banks. The differences between mean liquidity ratios of investment banks, cooperative banks, real estate banks, and saving banks are insignificant at 5% level for all time ranges selected for the analysis.

Binary Logistic Regression Models for Predicting the Probability of Above Average Liquid Assets to Total Debt and Borrowing Ratio

The results of the first model constructed to predict the probability of banks' having above-average liquidity ratios are summarized on Table 35. Financial regulation structures significantly contribute to the model for all time periods. From 2002 to 2009, the probability of holding above-average liquidity is higher for US banks than the banks from twin-peaks regulation structure. The coefficients are insignificant for integrated and functional regulation structures. All coefficients related to all financial regulations of are insignificant for before-crisis period. However, they turn to be statistically significant and positive after 2007 financial crisis. The probability of carrying above-average liquidity is lower for the banks from twin-peaks financial regulation structure than the banks as compared to banks from other financial regulation structures.

As respect with bank-specific variables, average net interest revenue to total assets and average net loans to total assets ratios are negatively related to the probability of holding above average liquidity for all time periods. As the net interest revenue to total assets and the loans to total assets increases the probability of holding above-average liquidity decreases. The probability of having above average liquidity is positively related to the size of total assets but negatively related to total deposits. For

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the period from 2002 to 2009, the average other operating income to total assets ratio is found to positively affect the probability of holding above average liquidity.

Table 35: Results of Binary Logistic Regression Model for Liquid Assets to Total Debt & Borrowing Ratios-Model I

	Results of Binary Logistic Regression Model for Above Average Liquid Assets to Total Debt and Borrowing Ratio - Model 1						
	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
2002-2009	regulation structure			28.349	3	0.000	
	us regulation structure	3.039	0.606	25.126	1	0.000	20.881
	integrated regulation structure	0.289	0.810	0.127	1	0.721	1.335
	functional regulation structure	0.310	0.723	0.184	1	0.668	1.363
	av_net_int_rev_assets_2002_2009	-0.341	0.126	7.349	1	0.007	0.711
	av_oth_opt_inc_assets_2002_2009	0.376	0.152	6.132	1	0.013	1.457
	av_net_loans_assets_2002_2009	-0.135	0.015	78.831	1	0.000	0.873
	log_assets_2002_2009	3.007	0.574	27.398	1	0.000	20.220
	log_deposits_2002_2009	-3.513	0.621	31.987	1	0.000	0.030
	gov_effectiveness_2002_2009	14.887	3.198	21.670	1	0.000	2920809.057
	rule_of_law_2002_2009	-17.224	3.630	22.512	1	0.000	0.000
	Constant	10.349	1.997	26.865	1	0.000	31216.315
2002-2006	regulation structure			15.468	3	0.001	
	us regulation structure	2.338	0.607	14.859	1	0.000	10.364
	integrated regulation structure	-0.030	0.775	0.002	1	0.969	0.970
	functional regulation structure	0.926	0.703	1.732	1	0.188	2.524
	av_net_int_rev_assets_2002_2006	-0.253	0.221	1.311	1	0.252	0.776
	av_net_loans_assets_2002_2006	-0.121	0.013	83.716	1	0.000	0.886
	log_assets_2002_2006	2.132	0.610	12.227	1	0.000	8.429
	log_deposits_2002_2006	-2.388	0.625	14.576	1	0.000	0.092
	gov_effectiveness_2002_2006	10.244	2.496	16.848	1	0.000	28106.865
	rule_of_law_2002_2006	-13.259	3.079	18.543	1	0.000	0.000
	Constant	9.579	2.021	22.463	1	0.000	14456.721
2007-2009	regulation structure			36.484	3	0.000	
	us regulation structure	3.489	0.729	22.899	1	0.000	32.763
	integrated regulation structure	5.776	0.962	36.080	1	0.000	322.399
	functional regulation structure	3.869	0.928	17.367	1	0.000	47.872
	av_net_int_rev_assets_2007_2009	-0.454	0.131	12.026	1	0.001	0.635
	av_net_loans_assets_2007_2009	-0.167	0.018	82.357	1	0.000	0.846
	log_assets_2007_2009	2.691	0.585	21.146	1	0.000	14.745
	log_deposits_2007_2009	-3.531	0.646	29.858	1	0.000	0.029
	total_stock_traded_gdp_2007_2009	0.012	0.003	18.687	1	0.000	1.012
	Constant	7.909	1.652	22.931	1	0.000	2722.347

The government effectiveness index is positively related to the probability of above-average liquidity from 2002 to 2009 and from 2002 to 2006. For the same periods, rule of law index is negatively related to liquidity. As the governments become more effective the probability of holding above average liquidity increases. However, as they

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become more respectful for rule of law, the probability of holding excess liquidity decreases. For the crisis period, total stock traded to GDP ratio contributes to the model but its coefficient is nearly zero.

Table 36 indicates the results of second logistic regression model for the probability of having above-average liquid assets to total debt and borrowing ratios. The country-of-origin has an impact on the dependent variable for before-crisis period. The probability of holding above-average liquidity is higher for US and UK banks than it is for Australian banks. The probability of having above-average liquidity ratio is mainly related to area of specialization. However, the coefficients of individual bank types are not significant at 5% level for periods from 2002 to 2009 and from 2002 to 2006. There are no significance differences between investment banks and other bank types in terms of holding above average liquidity. For crisis period, the probability of holding above-average liquidity is higher for investment banks as compared to bank holding companies, cooperative banks, and saving banks.

The average net loans to total assets ratio enters the model with negative coefficients for all time periods. Banks with fewer loans relative to their asset have higher probabilities of having above-average liquidity. For crisis period, the average other operating income to total assets ratio is negatively related to the dependent variable. As in the first model, the probability of having above average liquidity ratio is positively related to total assets and negatively related to total deposits during crisis period.

Table 36: Results of Binary Logistic Regression Model for Liquid Assets to Total Debt & Borrowing Ratios-Model II

Results of Binary Logistic Regression Model for Above Average Liquid Assets to Total Debt and Borrowing Ratio - Model 2							
	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
2002-2009	area of specialization			52.222	5	0.000	
	bank holding companies	-3.840	2.107	3.322	1	0.068	0.021
	commercial banks	0.595	2.018	0.087	1	0.768	1.812
	cooperative banks	-0.917	2.031	0.204	1	0.652	0.400
	re&mortgage banks	-0.203	2.048	0.010	1	0.921	0.816
	saving banks	-1.367	2.042	0.448	1	0.503	0.255
	av_net_int_rev_assets_2002_2009	-0.281	0.173	2.644	1	0.104	0.755
	av_net_loans_assets_2002_2009	-0.137	0.015	78.408	1	0.000	0.872
	pol_stability_no_violance_2002_2009	-4.397	1.028	18.293	1	0.000	0.012
	rule_of_law_2002_2009	-1.445	0.529	7.467	1	0.006	0.236
	Constant	14.220	2.520	31.836	1	0.000	1498456.737
2002-2006	country			40.297	6	0.000	
	usa	2.687	1.059	6.433	1	0.011	14.681
	uk	1.971	0.988	3.981	1	0.046	7.181
	germany	-0.343	0.969	0.126	1	0.723	0.709
	france	1.151	0.967	1.417	1	0.234	3.161
	italy	2.952	1.013	8.493	1	0.004	19.143
	netherlands	0.187	1.084	0.030	1	0.863	1.206
	area of specialization			35.096	5	0.000	
	bank holding companies	-3.847	2.375	2.623	1	0.105	0.021
	commercial banks	0.380	2.271	0.028	1	0.867	1.463
	cooperative banks	-0.804	2.300	0.122	1	0.727	0.448
	re&mortgage banks	-0.248	2.313	0.012	1	0.914	0.780
	saving banks	-1.061	2.317	0.210	1	0.647	0.346
	av_net_int_rev_assets_2002_2006	-0.321	0.221	2.104	1	0.147	0.725
	av_net_loans_assets_2002_2006	-0.134	0.016	74.702	1	0.000	0.874
	Constant	7.715	2.361	10.678	1	0.001	2241.699
2007-2009	area of specialization			14.388	5	0.013	
	bank holding companies	-3.985	1.642	5.889	1	0.015	0.019
	commercial banks	-1.901	1.534	1.535	1	0.215	0.149
	cooperative banks	-2.757	1.558	3.129	1	0.077	0.064
	re&mortgage banks	-2.706	1.566	2.984	1	0.084	0.067
	saving banks	-3.365	1.563	4.637	1	0.031	0.035
	av_oth_opt_inc_assets_2007_2009	-0.259	0.078	11.040	1	0.001	0.772
	av_net_loans_assets_2007_2009	-0.172	0.019	83.824	1	0.000	0.842
	log_assets_2007_2009	2.620	0.608	18.554	1	0.000	13.737
	log_deposits_2007_2009	-3.261	0.700	21.705	1	0.000	0.038
	total_stock_traded_gdp_2007_2009	-0.011	0.004	6.149	1	0.013	0.989
	voice_accountability_2007_2009	9.119	2.540	12.888	1	0.000	9130.926
	pol_stability_no_violance_2007_2009	-9.806	2.195	19.951	1	0.000	0.000
	Constant	11.452	2.952	15.050	1	0.000	94113.308

Political stability and rule of law indices appear to have negative relationship with probability of holding above-average liquidity. In other words, operating within a country with high political stability and respect for rule of law decreases the need for banks to keep their assets in liquid instruments. On the other hand higher voice and

accountability increases the probability of above-average liquidity for the crisis period.

Total stocks traded to GDP ratio is negatively related to the probability of having above-average liquidity as respect with total debt and borrowing between 2007 and 2009.

<u>Analysis of Asset Quality</u>

<u>Comparisons of Mean Loan Loss Provisions to Net interest Revenue Ratios</u>

The proxy to measure the asset quality of sample banks is the ratio of loan loss provisions to net interest revenue. High levels of loan loss provisions are the indicators of low asset quality.

Table 37: Mean Loan Loss Provisions to Net Interest Revenue Ratios by Country-of-Origin

	Mean Laon Loss Prov. / Net Interest Rev. of Banks by Country-of-Origin		
	2002-2009	2002-2006	2007-2009
USA	16.47	6.35	33.06
UK	13.34	5.71	25.46
Germany	21.47	21.92	21.67
France	12.75	9.37	18.35
Italy	18.56	14.38	25.52
Netherlands	12.81	6.92	21.02
Australia	10.41	4.83	19.43

Table 37 includes the mean loan loss provisions to net interest revenue ratios of sample banks on country-of-origin basis. From 2002 to 2009, Australian banks have the lowest level of average loan loss to net interest revenue ratios that is 10.41%. The amount is around 4% for before-crisis period. German banks seem to have the highest average ratio from 2002 to 2009 periods that is 21.42%. The banks from Italy and the USA

follow the German banks. Average loan loss provisions to interest revenue ratios of UK, Netherlands, and France originated banks are nearly the same and around 13% between 2002 and 2009.

The asset qualities of sample banks deteriorate during the crisis period. The most remarkable change is observed in the case of USA-originated banks. The average loan loss provision to net interest revenue ratio of US banks boost to 33.06% from around 6%. This corresponds to an increase of 420%. The second biggest decrease in asset quality occurs for UK-originated banks. Average loan loss provision to net interest revenue ratio of UK banks increased 340% after the crisis. Australian, Dutch, French, Italian, and German banks follow the banks from these two countries in terms of deterioration in asset quality during crisis period.

Table 38: ANOVA for Loan Loss Provisions to Net Interest Revenue Ratios by Country-of-Origin

ANOVA for Average Loan Loss Prov. / Net Interest Rev. by Country-of-Origin						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	6154.172	6	1025.695	4.393	.000
	Within Groups	108814.982	466	233.509		
	Total	114969.154	472			
2002_2006	Between Groups	22229.072	6	3704.845	22.550	.000
	Within Groups	76562.619	466	164.297		
	Total	98791.691	472			
2007_2009	Between Groups	13276.025	6	2212.671	2.016	.062
	Within Groups	510369.541	465	1097.569		
	Total	523645.566	471			

ANOVA results of mean loan loss provision to net interest revenue ratios as respect with country-of-origin are shown on Table 38. ANOVA is significant for the periods from 2002 to 2009 and from 2002 to 2006. However, the analysis is insignificant for the crisis period at 5% level. This result implies that the crisis led the differences across the asset

sample banks from different countries to disappear. This conclusion highlights the effect

of the crisis and associated losses on the asset qualities of sample banks.

Table 39: t-Test Comparisons of Loss Provisions to Net Interest Revenue Ratios by Country-of-Origin

Loan Loss Prov. / Net Int. Rev. for (2002-2009) (2002-2006) (2007-2009)						
Country	USA	UK	Germany	France	Italy	Netherlands
UK	[3.125} (0.184) [0.639] (0.590) [7.600] (0.134)					
Germany	[-5.00} (0.021) [-15.6] (0.000) [11.38] (0.017)	[-8.13} (0.001) [-16.2] (0.000) [3.789] (0.480)				
France	[3.717} (0.039) [-3.01] (0.016) [14.71] (0.000)	[0.592} (0.001) [-3.65] (0.000) [7.106] (0.103)	[8.719} (0.001) [12.54] (0.000) [3.317] (0.403)			
Italy	[-2.10} (0.398) [-8.02] (0.000) [7.545] (0.139)	[-5.22} (0.059) [-8.66] (0.000) [-0.054] (0.992)	[2.907} (0.259) [7.533] (0.000) [-3.44] (0.475)	[-5.81] (0.013) [-5.01] (0.001) [-7.16] (0.104)		
Netherlands	[3.657} (0.259) [-0.57] (0.797) [12.04] (0.095)	[0.532} (0.876) [-1.21] (0.595) [-4.44] (0.554)	[8.657} (0.011) [14.99] (0.000) [0.649] (0.929)	[-0.06] (0.984) [2.444] (0.290) [-2.67] (0.685)	[5.751] (0.105) [7.456] (0.003) [4.492] (0.549)	
Australia	[6.055} (0.008) [1.522] (0.175) [13.63] (0.009)	[2.931} (0.242) [0.883] (0.468) [6.030] (0.286)	[11.06} (0.000) [17.08] (0.000) [2.241] (0.676)	[2.338} (0.242) [4.536] (0.001) [-1.08] (0.804)	[8.149} (0.003) [9.546] (0.000) [6.085] (0.284)	[2.397] (0.471) [2.090] (0.352) [1.592] (0.831)

For the period from 2002 to 2009, Australian banks have significantly less average loan

loss provisions to net interest revenue ratios than US, German, and Italian banks. The

differences between Australian, French, and Dutch banks are insignificant for all time

ranges. German banks appear to have significantly the lowest level of asset quality

except the case of Italian banks. The mean asset quality of UK banks is higher than that

of German and French banks. French banks have the significantly less average loan loss

provisions to net interest revenue ratio than US, UK, German, and Italian banks.

Between 2002 and 2006, German banks seem to have the highest average loan

loss ratios as compared to banks from other countries. Australian and UK banks' mean

loan loss provision to net interest revenue ratios are significantly less than those of banks

from Germany, and France, and Italy. Dutch banks have significantly less mean ratio

than German and Italian banks. US banks have higher asset quality than German,

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French, and Italian banks. However, the average loan loss to net interest revenue ratios of US banks turns to be significantly higher than the banks from France, Australia, and Germany after the crisis. Except the differences of US banks from German, French, and Australian banks, all differences turn to be insignificant for the crisis period.

Table 40: Mean Loss Provisions to Net Interest Revenue Ratios by Financial Regulation Structures

	Mean Laon Loss Prov. / Net Interest Rev. of Banks by Financial Regulation Structure		
	2002-2009	2002-2006	2007-2009
USA	16.47	6.35	33.06
Integrated	18.91	18.81	22.87
Functional	15.07	11.37	21.22
Twin-Peaks	11.69	5.95	20.28

Table 40 is related to the mean loan loss provision to net interest revenue ratios of sample banks on financial regulation structure basis. The banks that are subject to Twin-Peaks regulation structure have the best asset quality for three time ranges. Banks from functional regulation structures seem to have the second lowest ratios from 2002 to 2009 and from 2007 to 2009. In terms of asset quality, the crisis seems to adversely affect the banks operating under US regulation structure more than banks from other regulation structure. The average loan loss provision to net interest revenue ratios of banks from integrated financial regulation structure are the most stable ones.

Table 41: ANOVA for Loss Provisions to Net Interest Revenue Ratios by Financial Regulation Structures

ANOVA for Average Loan Loss Prov. / Net Interest Rev. by Financial Regulation Structure						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	2388.609	3	796.203	3.317	.020
	Within Groups	112580.545	469	240.044		
	Total	114969.154	472			
2002_2006	Between Groups	10227.070	3	3409.023	18.053	.000
	Within Groups	88564.621	469	188.837		
	Total	98791.691	472			
2007_2009	Between Groups	11336.122	3	3778.707	3.452	.017
	Within Groups	512309.444	468	1094.678		
	Total	523645.566	471			

Table 42: t-Test Comparisons of Loan Loss Provisions to Net Interest Revenue Ratios by Financial Regulation Structures

Liquid Assets / Total Debt & Borrowing for (2002-2009) (2002-2006) (2007-2009)				
Regulation Structure	American	Integrated	Functional	Twin-Peaks
Integrated	[-13.24] (0.000) [-12.82] (0.000) [-13.92] (0.000)			
Functional	[-18.85] (0.000) [-21.27] (0.000) [-15.73] (0.000)	[-5.617] (0.025) [-8.443] (0.004) [-1.812] (0.449)		
Twin-Peaks	[-9.127] (0.003) [-8.690] (0.006) [-9.772] (0.002)	[4.109] (0.181) [4.140] (0.193) [4.144] (0.183)	[9.726] (0.004) [12.58] (0.001) [5.955] (0.082)	

ANOVA results are summarized on Table 41. There are significant differences between mean loan loss provisions to net interest revenue ratios of sample banks. Considering cross-country differences shown on Table 42, for the period from 2002 to 2009, banks from twin-peaks regulation structures have significantly higher level of asset quality than banks from US and integrated regulation structures. Banks operating under functional regulation structures dominate banks from integrated regulation structures in terms of asset quality. The differences with other regulatory structures are insignificant.

Between 2002 and 2006, banks from twin-peaks regulation structures have least level of loan loss provision ratio as compared to banks from other regulation structures.

Mean loan loss provision to net interest revenue ratio of US-originated banks is significantly lower that those of banks from integrated and functional regulation structures. However, during the crisis, the asset qualities of US-originated banks have deteriorated remarkably. For after-crisis period, mean asset quality of banks operating under US regulation structure is significantly lower than banks from other regulation structures. The differences among the mean loan loss provisions to net interest revenue ratios of banks from integrated, functional, and twin-peaks regulation structures become insignificant.

Table 43: Mean Loan Loss Provisions to Net Interest Revenue Ratios by Area of Specialization

	Mean Laon Loss Prov. / Net Interest Rev. of Banks by Area of Specialization		
	2002-2009	2002-2006	2007-2009
BHCs	18.76	7.93	36.56
Commercial	17.04	12.38	25.20
Cooperative	17.18	17.07	17.36
RE&Mortgage	8.72	5.56	13.75
Savings	22.01	22.55	21.11
Investment	15.00	8.62	25.65

The average loan loss provision to net interest revenues ratios of sample banks by area of specialization are displayed on Table 43. Saving banks seem the ones with highest loan loss provision to net interest revenue ratio between 2002 and 2009. But their mean ratio remained relatively stable as compared to other bank types given the relatively traditional nature of their operations. BHCs have the second lowest asset quality from 2002 to 2009. Mean loan loss provisions to net interest revenue ratios of commercial, cooperative and investment banks are close to each other and around 15 to 17%. Real

estate and mortgage banks turn to be the ones with highest asset quality from 2002 to 2009.

The financial crisis affected the asset qualities of BHCs more than those of other banks. From 2007 to 2009, the average loan losses relative to net interest revenues have increased to 36.56% level corresponding to a change of more than 360%. The average ratios of investment, real estate and mortgage, and commercial banks have boosted by 197%, 147%, and 103% respectively after the financial turmoil. The mean ratios of saving and cooperative banks remained nearly the same around 21% and 17% levels.

The ANOVA results are summarized on Table 44. The differences are significant. Table 45 implies that the BHCs have significantly higher asset quality than commercial and saving banks before the financial turmoil. After the crisis, their mean asset quality becomes significantly less than commercial, cooperative, real estate and mortgage, and savings banks. The differences between BHCs and investment banks are insignificant for three time periods. Commercial banks have significantly higher asset quality as compare to cooperative and savings banks between 2002 and 2006. After the financial turmoil, it is observed that their asset quality have significantly diminishes compared to cooperative and real estate and mortgage banks.

Table 44: ANOVA for Loan Loss Provisions to Net Interest Revenue Ratios by Area of Specialization

ANOVA for Average Loan Loss Prov. / Net Interest Rev. by Area of Specialization						
		Sum of Squares	df	Mean Square	F	Sig.
2002_2009	Between Groups	6915.882	5	1383.176	5.978	.000
	Within Groups	108053.272	467	231.377		
	Total	114969.154	472			
2002_2006	Between Groups	12782.171	5	2556.434	13.880	.000
	Within Groups	86009.520	467	184.175		
	Total	98791.691	472			
2007_2009	Between Groups	29328.906	5	5865.781	5.530	.000
	Within Groups	494316.660	466	1060.765		
	Total	523645.566	471			

Table 45: t-Test Comparisons of Loan Loss Provisions to Net Interest Revenue Ratios by Area of Specialization

Loan Loss Prov. / Net Int. Rev. for (2002-2009) (2002-2006) (2007-2009)					
Specialization	BHC	Commercial	Cooperative	RE&Mortgage	Savings
Commercial	[1.721] (0.410) [-4.45] (0.009) [11.36] (0.014)				
Cooperative	[1.577] (0.362) [-9.14] (0.000) [19.20] (0.000)	[-0.14] (0.936) [-4.69] (0.019) [7.841] (0.030)			
RE&Mortgage	[10.04] (0.000) [2.371] (0.115) [22.81] (0.000)	[8.318] (0.000) [6.822] (0.001) [11.45] (0.010)	[8.462] (0.000) [11.52] (0.000) [3.609] (0.228)		
Savings	[-3.26] (0.000) [-14.62] (0.000) [15.45] (0.000)	[-4.98] (0.000) [-10.17] (0.000) [4.09] (0.265)	[-4.84] (0.001) [-5.48] (0.002) [-3.75] (0.028)	[-13.30] (0.000) [-16.99] (0.000) [-7.36] (0.008)	
Investment	[3.757] (0.449) [-0.69] (0.824) [10.92] (0.203)	[2.036] (0.678) [3.761] (0.277) [-0.44] (0.957)	[2.179] (0.649) [8.454] (0.030) [-8.29] (0.301)	[-6.28] (0.225) [-3.06] (0.360) [-11.89] (0.167)	[7.015] (0.177) [13.93] (0.003) [-4.53] (0.558)

Cooperative banks' average loan loss provision to net interest revenue ratio is significantly higher than those of real estate and mortgage and investment banks before the financial crisis. However, their average ratio is less than that of savings banks for 2002-2009 and 2002-2006 periods. After the crisis, the difference between cooperative, real estate and mortgage, and investment banks disappear, but the difference between cooperative and saving banks remains negative and significant.

The asset quality of real estate and mortgage banks seems to be higher than that of savings banks for all of three time periods selected. Finally, the differences between the average loan loss provision to net interest revenue ratio of investment banks and those of other bank types are insignificant for all time periods with two exceptions. The asset quality of investment banks is significantly higher than that of cooperative and savings banks between 2002 and 2006.

The analysis of sample banks on area-of-specialization basis basically suggests that banks engaging in high-risky, innovative instruments have done well before the financial turmoil as compared to banks with relatively traditional investment. But the outbreak of the crisis resulted in remarkable amounts of loan losses and associated abasement in asset quality of those with high-risky, financially innovative investments.

Binary Logistic Regression Models for Predicting the Probability of Above Average Loan Loss Provisions to Net Interest Revenue Ratio

The results of the first logistic regression model constructed to predict the probability of allocating above-average loan loss provisions relative to net interest revenues are summarized on Table 46. Financial regulation structures have significant impact on the probability of having above-average asset quality from 2002 to 2009 and from 2006 to 2009. Between 2002 and 2009, the coefficients of integrated and functional regulation structures are significant and negative. It is more probable for banks from twin-peaks regulation structures to have above average asset quality than the banks from integrated and functional regulation structures. For before-crisis period, the coefficient of integrated regulation structures becomes insignificant. During the crisis period, the financial regulation structures do not impact the probability of having above-average asset quality.

Table 46: Results of Binary Logistic Regression Model for Loan Loss Provisions to Net Interest Revenue Ratios - Model I

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Results of Binary Logistic Regression Model for Above Average Loan Loss Provisions to Net Interest Revenue Ratio - Model 1						
	regulation structure			34.591	3	0.000	
	us regulation structure	0.087	0.380	0.052	1	0.820	1.091
	integrated regulation structure	-1.671	0.443	14.206	1	0.000	0.188
2002-2009	functional regulation structure	-1.134	0.549	4.274	1	0.039	0.322
	av_net_int_rev_assets_2002_2009	0.415	0.144	8.339	1	0.004	1.515
	av_oth_opt_inc_assets_2002_2009	0.218	0.103	4.449	1	0.035	1.243
	av_net_loans_assets_2002_2009	0.027	0.007	13.505	1	0.000	1.027
	log_deposits_2002_2009	1.114	0.153	52.843	1	0.000	3.046
	av_growth_2002_2009	-1.310	0.264	24.564	1	0.000	0.270
	Constant	-5.498	0.992	30.694	1	0.000	0.004
	regulation structure			22.804	3	0.000	
	us regulation structure	0.128	0.431	0.089	1	0.766	1.137
	integrated regulation structure	-0.822	0.457	3.242	1	0.072	0.440
2002-2006	functional regulation structure	-2.246	0.650	11.948	1	0.001	0.106
	av_net_loans_assets_2002_2006	0.016	0.006	6.373	1	0.012	1.016
	log_deposits_2002_2006	1.053	0.159	43.724	1	0.000	2.867
	mcap_of_listed_comp_gdp_2002_2006	-0.038	0.005	63.966	1	0.000	0.963
	Constant	-1.703	0.884	3.711	1	0.054	0.182
	av_net_int_rev_assets_2007_2009	0.408	0.133	9.394	1	0.002	1.504
	av_oth_opt_inc_assets_2007_2009	0.385	0.103	14.027	1	0.000	1.470
	av_net_loans_assets_2007_2009	0.021	0.007	8.880	1	0.003	1.021
2007-2009	log_deposits_2007_2009	0.749	0.139	29.095	1	0.000	2.115
	total_stock_traded_gdp_2007_2009	0.005	0.001	20.217	1	0.000	1.005
	av_equity_assets_2007_2009	-0.096	0.042	5.293	1	0.021	0.908
	Constant	-6.366	0.894	50.749	1	0.000	0.002

As respect with bank-based variables, average net loans to total assets ratio and logarithm of deposits have significant and positive coefficients for all selected time ranges. In other word to increases in amounts of deposits and loans decrease the probability of above-average asset quality. From 2002 to 2009 and from 2007 to 2009, average net interest revenue and average other operating income to total assets negatively affect the probability of above-average asset quality. Finally, average equity to asset is positively related to asset quality for the crisis period.

Average growth rate, market capitalization of listed companies to GDP, and total stocks traded to GDP ratios are negatively related to the probability of above-average

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loan loss provision to net interest revenue ratios for all time ranges. In other words, as

those variables increase the probability of higher asset quality increases as well.

Table 47: Results of Binary Logistic Regression Model for Loan Loss Provisions to Net Interest Revenue
Ratio – Model II

	Results of Binary Logistic Regression Model for Above Average Loan Loss Provisions to Net Interest Revenue Ratio - Model 2						
	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
	country			57.172	6	0.000	
	usa	2.137	1.005	4.521	1	0.033	8.478
	uk	3.698	0.927	15.918	1	0.000	40.379
	germany	4.532	0.893	25.750	1	0.000	92.958
	france	1.817	0.867	4.394	1	0.036	6.155
	italy	2.948	0.875	11.353	1	0.001	19.075
	netherlands	1.195	0.965	1.532	1	0.216	3.302
2002-2009	area of specialization			40.589	5	0.000	
	bank holding companies	0.132	1.246	0.011	1	0.916	1.141
	commercial banks	-0.714	1.102	0.421	1	0.517	0.489
	cooperative banks	-0.728	1.123	0.420	1	0.517	0.483
	re&mortgage banks	-2.782	1.185	5.513	1	0.019	0.062
	saving banks	0.295	1.157	0.065	1	0.799	1.343
	av_oth_opt_inc_assets_2002_2009	0.245	0.097	6.319	1	0.012	1.277
	av_net_loans_assets_2002_2009	0.044	0.008	33.259	1	0.000	1.045
	log_assets_2002_2009	0.977	0.146	44.656	1	0.000	2.657
	Constant	-9.447	1.599	34.926	1	0.000	0.000
	area of specialization			44.739	5	0.000	
	bank holding companies	0.917	1.404	0.427	1	0.514	2.502
	commercial banks	-0.272	1.208	0.051	1	0.822	0.762
	cooperative banks	0.286	1.237	0.053	1	0.818	1.330
	re&mortgage banks	-2.740	1.296	4.472	1	0.034	0.065
	saving banks	1.391	1.312	1.124	1	0.289	4.018
2002-2006	regulation structure			31.998	3	0.000	
	us regulation structure	1.288	0.839	2.355	1	0.125	3.626
	integrated regulation structure	3.270	0.695	22.163	1	0.000	26.305
	functional regulation structure	1.663	0.672	6.134	1	0.013	5.277
	av_net_loans_assets_2002_2006	0.023	0.007	10.845	1	0.001	1.024
	log_assets_2002_2006	0.997	0.163	37.365	1	0.000	2.711
	mcap_of_listed_comp_gdp_2002_2006	-0.032	0.006	30.988	1	0.000	0.969
	Constant	-4.984	1.610	9.584	1	0.002	0.007
	area of specialization			22.856	5	0.000	
	bank holding companies	0.370	1.077	0.118	1	0.731	1.447
	commercial banks	-0.168	0.961	0.031	1	0.861	0.845
	cooperative banks	-1.372	1.023	1.801	1	0.180	0.254
	re&mortgage banks	-1.874	1.039	3.254	1	0.071	0.153
	saving banks	-0.765	1.017	0.565	1	0.452	0.465
	regulation structure			13.170	3	0.004	
2007-2009	us regulation structure	-0.207	0.988	0.044	1	0.834	0.813
	integrated regulation structure	0.994	0.521	3.644	1	0.056	2.703
	functional regulation structure	-0.542	0.772	0.494	1	0.482	0.581
	av_oth_opt_inc_assets_2007_2009	0.377	0.111	11.565	1	0.001	1.457
	av_net_loans_assets_2007_2009	0.034	0.007	23.011	1	0.000	1.035
	log_deposits_2007_2009	0.692	0.150	21.225	1	0.000	1.998
	voice_accountability_2007_2009	-4.458	2.085	4.570	1	0.033	0.012
	av_equity_assets_2007_2009	-0.113	0.045	6.327	1	0.012	0.893
	Constant	0.596	3.285	0.033	1	0.856	1.814

Table 47 includes the results of the second logistic regression model to predict the probability of above-average asset quality. Country of origin affects asset quality between 2002 and 2009. Except the Netherlands, the coefficients of all countries are positive and significant. This means that the probability of having above-average asset quality is higher for Australian banks than the banks from other countries.

Area of specialization is another significant categorical variable for all time periods. However, just the coefficient of real estate and mortgage banks is significant and negative for before-crisis period. The probability of having above-average asset quality is higher for real estate and mortgage banks as compared to investment banks.

Unlike the models constructed for performance stability, capital adequacy, and liquidity, regulation structures impact the level of asset quality even after the country of origin and area of specialization are considered before and after the financial crisis.

For before-crisis period the coefficients of integrated and functional regulation structures are significant and positive. It is more likely for banks from twin-peaks regulation structures to have above-average asset quality than banks from integrated and functional regulation structures. However, for the crisis period, the coefficients of regulation structures become insignificant.

Average net loans to total assets ratio is negatively related to the probability of above-average asset quality for all time ranges. The probability of above-average asset quality is negatively related to total assets from 2002 to 2009 and from 2002 to 2006. The average other operating income to total assets ratio is negatively related to asset quality for the periods from 2002 to 2009 and from 2007 to 2009. Finally, logarithm of deposits is negatively and the average equity to total assets ratio is positively associated with asset quality for the crisis period.

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Regarding country-specific variables, the average market capitalization of listed companies to GDP ratio and the average voice and accountability index scores are positively related to the probability of above-average asset quality.

CHAPTER 5: CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH

2007 financial crisis triggered intensive debates concerning the appropriate regulation and supervision of financial markets. Motivated by those discussions, this study intends to discover two main issues. First of all, the study tries to find main regulatory issues that are discussed after the crisis. As a second issue, the study investigates the effect of financial regulation structures on the soundness of the banking sector.

Studies on the relationship between financial regulation and economic development have usually suggested that market-based financial regulation and rather liberal markets would produce the most efficient results in terms of economic development. However, challenging those propositions, the 2007 Financial Crisis has brought about significant regulatory concerns.

The third chapter of the study includes a qualitative analysis of reports and policy documents published by international and national authorities. Depending on this analysis, major regulatory issues discussed at global level are determined. Regulatory concerns highlighted by the 2007 Financial Crisis can be summarized under seven broad headings. The most important one is the need for macro-prudential regulation and ongoing supervision of systemic risk. In addition to macro-prudential regulation and supervision, micro-prudential and conduct-of-business regulation tools and practices should be enhanced. Third regulatory implication of 2007 Financial Crisis is related to the regulation of unregulated financial products and short selling. Furthermore, a new framework for the role of CRAs should be established to reduce the over-reliance on

credit rating provided by those agencies. All private pools of capital including hedge funds should be registered and subject to prudential and conduct of business regulation. Another regulatory implication of 2007 Financial Crisis is the need for increased international coordination and information sharing among the regulatory bodies from different countries. High level international coordination appears to be a requirement to control cross border activities of financial institutions and to mitigate the risks associated with global markets. Finally, the analysis suggests that there is an obvious trend in the world towards objective-based regulation structures. Under the new regulatory structure, three authorities would be responsible for three main objectives of financial regulation and supervision, namely sustaining systemic stability, ensuring soundness of individual financial institutions, and protecting the investors.

The fourth chapter is related to the regulatory implication of 2007 Financial Crisis that is mentioned above, namely the trend towards objective-based regulation structures. The chapter is an attempt to fill a significant gap existing in the course of financial regulation structures. The literature research displays that there is lack of empirical studies related to the interrelationship between financial regulation structures and financial system. A sample of 486 banks from seven countries is utilized to investigate the effect of financial regulation structures on banking sector soundness. The data covers the period from 2002 to 2009. The period is divided into two parts. While the period from 2002 to 2006 represents the before-crisis period, the period from 2007 to 2009 is the crisis period. Four major regulation structures are considered, namely integrated regulation structures of the UK and Germany, functional regulation structures of French and Italy, the twin-peaks regulation structures of Netherlands and Australia, and the regulation structure of the USA. In addition, together with country-of-origins

and areas of specialization of sample banks, some bank-specific and country specific variables are used for the analysis.

The soundness of sample banks is measured via four proxy variables. The first one is z-scores of sample banks which stand for the overall stability. The second one is equity to total assets ratio to measure capital adequacy. The third proxy is the liquid assets to total debt and borrowing ratio and it represents the liquidity levels of sample banks. Final proxy variable is the loan loss provisions to net interest revenue ratio that is used to measure asset qualities of sample banks.

For the periods from 2002 to 2009, from 2002 to 2006, and from 2007 to 2009, averages are taken for each variable used in the analysis except the categorical ones. ANOVA and Logistic regression models are constructed to investigate the effect of financial regulation structures on the soundness of banks. Two logistic regression models are constructed for each dependent variable. The first models include just the regulation structure to which the sample banks are subject to as categorical variable. The second logistic regression models include the country-of-origin and area of specialization, as well.

ANOVA of four proxy variables are made on the bases of country-of-origin, financial regulation structures, and area of specialization. Although there are significant differences among the mean z-scores, capital adequacy, liquidity, and asset quality levels of sample banks on country-of-origin and regulation structure bases, the most important categorical variable turned to be the area of specialization. Banks that engage in traditional financial activities, such as saving and real estate banks, are found to have highest level of stability, least levels of equity, liquidity levels, and asset quality. What is

important is that most of the differences among the sample banks become insignificant after the crisis indicating the global impact of the crisis.

The logistic regression analyses are conducted to predict the probability of banks to have above average soundness level. The regulation structures have significant impact on four variables selected to represent soundness in all time periods. The probability of having above-average stability is not significantly different between the banks from countries with twin-peaks regulation structure and the banks from other regulation structures. On the other hand, it is more likely for banks that are subject to twin-peaks regulation structures to produce highest level of asset quality with least equity and liquidity before the financial crisis. However, the effect of financial regulation structures disappears when the country-of-origin and area of specialization are included within the logistic regression models. One exception for this result is the analysis of asset qualities of sample banks. The probability of having above average asset quality is still related to financial regulation structures even after considering for country-of-origin and area of specialization.

As respect with bank-specific variables, total assets and total deposits are found to be inversely related to soundness. As financial institutions become more complex they become more unstable. On the other hand, as respect with country-specific variables, governance indices such as rule of law, voice and accountability, government effectiveness found to be positively related to banking sector soundness.

The main contribution of this study is twofold. It presents a composite picture of regulatory issues discussed at global level after the financial crisis. Secondly, the study is an attempt to fill the gap in the course of financial regulation structures. It is found out that financial regulation structures have an impact on the soundness of banking sector.

However, the evidence suggests that the governments should also consider the diversity of services provided by the financial sector and country-specific factors when designing regulation structures.

The study is also a contribution to new institutional theory of regulation highlighting the importance of institutional design on the regulatory effectiveness. After all, the study points out to the importance of political aspects of handling financial issues. Although there are significant efforts to develop universal standards of financial regulation, results show that there is still a long way to go for global regulation and supervision of financial markets and institutions. In fact, the results are in compliance with the view that unless a global leadership mechanisms is set up and the national states will delegate at least some part of their power in conducting monetary and fiscal policies to this mechanism, it seems plausible to be too optimistic as respect with exploiting the whole advantages and avoiding the threats of globalization process in the course of finance.

The study has some implications for further research. First of all, each of seven regulatory concerns highlighted in the third chapter is a matter of detailed studies. Further research should focus on enhancing the understanding of these regulatory issues. For instance, macro-prudential regulation and the factors that affect the performance of systemic risk surveillance can be the subject of extensive research. Furthermore, topics such as the individual soundness of banks, securitization, credit rating agencies, hedge funds, and mechanisms to augment international coordination in regulation can be handled in both qualitative and quantitative manner. Finally, the quantitative analysis provided within the fourth chapter is just an attempt to contribute to the literature on financial regulation structure. The sample, time range, and analysis methodology can be

changed to check the robustness of the results. New independent variables might be considered within the analysis. The concept of regulatory structure is a relatively new issue of debate among academicians and practitioners. It seems plausible to suggest that the subject has a vast range of untouched aspects from both theoretical and empirical perspectives.

APPENDICES

A. Summary of the Selected Papers on the Relationship between Regulations and Financial Markets

Authors	Date	Main Research Question	Results
La Porta, et al.	1997 1998	Legal determinants of external finance	Weakest investor protection and least developed capital markets in countries with French Civil Law tradition as compared to countries with German, Scandinavian, especially Common Law legal traditions More concentration of ownership in countries with less levels of investor protection
Demirguc-Kunt and Maksimovic	1998	The effect of legal and financial systems on the firms' ability to access external finance	External finance usage is positively related to: Efficiency in applying property rights Availability of stock markets Well-functioning institutions But not related to government subsidies
Barth, et al.	1998	The relationship between regulatory practices and the performance of banking sector in developing countries	Stricter restrictions on banking sector in countries with weak governmental and bureaucratic systems Mixed evidence related to the quality of those restrictions No evidence of lower probability of financial crisis in countries with restrictive banking regulations
Mailender	1998	Financial deregulation process and financial innovations international bond markets in 1990s	Increased need for international standards for international securitization, derivative markets due to the developments in financial innovation and for decreasing national barriers to benefit from the efficiencies provided by those international developments

Authors	Date	Main Research Question	Results
Demirguc-Kunt and Levine	1999	The advantages and disadvantages of bank-based and market-based financial systems	Larger, more active, and efficient banks, non-banks, and capital markets in richer countries. A tendency towards market-based financial systems is observed as the countries become richer Tendency of market-based financial systems in more liberal countries with common law tradition Tendency of bank-based financial systems in countries with more restrictive banking rules and French Civil Law tradition
Beck, Demirguc-Kunt, and Levine	2000	The development, structure, and performance of financial sectors	A new data set including statistical measures of size, activity, and efficiency of banking sector, non-bank financial institutions, equity, and bond markets
Deeg and Perez	2000	International capital mobility and the changes in corporate governance and corporate finance practices of Germany, France, Spain, and Italy	Convergence in terms of the elimination of restrictive barriers to global banking activities Availability of significant country-based differences across the corporate finance and governance practices
Malaguti	2000	Private and public-law instruments to reduce risks in international financial markets	Self-regulation by private parties and the opportunity of hedging via derivative instruments could achieve systemic stability in international financial markets International bodies together with national governments should employ the instruments of public law to reduce significant externalities whose risks for the whole system cannot be reduced by individual parties. Proposals by international bodies, arrangements, and best practices can guide the regulatory activities in international financial markets.

Authors	Date	Main Research Question	Results
Walter	2002	Relationship between financial and economic development	Developments in commercial banking, securities and investment banking, insurance, and asset management Three modes of development in financial intermediation: First mode: Investors deposits their savings via secondary financial claims to benefit from the risk diversification, safety, convenience, payment services, interest gains Second mode: Large investors can customize their own portfolios from a broad range of alternative standardized contracts and/or to prefer their portfolios to be managed by professionals for a fee through mutual or pension funds. Third Mode: Institutional investors can buy large amount of issued securities via investment banking, and all kinds of pools of capital such as hedge funds, private equity funds. The aim of the financial systems is to enhance static and dynamic efficiency. Static efficiency refers to the reduction in margins between the returns to savers and costs to borrowers, Dynamic efficiency refers to high degrees of product and process innovations in the financial system over time A balance should be constructed between financial innovation and stability given the fact that small changes in regulatory environment can create significant changes in overall functioning and structure of the financial services industry
La Porta, et al.	2002	Relationship between investor protection and corporate valuation	Firms in countries with better protection of minority shareholders and with higher cash-flow ownership of controlling shareholder are valued higher than their counterparts from countries with less protection of shareholders.

Authors	Date	Main Research Question	Results
Glaeser, et al.	2004	Relationship between institutional development and economic growth	Human capital is the main contributor of economic development rather than institutions Economic development in underdeveloped countries is achieved via good policies of dictators They develop their institutions afterwards Institutions are the result rather than a reason of economic development.
Das, et al.	2004	Relationship between regulatory governance and the stability of financial system	An overall financial system soundness index depending on the capital adequacy and non-performing loans ratios of banking sectors weighted by the ratio of bank credit to GDP A composite governance index depending on independence, accountability, transparency, and integrity of the financial regulation and supervision Regulatory governance has in general positive impact on the overall stability of a financial system
Beck, Demirguc-Kunt, and Levine	2005	The effect of a country's legal origin on the firms' ability to access financial resources	Firms in countries with French Civil Law traditions face more obstacles in reaching external resources than their counterparts from countries with common law tradition. Case law tradition is positively effect the capability of firms' to access external finance Judicial independence does not contribute to the explanation of firms' access to external finance
Demirguc-Kunt, Karacaovali, and Leaven	2005	Deposit insurance	A new database on the deposit insurance practices of a comprehensive set of countries

Authors	Date	Main Research Question	Results
Kerwer	2005a	CRAs and Global Governance Practices	International and national regulators should develop to develop standards for the valuation and forecasting processes followed by CRAs to mitigate accountability gap and over-dependency on credit ratings
Kerwer	2005b	Global Regulation Standards	Increasing trend in global regulation Increasing usage of best-practice rules and industry based standards instead of formal legal rules due to their easy adaptability to changing conditions Sovereign governmental bodies should be convinced to use their powers to enforce those standards The main issue is the accountability with the application of universally accepted best-practice standards
Serres, et.al	2006	The impact of financial regulations on the growth in OECD countries	Regulations on the financial system have significant effects on the productivity and output growth. Regulations influence the level of firm entries in the sector which use external resources more Significant differences are found across different OECD countries as respect with regulatory approaches employed for banking and securities industries Less significant in terms of competition restricting regulations The prevention of instability in financial markets is not legitimate reason for raising entry barriers in banking sector for countries with prudent financial sector behavior

Authors	Date	Main Research Question	Results
La Porta, et al.	2007	Economic consequences of legal origins	The concept of legal origins can explain systemically different practices in legal systems and regulations in different countries Convergence across various legal traditions due to financial globalization Market-oriented regulatory practices of common law become more widespread at times of relatively stable economic and financial activity, the state-oriented policies of civil law stick out at times of crisis and economic turmoil.
Marcelo, et al.	2008	Stress testing practices and supervision of systemic risk	Description of common definitions, stages and approaches of stress testing activities Some set of methodological guidelines in designing stress test to enhance the understanding of systemic stability
Pearson and Pearson	2008	Regulation of hedge funds to achieve global financial market stability and integrity	Hedge funds should be regulated on macro-prudential and micro-prudential basis to reduce the risks of manipulation, fraud, conflict of interest, and inadequate risk management practices and increase the transparency, international coordination, and investor protection
Demirguc-Kunt and Detragiache	2010	The relationship between the level of compliance with Basel Core Principles and banking sector stability	No obvious relation between the level of compliance and banking sector stability

Authors	Date	Main Research Question	Results
Figlewski	1984	Underlying reasons of setting margin requirements and the differences in the margin setting practices for stock-related contracts, futures, and options	Reasons to set Margin Requirements for Stock-Related Contracts: Limiting lending against stock collateral Ensuring the usage of resources in productive investments rather than for speculative purposes Protecting unsophisticated investors against their own excessive risk taking behaviors Reducing price volatility Empirical results suggest that only the regulations made for price stability purposes are of significance Market participants by themselves might limit their borrowing behavior for the purposes of avoiding speculative transactions and preventing the unwise risk taking Reason to set Margin requirements for Futures: Guaranteeing the performance of obligations by both parties at the date of maturity The cost of transaction created via margins for futures should not be higher than the benefit generated via decreased default risk so that the economic reason to enter future contract is not eliminated Reason to set Margin Requirements for Options: A combination of reasons to set margins for stock-related contracts and futures

Authors	Date	Main Research Question	Results
Fischel and Grossman	1984	Comparison of consumer protection regulations in futures and securities markets	Comparison in terms of disclosure requirements, broker registration and competency, the responsibility of brokers to inform the investors, insider trading, fee arrangements, trading of brokers for themselves and for their customers simultaneously, broker insolvency, civil penalties, private rights of actions, scope of regulations, and the availability of merit regulation It is investigated although there are areas where securities transactions are regulated more than the futures or vice versa, there are no significant differences in the degree of regulation for both markets. Just looking to the amount of regulations would not be sufficient to evaluate whether the aim of customer protection is fulfilled in financial markets The market by itself would be able to regulate the services providers since as long as the ones who could not offer services with high-quality at reasonable prices compared to their competitors would be eliminated Regulatory actions should focus on the elimination of negative externalities to the overall system, the enhancement of competition, and the reduction of the cost of gathering information which cannot be achieved by the market mechanisms.
Brunet and Shafe	2007	The developments in the course of energy derivatives regulation after the collapse of Enron	Changes in regulations related to organized exchanges and clearing mechanisms in OTC markets together with the changes in the structure of markets will reconstruct the confidence in energy derivatives markets The main participants of the energy markets are usually institutional investors including banks, deposit-taking institutions, insurance companies, and hedge funds

B. Summary of the Reports used for the Analysis

Organization	Name of the Report	Date	Main Regulatory Issues
BIS	Basel III: A global regulatory framework for more resilient banks and banking systems	2011	A Global Capital Adequacy Framework Leverage and Procyclicality Issues Global Liquidity Standards Determination of Risk Items Counterparty Risk Leverage Ratio
BIS	Basel III: International framework for liquidity risk measurement, standards and monitoring	2010	Standards for defining Liquid Assets Categorization of Assets in terms of Liquidity Liquidity Mismatch Issues Liquidity Coverage
BIS	Revisions to the Basel II market risk framework	2009	Revision to the Basel II Framework for measuring market risk Revision to the internal model approach for measuring market risk Revision to the supervisory review of market risk Changes to Disclosure Requirements for Market Risk Approach for Managing Liquidity

Organization	Name of the Report	Date	Main Regulatory Issues
Banque de France	Documents and Debates on Financial and Economic Crisis	2010	Main mechanisms underlying 2007 financial crisis Main Regulatory Implications of Financial Crisis Emphasis on the Globalization of Financial Activities Need for a global framework of financial regulation Need for more harmonized and coordinated regulation across different countries Simplification and standardization of financial instruments Revision to mark-to-market approach of accounting Enhanced disclosure Leverage Ratio and Liquidity Coverage Need for new required capital standards Emphasis on macro-prudential regulation, systemic risk, and counter-cyclicality
EU	The High-Level Group on Financial Supervision in the EU – Larosière Report	2009	The Regulatory Challenges of 2007 Financial Crisis Shortcomings of European Financial Regulation Structure before the Crisis Establishment of Functional Supervisors for Banking, Securities, and Insurance at EU level Establishment of Systemic Risk Board at EU level Emphasis on the Surveillance of Systemic Risk The Need for Enhanced Coordination for Cross Border Financial Activities

Organization	Name of the Report	Date	Main Regulatory Issues
EU	Financial Regulation in The European Union: Mapping EU Decision Making Structures on Financial Regulation and Supervision by Myriam Vander Stichele	2008	Description of European Regulatory and Supervisory bodies according to the Lamfalussy Process Interaction between Union Bodies and National Supervisors Emphasis on diminishing regulatory and supervisory differences among member states for a more integrated Europe
Coalition of Private Investment Companies (CPIC)	Hedge Funds: How They Serve Investors in US and Global Markets	2009	Depiction of the Hedge Funds Industry and the Risks associated with hedge funds Regulation should focus on activities not actors depending on their size and complexity Regulation should comprehend all systemically important institutions All parties of a financial products should be subject to supervision Enhanced transparency for the surveillance of systemic risk Greater transparency and reporting for hedge funds regarding their strategies, techniques used for the valuation of assets, risk exposures, audited financial statements Establishing proper risk management mechanisms Standards and increased accountability of hedge funds managers Advantages and disadvantages of short selling and the boundaries of short selling regulation

Organization	Name of the Report	Date	Main Regulatory Issues
Counter Risk Management Policy Group III (CRMPG III)	Containing Systemic Risk: The Road to Reform	2008	Proper corporate governance by financial institutions Calculation, management, and reporting of risks associated with various asset classes and counterparties Periodical estimation the probability of contagion and enhanced monitoring of the financial system as a whole Need for a global principle-based consolidation accounting that will be able to display inter-subsidiary or inter-affiliate exposures as well Need for a new framework for reporting off-balance sheet items Need for standards of sophistication for all market participants in high-risk complex financial instruments such as being authorized, having capability to understand risks and returns associated with products, to price and run stress tests on the products, having required governance, risk management, and internal control techniques, having enough sources to withstand potential sources All financial instruments should have a term sheet including a clear explanations of economics of instruments and rigorous scenario analyses displaying the behavior of instruments in extreme conditions Enhanced interaction between all related parties of the products Independency and accountability of risk management functions that will ensure proper monitoring of the risks and reporting the risk exposures and various scenario and stress test results to board of directors, supervisors Enhanced resiliency in credit markets via appropriate disclosure, valuation, collateral, and central clearing mechanisms

Organization	Name of the Report	Date	Main Regulatory Issues
FSA	The Turner Review: A Regulatory Response to the Global Banking Crisis	2009	The need for a systemic approach to regulate financial markets Measures that will increase the quantity and quality of capital in financial sector Mitigating procyclicality and using counter-cyclic capital buffers Establishment of leverage ratio to control excessive risk taking Considering liquidity risks at both institution and systemic level Regulations concerning CRAs Establishing CCPs for the clearing of OTC derivatives Regulation should focus on activity not the legal forms and/or geography of the financial institution
FSA	Reforming OTC Derivative Markets: A UK Perspective	2009	Shortcomings in the management of counterparty risk and lack of transparency in OTC derivative markets Greater standardization of OTC products without harming financial innovation Establishment of central clearing mechanisms (CCPs) for the listing and clearing of OTC derivatives to reduce counterparty risk Recording, collecting and disseminating the data related to OTC derivative transaction and products by those CCPs Enhancement of transparency Determination of global standards for CCPs Standards for the products that will be eligible for central clearing Capital charges for financial institutions should be in compliance with the risks they pose to the overall system

Organization	Name of the Report	Date	Main Regulatory Issues
G20	Enhancing Sound Regulation and Strengthening Transparency	2009	Emphasis on a System-Wide Approach and Counter-Cyclicality in Financial Regulation Regulation of Credit Rating Agencies Private Pools Of Capital Including Hedge Funds Compensation Schemes Risk Management Practices Enhancement Of Capital Adequacy Regimes Regulation Of OTC Derivatives Enhanced Transparency and International Coordination
G20	Reinforcing International Cooperation and Promoting Integrity in Financial Markets	2009	International coordination for developing global frameworks in different areas Emphasis on Early warning mechanisms, The importance of contingency plans and crisis management Determining cross-border supervisory arrangements Cross-border resolution regimes and bankruptcy laws Supervising Off- Shore Centers Money Laundering
G30	The Structure of Financial Regulation: Approaches and Challenges in a Global Marketplace	2008	Description of Institutional, Functional, Integrated, and Twin-Peaks Regulation Structures USA Regulation Structure is defined as an exception

Organization	Name of the Report	Date	Main Regulatory Issues
G30	Financial Reform: A Framework for Financial Stability	2009	18 Recommendations for a Reform to Enhance Stability in Financial Systems Need for a new prudential regulation framework including banks and non-banks financial institutions, especially systemically important ones The importance of consolidated supervision Increasing role of central banks as a systemic risk supervisor Including all kinds of systemically important institutions, private pools of capital, and funds under the regulatory framework for systemic stability purposes Need for a reform in the regulation of securities, OTC derivatives, credit default swaps, credit rating agencies, and compensation schemes to develop transparency and confidence in those markets Reform in fair value accounting techniques to prevent fire sales of assets and associated liquidity spillovers in times of economic downturns The trend towards objective-based regulation structures Need for more information sharing and coordination at national and international level

Organization	Name of the Report	Date	Main Regulatory Issues
IMF	Lessons of the Financial Crisis for Future Regulation of Financial Institutions and Markets and for Liquidity Management	2009	Excessive risk taking and overreliance on market forces prior to the crisis Emphasis on a systemic perspective in regulating and supervising financial markets Emphasis on reducing procyclicality Determining systemically important banks and non-bank financial institutions Interactions between regulated and non-regulated financial institutions Need for appropriate resolution regimes Need for enhanced information sharing and coordination at both national and international level Need for Enhanced disclosure of financial information related to all kinds of institutions and products Transparency in OTC derivatives markets Regulating leverage and liquidity Managing systemic liquidity
IMF BIS FSB	Guidance to Assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations	2009	Definition of Systemic Risk Size, Substitutability, and Interconnectedness as three major factors to determine systemic importance of a financial institution and markets Vulnerabilities such as leverage

Organization	Name of the Report	Date	Main Regulatory Issues
IMF	The Perimeter of Financial Regulation: IMF Staff Position Note	2009	A proposal for the objectives of financial regulation Emphasis on the surveillance of systemic risk and the empowerment of regulatory bodies to take and enforce corrective actions for systemic risk concerns Empowering regulators to oversee both regulated and unregulated parts of the financial system as well as the transfer of risks among those parts Development of early warning mechanisms to avoid difficulties in overall financial system New disclosure requirements to enhance market discipline Leverage and liquidity requirements Off-side and on-side supervision of compliance Standardization of securities and post-trade transparency in OTC derivatives markets
IOSCO	Objectives and Principles of Securities Regulation	2008	Principles Related to Securities Regulators, Self Regulation, Enforcement, Cooperation in Regulation, Issuers, Collective Investment Schemes, Market Intermediaries, Secondary Market
IOSCO	Code of Conduct Fundamentals for Credit Rating Agencies	2008	Quality and Integrity of the Rating Process Transparency Issues Conflict of Interest
IOSCO	Methodology for Assessing Implementation of the IOSCO Objectives and Principles of Securities Regulation	2008	Providing a scale to measure the degree of compliance of member states with the basic principles of securities regulation and supervision

Organization	Name of the Report	Date	Main Regulatory Issues
IOSCO	Report on Subprime Crisis	2008	The effect of securitization on the outbreak of the crisis Poor underwriting practices within subprime mortgage markets Lack of enough disclosure and due diligence practices as respect with structured financial products markets Lack of appropriate risk management and internal control mechanisms Issues related to fair value accounting and valuation techniques Liquidity concerns Problems associated with credit rating agencies such as overreliance on ratings, lack of transparency in publicizing the models and data used in rating process, possible conflict of interest problems due to the business models of CRAs
IOSCO	Unregulated Financial Markets and Products	2009	Issues Related to Securitization and Credit Default Swaps Incentive Structure and Emphasis on Long Term Interests of Investors Compensation Schemes and enhanced Risk Management Practices Retaining remarkable amount of interest within the issued products over their whole lives Transparency of Issuers, Brokers, and Sponsors Decreasing counterparty risk via centralized counterparty mechanisms (CCPs)
IOSCO	Hedge Fund Oversight	2009	Principles related to registration and authorization of hedge funds Organizational, operational and prudential standards Disclosure principles for both hedge funds and counterparties Conflict of Interest Issues Appropriate Risk Management Practices

Organization	Name of the Report	Date	Main Regulatory Issues
IOSCO	Regulation of Short Selling	2009	Four principles for the regulation of short selling Control of short selling for systemic risk concerns Appropriate disclosure of short selling transactions Monitoring the degree of compliance with the standards and enforcing appropriate measure in the case of any non-compliance Providing exemptions for certain products and transactions in order not to harm financial innovation and the price and market creation processes
OECD	Policy Framework For Effective And Efficient Financial Regulation: General Guidance and High-Level Checklist	2010	Transparency at all levels of financial regulation process Analysis of the existing structure of the financial systems and comparing with fundamental definition of a well-functioning financial system to discover the regulatory gaps to be filled Determining the objectives of financial regulation Accountability of regulators Providing regulators enough power and resources to enforce the regulations Determination of appropriate policy tools for fulfilling the regulatory objectives Basic features of effective and efficient regulation such as being precautionary, risk-based, comprehensive, consistent, and neutral against all interested parties. Regulation should provide sound incentives to interested parties The importance of international coordination Designing proper monitoring, control, and feedback systems

Organization	Name of the Report	Date	Main Regulatory Issues
Shadow Cabinet, UK	Tripartite Review: A Review of the UK's Tripartite System of Financial Regulation in relation to Financial Stability by James Sassoon	2009	Emphasis on Objective-Based Regulation Structure The micro-prudential regulator should provide required data to BoE for systemic risk oversight Tools that is similar to Spanish Dynamic provisioning model should be employed so as to reduce the pro-cyclic behavior of financial market participants Putting prudential regulation at the centre of the FSA Restructuring FSA by at the same time giving authority to the BoE to take measures in extraordinary circumstances Replacing FSA with two separate institutions, one would be responsible for prudential regulation and the other would be the conduct-of-business regulator Applying a combination of the recommendations asserted above Empowerment of regulatory bodies with enforcement power and necessary resources to pursue their responsibilities Taking the unregulated institutions and products under the umbrella of regulation Continuous attendance in international platforms to contribute global regulatory and supervisory frameworks

Organization	Name of the Report	Date	Main Regulatory Issues
SIFMA American Securitization Forum Australian Securitization Forum European Securitization Forum	Restoring Confidence in the Securitization Markets	2008	Problems associated with securitization markets contributed to the outbreak of the 2007 financial crisis Poor underwriting practices deteriorating the asset qualities Complex and highly leveraged positions Precarious behavior Undermining of possible liquidity problems due to the overreliance on ratings assigned to certain products Lack of a system-wide shared responsibility for integrity Self-feeding downward cycle existed in US subprime mortgage market Recommendations for restoring confidence in securitization markets Enhanced transparency of issuers, brokers and sponsors Issues related to CRAs such as transparency, the reliability of the rating process, and conflict of interest Better alignment of interests through proper compensation schemes between managers and investors Development of risk management, internal control, and valuation processes Arrangements concerning accounting techniques employed in valuation of assets

Organization	Name of the Report	Date	Main Regulatory Issues
The Department of the Treasury, USA	Blueprint for a Modernized Financial Regulation Structure	2008	Short-, Intermediate-, and Long-Term Recommendations for reforming US Financial Regulation Structure Short-Term Recommendations: More effective operation of PWG Establishment of a Mortgage Orientation Commission to evaluate, rate, and report on the adequacy of each state's system for licensing and regulation of participants in the mortgage origination process Extending the liquidity provider role of the FED to non-bank but systemically important institutions as well Intermediate-Term Recommendations: The abolishment of Thrift Charter given the decreased role of thrifts in mortgage orientation Including all state-chartered banks whether they are member of FED System or not under federal oversight by either FED or FDIC Enhancing the FED oversight of payment and settlement systems Establishment of a National Insurance Office under Treasury to regulate, supervise, set standards for national insurers The merger of CFTC and SEC to increase the effectiveness of securities and futures regulation and supervision Long-Term Recommendations Objective-Based Regulatory Approach as the optimal Regulatory Structure The FED as the market stability regulator A separate agency as the prudential regulator A separate entity as business conduct regulator

Organization	Name of the Report	Date	Main Regulatory Issues
The Department of the Treasury, USA	Financial Regulatory Reform A New Foundation: Rebuilding Financial Regulation and Supervision	2009	Establishment of Financial Services Oversight Council under the Treasury involving the members from major supervision agencies to advise the FED in determining systemically important FHCs Comprehending all systemically important and interconnected FHCs under federal consolidated regulation and supervision of the FED Filling the gaps and differences in the regulation of banking sector Enhancement of capital and prudential standards for all Banks and BHCs The compulsory registration of Hedge Funds and Liquidity issues related to Money Market Funds and the role Government Sponsored Enterprises Enhancement of Securities Regulation including OTC derivatives Enhanced Transparency Harmonization of Futures and Securities Regulation The creation of a New Consumer Protection Agency Supervision of CRAs Better compensation Schemes and Accounting Practices Increased International Coordination

Organization	Name of the Report	Date	Main Regulatory Issues
United States Government Accountability Office (GOA)	Financial Regulation: A Framework for Crafting and Assessing Proposals to Modernize the Outdated U.S. Financial Regulatory System	2009	Evaluation the effectiveness of existing regulatory and supervisory agencies in USA Recommendation for the improvement of US financial regulation structure Need for clearly defined goals of financial regulation Regulation should be adequately comprehensive so that all institutions and activities are regulated to ensure the goals of regulation Need for as systemic perspective Regulatory system should be flexible enough so that arrangements can be made depending on developments in the market place Regulatory system should ensure efficiency and effectives in regulation Regulatory system should ensure the protection of investors Regulatory agencies should be independent and accountable with enough authority to enforce the regulations and perform their responsibilities

C: Sample Outputs of Logistic Regression Analysis

Logistic Regression Model 1 Results for Average Z-Scores between 2002 and 2009

Case Processing Summary			
Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	467	95.9
	Missing Cases	20	4.1
	Total	487	100.0
Unselected Cases		0	.0
Total		487	100.0
a. If weight is in effect, see classification table for the total number of cases.			

Dependent Variable Encoding	
Original Value	Internal Value
0	0
1	1

Categorical Variables Codings			Parameter coding		
		Frequency	(1)	(2)	(3)
reg_str	1	121	.000	.000	.000
	2	196	1.000	.000	.000
	3	105	.000	1.000	.000
	4	45	.000	.000	1.000

Block 0: Beginning Block

Iteration History[a,b,c]			
		-2 Log	Coefficients
Iteration		likelihood	Constant
Step 0	1	522.289	-1.015
	2	521.341	-1.116
	3	521.341	-1.119
	4	521.341	-1.119
a. Constant is included in the model.			
b. Initial -2 Log Likelihood: 521.341			
c. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.			

Classification Table[a,b]					
			Predicted		
			aaz_scroe_2002_200 9		Percentage
	Observed		0	1	Correct
Step 0	aaz_scroe_2002_200 9	0	352	0	100.0
		1	115	0	.0
	Overall Percentage				75.4
a. Constant is included in the model.					
b. The cut value is .500					

Block 1: Method = Forward Stepwise (Wald)

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	47.784	3	.000
	Block	47.784	3	.000
	Model	47.784	3	.000
Step 2	Step	17.907	1	.000
	Block	65.691	4	.000
	Model	65.691	4	.000
Step 3	Step	22.391	1	.000
	Block	88.082	5	.000
	Model	88.082	5	.000
Step 4	Step	13.457	1	.000
	Block	101.539	6	.000
	Model	101.539	6	.000
Step 5	Step	5.138	1	.023
	Block	106.677	7	.000
	Model	106.677	7	.000
Step 6	Step	4.539	1	.033
	Block	111.216	8	.000
	Model	111.216	8	.000

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	473.557[a]	.097	.145
2	455.649[a]	.131	.195
3	433.259[b]	.172	.256
4	419.802[b]	.195	.291
5	414.664[b]	.204	.304
6	410.125[b]	.212	.315
a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001. b. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.			

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	.000	2	1.000
2	.419	5	.995
3	12.139	8	.145
4	8.518	8	.385
5	4.545	8	.805
6	4.891	8	.769

Classification Table[a]			Predicted		Percentage Correct
			aaz_scroe_2002_2009		
	Observed		0	1	Correct
Step 1	aaz_scroe_2002_2009	0	352	0	100.0
		1	115	0	.0
	Overall Percentage				75.4
Step 2	aaz_scroe_2002_2009	0	286	66	81.3
		1	48	67	58.3
	Overall Percentage				75.6
Step 3	aaz_scroe_2002_2009	0	310	42	88.1
		1	62	53	46.1
	Overall Percentage				77.7
Step 4	aaz_scroe_2002_2009	0	315	37	89.5
		1	63	52	45.2
	Overall Percentage				78.6
Step 5	aaz_scroe_2002_2009	0	319	33	90.6
		1	58	57	49.6
	Overall Percentage				80.5
Step 6	aaz_scroe_2002_2009	0	319	33	90.6
		1	64	51	44.3
	Overall Percentage				79.2

a. The cut value is .500

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	reg_str			43.811	3	.000			
	reg_str(1)	1.584	.312	25.802	1	.000	4.874	2.645	8.980
	reg_str(2)	.084	.398	.044	1	.834	1.087	.498	2.372
	reg_str(3)	.084	.518	.026	1	.872	1.087	.394	3.001
	Constant	-1.955	.276	50.243	1	.000	.142		
Step 2[b]	reg_str			35.672	3	.000			
	reg_str(1)	.130	.496	.069	1	.793	1.139	.431	3.011
	reg_str(2)	-1.714	.605	8.029	1	.005	.180	.055	.589
	reg_str(3)	-1.232	.618	3.980	1	.046	.292	.087	.979
	total_stock_traded_gdp _2002_2009	-.011	.003	15.775	1	.000	.989	.983	.994
	Constant	.640	.709	.815	1	.367	1.897		
Step 3[c]	reg_str			23.016	3	.000			
	reg_str(1)	-.162	.507	.103	1	.749	.850	.315	2.294
	reg_str(2)	-1.673	.616	7.378	1	.007	.188	.056	.628
	reg_str(3)	-1.369	.629	4.736	1	.030	.254	.074	.873
	av_oth_opt_inc_assets _2002_2009	-.675	.183	13.643	1	.000	.509	.356	.729
	total_stock_traded_gdp _2002_2009	-.013	.003	19.076	1	.000	.987	.982	.993
	Constant	1.645	.758	4.709	1	.030	5.179		

	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 4[d] reg_str			16.219	3	.001			
reg_str(1)	-.048	.521	.009	1	.926	.953	.343	2.647
reg_str(2)	-1.384	.631	4.803	1	.028	.251	.073	.864
reg_str(3)	-1.005	.651	2.387	1	.122	.366	.102	1.310
av_oth_opt_inc_assets_2002_2009	-.706	.187	14.319	1	.000	.494	.342	.712
log_deposits_2002_2009	-.599	.174	11.876	1	.001	.549	.391	.772
total_stock_traded_gdp_2002_2009	-.014	.003	20.401	1	.000	.986	.980	.992
Constant	3.770	1.025	13.535	1	.000	43.396		
Step 5[e] reg_str			15.350	3	.002			
reg_str(1)	.265	.542	.239	1	.625	1.303	.450	3.773
reg_str(2)	-1.016	.653	2.423	1	.120	.362	.101	1.301
reg_str(3)	-.792	.664	1.421	1	.233	.453	.123	1.666
av_oth_opt_inc_assets_2002_2009	-.650	.190	11.743	1	.001	.522	.360	.757
av_liq_assets_tot_debt_2002_2009	-.017	.008	4.708	1	.030	.983	.968	.998
log_deposits_2002_2009	-.618	.178	12.027	1	.001	.539	.380	.764
total_stock_traded_gdp_2002_2009	-.013	.003	17.872	1	.000	.987	.981	.993
Constant	3.763	1.035	13.217	1	.000	43.096		

	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 6[f] reg_str			18.163	3	.000			
reg_str(1)	.179	.547	.107	1	.744	1.196	.409	3.496
reg_str(2)	-1.256	.663	3.592	1	.058	.285	.078	1.044
reg_str(3)	-1.080	.685	2.486	1	.115	.340	.089	1.300
av_oth_opt_inc_assets_2002_2009	-.560	.196	8.194	1	.004	.571	.389	.838
av_liq_assets_tot_debt_2002_2009	-.022	.008	6.872	1	.009	.979	.963	.995
av_lloss_prov_net_int_rev_2002_2009	-.023	.011	4.128	1	.042	.977	.955	.999
log_deposits_2002_2009	-.540	.185	8.521	1	.004	.583	.406	.837
total_stock_traded_gdp_2002_2009	-.015	.003	20.374	1	.000	.985	.979	.992
Constant	4.173	1.084	14.835	1	.000	64.929		

a. Variable(s) entered on step 1: reg_str.
b. Variable(s) entered on step 2: total_stock_traded_gdp_2002_2009.
c. Variable(s) entered on step 3: av_oth_opt_inc_assets_2002_2009.
d. Variable(s) entered on step 4: log_deposits_2002_2009.
e. Variable(s) entered on step 5: av_liq_assets_tot_debt_2002_2009.
f. Variable(s) entered on step 6: av_lloss_prov_net_int_rev_2002_2009.

Logistic Regression Model 2 Results for Average Z-Scores between 2002 and 2009

Case Processing Summary			
Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	467	95.9
	Missing Cases	20	4.1
	Total	487	100.0
Unselected Cases		0	.0
Total		487	100.0
a. If weight is in effect, see classification table for the total number of cases.			

Dependent Variable Encoding	
Original Value	Internal Value
0	0
1	1

Categorical Variables Codings								
			Parameter coding					
		Frequency	(1)	(2)	(3)	(4)	(5)	(6)
country_2	1	121	1.000	.000	.000	.000	.000	.000
	2	63	.000	1.000	.000	.000	.000	.000
	3	133	.000	.000	1.000	.000	.000	.000
	4	63	.000	.000	.000	1.000	.000	.000
	5	42	.000	.000	.000	.000	1.000	.000
	6	24	.000	.000	.000	.000	.000	1.000
	7	21	.000	.000	.000	.000	.000	.000
specialization_2	1	120	1.000	.000	.000	.000	.000	
	2	161	.000	1.000	.000	.000	.000	
	3	51	.000	.000	1.000	.000	.000	
	4	73	.000	.000	.000	1.000	.000	
	5	56	.000	.000	.000	.000	1.000	
	6	6	.000	.000	.000	.000	.000	
reg_str	1	121	1.000	.000	.000			
	2	196	.000	1.000	.000			
	3	105	.000	.000	1.000			
	4	45	.000	.000	.000			

Block 0: Beginning Block

Classification Table[a,b]					
			Predicted		
			aaz_scroe_2002_2009		Percentage
	Observed		0	1	Correct
Step 0	aaz_scroe_2002_2009	0	352	0	100.0
		1	115	0	.0
	Overall Percentage				75.4
a. Constant is included in the model.					
b. The cut value is .500					

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.119	.107	108.480	1	.000	.327

Block 1: Method = Forward Stepwise (Wald)

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	74.150	5	.000
	Block	74.150	5	.000
	Model	74.150	5	.000
Step 2	Step	20.064	1	.000
	Block	94.214	6	.000
	Model	94.214	6	.000
Step 3	Step	8.982	1	.003
	Block	103.196	7	.000
	Model	103.196	7	.000
Step 4	Step	13.391	1	.000
	Block	116.587	8	.000
	Model	116.587	8	.000

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	447.191[a]	.147	.218
2	427.126[a]	.183	.272
3	418.144[a]	.198	.295
4	404.754[a]	.221	.329
a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.			

Classification Table[a]					
			Predicted		
			aaz_scroe_2002_2009		Percentage
	Observed		0	1	Correct
Step 1	aaz_scroe_2002_2009	0	332	20	94.3
		1	79	36	31.3
	Overall Percentage				78.8
Step 2	aaz_scroe_2002_2009	0	328	24	93.2
		1	76	39	33.9
	Overall Percentage				78.6
Step 3	aaz_scroe_2002_2009	0	330	22	93.8
		1	64	51	44.3
	Overall Percentage				81.6
Step 4	aaz_scroe_2002_2009	0	326	26	92.6
		1	67	48	41.7
	Overall Percentage				80.1
a. The cut value is .500					

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	specialization_2			62.980	5	.000	
	specialization_2(1)	19.095	16408.932	.000	1	.999	1.963E8
	specialization_2(2)	19.411	16408.932	.000	1	.999	2.692E8
	specialization_2(3)	20.682	16408.932	.000	1	.999	9.592E8
	specialization_2(4)	20.489	16408.932	.000	1	.999	7.913E8
	specialization_2(5)	21.791	16408.932	.000	1	.999	2.908E9
	Constant	-21.203	16408.932	.000	1	.999	.000
Step 2[b]	specialization_2			65.837	5	.000	
	specialization_2(1)	18.700	16124.451	.000	1	.999	1.322E8
	specialization_2(2)	19.181	16124.451	.000	1	.999	2.139E8
	specialization_2(3)	20.620	16124.451	.000	1	.999	9.015E8
	specialization_2(4)	20.224	16124.451	.000	1	.999	6.069E8
	specialization_2(5)	21.619	16124.451	.000	1	.999	2.449E9
	log_assets_2002_2009	-.663	.160	17.051	1	.000	.516
	Constant	-18.535	16124.451	.000	1	.999	.000
Step 3[c]	specialization_2			41.336	5	.000	
	specialization_2(1)	19.650	15817.784	.000	1	.999	3.417E8
	specialization_2(2)	19.325	15817.784	.000	1	.999	2.470E8
	specialization_2(3)	20.724	15817.784	.000	1	.999	1.001E9
	specialization_2(4)	20.526	15817.784	.000	1	.999	8.213E8
	specialization_2(5)	21.584	15817.784	.000	1	.999	2.365E9
	log_assets_2002_2009	-.662	.161	16.806	1	.000	.516
	pol_stability_no_violance_2002_2009	2.035	.675	9.096	1	.003	7.649
	Constant	-20.217	15817.784	.000	1	.999	.000
Step 4[d]	specialization_2			28.579	5	.000	
	specialization_2(1)	19.474	15098.000	.000	1	.999	2.867E8
	specialization_2(2)	19.459	15098.000	.000	1	.999	2.824E8
	specialization_2(3)	20.600	15098.000	.000	1	.999	8.838E8
	specialization_2(4)	19.938	15098.000	.000	1	.999	4.559E8
	specialization_2(5)	21.355	15098.000	.000	1	.999	1.881E9
	av_oth_opt_inc_assets_2002_2009	-.636	.215	8.762	1	.003	.530
	log_assets_2002_2009	-.676	.164	16.941	1	.000	.509
	pol_stability_no_violance_2002_2009	1.916	.689	7.725	1	.005	6.795
	Constant	-19.311	15098.000	.000	1	.999	.000

a. Variable(s) entered on step 1: specialization_2.
b. Variable(s) entered on step 2: log_assets_2002_2009.

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