Effective Regulation in Emerging Market Banking Industries: Twin-Peaks versus Market Discipline Plank of Basel Accord.

By

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DECLARATION

This is my original PhD dissertation, my own work (except as indicted in the references and acknowledgements), under the supervision of Prof. Kalu Ojah. It has not been presented before for a degree in this or any other University.

Euphemia Godspower-Akpomiemie

……

January 2018

DEDICATION

To

God Almighty,

My one and only mother: Julianna Adagu Umeukeje,

My husband: Mr. Godspower Akpomiemie,

And

My angels: Ejiro, and Yoma Godspower-Akpomiemie.

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God, it's all about YOU. I give you my humble and sincerest appreciation.

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LIST OF ACRONYMS

Advanced Measurement Approach	AMA
Asset Management Company of Nigeria	AMCON
Australia Financial Institution Commission	AFIC
Australian Competition and Consumer Commission	ACCC
Australian Prudential Regulation Authority	APRA
Australian Securities and Investment Commission	ASIC
Authority for the Financial Markets	AFM
Autorité de Contrôle Prudentiel	ACP
Autorité des Marchés Financiers	AMF
Basel Committee on Banking Supervision	BCBS
Basel Core Principles	BCP
Capital Asset Ratio	CAR
Commission Bancaire, Financière et des Assurances	CBFA
Core Principles	CP
Difference-in-differences	DID
Dirk Scheringa Beheer	DSB
Effective Maturity	EM
Exposure at Default	EAD
Export Credit Agencies	ECAs
Federal Depository Insurance Corporation	FDIC
FDIC Improvement Act	FDICIA
Financial Services and Markets Authority	FSMA
Financial Services board	FSB
Financial Stability Institute	FSI
Financial Stability Oversight Committee	FSOC
Financial Stability Reviews	FSR
Generalized Method of Moments	GMM
Gross Domestic Product	GDP
Group 30	G30
Indian Credit Rating Agency	ICRA

Insurance and Superannuation Commission	ISC
Insurance Supervisory Authority	ISA
Internal Rating Based	IRB
International Monetary Fund	IMF
Kaiser-Meyer –Olkin	KMO
Liquidity Coverage Ratio	LCR
Loss Given Default	LDG
Mandatory Subordinated Debt policy	MSDP
Market Discipline	MkD
National Credit Regulator	NCR
Nationale Bank van België (National Bank of Belgium)	NBB
Net Stable Funding Ratio	NSFR
Organization for Economic Co-operation and Development	OECD
Overall Market Discipline	OvMkD
Pensioen en Verzekeringskamer	PVK
Principal Component Analysis	PCA
Probability of default	PD
Propensity score matching	PSM
Reserve Bank of Australia	RBA
Required Stable Funding	RSF
Risk Weighted Asset	RWA
Small Medium Enterprises	SMEs
South African Reserve Bank	SARB
The De Netherlandsche Bank (the Netherland Central bank)	DBN
Too Big to Fail	TBTF
United Kingdom	UK
United States	US
World Development Indicators	WDI
Worldwide Governance Indicators	WGI

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ABSTRACT

This study examines the efficacy and performance effects of two major ideas in financial regulatory innovation: the market discipline principle of Basel II Capital Accord, and the twin-peaks model of financial regulation. These two regulation ideas are examined for their differential effects on emerging market versus developed market banks. Generalized Method of Moments (GMM) estimation and logistic regression techniques are the main tools of analysis in the study, as well as difference-in-differences (DID) technique that is used for robustness checks.

Market discipline is found to exist in the banking industries of our sample countries, and bank performance and stability are responsive to the implementation of the market discipline principle. Market discipline affects the two distinct economies of emerging and developed economies differently, with there being higher levels of market discipline from both internally and externally originated market discipline in developed market, than in emerging market economies. The twin-peaks financial regulatory model is found to positively affect banks, with significant improvement on bank performance and stability that is attributable to adoption of twin-peak features by emerging market countries. Interestingly, it is found that market discipline and twin-peaks regulatory model are complements rather than substitutes in the emerging economies' financial regulatory space.

Based on the above findings and various other policy implications of the study, we recommend that countries which have already implemented Basel II's market discipline principle should also endeavor to implement twin-peaks financial regulatory model as well, for enhanced bank performance. Compliance with financial regulatory policies, in general, is also found to be value-enhancing for national financial markets; therefore, we additionally recommend that countries, of both emerging and developed economy levels, should endeavor to comply with required financial regulatory policies that are already in place.

Chapter One

1. INTRODUCTION

1.1. Background of the Study

A major dilemma that faces most countries regarding the evolving global financial market architecture is that financial sectors are globally integrated, but nationally regulated (Kodongo and Ojah 2012, 2011). For this reason, disparate national regulators need to abide by some minimum international standards, as well as pursue greater co-ordination among their countries. This dilemma and need for collaboration has led most countries to become advocates of search for improved global financial regulation standards in order to minimize the potential for contagion, and thus, make financial sectors safer and more stable. Therefore, exploring effective regulatory methods that would be most amenable to emerging economies' environment are the focus of this study.

In the quest for a better financial system and minimization of bank failures and its contagious effect in the economy, the Basel Committee on Banking Supervision (BCBS) was formed in 1975 by 10 central bank governors of some of the world's largest economies (G10 countries)[1]. In 1988, the committee came up with Basel I capital accord, with the objectives of reinforcing banking stability and soundness as well as limiting the competitive differences among banks (Basel 1998). Basel I capital accord mandated banks to hold an equity cushion (minimum capital requirement of 8% of banks' risk weighted assets) to protect depositors in the event of bank failure, and provided a defined approach for calculating the capital adequacy ratio. By 1999 most countries, especially Basel member states, including emerging market economies successfully implemented Basel I.

Like many other regulations, the Basel I accord threw up unintended consequences; for instance, risk was not well differentiated, and this shortcoming was found capable of contributing to macroeconomic fluctuations (Blum and Hellwig 1995). Banks could decide to shrink their assets by reducing lending instead of recapitalizing (Rochet 1992, Tirole 1994). Decrease in credits availability leads to a decrease in investment opportunities, increased unemployment, reduced production activities and attendant low cash flow from production; and these would in turn lead to high default rate, thereby reducing banks' returns from outstanding loans (Hanson, Kashyap, and Stein 2011,

[1] G10 is made up Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, United Kingdom, and the United States; Formed since 1962 to take part in the General Arrangement to Borrow (GAB). The group was modified in 1964 to include the eleventh member, Switzerland, while Luxembourg became an associate member, but the name "G10" remained unchanged.

Blum and Hellwig 1995). Brealey (2006) posits that though equity capital could provide protection against bank failure, too strict capital requirement could have correspondingly disadvantageous outcomes such as the ones just described.

Due to much criticism of Basel I, its revised and/or upgraded version (Basel II) was introduced in 2004 to ensure a more accurate risk measurement and reduction in regulatory arbitrage by banks[2], which was one of the shortcomings pointed out against Basel I (Benink and Wihlborg 2002). Basel II's objectives were based on three pillars: a more risk-sensitive minimum capital requirement of 8%, supervisory review, and mandatory information disclosure (market discipline). The essence of the second pillar (supervisory review) is to mitigate gaming and manipulation of figures while computing the capital adequacy ratio as well as to permit remedial action, where necessary (Jackson 2001), especially in countries adopting the more complex approach of risk assessment (Internal Rating Based [IRB] approach) (Carey and Hrycay 2001, Benink and Wihlborg 2002). The third pillar (market discipline), which is one of the key focus-issues of this study, focuses on mandatory information disclosure by banks to satisfy particularly uncompromising disclosure criteria for transparency, which would in turn materially increase and improve information to the public, and in turn encourage a better and more accurate measurement of a bank's risk profile.

There have been some concerns that exclusive reliance on market discipline can render the financial sector ineffective due to the opaque nature of banks and the release of incomplete or erroneous false information to the market, which can lead to false market reaction (Dhumale 2000, 2001, Linnell 2001, Prowse 1997, Morgan 2002). This concern is more prevalent in emerging market, with relatively underdeveloped capital market where the volume of subordinated debt required for effective market discipline may not be met (Karacadag 2001). Also market discipline would appear more effective in perfect and well informed markets (Scott 2004), which is not commonplace in the real world. In a market with information asymmetry and externalities like markets in emerging economies, market discipline practice could trigger bank runs, which can, in turn, destabilize the financial system (Diamond and Dybvig 1983, Goodhart et al. 2013). But other researchers argue that market discipline as an incentive-based regulation should be a complementary regulatory tool, not a substitute to rule-based regulation (Hamalainen 2006, Bruni and Paternò 1995).

[2] Sometimes banks circumvent financial regulation deemed unfavorable, through product innovations and transactions reformation such as asset (especially loans) shrinkage.

1.1.1. Problems of Adopting Specific Regulations

Basel II implementation has continued across the globe, including developing countries like Malaysia, Morocco, Namibia, and South Africa (Basel 2014). But the pace of implementation (i.e., of the risk-sensitive capital requirement) has not been as smooth as that of Basel I. According to Financial Stability Institute Report (FSI), as at July 2014, some emerging economies such as Angola and Chile are still cautious about implementing Basel II (FSI 2014). The concern is that most countries are still contemplating how to effectively implement Basel II, the best approach to deploy, and concerns about its implications. The BCBS[3] understands the caution, as no country is mandated to immediately implement Basel II (Caruana 2005a). Yet Basel II is perceived as a global norm; ratings and investability of countries and their firms are often based on their banking industries' capacity to implement globally accepted regulations (Claessens, Underhill, and Zhang 2008, Gottschalt and Griffith-Jones 2006).

FSI has conducted a number of surveys on the status of Basel II implementation on both BCBS and non-BCBS member countries (Basel 2014). The survey revealed a very high percentage of countries (respondents) intending to adopt Basel II from 2007 through 2015 (FSI 2004, 2006, 2008). The result seems to reveal over-optimism as most countries later postponed implementation due to lack of technical and human resources necessary for policy implementation (Gottschalt and Griffith-Jones 2006, Cornford 2006a, b). Countries such as Ghana and Zambia that indicated adoption of Basel II at the beginning and ending of 2008, respectively, have not made any move towards implementing Basel II as of 2013, though Zambia published draft of the regulation in 2013.

Besides lack of technical and human resource skills, emerging market countries are concerned about the different available approaches (standardized and internal rating based approaches) for determining credit risk for capital adequacy requirement. Foreign banks operating in these emerging markets are likely to adopt the more complex approach (IRB), while the local (mainly small) banks adopt the simplified standardized approach as prescribed by the BCBS. The local banks are likely to be left with higher capital requirement, since the IRB approach could reduce the capital adequacy ratio for qualified foreign banks (Tarbert 2000, Dhumale 2001). Host country regulators will lose supervisory power over foreign banks; if alternatively, they try to impose simplified standardised approach on foreign banks, they may face severe resistance or even a pull out of foreign business.

[3] BCBS membership has been changed and updated many times; as at the time of this research BCBS is made of 27 national jurisdictions: the G 10 members plus Argentina, Australia, Brazil, China, Hong Kong SAR, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, Singapore, South Africa, Spain, and Turkey.

Importantly, foreign banks using IRB approach will likely channel available credit to high-quality, low-risk borrowers (rated above BBB) at the expense of borrowers rated below BBB (Griffith-Jones, Segoviano, and Spratt 2003, Reisen 2001). Moreover, the smaller banks will be unable to fill the gap of providing sufficient credit to such high-risk profile borrowers (Rime 2001b). Such a scenario contradicts the objective of financial regulation which is to reduce banks' exposure to vulnerability and risks in order to ensure safety and soundness of financial systems (Gottschalt and Griffith-Jones 2006). It also contradicts the Basel I objective of reducing the competitive differences among international banks.

As the global financial crises took hold in mid-2008, less attention was devoted to Basel II implementation, as it soon became clear that coordinated action would be needed, not only to prevent a collapse of the world financial system, but also to oversee the building of a more effective global framework for financial sector regulation and supervision. The G20 summit, in Seoul, in November 2010 came up with a new Basel capital accord (Basel III), with the objective to introduce macro prudential tools (13% minimum capital adequacy ratio, 3% minimum leverage ratio, and a minimum liquidity ratio to ensure banks are liquid enough in the event of financial crisis) to further address systemic risks in the financial system as well as supplement the micro prudential focus of Basel I and II (Hannoun 2010a). Besides the long phase-in provision of Basel III (from 2013 through 2019), adoption of certain planks of Basel II, for instance the market discipline plank, remained far-fetched in many emerging market economies, alongside lack of evidence on its efficacy in such economies.

1.1.2. Alternative Regulatory Perspective: The Twin-peaks Model

An increasingly popular regulatory model that is globally recommended for financial institutions besides the Basel capital accords, is the twin-peaks regulatory model (G30 2008). It is the second main regulatory innovation idea-focus of this study. The twin-peaks financial regulatory model advocates that regulatory objectives be focused on financial institutions' functions and activities by two correspondingly separate authorities, instead of having a regulatory authority focus on the entire essence of individual financial industries (Pan 2010, Botha and Makina 2011). It specifically stipulates that prudential supervision be separated from market conduct supervision of financial industries. That is, two independent regulators will focus on achieving specific regulatory objectives by focusing on market conduct, while fostering policies that maintain overall financial system stability.

The aim of the prudential regulators would be to maintain and boost the safety, reliability, and soundness of regulated financial institutions. Prudential regulation includes micro- and macro-prudential aspects. Macro-prudential regulation or supervision refers to the analysis of strengths and vulnerabilities of financial systems as a whole (systemic risk), while micro-prudential refers to the safety and reliability of individual financial institutions. Market conduct regulators are meant to provide protection to consumers of financial services and promote confidence in the financial institutions. Better market conduct will result in improved consumer confidence in financial services, and ultimately enhance the financial sector's sustainability. A key strength of the twin-peaks model is that it allows each regulator to focus on its core mandate: financial soundness and stability in the case of the prudential regulator, and similar functions in market activities in the case of market-conduct regulator[4].

1.2. Motivation

It is, therefore, important to investigate regulation of the banking industry in emerging markets due to the fact that some emerging markets are still sceptical, or unclear about benefits of adopting the globally recommended and technically required financial regulations. The major negative unintended consequences of the prevailing globally popular financial regulatory policies appear highly likely to affect emerging economies negatively. For instance, the consequences of credit rationing of Basel II will affect emerging markets, as big banks will concentrate credits to low-risk borrowers, indirectly neglecting the high-risk borrowers, which are relatively more in emerging market economies. Alternatively, such risky borrowers will be left to depend on smaller and less sophisticated emerging market banks, thereby increasing banks' level of risk-taking.

Importantly, the market discipline principle by way of mandatory disclosure seems likely to work better in a well-informed market, with less information asymmetry and market externalities (Scott 2004), which are features lacking in emerging markets. Availability of subordinated public debts required for effective market discipline may not exist in emerging economies with relatively underdeveloped capital markets (Karacadag 2001). The emerging market countries sampled in this research are Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Kuwait, Malaysia, Mexico, Morocco, Namibia, Nigeria, Peru, Philippines, Russia, South Africa, Thailand, Turkey, and Zambia.

[4] By having simultaneous regulatory eyes on both form and function of the financial institutions and markets (system), the overlooking of shadow banking activities while focusing exclusively on forms of financial institutions will be avoided.

For benchmarking purposes, four developed countries (Australia, Belgium, France and Netherlands) that have fully implemented twin-peaks regulatory model as at 2014 were added in the sample.

1.2.1. Features of Sampled Countries

Eighteen of these emerging market countries chosen for this research are among the 22 countries listed by Bloomberg Market in 2013 and 2014 as the most attractive emerging markets for investors, based on GDP growth, inflation rate stability, government debt as a percentage of GDP, and ease of exploring business opportunities. Thus, this selection is based on likelihood of more functioning banks as well as required data availability for the study compared to other developing countries. In addition, Nigeria is added to the sample because it is one of the largest markets in the Sub-Saharan region. According to UnitedNations (2018), African economies were expected to expand growth by an aggregate of 3.6% in 2017, Nigeria contributed to about half of the estimated growth in 2017. Also Kuwait is chosen to represent the Middle East, which is not covered in the Bloomberg list.

India made a significant move towards evolving a stable financial system, but has experienced vulnerabilities in the financial sector since the global financial crisis of 2007/2008. Non-performing loans increased from 11.09% as at March 2008 to 36.36% as at March 2013 (Lindner and Jung 2014). The IMF's 2013 Financial System Stability Assessment report shows that though India has a strong and developed financial regulatory regime, few gaps and regulatory implementation constraints exist, including low information flow to and from international supervisors[5]. The report also shows that Indian banks are faced with asset quality deterioration and pressures on systemic liquidity. Lindner and Jung (2014) posit that India requires a push forward with financial system reforms. Along that line, the IMF report recommends, among other things, a greater independence of regulatory agencies and joint regulation of financial conglomerates, which is one the objectives of twin-peaks system of financial regulation.

South Africa's financial sector has also experienced vulnerability despite its modern and relatively sophisticated financial regulatory framework (IMF Report 2008)[6]. Firms and households are heavily indebted and vulnerable to high interest rates, while banks are increasingly exposed to credit risks. These vulnerabilities became obvious in August 2014 when African Bank, which specifically lends to low-income households, became insolvent and needed rescue. Though African Bank's problem might not pose systemic implication due to its small size, it suggests that asset quality could easily

[5] IMF Country Report No. 13/8 https://www.imf.org/external/pubs/ft/scr/2013/cr1308.pdf (accessed January 2015).
[6] IMF Country Report No. 08/349 http://www.imf.org/external/pubs/ft/scr/2008/cr08349.pdf (accessed January 2015)

deteriorate due to excessive risk-taking, and high interconnectedness among small banks (and other small financial institutions) could pose a systemic risk. The IMF's 2008 Financial Stability Report recommends a more competitive financial system to make the financial sector more efficient, and to establish a clear and defined regulatory responsibility to minimize information overlaps and gaps among regulators and policy makers. This recommendation led to South Africa's proposal of the twin-peaks financial regulatory model in 2013.

IMF Financial Stability Report (2013) recommends an enhanced supervisory oversight for Nigeria's banks with international regulatory affiliation. Also a defined supervisors' capacity is needed to establish a clear level of regulatory authority over the banks. Though many of Nigeria banks experienced healthy revenue and asset growth in recent years, asset quality issues continued to hinder the banking sector's growth. Nigeria established only 7 new banks between 2004 and 2016 since after its banking sector reform in 2004. Nonperforming loans dramatically increased from 11.7% in 2011 to 14% in 2016. In 2015, the CBN made a move to increase capital adequacy ratio (CAR) of systematically important banks (SIBs) to 16%, which was never implemented due to financial weakness in the economy at that time (See the Report, Nigeria 2017[7]. The IMF in its 2017 article IV consultation[8], three SIBs were noted to be undercapitalized with CAR below 8% and requested that the CBN work with the institutions to successfully meet CAR guidelines. Other emerging market countries like Morocco, Egypt, received similar recommendations from IMF, though some of them (like Chile and Mexico) already have relatively sound financial system reforms.

Therefore, a further motivation for this study is found in the fact that the "one size fits all" approach to global financial regulation seems unsuitable for emerging market countries. Also the above regulatory gaps and recommendations identified by the IMF in most emerging market countries need to be bridged and internalized, respectively. On that note, a sound financial regulatory framework suitable for emerging market countries is required, especially to effectively regulate financial services conglomerates as to avoid regulatory arbitrage and the likes of it, which, in turn, increases financial fragility.

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[7] https://oxfordbusinessgroup.com/nigeria-2017 or https://oxfordbusinessgroup.com/overview/road-recovery-reforms-help-sector-achieve-stability-and-growth

[8] https://www.imf.org/en/Publications/CR/Issues/2017/04/05/Nigeria-2017-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-44792

1.3. Problem Statement

The objectives of banking regulation and supervision is the minimization of financial fragility (both micro and macro kinds) without stifling banks' performance and innovativeness. Yet several well-meaning regulatory and supervisory policies have yielded negative unintended consequences. The recent financial regulatory policies (Basel I, II, and III) have been met with criticisms and/or have yielded negative financial stability implications, especially for emerging market countries.

The questions then are: do we understand the potentials and effects of such consequences regarding the two currently most touted identifiable frameworks for banking regulation (innovations) — market discipline oriented model and the twin-peaks model? Are these two regulatory frameworks substitutes or complements? As Ferguson (1999) argued that in financial modernization, regulation from both market and government authorities will play an important role. Which of the two regulatory/supervisory models is more appropriate for emerging markets' banking landscape? A failure to align these matters appropriately is likely to turn the cure intended by regulatory architectures (models) into worse maladies (financial instability).

In line with many works geared towards effective global financial regulation, this research investigated comparative guides between reinforcing banks' market discipline principle of the Basel Accords, and implementation of the new twin-peaks model of financial market reform and regulation. In fact, the more encompassing essence of this study is to compare the above mentioned two currently touted approaches to banking regulation and supervision, focusing on emerging market banking industries, with a view to ascertaining which is differentially more effective for these differentially characterized national banking industries.

The main concern is that, as is often naturally the case, recommended regulatory models may have focused mainly on conditions prevalent in the environments of the designers — developed countries experts, and not experts from frontier and emerging countries (Claessens, Underhill, and Zhang 2008). The banking environments of the former group are evidently different than those of the frontier and emerging markets, and therefore may not require the same structure of regulation.

1.4. Research Aim and Objectives

The aim of this study is therefore to compare and contrast the two frameworks that are the most recent central issues (innovations) in international banking regulation, namely the market discipline framework and the twin-peaks model. This aim is achieved by investigating the extent to which

banks in the emerging market countries adopted the market discipline principle and how it has contributed in improving banks performance and stability; as well as ascertain the factors that contribute to or impede the smooth adoption of market discipline framework. This study also measured how the twin-peaks model maintains and/or strengthens the safety, reliability, and soundness of regulated financial institutions, and improves consumer confidence in the financial services institutions. To achieve this stated aim, the following research questions were answered.

1.5. Research Questions

- What is the extent of adoption of the market discipline and the twin-peaks regulatory principles and/or features in the emerging market banking industries?
- How far have these principles enhanced safety and soundness of regulated banks?
- What are the factors contributing to the successful adoption of the market discipline principle of Basel Capital Accord by banking industries in emerging markets?
- What is the appropriate structure for future regulatory framework in emerging markets' banking industry?
- Does the quality of regulation affect banks' performance and stability?

1.6. Significance of the Study

Despite the concerns about the effectiveness of market discipline practice in emerging economies, very few empirical studies (Calomiris and Powell 2001, De Mendonça and Loures 2009) have investigated the effect of market discipline in Argentina and Brazil, respectively. Calomiris and Powell reported the existence of market discipline in Argentina between 1992 and 1999, while De Mendonca and Loures reported weak presence of market discipline in Brazil between 1995 and 2006. These two studies were conducted separately on two emerging market countries when market discipline principle had not yet become a global financial regulatory requirement, though there was a national requirement from Argentina's financial regulatory authorities for information disclosure.

Further, few empirical studies have been conducted in respect of the twin-peaks model, which focuses mostly on the effect of supervisory integration in supervisory architecture and the resulting quality (Čihák and Podpiera 2008). Other related studies have been surveys and theoretical reviews (Taylor and Fleming 1999a, Schoenmaker 2013, Kremers and Schoenmaker 2010, Kremers, Schoenmaker, and Wierts 2003). None has provided needed empirical evidence on this highly touted new regulatory model.

Despite the paucity of existing research on the two currently most identifiable frameworks (innovations) in banking regulation (market discipline oriented model and the twin-peaks model), these two important questions still remain unanswered: (i) which of the two regulatory frameworks is more appropriate for emerging market economies' banking landscape? (ii) Are these two regulatory frameworks substitutes or complements? To address these concerns, we empirically carried out cross-country analysis comparing the twin-peaks model and the market discipline principle in emerging market economy vis-a-vis developed market economy context, focusing on the effect of implementation of these two regulatory policies on bank performance and stability.

1.7. Salient findings of the study

This study being first of its kind in the emerging market context has expectedly contributed to the literature in various ways. In the context of market discipline principle, (i) We found that there are two explicit dimensions of market discipline: internal- and external-originated market discipline, which exhibit different effects on bank performance and stability. (ii) We also discovered that market discipline exists in the banking industry, and that bank performance and stability exhibited significant changes during period of implementation of market discipline principle. (iii) Moreover, we found that market discipline affects the two distinct economies (developed and emerging economies) differently.

There is a higher level impact of market discipline from both internal and external dimensions of market discipline in developed market economies, compared to emerging market economies. This latest result confirms the view, that most emerging market banks do not maintain a high level of presence of subordinated debt required for an effective market discipline. Furthermore, (iv) we found that existence of quality legal institutions in a country improves the positive effects of market discipline on bank performance and stability. (v) Apart from the lack of technical and human resource capacities, both country- and bank-specific factors also determine a country's likelihood of adopting market discipline principle in emerging market economies.

From the twin-peaks regulatory model perspective, (i) we found that bank performance and stability significantly increased during implementation period of the twin-peaks model. (ii) The adoption of mere features of twin-peaks regulatory model by emerging market countries, contributed positively to performance and stability of financial institutions. (iii) We also found that a country's likelihood of implementing twin-peaks regulatory model is highly dependent on the effectiveness of a country's

political and legal institutions. The level of GDP growth also affects the likelihood of twin-peaks implementation. More specifically, (iv) we found that it should be left to a country's discretion to either involve central banks in twin-peaks regulatory structure or use regulatory bodies independent of the central bank.

Involvement of the central bank increases owners' equity (more capitalized banks), while use of regulatory bodies independent of the central bank increases banks' loan portfolio (increase in ease of access to loan, especially for SMEs). (v) Before drawing final inference based on the effects of twin-peaks model on banks, we examined effects of a single authority regulatory model on banks' performance and stability. We found that despite implementation of market discipline principle, a single authority based regulatory structure does not favorably impact bank performance and stability. Finally, (iv) by estimating interaction effect of market discipline and twin-peaks on bank performance and stability, we conclude that twin-peaks financial regulatory model is more likely a complement to market discipline principle of Basel II, than a substitute.

To further justify our research focus on financial regulation, and to explore further the importance of financial regulation in the banking industry of emerging market economies, we particularly investigated and found that compliance with regulatory policies that are already in place enhances bank performance and stability. Based on the findings of this research, several useful policy implications have been drawn (see chapter six for these).

1.8. Outline of the Study

The study is structured as follows: Chapter 1, as is already clear, includes the introduction and broad description of the subject matter, an articulation of the problem statement, and aims and objectives of the study. Chapter 2 contains the literature review, detailing the different forms of financial regulations and the extent of their implementation, especially the Basel Accords and the Twin-peaks regulation models. Chapter 3 contains the research methodology, the data collected, and the research design used in the study. Chapter 4 focuses on interpretation of results based on the analysis of the first plank of the study: market discipline principle of Basel II capital accords. Chapter 5 details the result of analysis of the second plank: twin-peaks financial regulation model. Finally, section 6 concludes the report in relation to the research questions, with a focus on what has been resolved, policy implications of the research and what requires further research intervention.

CHAPTER TWO

2. LITERATURE REVIEW

This chapter is in three parts. Part one defines regulation, focusing on rationales/economics that underpin regulation, as well as industry motivation for regulation. Part two deals with the overview of financial regulation, defining regulation and detailing theories that particularly underpin financial regulation. Features, as well as different regulatory structures of financial regulation are explained. Part three explains and summarizes the different regulatory policies in place, starting from Basel I through Basel III. This part also explains in details the two major idea-focuses of this research (study): market discipline and twin-peaks models of financial regulation.

PART 1: OVERVIEW OF REGULATION

2.1. Definition of Regulation

There is no specific all-encompassing definition of regulation in both the economic and legal literatures, but the general objective of regulation is to protect the public from being exploited by industries or firms with monopoly power (Baumol and Blinder 2015), which is in line with public interest theory of regulation. Different researchers define regulation differently: Gaffikin (2005) defines regulation as specified commands or deliberate influence on body of corporates to direct and monitor the establishment, management, operations and winding up of such corporates. Gaffikin argues that regulation should not be viewed only from the negative side of control and restrictions, but from positive as well, because it facilitates, enables, and smoothens activities of organizations and society. Baumol and Blinder (2015) define regulation as the activities of government agencies to control or restrict some decisions made by specified sectors, industries, or firms. Den Hertog (1999) defines regulation as "employment of legal instruments for the implementation of social-economic policy objectives".

There is a clear distinction between social and economic regulation, social regulation covers environmental, occupational health, safety, consumer protection, and labor regulations. While economic regulation focuses on the market structures with imperfect or excessive competition to neutralize the adverse effect of dominant firm behavior to achieve market stability (Viscusi, Harrington, and Vernon 2005). There are two types of economic regulation, namely structural and

conduct economic regulation (Kay et al. 1988). The structural regulation deals with the regulation of the market structure, for instance regulation of the entry and exit requirements into and from the market; and the regulation of the quality of professionals needed in the market.

The conduct regulation deals with the regulation of the market behavior (producers and consumers); for example, price control, advertising, and minimum quality standards. This study covers both structural and conduct economic regulation: the twin-peaks regulatory reform is a structural regulatory policy where dual regulatory structures exist (prudential and market conduct regulatory bodies). The market discipline principle of regulation is a conduct regulation where financial industries (firms in them) are required by the regulatory agency to provide maximum possible information disclosure for the benefit of the market participants.

2.1.1. Principles/Elements of Regulations

For an effective regulatory implementation, some regulatory regimes divide regulation into different components, named, principles or elements of regulation (Akinbami 2013). The first principle is the aim or objectives of the regulation in question, which must be based on or closely related to the interest of the public which the regulation is designed for. The second element is the rules or standards on which regulation is based on. This principle is very important because the structure of the rules can affect the extent of successful regulatory implementation. Third component consists of the institutional structure of the regulatory regime, and the number of regulators that will be responsible for the regulation as well as the powers and responsibilities bestowed upon each regulator. The fourth component is the regulatory approach to be adopted in the regulatory implementation. It consists of the styles/approaches the regulators will adopt to achieve the regulatory objectives. It therefore has to do with consistency and accuracy as well as policy considerations the regulators must consider while carrying out their regulatory functions. The final component is regulatory enforcement, which refers to sanctions imposed by the regulators in case of non-compliance with regulatory rules. Sometimes this component is seemed to be separate from regulation as sanctions only come into place when regulation fails. This study focuses more on components two and three. Market discipline deals with rules and standards in which regulation is based on, while twin peaks focuses on the structure of financial regulation, where two independent bodies are assigned to carry out financial regulation.

2.2. Economic Theories that underpin regulation

The economic literature has explained economic theory of regulation in two main ways. It could be positive or normative theory (Blaug 1993, Hennipman 1992). The positive economic theory of regulation provides the economic explanation of regulation in relation to cause-and-effect analysis (consequences) of regulation while the normative theory provides cost-benefit analysis of various regulatory policies, and decides which is most efficient (Hahn and Hird 1991, Guasch and Hahn 1999). This study applies positive theory, by analyzing the consequences and effects of the regulatory framework of the market discipline and the twin-peaks system of financial regulation. Some of the positive theories of regulation are explained below.

2.2.1. The public interest theory

The first theory of regulation aims at the interest of the public while allocating scarce resources. This theory is rooted in the theory of welfare economics of Pigou (2009) and Samuelson (1947), which posits that voluntary allocation of resources would fail to distribute society's scarce resources in a way capable of attaining an optimal social welfare. In practice, efficient resource allocation is not possible and therefore could not be controlled by market mechanism, so a demand for improving the allocation arises (Bator 1958). According to public interest theory, for the interest of the public, government regulation is required to overcome the impediments hindering efficient allocation of resources (Arrow 1969, Joskow and Noll 1981, Shubik 1970, Posner 1974, Uche 2001).

This first theory, though desirable, has been criticized by many famous theorists (Dahlman 1979, Toumanoff 1984, Friedman 1960, Stigler 1971). Public interest theory assumes that government regulation could account for economic efficiency, but it fails to point out that sometimes, fairness and redistributions might be achieved at the detriment of economic efficiency (Joskow and Noll 1981, Posner 1974). This assumption has been theoretically and empirically criticized. Theoretically, Stigler and Friedland (1962) argue that regulating resource allocations does not usually make the economy as a whole more efficient. Empirically by Ng (2003), that unavoidable inefficiency might exist, which could lead to inefficiency of regulation. Unavoidable inefficiencies could include; flawed information available to regulators, both in drawing up proposals and its enforcement. Inefficient safety standards could be applied by the regulators (Viscusi 1985). Inefficient combination of product factors could be selected by the firms being regulated, which will result to high cost of production (Baumol and Klevorick 1970).

This is the case in the financial system, where despite different regulatory reforms in place to monitor the activities of banking industries, the global economy continues to experience financial crises. The Basel capital accord, like many other regulations due to unavoidable consequences, pushed up unintended consequences such as raising the total level of equity in the global system, causing credit-crunch and fire-sale as banks try to meet the minimum capital requirement (Hanson, Kashyap, and Stein 2011).

2.2.2. The private interest theory

Private (special) interest theory could be traced far back to political scientists Marver H. Bernstein and Gabriel Kolko in 1955 and 1965, respectively (Hägg 1997). Bernstein and Kolko independently carried out studies on US independent regulatory commissions and railway regulation respectively. Bernstein found that on behalf of the community, the commissions are out to protect the industry they are obligated to regulate, while Kolko found that the railway was designed to serve the interest of the rail owners. In other words, Berstein and Kolko stipulated that public regulation may be carried out in response to the request of particular pressure groups, which may have interest in the outcome of the regulatory policy. This observation was called the capture theory, which assumes that regulation should serve the interest of a particular branch or sector of industry (interest group). One of the complicating factors in capture theory is that, the regulatory agency might appear captured by the interest group (branch being regulated), therefore would be expected to produce results to favor the special interest group (Tollison 1988, Baxter 2011).

In financial regulation, capture has been the central foundation for preferring market discipline to rule-based regulation in most cases. The reason is that market forces perhaps would be less disposed to capture, thereby providing reliable and consistent means of achieving efficient results (Baxter 2011). Perhaps, that is why the Basel II accord highlighted in its third pillar, the benefits of market discipline principle as an instrument to combat financial instability. Also with twin-peaks financial regulatory reform, it might be difficult, if not impossible, to capture the two independent regulatory bodies (prudential and market conduct regulators) at the same time. Therefore, twin-peaks regulatory reform might be an efficient tool against regulatory capture.

Another branch of private interest theory is the Chicago theory of regulation by Stigler (1971). It stipulates that regulation is primarily designed to benefit the industry being regulated (interest groups) in the form of grants and subsidies, and restriction on market entry to limit excessive

competition. Posner (1971) first criticized Chicago theory, that in most cases consumer groups also strongly benefit from regulation and not only the interest groups (industries). For instance, uniform prices for gas, rail, water, electricity and so on, benefit both the consumer and the interest groups (cross-subsidization).

In the case of financial regulation, financial regulatory policies are designed to benefit both the public and private interest groups, as stipulated by Posner. For instance, one of the objectives of the Basel capital accord is to limit competitive differences among banks. Also the minimum capital requirement of the Basel accords is set to create capital cushion to protect depositors in the event of bank failure (Basel 1998). On the other hand, the information disclosure requirement is to enable market participant assess the stability of financial institutions for sound investment decision. The twin-peaks regulatory model (prudential and market conduct regulation) is also for both financial institutions and consumers. The prudential regulators are to identify and mitigate any systemic risk, to avoid contagious failure of financial institutions, while the market conduct regulators effectively represent financial institutions' customers and investors to ensure fair treatment and fair clauses on financial contracts (Pan 2010, Wymeersch 2007).

2.2.3. Institutional inadequacy theory

Another economic theory underpinning regulation is the institutional theory, which came up due to the debate on who and what influences regulation and regulatory policies (Levy and Spiller 1994). The theory states that the environment of an institution can strongly affect the development of structures in that organization, perhaps more intense than public and institutional pressure (public/private interests) (Meyer and Rowan 1977, DiMaggio and Powell 1983, Bjorck 2004, Baldwin, Cave, and Lodge 2012).

According to the findings of Rowan (1982), when an institutional environment is controversial, uncoordinated or unregulated; innovation and creativity is slow. This argument is supported by Tolbert and Zucker (1983) and Zucker (1987), that when there is regulatory pressures from the states (regulators), organizations adopt new structures quickly, unlike when the states are lenient in regulatory policies, adoption rate is slower. These findings confirm the arguments by Arestis and Stein (2005) and Arestis, Nissanke, and Stein (2005) that institutional theory is a perfect alternative theory to financial liberalization, which they blamed to be responsible for the widespread of financial

crises. This brings in the argument of this study that efficient and suitable financial regulation is required in emerging market economies for financial and economic stability.

2.3. Industry motivation for regulation

Economic theories of regulation provide some justifications that externalities and market failures, which hinder efficient allocation of resources, are the motivating factors for regulation. Carmichael (2004) highlighted the components of such externalities and market failures to include imperfect competition, unbalanced market operation, information asymmetry, and systemic instability. Imperfect competition, especially monopolistic market structure can lead to price increase, high transactional costs, and inefficient quantity of goods in the market. On that note, government regulation is required to improve efficiency of resource allocation through facilitation and maintenance of market operations by enforcing price rules and meting out punishment against breach of regulation (Braeutigam and Panzar 1989, Den Hertog 1999, Pejovich 1979).

Second, externality can take the form of unbalanced market operation, which emanate from destructive or excessive competition arising from long-term over-capacity (excess goods and services produced/delivered in relation to the actual need). Excessive competition could lead to a wide range of price fluctuations, affecting the decision making ability of producers and consumers (Kahn 1990). Regulation should be put in place to prevent these permanent negative effects on the economy. This could be through either budgetary and monetary policies for specific sectors or through other wage and price regulation (Breyer and Breyer 2009, Ogus 1994). Such regulation should not offset competition, but preserve and make it effective (Gaffikin 2005) by regularizing market imperfections that could reduce consumer benefit in the market place. For instance Australian Competition and Consumer Commission (ACCC) ensures competitiveness and stand against anti-competition behavior in Australia.

Third, inefficient allocation of resources may occur due to asymmetry of information, which could lead to adverse selection and moral hazards, with respect to quality and prices of goods and services (Hirshleifer and Riley 1979, Hirshleifer 1992). In this case, regulation should be required to set a minimum requirement on information made public, which would reduce information problem (Leland 1979). Search cost could also be minimized by setting up rules on price and quality marking, to avoid misleading information for instance, a ban on excessive advertising (Barzel 1982, 1985, Beales, Craswell, and Salop 1981).

Fourth, regulation is required to prevent systemic (economy-wide) damages that would arise due to institutions' failures, especially in financial institutions. Systemic damages could be induced due to runs on one institution that spread to others through interconnectedness in the clearing system (Bhattacharya and Thakor 1993, Chari and Jagannathan 1988, Diamond and Dybvig 1983, Jacklin and Bhattacharya 1988, Postlevvaite and Vives 1987, Acharya et al. 2009, Acharya and Yorulmazer 2008, Acharya 2009, Huang, Zhou, and Zhu 2012, Calomiris 2009). The dangers of customer runs could be prevented through adequate information provision. Benston and Kaufman (1996) and Calomiris and Mason (1994) prove that adequate information enabled depositors and traders to differentiate between solvent and insolvent banks during financial panics in the U.S.A. The major problem is that not all individual customers can effectively monitor and measure bank capitals and risk taking. These problems provide justifications for an average depositor to depend on regulatory bodies to monitor and discipline financial institutions on his/her behalf.

PART 2: FINANCIAL REGULATION

2.4. Definition

Financial regulation literally entails the overall monitoring of financial institutions and markets, by setting up certain rules, requirements, restrictions and guidelines on financial institutions' business models. According to Currie (2006), an effective financial regulation is one which recognizes the need for a stable financial and economic structure that would prevents financial instability and, in turn, prevents financial crises. Financial regulation can take different forms, including rule-based regulation; incentive-based regulation; market-based regulation; disclosure regulation; and use of other protection schemes such as deposit insurance, and other individual jurisdiction schemes like Investors Compensation Scheme (ICS) in the United Kingdom (Ely 2008, Gaffikin 2005). The major purpose of any of these forms is to prevent banks from taking excessive risks while supplying credits, and to ensure that banks have adequate capital to internalize any losses, as well as sufficient reserves to cover for nonperforming loans (Stiglitz 2001).

Rule-based, market-based, and disclosure regulations are predominant in financial regulation. In rule-based, just like the minimum capital along with leverage and liquidity ratio requirements of Basel capital accord, regulators specify the activities financial institutions should undertake, which will be strictly enforced with penalties meted out against failure to comply. In Market-based

regulation, the central banks use monetary policy tools such as open market operations, reserve requirements, and discount rates to control the amount of money in circulation. Disclosure regulation is adopted by the Basel Committee on Banking Supervision (BCBS) in Basel II, requiring banks to operate transparently and provide required information for financial consumers to make informed financial decision (Basel 2004). It is also a form of market-based regulation, as market participants are expected to discipline banks based on information made (or not made) public.

Researchers have argued that a financial regulation is never effective if it is formulated just to remedy or reverse conditions already generated by a present event (Kregel and Papadimitriou 2012, Cunningham and Zaring 2009, Allen and Carletti 2013b). Ely (2009) argues that any policy making that only focuses on responding to consequences and outcomes of problems rather than addressing the causes of the problems will only end up introducing more fragility to the financial system. This is what Allen et al. (2012) referred to as "the cure being worse than the diseases". Unfortunately, the recent approaches to financial regulation largely focus on providing solutions to the present situations by applying series of changes to extant regulatory models as well as business models of financial institutions, while paying little or no attention to the basic structure of the financial system. According to Pan (2010) and Llewellyn (1999), for a financial regulatory system to be optimal, such system must consider and include the economic theories and societal rationales that underpin financial regulation. They also add that regulatory objectives and the appropriate preferred regulatory structures should be taken into considerations for an optimal financial regulatory system.

2.5. Economic theories of financial regulation

Some economic theories of regulation, as detailed earlier, explain the rationales for regulation in the society, but some theories specifically explain the foundations of financial regulation.

2.5.1. Financial liberalization theory

Theory of financial liberalization originated from separate works of McKinnon (1973) and Shaw (1973) on the relationship between economic growth and financial development (Fry 1978). McKinnon and Shaw based their theory on the phenomenon that financial development leads to economic development; that is, the more the financial system is liberalized, the more there will be economic development. According to Arestis and Stein (2005) and Arestis, Nissanke, and Stein (2005) financial liberalization theory inspired the policies that gave rise to financial crises. Their view

is that McKinnon-Shaw phenomenon has stimulated widespread (contagion) of financial crises, especially due to the weak foundation of the theory (no consideration of financial crisis).

Some of orthodox IMF and World Bank financial liberalizations include liberalization of interest rates, elimination of quotas for priority lending, foreign ownerships on banking sector, privatization of commercial banks. In 1989, Venezuela implemented financial liberalization, by 1994, there was a meltdown in their banking system, within eight months, 17 financial institutions failed, and 20% of the GDP was estimated for clean-up (Vera 2000). In the late 1990's Mexico implemented financial liberalization, government intervention to combat the financial crisis gulped 17% of the country's 1998 GDP. Other regions, including Africa and Caribbean were not favored by this policy in the 1990s (Stein, Cuesta, and McLennon 2002). Also Demirgüç-Kunt and Detragiache (1998a)'s survey on banking crises in 53 countries between 1980 and 1999 linked 78% of all crises to the era of financial liberalization. Many others studies (Okuda and Mieno 1999, Okuda, Hashimoto, and Murakami 2002, Williams and Intarachote 2002, Hao, Hunter, and Yang 2001), focusing in different countries posit that financial liberalization increases banks' operational costs, adversely affects technological progress and decreases profit efficiency at an increasing rate over time. Though Gilbert and Wilson (1998) show evidence of positive productivity with financial liberalization, Hao, Hunter, and Yang (2001) dispute this with evidence that such relationship is temporary and is not sustainable over a period of time.

The above arguments denote that financial regulation instead of liberalization is essential for the well-functioning of the financial system, which would have positive impact on economic development. The arguments are in line with the purpose of this study, which is proposing an efficient regulatory reform for the financial system (between market discipline principle and twin-peaks regulatory reform), especially for the emerging market economies.

2.5.2. Information asymmetry theory

Markets have the natural features of information differences between buyers and sellers. Such differences (information asymmetry) are clearly pronounced in financial markets (Brealey, Leland, and Pyle 1977, Mishra, Heide, and Cort 1998). Borrowers know their default probability and level of collateral better than the lenders, but may not completely disclose their level of potential default. Information asymmetry poses two potential problems: adverse selection and moral hazard (Hirshleifer and Riley 1979, Hirshleifer 1992). Due to information asymmetry, customers cannot

attest to the quality and price of goods and services in the market (Akerlof 1970, Eisenhardt 1989). Moral hazard could also exist, as suppliers can easily exploit the buyers by exaggerating the quality and price of products and services (Holmstrom 1982, Hölmstrom 1979).

Information asymmetry between firms and investors has been used to explain the constraints in accessibility of credit, which is the major problem facing SMEs (Bernanke, Gertler, and Gilchrist 1994, Rajan 1992, Kashyap, Stein, and Wilcox 1996). It induces an informed lender to concentrate on clients with accessible information, and deny some firms access to credit due to hidden information. Also, well informed investors have more ability to predict positive future returns than less informed investors, thereby causing disparity in investment opportunities and decision making between investors (Chan, Menkveld, and Yang 2008, Yang 2003, Chakravarty, Sarkar, and Wu 1998). To mitigate information asymmetry and its potential problems, firms should make information public for the benefit of information disadvantaged market participants (Diamond 1984). But the major issue is that a private market might not voluntarily provide accurate information needed by investors without a mandatory requirement by financial regulators (Leland 1979, Stiglitz 1985, Hirshleifer 1971), especially in underdeveloped countries (Akerlof 1970).

Information asymmetry theory could be viewed as the motivation behind BCBS's proposal for the market discipline principle, where banks are mandated to make financial information public. If complied, the actions of the most vulnerable stakeholders will expose risk taking behavior of banks (see market discipline in the later part of this chapter). Due to presence of transaction and search cost in the course of investors and other customers searching for reliable information, financial intermediation, along with effective regulation, can be regarded as an expected remedy to information asymmetry.

2.5.3. Theory of financial intermediation

Historically, banks play the role of intermediation in the financial sector, originating, distributing, and servicing funds (Fama 1980, Oldfield and Santomero 1995). This is contrary to the traditional Arrow-Debreu model, which posits that in resources allocation, markets are perfect and complete, firms and households interact directly with each other; therefore, there is no role for financial intermediaries (Arrow and Debreu 1954, Geanakoplos 1989, Scholtens and Van Wensveen 2000, 2003). The importance of financial intermediaries and their roles in the financial sector have been found in the theory of financial intermediation. This theory focuses on how efficient an intermediary

is, based on the ability to minimize costs, information asymmetry, and the risks involved in financial operations (risk management). Also that transaction cost and asymmetry of information are the major limitations in financial intermediation (Pyle 1971, Brealey, Leland, and Pyle 1977, Diamond 1984, Marty 1961, Santomero and Babbel 1997, Santomero 1997, Allen and Santomero 1997).

According to Merton (1989) & Merton (1995b), the most important role in financial intermediation is the ability of a financial institution to distribute risks across different market participants at a minimum cost. While some managers would prefer optimal risk management strategies and only mitigate for high cost of bankruptcy, (Marcus 1984, Santomero 1989, Gruber and Warner 1977, Weiss 1990), others might prefer stable earnings for personal reasons (Pagano 2001, Breeden and Viswanathan 1998, DeMarzo and Duffie 1995). These conflicting agendas are compelling to our argument that effective and efficient financial regulatory reform is required for financial systems to have smooth running of financial markets, for the best interest of both managers and the public (shareholders and financial services consumers).

2.5.4. Fluidity of financial product innovation

Another aspect of the financial system where financial regulation is required is in the evolvement and variability of financial products and services (financial innovations). Financial innovation could either be in the form of products such as new derivatives contracts, financial securities, and other investment products; or in the form of services/processes such as new means of pricing securities, processing transactions, or distributing securities, etc. For a financial innovation to be feasible it must contribute to efficiency/effectiveness and/or completeness of the market, by reducing transaction costs, information asymmetry and its consequences (moral hazard and adverse selection) involved in financial intermediation (Tufano 2003).

The excitement of the consumers of financial services to try almost everything new has led the financial institutions to propose innovations lacking substance in making the financial market more efficient and/or near complete (Van Horne 1985). Many are invented to manipulate accounting profits, with little or no economic benefits, especially if the public has shown little positive reaction towards the new product/service. Assumed innovations are being sold with attractive fees and at a disguised cost to the consumers, which reduces if not totally eliminates expected benefits to financial services consumers. With respect to all these problems, an efficient regulatory reform is needed to

guide both the financial institutions and financial product consumers on the extent and credibility of financial innovation.

In as much as financial regulation is needed to monitor the credibility and extent of financial innovation, it could also trigger a number of innovations. In the 1970s and 1980s when constraints on financial institutions were lowered or entirely removed in some cases, market participants developed new lines of businesses, acquiring previously unattainable returns (Silber 1983). Most important innovations occurred, such as development of derivatives securities, starting with introduction of the foreign currency futures in 1972 (Van Horne 1985, Allen and Santomero 1997). On the other hand, when constraints are imposed or tightened, financial innovation would be in form of defensive strategies, aiming at profit restoration and risk reduction. This scenario of the financial institutions circumventing regulation usually weakens government and financial regulatory bodies' efforts to come up with an effective regulatory reform for the financial system.

According to Pakravan (2011a), financial innovation has increasingly pushed banks into shadow banking, with large proportion of the banks' revenues coming from highly complex and interconnected products and services like swaps, futures and options. This massive and complex transformation has led financial regulators into confusion on deciding which regulatory tools are effective in analyzing and managing the complex and interconnected system of financial innovation. According to (Merton 1995a), another issue is that, innovation triggers major changes in hierarchy of an institution, infrastructures to support the innovation, and knowledge required for implementation might be different from existing experience of many managers.

With this regard, Pakravan (2011a) suggests that government and other regulatory bodies should come up with appropriate financial regulatory policies (not policies that will entirely impede innovation), to reduce regulatory arbitrage through innovation. This idea is contrary to Van Horne (1985)'s, that financial innovation will be obstructed by regulatory bureaucracy. He recommended a self-policing for the innovation suppliers as well as an ultimate market discipline hopefully from a better informed and suspicious market that would be able to respond effectively to the flow of financial ideas in the market. Dan, Renxiang, and Qizhuang (2009) disagree with Horne's opinion. They argue that government intervention is needed to enable both the suppliers and demanders of innovation create a favorable environment that would drive financial innovation development.

In this study, our premise disagrees with Van Horne (1985); entrusting innovation regulation only to self-policing by the suppliers will not be an adequate approach to financial system fluidity. The question is; how would a profit-oriented innovation supplier, in the face of excessive demand for newly innovated products, regulate itself for the interest of the public? Also financial market (especially in emerging market) being incomplete with information asymmetry, would not be effective as a disciplinary tool to fish out those ideas posed as financial innovations that are not really innovations. This study argues that twin-peaks financial regulatory reform might be better at regulating numerous financial innovations that occur over a short span of time than market discipline principle, especially in emerging markets with more incomplete markets and externalities than in developed markets.

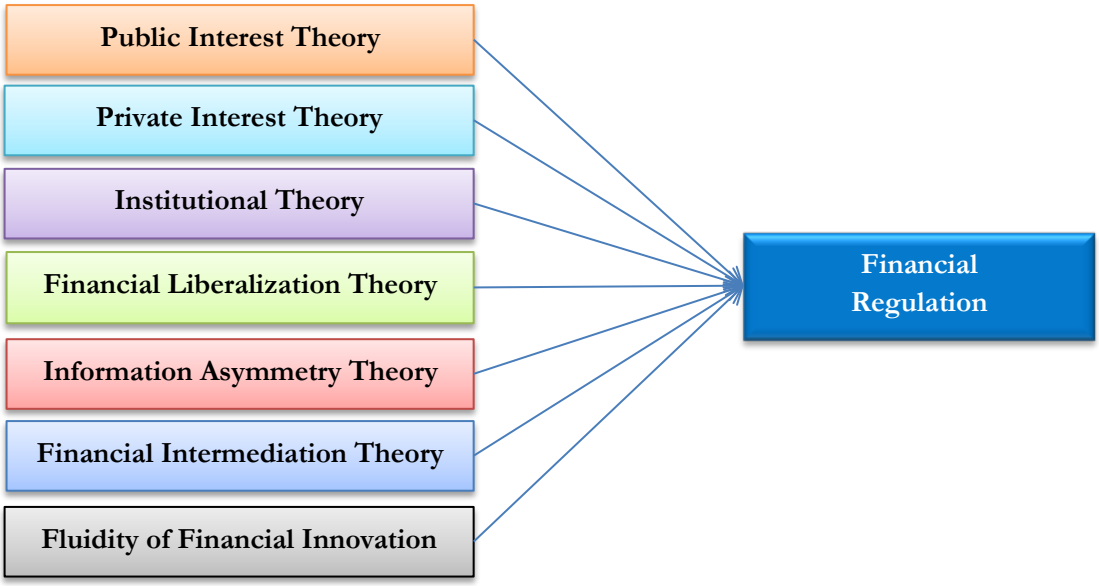
2.5.5. Converging the theoretical framework

The theories identified thus far as underpinning financial regulation and all other regulations are interconnected. The reason is that individuals and financial institutions may have different motives for financial regulation, while the regulators have the single motive of (financial) stability. But this study tries to emphasize the benefits of regulations to individuals/institutions, to regulators, and to the financial system as a whole. The public interest theory appears designed for both the regulators and individual consumers. The theory requires that regulation be put in place for efficient allocation of scarce resources for the interest of the public. The private interest theory is for the interest of financial institutions that are being regulated, to get grants and subsidies, and pursuit of entry restrictions to limit competition. Subsequent theories (institutional, information asymmetry, financial intermediation, etc.) are variously for the interest of the three groups under consideration. For this reason, a single theory might not be sufficient to explain and derive reliable conclusions on efficient and effective regulation for financial system stability. Instead different theoretical perspectives are integrated into a single study (framework) to enrich and strengthen the research findings.

The information asymmetry theory specifically underpins the first concept of this research (embodied in the market discipline principle). The theory requires that the information gap between lenders and borrowers be bridged. It explains the objective of Basel Committee on Banking Supervision (BCBS), that financial institutions should disclose all relevant information for the benefit of investors and other financial products consumers. This mandatory disclosure will facilitate access to information by investors which will enable them to directly or indirectly discipline banks that engage in excessive risk takings.

The institutional theory particularly underpins the second concept of this study (twin-peaks regulatory framework), which deals with an effective regulatory structure of financial regulation, to achieve multiple regulatory objectives. The relevance of institutional theory to this study is based on the cognizance that institutional environment affects the structure and behavior of an organization, which in turn determines how the organization would be effectively regulated (Meyer and Rowan 1977, DiMaggio and Powell 1983, Bjorck 2004), especially from emerging market perspectives (Hitt, Li, and Worthington 2005, Hoskisson et al. 2000, Meyer and Nguyen 2005).

Figure 2.1: Convergence of the theoretical Literature



2.6. Societal motivation for financial regulation

Along with industry motivation of regulation outlined in the earlier part of this chapter, individual financial consumers also have some justifications to demand for financial regulation, which include;

Consumer confidence and generalization: Due to changes in the financial system as a result of innovation, many products and services offered by financial institutions are becoming increasingly so blurred and complex that they are difficult to be differentiated (Demaestri and Guerrero 2003). Consumers may be aware of the existence of both good and bad products/institutions, but unable to differentiate them at the point of purchase due to lack of sufficient and reliable information. Regulation is therefore needed to set a minimum quality standard, which will enhance consumer confidence and push low quality producers out of the market.

The Grid Lock problem: In some circumstances, banks are subjected to herd behavior (Llewellyn 1999, Ely 2009); a risk averse manger would prefer to adopt other banks' strategies, with the intention that, if he does not, and mistakes occurred or loses are incurred, he would receive the blame, but if he does, and incurred loses, the defense would be that systemic error occurred. This peer group pressure on banks' management might be stronger than the pressure to acquire reputation for quality, honesty, trust worthiness, and prudence. Another aspect of "grid lock" in the financial industry is in the sale of financial contracts. Sales people are paid on commission basis despite inappropriate or incorrect policies being sold with hidden and unfavorable terms and conditions. Profit skimming could also occur as a result of "grid lock" where firms choose to supply their products and services to some group of consumers to generate greatest returns (wind fall profits), while ignoring other consumers (Gaffikin 2005, Baldwin, Cave, and Lodge 2012). Regulation is needed to set a standard to be applied by all firms. Such regulation might not be too tight that firms would like to circumvent it, but could be in the form a guarantee that firms should operate at a certain standard for the interest of the consumers.

Consumer Demand for Regulation: Consumers may demand that regulatory agencies impose certain forms of regulations on financial institutions to provide them with a level of service. Some of the reasons could be first, to lower transaction/search costs and information asymmetry involved in investigating and analyzing the credibility of financial institutions and their products/contracts. Second, consumers may demand for regulation due to unfavorable past experiences with financial institutions, as the value of most financial contracts (especially long term) are only known after the contracts are executed. Third, consumers may need protection against some risky commitments with financial institutions. Fourth, consumers may demand regulation to secure the economies of scale in self-monitoring and supervision as the regulatory bodies will carry out the monitoring function.

2.7. Objectives of financial regulation

Regulatory objectives should be to ensure financial stability by safeguarding the integrity, safety and soundness of financial institutions and the financial system as whole. Many researchers have different but related views about financial stability. Some see financial stability as a situation where the financial system works effectively, with efficient resource allocation, risks mitigation, debt settlements, and the ability to absorb economic shocks (Schinasi 2005, Schinasi 2004, Borio and Drehmann 2009). While Allen and Wood (2006) consider financial stability as a scenario in which the likelihood of occurrence of financial instability is minimized.

Due to the significance of financial stability, it has attracted the attention of both policy makers and academic researchers, but researchers' devotion towards financial stability has markedly increased since the recent global financial crisis of 2007/2008. Such researchers include among others, Buncic and Melecky (2013); Beck, De Jonghe, and Schepens (2013); Arnold et al. (2012); Huang, Zhou, and Zhu (2012); Schoenmaker and Wagner (2011); Huang, Zhou, and Zhu (2009); Acharya et al. (2009); Uhde and Heimeshoff (2009); Berger, Klapper, and Turk-Ariss (2009); and Beck (2008); Nier et al. (2007); Oosterloo, de Haan, and Jong-A-Pin (2007) and Goodhart (2006).

Regulatory objective has been described in two parts: (i) prudential and systemic regulatory objectives and (ii) market or business conduct regulatory objectives (Kremers, Schoenmaker, and Wierts 2003, Goodhart et al. 2013, Stewart 2001, Llewellyn 1999, Falkena et al. 2001, Di Giorgio, Di Noia, and Piatti 2000, Demaestri and Guerrero 2003, Wymeersch 2007). Although some approaches consider broader a set of financial objectives to include price stability through monetary policy (Kremers and Schoenmaker 2010) and financial market development through financial innovations and allowing new market developments for financial services (Pan 2010, Kremers, Schoenmaker, and Wierts 2003, Di Giorgio, Di Noia, and Piatti 2000). Falkena et al. (2001) posit that financial regulation should be narrowed down to a reasonable range of objectives. The larger the range of regulatory objectives, the more demanding and sophisticated the regulatory process becomes. Also, the wider the range of objectives, the more the complexity of regulation, the higher the cost of effective implementation, and the higher the potential for conflict between objectives. Therefore there seems to be a building general consensus to limit key regulatory objectives to only prudential and market conduct regulation thrusts.

2.7.1. Prudential Regulatory objectives

Prudential regulation focuses on the safety and soundness of financial institutions and links it to the financial system stability as a whole to mitigate potential systemic risk (Llewellyn 1999, Goodhart et al. 2013, Demaestri and Guerrero 2003, Allen and Herring 2001). Prudential regulation is further divided into macro and micro prudential financial regulation.

Macro prudential Regulation: The aim of macro prudential regulation is the control of systemic risk and social cost that is linked to the failure of Systemically Important Financial Institutions (SIFIs), which could destabilize the real economy (Herring and Carmassi 2008, Hanson, Kashyap, and Stein 2011, Stewart 2001). For instance, the failure of one SIFI could lead to general loss of

confidence in the whole financial system by the public. For the fact that if the financial system as a whole goes down, individual financial institutions go down as well, macro prudential regulation is more important than micro prudential regulation. Therefore, strengthening macro prudential regulation in the regulatory framework is very essential (Crockett 2000, Kremers and Schoenmaker 2010). On that note, macro prudential regulation has been the major focus of financial regulators, and is explained in detail in the latter part of this chapter.

Micro prudential regulation: Micro prudential regulation addresses safety and soundness of individual financial institutions rather than the whole financial system, notwithstanding the impact of financial distress in the overall economy (Hanson, Kashyap, and Stein 2011, Borio 2003). The regulation focuses on monitoring and inspecting individual financial institutions' compliance and adherence to prudential prescription, and enforcing corrective measures if need be (Herring and Carmassi 2008).

It has been argued that micro prudential regulation has not been effective in combating the global financial crisis, as it has largely ignored the financial system and focuses on individual financial institutions (French et al. 2010, Saporta 2010, Brunnermeier et al. 2009, Borio 2003, Kashyap, Rajan, and Stein 2008, Crockett 2000). The regulatory framework in place prior to the 2007/2008 global financial crisis was mostly micro prudential in nature, that is why such regulation was not effective in combating the global financial crisis. Its aim and approach to preventing the failure of the financial system is not fully thought out, as it limits risk of financial distress to individual institutions, (Hanson, Kashyap, and Stein 2011, Borio 2003). The micro prudential regulation controls include legally required capital, credit limits, portfolio investment limits, risk based capital ratios, and off-balance sheet regulations (Di Giorgio, Di Noia, and Piatti 2000).

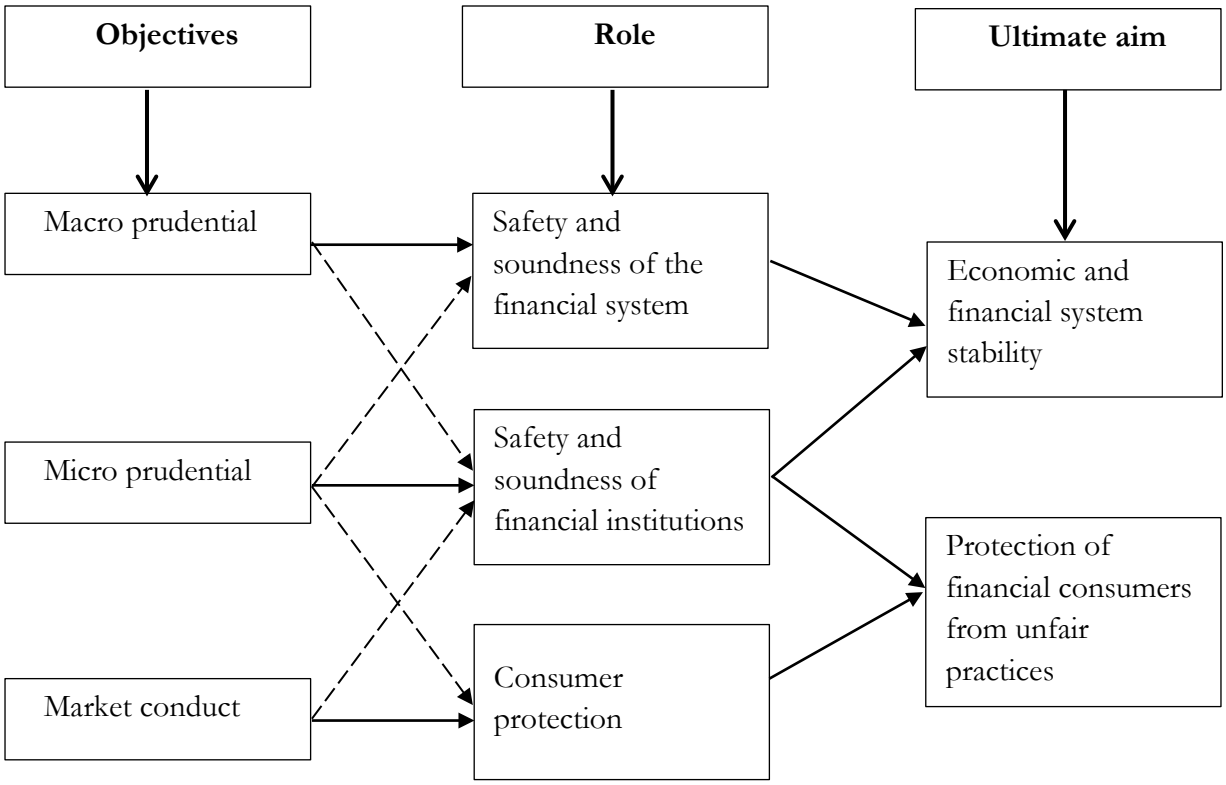
2.7.2.. Market Conduct Regulatory objectives

The rationale for market conduct regulation is to correct for market imperfections and externalities, which lead to market misconducts that reduce or eliminate consumers' confidence (Demaestri and Guerrero 2003, Carmichael 2004). Regulators should establish rules and principles to guide financial institutions' behavior and protect financial consumers from unfair practices such as fraud, misleading financial advice, and other forms of market abuse, thus improve consumer confidence (Llewellyn 1999, Goodhart et al. 2013, Herring and Carmassi 2008). The most vulnerable customers are retail customers who are unable to obtain necessary information to protect themselves from such

ill practices, but almost exclusively rely on information delivered by financial institutions and agents (Pan 2010).

To achieve market conduct regulation, regulators must address the issue of information asymmetry, by requiring financial institutions to publicly provide adequate information necessary for effective investment decision making by customers and investors (Pan 2010, Herring and Carmassi 2008, Llewellyn 1999, Carmichael 2004, Schoenmaker 2013, Wymeersch 2007). Apart from adequate information disclosure, customers should be provided with quality and objective financial advice by competent and well trained staff. While information explains the essential features of financial products and services, advice implies recommending a particular product or service based on customer's needs and affordability (Schoenmaker 2013). Also there should be cost-effective compensation should financial services firms be in breach of contracts against customers (Pan 2010, Falkena et al. 2001). The third pillar of the Basel II capital accord aims at facilitating market conduct regulation, it requires financial institutions, especially banks, to make financial information public for the benefits of depositors and investors (Basel 2004).

Figure 2.2: Regulatory objectives and their policy framework.



Source: Author's Construction

2.8. Macro prudential approach to financial regulation

The recent global financial crisis has revealed the weaknesses in financial regulatory frameworks and the need for a macro prudential regulatory approach instead of solely relying on micro based approach to financial regulation. Therefore; policy makers and academic researchers around the world have been advocating for the adoption of macro prudential approach in financial regulation [see Turner (2010); Caruana (2010); Hannoun (2010b); Allen, Babus, and Carletti (2009); Balogh (2012)]. Though there are different versions to the view of macro prudential objective, but all versions point to the general view of ensuring financial system stability by mitigating the risks and macroeconomic costs of systemic crises.

According to Clement (2010), macro prudential approach should be based on overall market intelligence and macroeconomic information with the objective of limiting cost of financial distress. This view is in line with Crockett (2000) and Kashyap, Berner, and Goodhart (2011). Brunnermeier and Pedersen (2009) posit that macro prudential policy should aim at balancing the differences in risk measurement during economic boom and bust, with the evidence that there is decline in measured risk in boom periods and subsequent rise during economic downturn. While Perotti and Suarez (2009b) posit that macro prudential policy should aim at individual banks (SIFIs) whose failure could lead to financial system instability, Hanson, Kashyap, and Stein (2011) added that macro prudential policy should aim at mitigating the social costs that arise due to general shrinking of assets in the financial system.

At least three rationales why macro prudential framework should be strengthened have been identified. First, the cost of financial instability could be too high to be ignored. According to IMF estimates, the cost of banking crises could be as high as 10% of GDP in many cases (Crockett 2000). Also indirect costs including negative impact on output and economic growth opportunities over time will definitely be high. Second, reliance on only micro prudential regulation might not be an adequate framework; excessive effort might be vested on deposit insurance for bail out in the event of failure of an institution. Though depositors may be bailed out by the safety net during financial crises, but they (depositors) are not spared from the long run effect of financial distress, which among others include higher costs of both physical goods and credits, and higher rate of unemployment (Crockett 2000, Borio 2003).

Third, with the nature of financial instability (cross-sectional/time dimension), strict micro prudential framework is less likely to be adequate in preventing the financial system failure. Cross-sectional dimension financial instability is financial system failure due to systemic risk through interconnected payments system and balance sheet interlinkages among financial institutions, especially SIFIs (Hellwig 1995, Huang, Zhou, and Zhu 2009, 2012, Allen and Gale 2000, Schwarcz 2008). This trend has shifted the too big to fail clause to too interconnected to fail (Pakravan 2011a). While time-dimension is failure through general exposure of all financial institutions to common economic risk factors over time. In other words it is evolvement of risk over time, in relation to financial and economic cycle, which is pro-cyclicality in the economy (Clement 2010). Financial system failure through time dimension is more severe, long lasting and is the major causes of financial crises around the globe (Borio 2003). To mitigate such economic wide risk, a macro rather than micro prudential approach is required.

2.8.1. Macro prudential tools[9]

To achieve the macro prudential objective, macro prudential tools are required to supplement other available policy tools (monetary and fiscal policy) for financial system stability. According to literature, some of the macro prudential tools include.

Time varying capital requirement:

Financial policy makers have been concentrating on increasing banks' regulatory capital (as a macro prudential measure) without considering one of the sources of time-dimensional financial instability; pro-cyclicality of the financial system (Admati et al. 2013, Goodhart 2010, Turner 2010, Repullo, Saurina, and Trucharte 2010, Saurina and Trucharte 2007). Hanson, Kashyap, and Stein (2011) proposed a time varying capital requirement for banks, where higher capital ratio is required in good time and lower in bad time. This proposal is supported by Kashyap and Stein (2004), who argue that counter cyclicality buffer is the major solution to the problem of pro-cyclicality in capital regulation. Basel III capital accord's countercyclical buffer of 0% to 25% in the recent proposals is in cognizance with Hanson, Kashyap and Stein suggestion. But they further argue that the implementation of countercyclical buffer of Basel III is based on country level credit provisioning, depending on the excessive credit growth; that regulators may face political challenges when requesting for the actual implementation.

[9] Also see Instruments for macro prudential policy; December 2011; Bank of England; A discussion paper. http://www.bankofengland.co.uk/publications/Documents/other/financialstability/discussionpaper111220.pdf.

Pro-cyclicality could lead to improper risk assessment in loan loss provisions and valuation of collateral using loan-to-value ratios. Dynamic loan loss provision mechanism adopted by Spain in 2000 seems preferable in risk assessment compared to static mechanism. It is forward looking and facilitates earlier detection and mitigation of credit losses in banks' loan portfolios (Saurina 2009b, De Lis, Pagés, and Saurina 2001), especially when credit risk of banks' profile along with business cycle is taken into consideration (Jiménez and Saurina 2007). On the angle of loan-to-value ratios, maximum ratios should be allowed to vary over time, instead of having a fixed figure despite the economic cycle (Borio, Furfine, and Lowe 2001).

Higher quality and quantity of capital:

Many researchers argue that higher quantity and quality capital adequacy is a major tool for macro prudential objective (Teglio, Raberto, and Cincotti 2012, Cincotti, Raberto, and Teglio 2012, Tirole 1994, Hanson, Kashyap, and Stein 2011, Rochet 1992), though some argue that holding high capital may be costly for banks especially during recession resulting in high cost of finance for firms that depend on banks' credit (Drumond 2009, Yilmaz 2009). Also it could reduce banks' willingness to negotiate for loan with potential clients (Thakor and Furlong Wilson 1995). Hellmann, Murdock, and Stiglitz (2000) add that deposit rate control should supplement sufficient high capital requirement, by putting a ceiling on the deposit rate banks charge to customers. Deposit rate control will limit excessive competition in deposit market, increase profit, reduce bank's incentive to invest in speculative asset, and motivate banks to invest in prudent assts.

The Basel accord addressed the capital requirement by increasing both the quantity and quality of banks' minimum capital requirement in Basel III. Currently 75% of tier 1 capital is based only on equity capital. Hanson, Kashyap, and Stein (2011) argue that though Basel III proposal looks pretty good, the major shortcoming is the very slow phase-in period (the higher required quality and quantity of capital will only be fully effective in January 2019). The justification for the slow phase-in period is to avoid asset shrinkage of banks instead of raising the actual capital, if they are compelled to comply with the requirement within a short period of time.

Hanson, Kashyap, and Stein (2011) further argue that pushing for banks to raise an incremental amount for every new set of equity claims issued, instead of capital ratio, would solve the problem of asset shrinkage. This is the type of stress test major US banks underwent in 2009, the Supervisory Capital Assessment Program (SCAP). In this program, banks were required to raise an amount on every new equity capital through equity issues or asset sales. Any bank that failed to raise the equity

through private markets faced imposition of equity injection from the treasury, which will place some restrictions on executive compensation (Bernanke 2009).

The program worked well then as most banks were able to raise even more than the required capital (see Hirtle, Schuermann, and Stiroh (2009) for full discussion on lessons from SCAP). SCAP was beneficial as regulators were strict on the program, banks were not given any choice on whether to issue equity, therefore the adverse selection that normally accompanies share issues was eliminated. According to Myers and Majluf (1984) if banks had the option of choice on whether to issue equity or not, their decision to issue may give signal to the public that management needs overhauling, such signal may affect the share prices if eventually issued. Hanson, Kashyap, and Stein (2011) recommend a program like SCAP for Basel accord, especially for troubled banks instead of slow phase-in time period of Basel III.

Gauthier, Lehar, and Souissi (2012) recommend an implementation of macro prudential capital requirement, where capital requirement is based on specific bank's risk contribution to the whole financial system rather than on individual bank size or probability of default. After analyzing a sample of Canadian banks, they found that macro prudential capital requirements could reduce both individual bank's default probability and likelihood of systemic crisis by about 25%.

Contingent capital:

During financial distress, private investors are usually reluctant to provide capital for banks, existing shareholder are also unwilling to dilute their stake with share issuance or fire sales (Brunnermeier 2008, Adrian and Shin 2010, Duffie 2010a). Many at times, the government had to inject equity through treasury, which is expensive to tax payers and usually affect bankers' incentives. To avoid this situation, banks should be required to hold contingent instruments that can automatically be converted to increase banks' equity in the time of distress (Avdjiev, Kartasheva, and Bogdanova 2013, Pazarbasioglu et al. 2011, Calomiris and Herring 2011, Pennacchi 2010).

Researchers have proposed two types of contingent capital: reserve or contingent convertibles and capital insurance. Contingent convertible (CoCos) allows a bank to issue debt securities that can automatically be converted into equity capital should the bank's stock market value or regulatory capital fall below a stipulated level (French et al. 2010, Flannery 2005, Flannery 2016, McDonald 2013). For instance, Lloyds Bank issued contingent convertible debt of 7.5 billion pounds in November 2009, which will convert automatically to equity if Lloyds' tier 1 capital ratio goes below

5%. While the first national proposal and adoption of contingent capital is the one by Swiss banking regulators. The proposal was to raise capital ratio for SIFIs to 19%, with 10% in common equity tier 1 and 9% in contingent capital (Pazarbasioglu et al. 2011, Hanson, Kashyap, and Stein 2011).

The second proposed contingent capital is capital insurance, where banks purchase insurance policy that will pay off in the event of financial meltdown (Kashyap, Rajan, and Stein 2008). To avoid the insurer defaulting at the time of settlement, the policy would be fully collateralized. The insurer would be required to lock up the full amount up front. For instance a bank may sign a contract for a capital insurance of R30 billion with a pension fund against economic downturn (drastic fall in banks' share price below a stipulated level) any time in the next 10 years. The contract terms will require the pension fund to lock up the R30 billion with a custodian. If economic downturn occurs within the next 10 years, the money is paid to the bank, if not the money is reverted back to the pension fund.

A similar case to pension fund insurance is where the executive compensation for key bankers is reformed by instituting bonus hold back. French et al. (2010) suggest several years of hold back on a significant portion of senior managers' compensation, which will not be in the form of stocks or options but in a fixed amount. Managers are to lose the amount in the event of bank failure or significant bailout from government. Bonus hold back is more advantageous in the sense that it provides buffer to the banks, also creates incentives, as managers will work hard so as not to lose their compensation. On the other hand, it increases profitability and shareholders' wealth. Managers also partake in bearing the risk of bank failure contrary to taxpayers and creditors bearing the risk where no holdback is implemented (Hanson, Kashyap, and Stein 2011).

Debt maturity:

The recent global financial crisis has identified that larger share of short term compared to long term debt in banks' balance sheet is also a source of banks' fragility (Hanson, Kashyap, and Stein 2011, Martin, Skeie, and Von Thadden 2014, Gorton and Metrick 2012, Brunnermeier 2008, Gorton 2009). The balance sheet of an average bank consists of majority of short term debts; deposits and whole sale funding such as repurchase agreements and commercial paper. In as much as depositors will be compensated through safety net in the event of banks' failure, so is not true of wholesale fund (Hanson, Kashyap, and Stein 2011).

Not every financial institution will be perfectly hedged in terms of maturity mismatch when they finance long term illiquid asset with short term liquid liabilities (Shin 2009, Adrian and Shin 2009a). Among other high profile bank failures, Northern Rock, Bear Stearns, and Lehman Brothers collapsed mainly due to refusal of repo and commercial paper creditors to roll over loans. The failures would have been avoided if the banks had more long term compared to short term debt (Shin 2009, Gorton and Metrick 2012, Duffie 2010b).

Maturity mismatch also creates huge externalities in the event of fire sales. If a bank has more short term debt and could not internalize it during a crisis, inability to roll over the short term debts will induce the bank to sale off its assets. This will impose fire sale on other banks with similar assets, as they watch the value of their assets diminish, hence regulating the level of short versus long term debt in a bank's balance sheet is necessary (Stein 2012). The net funding and liquidity coverage ratios of Basel III seem to be the best instrument to regulate maturity mismatch, though an optimal policy tool should consist of both capital, liquidity and net funding ratios, with additional penalty on short term funding in the form of tax (Perotti and Suarez 2009a, b, Perotti 2014, Brunnermeier and Pedersen 2009). Benigno et al. (2013) suggest that regulators should aim at combination of policies that would minimize the cost of financial crisis as well as policies that prevent its occurrence.

Shadow Banking Regulation:

Many regulatory policies for financial stability focus on the soundness of financial institutions, especially banks. An important question to be addressed is whether sanitizing the banking system alone is enough to stabilize the financial system as a whole (Kashyap, Berner, and Goodhart 2011). Many authors have argued that most of the regulatory policies and complexity of financial instruments have created incentives to move financial activities from banking industry to unregulated nonbank financial institutions i.e., "the shadow banking system" (Hanson, Kashyap, and Stein 2011, Pakravan 2011a, b, Stein 2010).

Such nonbank financial institutions are not being financed by deposits, but they are still subject to wholesale funding, such as liquidity transformation and credit issuance, but they are not officially subjected to traditional financial regulation (Gorton and Metrick 2012, Gorton 2009, Covitz, Liang, and Suarez 2009). They engage in securitization and hold tranches of asset-backed securities, based on different forms of credit cards, auto and student loans. The 2007/2008 global financial crisis has flagged the importance of shadow banking regulation. The failure of some nonbank financial

institutions like Lehman Brothers and Bear Stearns in 2008 caused the major problems during the global financial crisis (Kashyap, Berner, and Goodhart 2011).

For financial stability to be achieved, regulators should incorporate shadow banking activities while designing regulatory policies, (Adrian and Shin 2009b, Hanson, Kashyap, and Stein 2011). Regulators should impose equivalent capital standards on a given type of credit exposure, regardless of who is holding the exposure, whether it is a bank, broker dealer, hedge funds, or special purpose vehicle. The easiest way to achieve such regulation is through broad-based regulation of haircuts on asset-backed securities (Hanson, Kashyap, and Stein 2011). Regulators should cap an optimal amount of short term fund 'haircut" that could be issued against asset-backed securities, also the haircut should vary with economic conditions to combat pro-cyclicality (Stein 2012). Haircut will alter interbank loan activities, if a nonbank financial institution is compelled to commit more of its own capital as collateral for securitized loan, the volume of such activity will be minimized. Therefore in the event of loan default, the interbank loss and default is reduced with lower spillover effect (Kashyap, Berner, and Goodhart 2011).

2.8.2. Test of macro prudential tools

Testing the effectiveness of macro prudential tools is still far from being subjected to empirical analysis due to the facts that some of the tools were recently introduced. Data needed to analyze macro prudential polices are scarce, it is work-in-progress to clarify what kind of data is needed for such analysis. Satisfactorily established models are required to capture the interaction between macro economy and financial system. See (He and Krishnamurthy 2014, Brunnermeier, Gorton, and Krishnamurthy 2011) on macro prudential data collection requirements. Despite the difficulties in measuring macro prudential polices, in recent years few empirical works have tried to scale the huddles, by applying some approaches to testing the effect of macro prudential tools. Some of the approaches applied and the outcomes are explained as follows.

The use of event studies on cross section of countries and central banks, example by IMF (Hilbers et al. 2005, Crowe et al. 2013, Lau and Terrier 2011), and BIS (Montoro and Moreno 2011). Most of the researches on housing boom show evidence of positive correlation between well managed loan-to-value ratios and underlying forces on house prices. Though Crowe et al. (2013) indicate that one of the limitations to the result is limited availability of data on loan-to-value ratios. Other studies on macro prudential polices and real estate booms include Crowe et al. (2012); Wong et al. (2011); Igan

and Kang (2011); and Wong et al. (2004). Also using event studies, evidence from emerging economies shows that reserve requirements used partly for financial stability purposes could smoothen credit growth and stabilize capital flows in private sector (Montoro and Moreno 2011).

A second approach is the use of authorities and public observation assessment on the effectiveness of macro prudential instruments (Borio and Shim 2007, Borio, Furfine, and Lowe 2001). Assessment based on both authorities' and individual countries' view might not be productive in assessing the effectiveness of macro prudential policy tools. While authorities' views may be subjective, individual countries' and banks' experiences may be counterfactual, not knowing the actual effect of not having macro prudential measures in the financial system (Galati and Moessner 2013). Borio and Shim (2007) conclude that best assessment for effectiveness of macro prudential tools is through a more methodological and regular analysis of different events and occurrences in the financial system.

Third, reduced form of regression analysis of cross-country studies was also applied to analyze the effect of macro prudential tool on the pro-cyclicality of credit growth, leverage and capital ratios, an evidence of reduction in systemic risk and financial instability was indicated[10]. Though the method failed to capture the interaction between policy, financial, and macroeconomic variables, Systemic risk is reduced by minimizing pro-cyclicality mostly through credit or liquidity related measures like loan-to-value ratios and reserve requirements respectively (Galati and Moessner 2013).

Fourth, the use of Dynamic Stochastic General Equilibrium (DSGE) model to simulate macro prudential polices (Antipa, Mengus, and Mojon 2010) or the use of large-scale global macroeconomic model for National Institute of Economic and Social Research (NIGEM) (Catte et al. 2011). Using DSGE model on the effect of macro prudential policies in US, UK and other Euro areas, Antipa, Mengus, and Mojon (2010) find macro prudential tools could smoothen past credit cycles if earlier applied and could reduce the effect recent economic depression.

Research on the use of statistical or dynamic loan loss provision approach adopted by Spain in 2000 as a macro prudential tool indicates that its nature of counter cyclicality allows it to generate buffer during lending booms which will be used in recession (De Lis, Pagés, and Saurina 2001, Caruana 2005b, Saurina 2009a, b). Though dynamic loan loss provision approach is not without a fault, but

[10] See IMF Global Financial stability Report; Grappling with crisis legacies; September, 2011. Available at, http://www.imf.org/External/Pubs/FT/GFSR/2011/02/index.htm

Saurina (2009b) provides empirical evidence on how loan loss provision in Spain has evolved since 2000 with low level of problem loan till 2007. Fillat and Montoriol-Garriga (2010) also posit with empirical evidence that US banks would have been in a better position to absorb their loan portfolio in the 2007/2008 global financial crisis, if the dynamic loan loss provision approach was adopted.

2.9. Structure of Financial Regulation

Another requirement according to Pan (2010), for an optimal financial regulatory system is its structure. The global financial systems have undergone structural and operational changes, and become more complex due to dynamic improvement in technology, increased competition, speedy product innovation, and trade reforms (Wymeersch 2007, Allen and Santomero 1997, Santomero and Trester 1998, Pakravan 2011a, b). But the major issue is if the regulatory structural changes are optimal to sustain the complex financial system, as well combat financial crises caused by market instability.

Different jurisdictions adopt different regulatory structures, for instance, the United States has many federal and state regulators that individually focused on banks, security firms and, insurance companies (sector-based regulation and multiple regulatory model). The United Kingdom has Financial Services Authority (UK FSA) which carries out almost all the regulatory tasks (single regulatory model), while Australia and Netherlands split regulatory tasks between two large regulators (twin-peaks regulatory model). Although the United Kingdom is moving towards twin-peaks regulatory model so quickly and urgently, which was made obvious, in June 2012, in Mervyn King's (former Governor of Bank of England) speech, "We need to put it right…. both the culture and structure…from excessive levels of compensation to shoddy treatment of customers".

Other countries like France, Canada, and South Africa are also moving towards adopting features of twin-peaks model, the US Blueprint of 2008 and original Dodd-Frank Reforms of 2010 were based on twin-peaks modelling (though not all have been implemented) (Pan 2010, Botha and Makina 2011, Dodd-Frank 2010). For the purpose of delineation, we explain three structures of regulatory system; sector-based, activity or functional-based, and objective-based regulation.

2.9.1. Sector-based regulation

Sector-based regulation is a traditional form of regulation, where financial services firms are regulated based on their main line of businesses — banking, insurance and security sectors (Pan 2010, Di Giorgio, Di Noia, and Piatti 2000). The United States operates one example of sector base

regulation; National Credit Union supervises credit unions, Office of Thrift Supervision regulates savings and loans, state banking authorities regulate state chartered banks, and Office of Comptroller of Currency regulates federal chartered banks. Justification of sector-based regulation is based on the fact that each regulatory body understands the activities and practices of each regulated sector, as they already developed profound expertise in their respective sectors (Pan 2010).

The major problem with sector-based regulation is that it could be inconsistent, especially while regulating financial conglomerate. Many large financial institutions provide financial services across the three financial sectors. It means that such institution will report to three different regulators, each specializing on different services without a single regulator responsible for the overall health of the institution (Pan 2010, Botha and Makina 2011). Secondly, there could be inefficiency in identifying and managing systemic issues, as each regulator concentrates in regulating only small part of the financial system.

2.9.2. Activity-based regulation

An alternative to sector-based regulation is the functional or activity-based or hybrid model of regulation. In this type of regulation, separate regulators are responsible for different financial activities being carried out by all financial sectors. For instance, one regulator will take charge of deposits and lending, another with derivatives trading, third, with sale of insurance contracts, forth with investment management, and fifth with issuance of securities and trading in all the three financial sectors (Botha and Makina 2011, Pan 2010).

An advantage is that it allows for identification of systemic problems, as supervision is extended to numerous institutions (shadow banking) that are too small to be subjected to a traditional (sector-based) regulation or with limited scope of financial services. For instance some companies that could never be classified as financial institutions (especially clothing and home ware companies) undertake some financial activities and issue credit cards to their customers. Such companies are not regarded as financial institutions, therefore are not covered under sector based regulation. The flaws of activity-based regulation are that a single firm will be regulated by several regulators, each with different rules and authority, which will make it difficult to ascertain different objectives and boundaries of each regulator (Wymeersch 2007, Llewellyn 2006). Moreover, no regulator among the several will have complete information and control required by the firms to contribute to the stability, safety and soundness of the overall financial system.

2.9.3. Objective-based regulation

The objective-based regulation is another option to the sector-based regulation, where regulators' responsibilities are arrayed according to regulatory objectives required to ensure the safety and soundness of the financial system (Pan 2010, Di Giorgio, Di Noia, and Piatti 2000). Objective-based is similar to activity-based regulation, in the sense that both approaches consider the conglomerate aspect of financial institutions, instead of specializing in the three traditional sectors. The major difference is that objective-based is focusing mainly on achieving the regulatory objectives while regulating the different activities of the financial institutions. Also the activities are well grouped according to similarities to avoid having so many regulatory bodies with conflicting interests. This approach seems to suit the modern financial system, where financial institutions are no more exclusively classified into three sectors; banking, insurance, and securities issuance.

In objective-based regulation, regulators maintain a degree of specialization as well as a general view of financial system. This general view will increase the chances of the regulators to prevent and/or monitor systemic problems. Llewellyn (2006) recommends objective-based regulation, because regulators might be most effective and efficient if they have a clear and specific defined objective. Secondly there might be an increased level of transparency and accountability when an objective is clearly and precisely defined. A major issue to consider in objective-based regulatory structure is to decide if regulatory authority should be in the hand of a single regulator (single regulatory model), two regulators (twin-peaks regulatory model), or multiple regulators, with one regulator overseeing the other regulators (lead regulatory model).

Single regulatory model:

The single regulatory model assumes that one regulatory agency can simultaneously and efficiently achieve all the regulatory objectives (Di Giorgio, Di Noia, and Piatti 2000, Pan 2010, Briault 2002). This model is justified by its uninterrupted regulatory power over all aspect of the financial system, and the assumption that it could provide transparent accountability as all regulatory inquiries and objections are directed to a single regulator. Also its implementation in United Kingdom's in 1998, led to cost reduction in the first four years.

However, the assumption that a single regulatory model could efficiently and effectively meet all regulatory objectives is easier said than done. Single regulators make independent decisions, contrary to where regulatory decision would have been among several regulatory agencies. The risk is that authorities may seek their personal interests at the expense of public interests, which could result to

under-regulation and misappropriation in allocation of scarce resource (Posner 1974). On the other hand, single regulatory model could lead to over-regulation, where the regulator exercises monopoly power as no competitor exists to oppose the regulatory process (Herring and Carmassi 2008). Public interest theory of regulation is against monopoly as it hinders allocation efficiency and technology developments (Kane 1984, 1997). Lastra (2003) argues that it may be possible for a single market with a single currency to need a common rule, but requiring a single supervisor may be quite disastrous in estimating systemic issues.

Twin-peaks regulatory model:

The twin-peaks regulatory model is defined by the G30 (2008) as a regulatory model by objective, where two regulators will independently be responsible for the prudential and market conduct regulatory objectives, while regulating the functions and activities of financial services firms rather than the form (i.e., the different sectors). Twin-peaks model is designed to incorporate the benefits and efficiencies from single regulatory model, namely, reducing costs and regulatory redundancy, and introducing clearer lines of regulatory responsibilities, but disregards the fact that all regulatory authorities be combined as one body (Pan 2010, Botha and Makina 2011).

One concern over twin-peaks is that coordination problem might exist between the two independent regulators, especially as they try to achieve conflicting objectives. Such potential coordination problem might be high when the two regulators regulate the same financial firm, especially in this modernized financial system where large financial institutions conglomerate into banking, insurance, and security activities. To account for the problem, Pan (2010) suggests for a coordination mechanism to supplement twin-peaks, but this task might not be assigned to elected government officials, as they might politicize the regulatory process. This confirms Dincer and Eichengreen (2012) findings that countries with regulatory authorities independent of the government are more conservatively regulated and have more stable financial system.

Lead regulatory model:

In a lead regulatory model, multiple regulators exist with clearly defined lines of regulatory authorities, but a single regulatory agency (lead regulator) assumes the responsibility for coordinating and monitoring the activities of the several regulators (Pan 2010). Private interest theory of regulation is in support of twin or multiple regulatory bodies, in the sense that competition among different regulatory bodies may help generate information and equally strengthen incentives for efficient regulation (Kane 1997). Also public interest theory of financial regulation is against

monopolistic government regulatory system, as it may be sluggish to identify changes in policy making technologies (Kane 1984). The concern over lead regulatory model is that the lead regulator might not be competent enough to evaluate and analyze its own regulatory interests, as well as the interests of other agencies. Also the lead agency might rank its own regulatory interests over all other agencies' interests, which will likely pose high risk of regulatory failure.

PART 3 FINANCIAL REGULATORY POLICIES

2.10. Basel I Capital Accord

There were frequent occurrences of global bank failures in the 1970's and 1980's; for instance, United States National Bank in 1973, Franklin National bank in 1974, and Continental Illinois National Bank and Trust in 1984. The Bankhaus Herstatt of Germany also failed in 1974, while one of the largest banks in England (Johnson Matthey Bankers Ltd) experienced great financial difficulties, between 1982 to 1984, including profit decline by almost two-third due to increase in loan losses provisions. Also in the 1980s and 1990s, many countries, including Venezuela and Mexico implemented financial liberalization/deregulation, which was not favorable; instead of experiencing stability, these countries experienced bank failures and economic meltdown (Vera 2000, Stein, Cuesta, and McLennon 2002, Demirgüç-Kunt and Detragiache 1998b).

To mitigate or prevent bank failures and their contagious effect, 10 central bank governors among the world's largest economies (G10 countries)[11] met in February 1975 to institute a committee to enhance banking regulation and supervision. Later in 1987, the committee met in Basel, Switzerland to establish and promote regulatory/supervisory framework for efficient and effective banking and finance practices (Basel 2001). This group was later renamed Basel Committee on Banking Supervision (BCBS), as at the time of this research BCBS is made of 27 jurisdictions[12].

The BCBS approved a regulatory framework in December 1987, released to banks in July 1988, with two fundamental objectives; to reinforce the stability and soundness of the global banking system; and to limit the existence of competitive differences among banks globally (Basel 1998). This framework is referred to as Basel I capital accord. To achieve the above mentioned objectives, Basel

[11] G 10 is made up Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, United Kingdom, and United States; the group was formed since 1962 to take part in General Arrangement to Borrow (Altman and Sabato). The group was amended in 1964 to add the eleventh member, Switzerland, while Luxembourg is an associate member, but the name "G 10" remained unchanged.
[12] The G 10 members, plus Argentina, Australia, Brazil, China, Hong Kong SAR, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, Singapore, South Africa, Spain, and Turkey.

I came up with three proposals. First, to set up a minimum regulatory capital ratio for international active banks, second, to give a definite definition of regulatory capital, and third, to provide a uniform approach for calculating the capital adequacy ratio of banks.

2.10.1. The Minimum capital requirement

Basel I accord mandated banks to have an equity cushion (minimum capital requirement of at least 8% of banks' capital to its total assets), to protect the depositors in the event of bank failure. According to Basel I, the total assets are not the total nominal value of banks assets. Rather banks' assets were recalculated based on banks' risk exposure, referred to as banks' Risk Weighted Asset (RWA). Thus the minimum capital ratio of banks is stated as capital divided by RWA, which should not be less than 8%.

2.10.2. The Concept of capital

Before the Basel I proposal, there was no definite definition of capital for banks except the normal accounting definition of asset - liabilities = equity or capital. One of the major achievements of Basel I was the setting up a definite definition of capital for banks from the regulatory perspective. The BCBS defined capital in two categories **(tier 1 and tier 2)**, based on quality of capital as well as their low priority in relation to repayment should a bank go bankrupt of becomes insolvent. The Basel committee decided that **tier 1 capital** should be made up of issued and fully-paid ordinary stocks, as well as perpetual non-cumulative preference shares, published and disclosed reserves from post-tax retained earnings. Other surpluses such as share premium, general and legal reserves are also included. According the Basel I, tier 1 capital should consist of 50% of banks' capital base, which means that tier 1 capital should be 4% of banks' RWA.

Tier 2 capital is prioritized over tier 1 in terms of capital repayment in the event of bankruptcy. The following categories of capital are included in tier 2: undisclosed reserves, revaluation reserves, general provision/loan loss reserves (which is limited to 1.25 percentage points of RWA), hybrid debt/equity capital instrument (instruments with certain features of both debt and equity), and Subordinated term debt (subordinated debts with over five years maturity life limited to maximum of 50% of core capital, and is subject to amortization arrangement).

2.10.3. The risk weights

Basel I Accord focused on credit risk in setting up the minimum capital requirement for banks but further extended it to country transfer risk. Also, the Basel I's revised version of 1996, later

incorporated market risk in its assessment of capital adequacy (Basel 1996). The focus on credit risk is typically due to its high correlation with default risk; therefore riskier assets (assets with high default risk) should be protected by holding and maintaining high equity level in relation to debt. In calculating the risk weights, banks' assets are categorizing into four risk buckets of 0%, 20%, 50%, and 100% (see table 2.1). The risk category determines what value of asset to be included in adjusting the risk weighted assets (RWA). To account for the country transfer risk, the BCBS decided to use full OECD[13] member countries as a measure of credit standard. This is to factor in the fact that transfer risk and credit standing greatly differ between countries, especially between developed and developing countries.

Table 2.1: Categorization of Basel Accord's based RWA

Risk Weight	Class of Assets
0%	Cash, treasury bills, notes, bonds, and gold, obligation on OECD governments and U.S. treasuries.
20%	Claims on OECD banks, agency backed securities issued by the U.S. government, and municipalities' issues.
50%	Regular residential loans.
100%	Other claims such as consumer loans, corporate bonds, credit cards, claims on non-OECD banks, equities, real-estate, plant and equipment.

In determining the capital adequacy ratio, Basel I also incorporated credit risks associated with off-balance sheet engagements both trading and non-trading activities. The accord stipulated that off-balance sheet activities be converted to credit risk equivalent using a credit conversion factor of 100%, 50%, 20%, 0%, depending on the type of off-balance sheet activity or transaction (Basel 1998). The off-balance sheet instruments will be multiplied by the conversion factor, the product is then weighted along with other assets to get the RWA.

The credit risk equivalent of interest and exchange rates related items (forwards, swaps, futures, options) are calculated differently. The interest and exchange rates are calculated using either the current exposure method by marking the contracts to market (to cover for market risk), then add a factor to cover for future exposures for the remaining life of the contract. The second option is to use the original exposure method where the conversion factor is applied on the nominal value of each contract in relation to its type and maturity.

[13] Organization for Economic Co-operation and Development (OECD) is an international organization dedicated to global development.

In 1996, the BCBS revised the Basel I accord to incorporate market risks in determining the capital adequacy ratio, and redefined capital to incorporate the third tier (tier 3), which consist of short-term subordinated debt (Basel 1996). The major purpose of tier 3 capital is to have a proportion of capital to subsume for the market risk, in other words, banks are only allowed to use short-term subordinated debts to support market risk. For short-term subordinated debt to be considered a tier 3 capital, it must be unsecured and fully-paid, within at least two years of original maturity period. It must not be repaid before its maturity, except with supervisory authorities' consent, and must be issued with a clause that both interest and capital may not be paid if bank's capital ratio is maintained below the capital adequacy ratio.

2.10.4. Basel I implementation and its criticism

Basel I implementation appeared efficiently in the Basel Committee states, by 1999, most countries; including emerging market countries had adopted Basel I Accord. Like many other regulations, the Basel I accord threw up unintended consequences; for instance, it perversely encourages risk seeking behavior, and promoted the loan securitization, which unwittingly led to the relaxation in the subprime market[14] (Berger, Herring, and Szegö 1995, Jackson et al. 1999). The Accord eventually succeeded in raising the total level of equity capital in the global banking system, without a positive effect in economic activities (Rime 2001a, Goodhart, Hofmann, and Segoviano 2004).

It might be possible that increased capital could reduce excessive risk taking (Rochet 1992, Tirole 1994), but the critical issue is that an expectation and anticipation of future capital requirement may induce banks to take excessive risk today in anticipation of higher returns which will boost capital level. On the other hand, if many banks experience low returns at the same time, there is a tendency that they will take measures to ensure capital adequacy at the same time. If they all decide to shrink their assets by reducing lending instead of recapitalization, that will result to an unpleasant chain reaction (credit crunch). Decrease in credits availability leading decrease in investment opportunities, unemployment is increased, which in turn reduces production activities as well as cash flow from production, leading to high default rate, thereby reducing banks' returns from outstanding loans (Hanson, Kashyap, and Stein 2011, Blum and Hellwig 1995, Acharya 2009, Goodhart, Hofmann, and Segoviano 2004, Santomero and Watson 1977).

[14] Subprime market is a market for subprime credit, a credit for clients of questionable or insufficient credit histories.

Goodhart, Hofmann, and Segoviano (2004) studied the macroeconomic effect of Basel I and find that capital asset ratio (CAR) in the USA increased from 9.5% to 13% between 1990 and 1993, which was due to both increase in regulatory capital and reduction in risk-weighted assets. This denotes that the increase in CAR could have led to a decrease in credit supply to the economy (credit crunch). They also prove that economic activity is closely correlated with credit creation by assessing the real GDP and lending growth in USA since 1965 [see also Friedman et al. (1993); Berger and Udell (1994); Walsh and Wilcox (1995); Lown, Morgan, and Rohatgi (2000); Lown and Morgan (2006)]. A research by Peek and Rosengren (1995) on New England on all large banks insured by Federal Depository Insurance Corporation (FDIC) also revealed that banks reduce credit more when under enforcement action. Thakor and Furlong Wilson (1995) also found that increase in capital requirement reduces banks' willingness to renegotiate future loan with clients.

Other studies with negative views on higher capital requirement include Besanko and Kanatas (1996), who argue that enforcing an accounting-based capital requirement on some capital of impaired but solvent banks may have the perverse effect of reducing the market value of the banks' equity, which in turn would lead to the inability of such banks to satisfy market-based capital standards. Santos (2001) Brealey (2006) add that raising minimum required capital standards may improve banks' stability but it is also a potential source of operation costs in banking business, which may lead to inefficiency, as other intermediaries may not be perfect substitutes to banks.

Some of the limitations noticed in the styles proposed by Basel I Accord, among others, which led to its first amendment and revision in June 2004 (Basel II) include: First, while the alleged aim of Basel I Accord was to set up a minimum capital standard for internationally active banks, it's "ulterior" objective was to "level the playing field" by reducing or eliminating the funding-cost advantage of banks in Japan. But this advantaged Japanese banks to hold more than 1/3 (one-third) of international lending (Wagster 1996).

Second, capital is difficult to define, as well as difficult to measure and monitor, especially as the BCBS stipulates in most cases that inclusion and deduction from capital are at the discretion of the national supervisory authorities. The national accounting methods vary from country to country, this will result in different countries applying different definitions of capital while adjusting for RWA (Tarbert 2000). Third, Basel I risk assessment do not align with actual level of risks. It did not consider the various levels of macroeconomic risks within various countries; rather, it presumes an

average market for all (Jones 2000, Griffith-Jones and Spratt 2001, Decamps, Rochet, and Roger 2004). Also the Accord focused only on one aspect of financial regulation (capital adequacy) ignoring all other factors (e.g. legal and accounting systems that could differentiate the regulatory regimes in different countries (Pop 2006).

Fourth, the risk-weights distinction is unfair and suboptimal. For instance countries like Estonia, Chile or Slovenia receive the same risk weight as United Kingdom and the United States. The same issue is applicable to 100% weight assigned to corporate debts, disregarding the credit status of individual issuers (King and Tarbert 2011, Jones and King 1995, Griffith-Jones and Spratt 2001). The lower (20%) risk-weight assigned to short-term loans for OECD banks created a favorable bias for them, relative to non-OECD banks. The risk-weight of 100% assigned to non-OECD credits with more than one year maturity is far higher than 20% of that of OECD members. This bias creates a distorting motivation for developing countries to seek OECD membership. The risk-weight could as well encourage regulatory arbitrage, whereby banks engage in loan securitisations, and shift their portfolios to lower quality assets (Benink and Wihlborg 2002).

2.11. Basel II Capital Accord

The flaws of Basel I along with advancement in risk management approaches and technologies in the financial market led to the development of a new Basel Accord (Basel II) in June 2004. The primary aim of Basel II is to ensure accurate risk measurement to reflect the actual risk level in banks' assets, thereby reducing banks engagement in regulatory arbitrage, which was one of the problems associated with Basel I. To achieve this aim, the accord built its foundation on three pillars. The first pillar retained the minimum capital requirement of Basel I, with new rules for measuring risk for different kinds of assets. The second pillar is an internal assessment procedure by national regulatory authorities, while the third pillar is proper risk disclosure to ensure transparency and enable market discipline.

2.11.1. Pillar 1, Minimum Capital Requirement (incorporating operational risk)

The first pillar of Basel II requires bank to maintain a minimum capital adequacy ratio of 8% of RWA as stipulated by Basel I. Pillar one maintained the approaches laid by Basel I in calculating the minimum capital ratio, but incorporated operational risk in measuring the RWA of banks. Pillar one employed more complex approaches in measuring the credit risk; the standard risk-based, the foundation internal risk-based, and the advanced internal risk-based approaches.

2.11.1.1. The standardised risk-based approach

The standardised approach maintained Basel I's approach to risk assessment with few amendments; adding two more risk buckets (150% and 35%) and abolishing of the OECD distinction of risk assessment. Also asset risk is measured and assigned to buckets based on credit ratings by external rating agencies. The choice of external rating agencies (like Standard and poor's, Moody's and Fitch) depends on the national supervisor's assessment based on objectivity, transparency, credibility and independence, among other criteria.

Basel II provided different risk weights for sovereign governments, banks, and corporate institutions (see table 2.2). The proposal also suggested an option to use export credit agencies (ECAs) in rating sovereign risk. The essence of this supplement is to address the concern that private rating agencies might not be able to detect warning signs of potential crises and adjust accordingly. Meanwhile there are concerns that some ECAs might be dependent of government which renders their credibility and transparency questionable. The BCBS provided two options in assessing bank's risk weights, the choice of an option by national supervisors should be consistence across all banks in their jurisdiction. Under the second option, the BCBS offered a favorable preferential risk weight to short-term debts with original maturity of three months or less. The risk weight of 35% is not reflected in the rating categories, as it is exclusively meant for mortgages fully secured for residential purposes. Basel II retained the credit conversion factors for off-balance sheet items of the Basel I.

Table 2.2: The standard risk-based approach

Weights/Credit Ratings			**AAA to AA-**	**A+ to A-**	**BBB+ to BBB-**	**BB+ to B-**	**Under B-**	**Unrated**
Sovereigns		Risk weights %	0	20	50	100	150	100
		ECA risk scores	1	2	3	4 to 6	7	
		ECA Risk weights	0	20	50	100	150	
Banks	**Option 1**	Risk weights %	20	50	100	100	150	100
	Option 2	Risk weights %	20	50	50	100	150	50
		Short-term debt %	20	20	20	50	150	20
Corporates		Risk weights %	20	50	100	100	150	100

2.11.1.2. The Internal Rating Risk-Based Approach (IRB)

Internal risk-based approach (foundation and advanced) was designed to allow larger and more sophisticated banks to adopt an internal risk management approach in measuring credit risk. To assess a bank to be larger and more sophisticated, such banks must satisfy some minimum requirement set up by the BCBS, which include among others: meaningful risk category, accuracy of

the rating system and processes, high level of transparency, effective data collection, and accurate estimation of borrowers' default probability.

IRB approach is based on four risk components which should be applied by banks in estimating credit risk; Probability of default (PD), which measures the possibility of a borrowers' default in loan services; Loss Given Default (LDG), which is the estimated loss banks would incur in the event of borrowers' default (1- recovered); Exposure at Default (EAD), which is the amount banks are entitle to lose due to loan default; and Effective Maturity (EM), which is the life span of banks' assets. If the estimation of the risk components is flawed, the IRB approach will have little or no effect in its risk-sensitivity over Basel I and standard risk-based approach of Basel II.

For this reason, the BCBS will ensure that banks comply with the above requirements before deploying IRB approach. The two components of IRB only differ on how and who determines the risk-weights to be assigned to the risk components. Under the foundation internal risk-based approach, the PD is internally determined by banks, but is subject to supervisors' approval. The EM is set at 2.5 years, except for repo transactions where EM is set at 6 months. Under the advance internal risk-based approach, all the four risk components are measured by banks, but subject to supervisor's approval.

The BCBS also requires that banks should cover for exposures arising from securitisation, based on the supervisors' review depending on the economic effect of such transaction. The standardised approach treats securitisation exposure by applying the same risk weight of the underlying exposure securitised. Under IRB approach, the risk weight for securitisation exposure is separated into long-term and short-term rating category based on external credit ratings (See table 2.3). While determining the minimum capital ratio, any ratings below B+ or unrated under long-term category and ratings after A-3/P-3 or unrated under short-term category is deducted from capital (50% from tier 1, and 50% from tier 2 capital).

Table 2.3: Securitization exposures

Long-term rating category	**AAA to AAA-**	**A + to A-**	**BBB+ to BBB-**	**BBB+ to BB-**	**B+ and below or unrated**
Risk weight (%)	20	50	100	350	To be deducted
Short-term rating category	**A-1/P-1**	**A-2/P-2**	**A-3/P-3**	**-**	**Other ratings or unrated**
Risk weight (%)	20	50	100	-	To be deducted

To account for operational risk in measuring RWA, Basel II required banks to apply either or combination of different methods, (a) basic indicator approach (b) standardised approach and (c) advanced measurement approach. The basic indicator approach requires banks to hold capital against operational risk which must be equal to 15% of average banks' gross income for more than three previous years. Gross income must be greater than zero to be qualified as an indicator.

Standardised approach is similar to basic indicator approach with the exception of using gross income for different business lines with varying indicators (%). Basel II outlined eight different business lines with different indicators to be used as a proxy for banks' business operation, which include corporate finance, payment and settlement, and trading and sales with 18% indicator; commercial banking and agency services have 15%, while retail banking, retail brokers, and asset management have 12%. The sum of the capital charges against the eight business lines gives the amount of capital banks will hold against operational risk.

Using the advanced measurement approach (AMA), the buffer for operational risk will equal the risk measure stipulated by the banks' internal operational risk measurement system. For a bank to qualify for either standardise approach or AMA, such bank must be operating with a sound risk management system applied with integrity, also with satisfactory resources in the major business lines outlined by Basel II.

2.11.2. Pillar 2, Supervisory Review

The second pillar of the Basel II Capital accord required national supervisors to carry out reviews on banks' operations while implementing the capital adequacy ratio of pillar 1. Pillar 2 provides supervisors with confidence to assess individual bank's risk profile and consider remedial action where necessary (Jackson 2001). Estrella (1998) argues that formulas and figures may be necessary in regulation, but here could be gaming and manipulations of figures, especially for banks using internal ratings.

Banks may place relatively high risk with high return assets in a low risk bucket (risk arbitrage). There might be penalties on banks that intentionally miss-match risks, but it might be impossible to impose penalty on a bank whose risk behaviour has led to distress and bankruptcy (Benink and Wihlborg 2002, Carey and Hrycay 2001). On that note supervisory review perhaps might be more essential than the rule-based regulation, especially for larger and more sophisticated banks (Saidenberg, Schuermann, and Center 2003).

2.11.3. Pillar 3, Market Discipline

Pillar 3 consists of disclosure requirements to allow market participants assess the soundness and stability of financial institutions, especially banks. The rationale behind market discipline is that banks perceived to be stable in the market place perhaps will be preferred by creditors, investors, and depositors, to banks perceived to be riskier (Tarbert 2000). Pillar 3 of Basel II requires banks to disclose publicly all issues concerning banks' capital and its level of adequacy as a buffer against risks exposures. The committee requests banks to publicly disclose information semi-annually, with the exception of a general summary of banks' risk management policies and objectives, which should be made public annually. But the committee request that systematically important financial institutions disclose their total capital, capital adequacy ratios, and tier 1 capital on a quarterly basis. Another important fact in pillar 3 is that the committee considered the need for banks to withhold proprietary or personal and confidential information during information disclosure.

2.11.4. Criticism of Basel II

2.11.4.1. Levelling the playing ground

One of the objectives of the BCBS is to level the financial playing field among nations, which Basel I failed to achieve. Basel II still failed to address the economic and legal differences among nations, which could make the playing ground uneven. More importantly, the internal rating-based approach is to be applied by sophisticated banks, most likely banks in developed countries. Since the IRB approach could reduce capital adequacy ratio for a qualified bank, a bank applying the standardised approach is likely to be left with higher capital requirement, with effective competitive disadvantage (Tarbert 2000, Dhumale 2001).

In this regard, the playing ground was still not levelled. The global financial crisis of 2007/2008 revealed the inaccuracy in the definition of capital, especially tier 1 capital and placing the capital ratio at 8%. Banks were able to restructure financial products with lower cost of capital to enable them comply with Basel II (King and Tarbert 2011, Tarbert 2000). Just as Basel I, Basel II also did not consider the positive effect of portfolio diversification in risk reduction, measurement of required capital is strictly based on individual assets instead of on the entire banks' portfolio.

2.11.4.2. The standardised risk measurement approach

The use of rating agencies might be seen as breath of fresh air in the financial system burdened with regulatory laws. Ratings make it easier for market participants to evaluate firms (Tarbert 2000). But the criticisms and negative effect generated by the use of rating agencies are huge. The risk

bucketing is not well categorised, it did not reflect the actual loss experience of institutions. In table 2.2, all unrated borrowers belong to 100% risk weight without proper differentiation, also borrowers of different risk profiles belong to the same risk bucket, (for instance AAA to AA-, A+ to A-). This scenario could induce regulatory arbitrage as banks will concentrate on lower risk profile borrowers in a particular bucket (Linnell 2001, Griffith-Jones and Spratt 2001, Griffith-Jones, Segoviano, and Spratt 2003).

Rating of banks and corporates by external rating agencies are linked to countries' sovereign ratings, all institutions in a given country have no equal risk, there could be a risky bank in a less risky country and less risky bank in risky country, this could lead to capital requirement arbitrage (Tarbert 2000, Ferri, Liu, and Majnoni 2001). Private rating agencies might not be reliable during financial crisis. For instance, closely before the Asian crisis, ratings of some countries were still very high. Also the fact that rating agencies failed to foresee the defaults on mortgage related securities before the subprime crisis, raised some issues on their transparency and credibility (Flannery 2009). Also external rating agencies employ different methods in rating assessments, which could lead to discrepancies and irregularities in the rating scores (Griffith-Jones and Spratt 2001).

Another vital issue in using external rating agencies to set prudential standard is that these agencies are being remunerated by the institutions they rate. The agencies could maximise their personal gains by granting favorable ratings to their clients (Dhumale 2001). The existence of such bias questions the credibility and independence of these agents, also such could lead to regulatory capture where the institutions being rated demand favorable scores from rating agents (Tarbert 2000).

2.11.4.3. IRB risk measurement approach

Internal ratings method is inconsistent across all jurisdiction, no two banks will apply the same risk evaluation method, so its accuracy might not be reliable (Krahnen and Weber 2001). The approach would induce banks into credit concentration. Banks would prefer to increase credits to borrowers rated above BBB, and reduce credits to borrowers rated below BBB (Griffith-Jones, Segoviano, and Spratt 2003, Reisen 2001, VanHoose 2007, Repullo and Suarez 2004, Ruthenberg and Landskroner 2008). Being that most borrowers rated below BBB may emanate from developing economies, the major negative effective would be reduction in international bank lending to the emerging market industries (the most needed of such funds), which will result in reduction in capital flows, investments, productivity, and development prospects. Finally, without adequate supervision and

serious penalties, banks with IRB approach could assign favorable rates contrary to their actual risk profile (Kirstein 2002).

2.11.4.4. Pro-cyclicality

Pro-cyclicality means the intensification of business cycle as a result of decrease in availability of credit in time of recession and vice versa in economic boom period. A risk-sensitive capital requirement like that of Basel II would intensify such business cycle waves, as it tends to increase during recession and decrease in boom period, (Pederzoli and Torricelli 2005). The concern with pro-cyclicality is that the PD which is cyclical in nature is used in determining the capital requirement, of which the 8% minimum capital requirement is fixed throughout the cycle (Reisen 2001, Griffith-Jones and Spratt 2001, Koopman, Lucas, and Klaassen 2005). During recession, it is difficult and expensive for banks to raise external funding, and existing share holder are not willing to compromise their stake with fire sale (Duffie 2010a, Adrian and Shin 2010, Brunnermeier 2008). In such situation, this co-movement in capital requirement and business cycle will induce banks to further reduce credits during recession, which will in turn fuel an existing economic downturn (Drumond 2009).

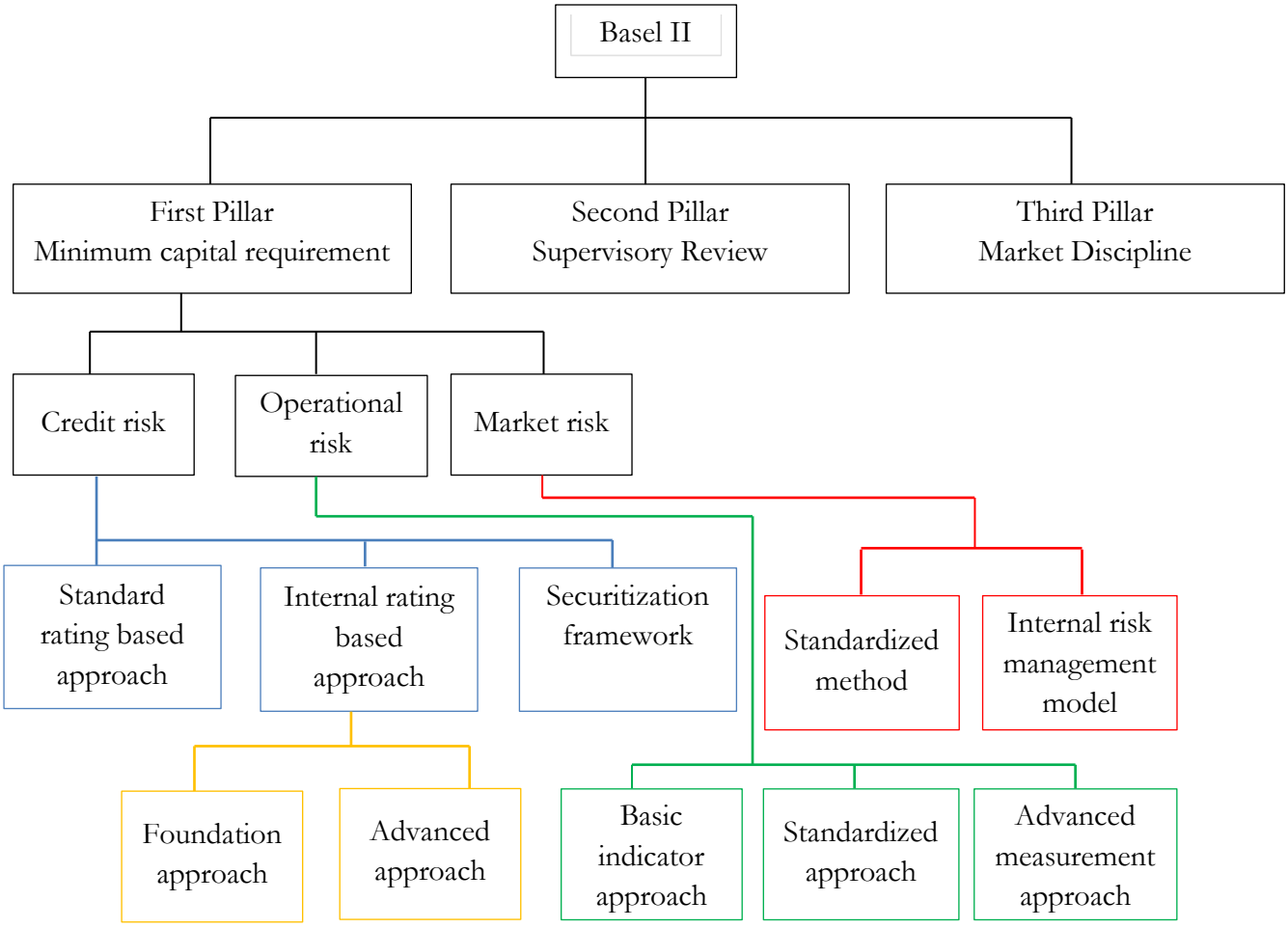
Already, banks' behaviour towards lending is naturally pro-cyclical (Lown and Morgan 2006, Lown, Morgan, and Rohatgi 2000, Bangia et al. 2002, Carey 2002, Lowe 2002, Amato and Furfine 2004, Furfine and Amato 2003). Altman et al. (2005) posit that in the advanced IRB approach, pro-cyclicality effect may be higher, if banks' internal estimate of LGD is used, depending on how banks estimate their recovery rates. Though the use of long-term recovery rates may mitigate the problem, but that would mean that banks will not regularly update their risk profile. This generates a more serious and hazardous problem, as banks trade stability with precaution. On that note, adopting the IRB approach will instead promote and fuel the pro-cyclicality in banks' behaviour (Griffith-Jones and Ocampo 2000, Ocampo 2002, Griffith-Jones and Persaud 2008, Catarineu-Rabell, Jackson, and Tsomocos 2005, Andersen 2011, Saurina and Trucharte 2007, Heid 2007, Kashyap and Stein 2004, Borio, Furfine, and Lowe 2001, Allen and Saunders 2003, Segoviano and Lowe 2002, Milne 2001).

2.11.4.5 Other Criticisms

The pillar 2 of Basel II is intended to supplement pillar 1 through supervisors' review, but there are no legal rules and resolutions to supplement supervisor's decisions and actions, rather focused mainly on principles (Kaufman 2005). The market discipline of pillar 3 focused on mandatory disclosure and transparency, which banks have the natural tendency to avoid, as financial

institutions, especially banks are naturally opaque in nature (Morgan 2002). Kaufman (2005) argues that pillar 3 could be more effective if focused on reducing the likelihood of too big to fail (TBTF) status of some financial institutions. Also, despite that adequate disclosure will provide some motivations for banks to maintain capital adequacy, BCBS failed to concede that market disciplining might not be effective in countries with complete deposit insurance covers (Tarbert 2000, Benink and Wihlborg 2002) or countries with more incomplete market or more externalities, where there is limited access to information.

Figure 2.3: Basel II at a glance.



Source: Author's Construction

2.12. Basel III Capital Accord

One of the reasons for severity of the 2007/2008 global financial crisis was due to excess leverage on both on and off balance sheet activities of banks in many countries. This was followed by slow and steady depletion of quantity and quality of banks' capital, coupled with inadequate liquidity buffers held by banks (Basel 2010a). The crisis was further escalated by the pro-cyclicality and high

interconnectedness of financial institutions. The banking sector lost credibility due to the erosion of solvency and liquidity status, this weakness quickly spread to the whole financial system and the real economy. To supplement the Basel II capital accord during the crisis, the BCBS issued some frameworks: "Liquidity Risk Management and Supervisory Challenges" in February 2008 and "Principles for Sound Liquidity Risk Management and Supervision" in September 2008 following the collapse of Lehman Brother the same month (Basel 2008). The committee also issued another framework in July 2009 to strengthen Basel II with respect to securitization, off-balance, and trading book exposures.

Even as Basel II has not been fully implemented due the 2007/2008 global financial crisis, in September 2010, the BCBS announced a new regulatory design, endorsed in November 2010 at the G20 Summit in Seoul, and was issued in the following month, to revise and strengthen the three pillars of Basel II. This new standard is called Basel III capital accord. Basel III has many objectives, with the sole aim of introducing macro-prudential measures to address systemic risks that could affect the financial system, as well supplement the micro-prudential measures of Basel I and II (Hannoun 2010a). The three major inputs of Basel III include, strengthening the capital adequacy framework; introducing minimum leverage ratio; and minimum liquidity ratio.

2.12.1. Strengthening the capital framework

The Basel III reform raised the quantity and quality of banks' regulatory capital and introduced some macro-prudential approaches to curtail systemic risk, for instance the introduction of additional buffers (capital conversion and countercyclical buffers). The accord also enriched risk coverage by raising capital requirement for securitization exposures, which is the major source of loss for internationally active banks.

2.12.1.1. Raising the quality and quantity of capital base

Basel III retains the 8% minimum capital requirement at face value, but redefined components of capital. The components of tier-1 capital are common equity tier-1 and additional tier-1 capital. Common equity tier-1 comprises of common stocks, retained earnings, share premium, disclosed reserves and other comprehensive income. Additional tier-1 capital comprises of paid in and other forms of capital that do not comply with the standard of common equity tier-1, mainly subordinated preferred stock and other bank's subordinated debts. Tier-2 capital comprises of low quality equity capital and subordinated debts, which include preferred stock with non-perpetual features; share premium from issuance of any instruments included in tier-2; loan loss provisions held against

unidentified loses, convertible debts as well as any other instrument not qualified as tier-1 capital. The basic assumption of Basel III is that common equity tier-1 will provide the greatest capacity to absorb losses, on that note it is set as the predominant component of tier-1 capital at 4.5% of RWA, while the additional tier-1 capital is set at 1.5%, giving a total of 6% (Baltali and Tanega 2011).

2.12.1.2. Capital conversion buffer

The rationale behind additional buffers is that banks should establish high capital level during the time of economic boom, which could help banks absorb losses during economic downturn (Wellink 2010). During the global financial crisis (2007/2008), banks were still distributing dividends and bonuses to staff to signal a fictitious good financial position, which further depleted banks' capital reserves making banks unable to absorb further losses (Caruana 2010, King and Tarbert 2011).

Based on that, the BCBS required banks to hold a capital conversion buffer of 2.5% of total capital, in excess of the 4.5% common equity tier 1 capital. This means that banks are required to hold total common equity tier 1 of 7% (4.5%+2.5%) of the RWA. Banks will be restrained from distributing earnings if capital level falls below the common equity ratio, this will enable such banks to continue in operations despite the fall in capital as well be able to rebuild the capital level. For instance, if a bank holds 6.0% of common equity ratio, which is less than the required 7% (it means such bank's capital conservation buffer is less than 2.5%), such bank is required to rebuild the conservation buffer by refraining from earnings distribution. Should a bank fail to reduce distribution despite the reduction in required capital level, the accord authorizes regulators to cut back on banks' distribution until the buffer is recapitalized.

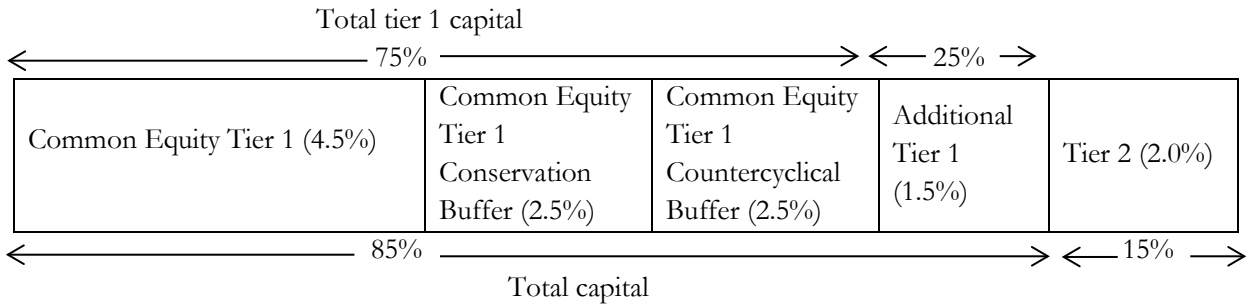
2.12.1.3. Countercyclical buffer

To remedy pro-cyclicality in the financial system, Basel III requires for implementation of countercyclical buffer to serve as additional capital pool accumulated during the period excessive credit growth. This buffer aims at reducing credit availability during the time of excess credit growth and reducing banks' intention to restrict credit during economic downturn. Countercyclical buffer ranges from 0% to 2.5% of RWA depending on the financial and economic stability indicators (credit and GDP growth) in a jurisdiction, based on the discretion of the national authorities.

A bank's buffer is calculated based on the weighted average of all buffers applied in all jurisdictions where such bank has credit exposures. This means that buffer levels vary as credit cycles are not always similar across all jurisdictions. Banks are given up to 12 months to raise to countercyclical

buffer level imposed by national authorities, while decision to reduce the buffer takes effect immediately. Defaulted bank is penalized through restriction on distribution, just as in capital conversion buffer. Basel III mandated that countercyclical buffer be met with common equity tier-1 capital. The additional buffers practically increased the capital adequacy ratio from 8% of Basel I and II to 13%, total tier-1 capital is 11% (4.5+2.5+2.5+1.5), while tier-2 is only 2% of RWA. This means that 85% of the capital adequacy ratio required by banks must be in high quality equity capital while tier 2 is left only with 15%, unlike in Basel I and II where tier-1 and 2 capital are of equal proportion. (See table 2.4).

Table 2.4: Basel III capital requirement



2.12.2. The minimum leverage ratio

During the 2007/2008 financial crisis, many banks maintained strong capital adequacy ratios but were operating with excessive on/off balance sheet leverage. To mitigate this risk, Basel III capital accord requires banks to maintain a 3% minimum leverage ratio, measured as tier-1 capital relative to total exposure. Total exposure should consist of banks' assets, including off balance sheet exposures and derivatives. Banks are required to effectively and separately run a risk-based capital requirement and a total risk exposure models for effective leverage ratio implementation. It is also required that consistency be maintained across all jurisdictions despite differences in accounting methods.

2.12.3. The Liquidity Ratio

During the 2007/2009 global financial crisis, financial institutions were unable to secure short term funding, it was difficult to convert asset into cash without extra cost or loss of value, most banks relied on Central Bank lending facilities. As Central Banks facilities available to those banks declined along with severe decline in the value of illiquid asset, banks' capital level began to deplete (King and Tarbert 2011). Based on that, the BCBS decided to incorporate liquidity ratio as a key component of

Basel III, by introducing two minimum standards for liquidity ratios; liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) (Basel 2010b).

Liquidity coverage ratio (LCR) is designed to cover for banks' inability to survive stress periods (periods of systemic shocks) due to lack of high quality liquid assets. It requires banks to hold high liquid asset that can easily be converted into cash to meet liquidity needs for a period of 30 days during a period of severe liquidity stress. During such period, banks' high quality liquid assets should be equal to or greater than banks' net cash outflows for the next 30 days.

$$LCR = \frac{\text{High quality liquid assets}}{\text{Total net cash out flow over next 30 days}} \geq 100$$

High quality liquid assets are those assets that could remain liquid during stressful periods and can easily be converted into cash without losing value. They also possess low credit and market risk, easy to value, and are not highly related with risky assets. Net cash outflow over the next 30 days defined by Basel III is the difference between total expected cash outflow and total expected cash inflow during a stressful period. Cash inflow to be deducted is expected to be 75% of the total expected cash outflow, this was to prevent banks from relying on imaginary assumptions of cash inflows to meet the liquidity requirement (Bindseil and Lamoot 2011).

While the LCR is designed to motivate for short-term liquidity, NSFR is designed to ensure that banks' assets and operations are also covered with medium and long-term funding.

$$NSFR = \frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} > 100$$

Available stable funding is defined as part of capitals and liabilities that could be relied upon as sources of financing for at least over one year during an extended period of stress. It is calculated by assigning weights to the different categories of funds available to banks during the period of stress. Basel III provides weights of 0%, 50%, 80%, 90% and 100% depending on the level stability of the available funds and the nature of institutions providing the funds. Total regulatory capital (tier-1 and 2) receive a weight of 100% while unsecured wholesale funding and non-maturity deposits receive weight of 50%. The sum of the weighted amount is the available amount of stable funding.

Required amount of stable funding is measured using supervisors' discretions depending on the banks' liquidity risk exposures and other selected banks' activities. It is determined by multiplying

the value of assets and off balance sheet exposure by a required stable funding (RSF) factor assigned to each asset. Cash and short-term unsecured instruments with less than one year maturities receive RSF factor of 0%, while other assets and off balance sheet exposures may receive RSF factors of 5%, 20%, 50%,65%, 85%, and 100% depending on their level of liquidity.

2.12.4. Counterparty Credit Risk

Despite the three major inputs of Basel III (increase in quality and quantity of capital, leverage ratio and liquidity ratio) in banking regulation, Basel III also emphasized the need for assessing banks' capital requirement to cover for counterparty credit risk. To account for counterparty credit risks, banks are required to conduct stress test of default risk, using not less than three years banks' historical data. Market data can also be used but must be updated frequently (quarterly or less) as the market permits. The adequacy of the test will be based on a benchmark portfolio measured using similar data by banks with similar exposures. Another assessment for counterparty credit risk is for banks to identify and mitigate risks that could arise as a result of increase in a bank's exposure to counterparty due to decline in counterparty's creditworthiness. This is called wrong-way risk.

2.12.5. Basel III implementation

BCBS designed a phase in approach for implementing Basel III, to balance the requirement for higher capital and liquidity requirement with the need for a speedy economic recovery (King and Tarbert 2011). BCBS requires that Basel III framework be implemented starting January 2013 through January 2019. Tier 1 capital requirement of 6.0% must be reached by January 2013, followed by capital conversion buffer from January 2016. Banks will start with 0.625 % of capital conversion buffer by 2016, with additional 0.625% each year until the required 2.5% is reached.

Countercyclical buffer follows the same phase with capital conversion buffer, though with national supervisors' discretion depending on economic conditions and cycles. The minimum leverage ratio of 3% began a test run from January 2013 to end in December 2016. Banks should compute the leverage ratio during this period and publicly disclose it from January 2015, with full implementation from January 2017. Implementation of the liquidity coverage ratio will take effect from January 2015, while the net stable funding ratio will be implemented three years as from January 2015.

2.12.6. Critics of Basel III

Many researchers have studied the costs and benefits of implementing higher capital requirement (Miles, Yang, and Marcheggiano 2013, Kato, Kobayashi, and Saita 2010, Barrell et al. 2009, Elliott

2009, 2010, Kashyap, Stein, and Hanson 2010, King 2010). While some authors basing their argument on Modigliani-Miller theorem[15], argue that the cost effect of higher capital requirements on both banks and consumers are relatively small and could be avoided (Schanz et al. 2011, Miles, Yang, and Marcheggiano 2013, Elliott 2009, 2010), others argue otherwise. Elliott (2010) concludes banks should be able to adjust to higher capital charges through combination of some strategies that will not have strong negative effect on loan prices and availability. For instance banks could reduce loan loss reserves, liability costs, and operating costs to compensate for high capital charges. While King (2010) posits that though some strategies such as increase in issuance of government bonds could reduce but not completely eliminate the high lending spread posed by high capital requirement.

It is quite over simplified to think that the cost of banks capital remains unchanged even after regulatory capital requirements is increased (Modigliani-Miller theorem). Bank funding structure (debt versus equity) along with lending rates has a second-order effect on intermediation cost, though the effect could be relatively small depending on the extent of departure from Modigliani-Miller theorem, but it could lead to regulatory arbitrage, shifting intermediation activities to the shadow banking (Admati et al. 2012, Brealey 2006, Kashyap, Stein, and Hanson 2010, Cosimano and Hakura 2011). This means that, for Basel III reform to be effective, increased financial regulation should be extended to the shadow banking sector, if not, the expected outcome would be unintended consequences (Kashyap, Stein, and Hanson 2010).

BCBS along with other Basel capital accord's researchers (Angelini et al. 2015, Schanz et al. 2011) presumed that Basel III reform will reduce output volatility, especially the adoption of countercyclical capital buffer. Also that higher capital liquidity requirements could make banking system stronger, reduce occurrence of and brutality of financial crises, which serves as a trade-off of higher cost of capital and lending rates (Ennis and Price 2011). But the major question that follows is; at what point should the probability of bank failure be lowered to outweigh the cost of operating with high funding cost? Barrell et al. (2009) and Barrell et al. (2010) conclude that the best thing to consider in financial regulation is to balance the cost of higher lending and other losses with the benefits from preventing financial crisis and its severity.

[15](Modigliani and Miller 1958, 1959, 1963, Durand 1959); the Weighted average cost of capital remains constant, despite changes in capital structures, because cost of equity which is more expensive will be covered by decrease in per unit cost of both debt and equity, due to lower risk of insolvency.

2.12.6.1. Effect of Basel III on Banks' Balance Sheet

To respond to the increased capital requirement under Basel III, international credit rating agencies have predicted various additional capital infusion needed by banks in India. Indian Credit Rating Agency (ICRA), Fitch, and Macquarie Capital Securities predicted additional $80 billion, $50 billion, and $35 billion respectively for public sector banks following the adoption of Basel III capital requirement (Jayadev 2013). The concern is that raising the additional funds may be quite difficult, leaving banks with no option than intensive contraction of the balance sheet.

Also, for banks to adjust to the liquidity requirement, certain business operations will be affected; from reducing loan assets including commercial loans, to increasing equity funding, long-term debt, and stable customer deposits. Though there is phase-in period, but markets may react due to expectation of required adjustments and discipline banks that do not have considerable liquidity ratios. This scenario leaves banks with the struggle of increasing and reducing liquidity of their assets and liabilities respectively, far ahead of the end of implementation period, January 2019 (Allen et al. 2012).

2.12.6.2. Effect of Basel III on GDP

Many studies including World Bank Reports, have argued that Basel III implementation would have negative effect on GDP for both developed and developing countries. Though Cecchetti (2010) argues a 1% point decrease in probability of financial crisis results to a benefit of 0.6% of GDP. He also argues that a 1% point increase in the capital ratio to meet the Basel III capital requirement could reduce the probability of financial crisis by 50%, thereby resulting to huge margin increase in GDP. On the contrary, a study on three main OECD economies (United States, Euro Area and Japan) by Slovik and Cournède (2011), designed to assess the macroeconomic impact of transition to Basel III, found that implementing Basel III would lead to a decrease in GDP growth by between 0.05 to 0.15% per year.

This study's outcome is in line with Macroeconomic Assessment Group (MAG's) (2010) report of decrease of between 0.03% and 0.05% in annual GDP, except that MAG's assessment is lower in range. The decline in GDP is attributed to high lending spread employed by banks due to high capital requirement, which was transferred to customers. They posit that 1% increase in capital to RWA ratio on average increases the lending ratio of banks in the three OECD economies by 14.4

basis points The study also placed blames on financial regulation for the delay in economic recovery from the 2007/2008 financial crisis (Slovik and Cournède 2011).

Birovljev, Davidović, and Štavljanin (2012) studied the impact of Basel III implementation using a survey on 263 banks from 13 Basel member jurisdictions. Not considering the implementation period, 1% increase in capital requirements leads to reduction in GDP by 0.1%. If Basel III is implemented for two years, there will be more negative effect of between 0.05% to 0.28% reduction in GDP at about 10th quarter from the beginning of implementation period.

Considering spill-over effect across countries, Birovljev, Davidović, and Štavljanin (2012) argue that a four-year implementation period will lead to spill-over effect of -0.09% and -0.01% in developing and developed countries respectively. Base on this, the world GPD is expected to reduce by 0.016% in response to increased capital requirement. Simply put, higher capital requirements of Basel III will lead to high lending spread, as banks will shift a rise in funding costs to their clients, which will in turn affect economic output.

2.12.6.3. Effect of Basel III on availability of credit

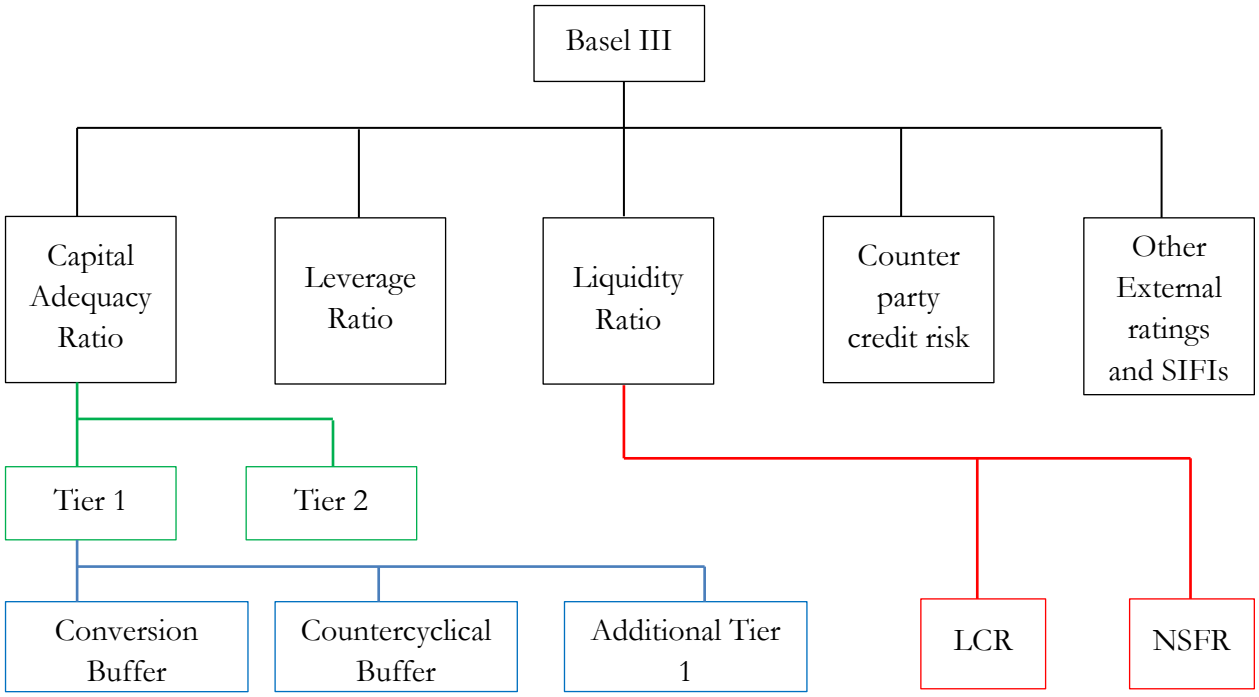
Bank loans are the most important and major source of external funds, and reduction in bank credits are generally not substituted by other external sources of funds (Mayer 1990, Hoshi, Kashyap, and Scharfstein 1991). The general criticism of Basel III is that liquidity requirements in Basel III are forcing banks to increase their holdings of liquid assets. This means that they have to reduce non-liquid assets and restrict credit to both large, small and medium enterprises (SMEs), as well as individual customers. The implication is that, while larger companies may have access to alternative sources of credit, small companies and individuals may not. This scenario, which is attributable to Basel III's liquidity requirements, points to a major unintended consequence of reducing bank credits to SMEs, which effectively reduces SMEs' access to external debt financing, resulting to low investment and economic development. As banks' credits will be concentrated on less risky firms, SMEs will be disadvantaged and competition pressure will be reduced, leading to high prices of goods and services in the market (Bernanke 1993, Blum and Hellwig 1995).

Allen et al. (2012) agree with the critics that Basel III reform, if implemented, will limit and reduce both availability of credit and economic activities, but they opine that this particular negative impact of Basel III is widely misunderstood. The challenge is not as a result of the higher capital and liquidity requirements of the Basel Accords; but the challenges of adjustment, and other subsequent

changes necessary across the financial services industry to accommodate reforms. These challenges threaten to starve the economy of credit and thus imped economic growth while adjustment is still incomplete. If this is not controlled, then the cure intended by Basel III will turn out to be worse than the disease (Allen et al. 2012).

For Basel III to be worthwhile, Allen et al suggested many measures to supplement the reform. Such measures include, re-establishment of securitization, but avoid the mistakes made between 2004 to 2007 securitization credit boom, holding risky loan exposures, which will attract investors' funds to risky borrower, maintaining off rather than on balance sheet exposures. They also suggest that regulators, banks and investors should engage in a productive negotiation about the potential changes in banking business and operation due to Basel III implantation. If these are not considered, then Basel III might not achieve its goal, instead it could lead to more harm.

Figure 2.4: Basel III at a glance



Source: Author's Construction

2.13. The Market Discipline Principle

Regulating financial institutions have become more difficult as a result of the increased complexity of most financial institutions attributed largely to recent financial innovations. For efficient financial regulation, many analysts have the view that bank supervisors should supplement traditional regulatory procedures with market discipline (Flannery 2001, Iannotta 2011, Ferguson 1999). There

has been some evidence that investors can independently asses firms' true financial position through market forces (Flannery and Sorescu 1996, Flannery 2001, 2009, Gilbert 1990).

Even in the wake of financial crisis, uninsured depositors responded to banks' fragility by increasing market discipline; this places a check on banks that would likely take more risk in the event of systemic instability (Karas, Pyle, and Schoors 2013, Nier and Baumann 2006). This effect of market discipline on Banks' risk behavior has increased the interest of financial regulators in the use of market forces to assist in achieving regulatory objectives, thereby proposing the market discipline principle in the Basel capital accord.

Market discipline can be defined as a situation where market participants directly or indirectly behave in a manner that reflects financial institutions' general state of affairs (i.e., level of solvency) (Lane 1993, Eling 2012). In other words, market participants could provide signals concerning financial institutions' risk level. A financial institution with excessive risk taking can be disciplined by depositors, equity and debt holders through demand for higher return on investments or additional collateral for certain credit transactions. If the level of risk indicated is not acceptable, market participants may withdraw their investments or declined from investing with such institution (Demirgüç-Kunt and Huizinga 1999b, Park 1995, Kwan 2002). Bliss and Flannery (2002) explained market discipline in two distinct roles: market monitoring and market influence.

Market monitoring infers that market participants should be able to evaluate firms' financial conditions and use such knowledge in pricing firms' securities. Market influence could be direct, semi direct, or indirect (Hamalainen 2006). Investors' behavior could directly influence banks through physical negotiations to avoid risky exposures or semi-directly through signals in security price changes or through selling off of investments. Indirect influence is when regulatory actions are initiated either by regulatory bodies or stake holders due to signals from either direct or semi direct influence or both. Market discipline could have been more efficient in a perfect market, with perfect information and competition, with no externalities and agency costs (Scott 2004). But such market is rare to be found in the real world not to talk of in emerging economies.

The Basel committee has proposed the market discipline principle as one of the three pillars to hold financial regulation. Market discipline is the third pillar of Basel II capital accord, it requires financial institutions, especially banks, to effectively disclose all information necessary to enable investors and other market participants make informed investment decisions. In other words, banks are required

to be as transparent as possible in providing information to enable market participants make accurate decisions concerning their investments.

While making investment decision, investors incur both search and analysis costs; credible and reliable information has the tendency of reducing such costs to a minimum (Herring 2004). Basel II Accord highlighted that combining the market forces in the traditional safety nets will contribute towards effective financial regulation (Basel 2004). The information disclosure mandatorily required from banks by Basel II will increase transparency and facilitate the ability of the market participants to discipline banks (De Ceuster and Masschelein 2003), especially for bank holding companies (Curry, Fissel, and Hanweck 2008).

Jordan, Peek, and Rosengren (2000) studied 35 US bank holding companies, to find the effect of publicly announcing supervisory information that was formerly confidential between 1989 and 1994. They found that release of such information significantly affected the perception of market participants which resulted in an average of 5% reduction in stock prices. Also evidence from a study on 104 Indonesian banks shows that market discipline is more effective in foreign and listed banks compared to domestic and unlisted banks (Hadad et al. 2011). Therefore financial regulatory policy should encourage and mandate foreign and domestic banks to get listed in formal capital markets.

As mentioned earlier, market discipline could be through price effect, where the prices and yields from instruments are affected due to high risk exposure or quantity effects, where depositors or investors withdraw their investments thereby reducing the quantity of funds available. Some researchers have argued that the effect of information on prices and spreads of instruments is relatively weak (Collin-Dufresne, Goldstein, and Martin 2001, Delianedis and Geske 2001). But many researchers both earlier and recently BCBS researchers have found evidence that share prices could be used to detect a defaulting firm (Pettway 1976, 1980). It has also been found that the wide spreads on corporate bonds exists because investors are pricing unexpected undiversified losses which exist in the market (Amato and Remolona 2003, 2005, Jagtiani, Kaufman, and Lemieux 1999, Morgan and Stiroh 1999).

On the other hand, many studies have examined the response towards changes in banks' stability condition and the quantity of available funds (Park and Peristiani 1998, Goldberg and Hudgins 2002, Martinez Peria and Schmukler 2001, Birchler and Maechler 2001, Maechler and McDill 2006, Berger

and Turk-Ariss 2010). These studies prove that depositors discipline banks in the event of instability in banks' financial condition, through deposit withdrawals and refusals to rollover debts. The quantity of deposits, especially uninsured deposits decline as banks show signs of stress (Baer and Brewer 1986). This indicates that market forces could provide market-based incentives for banks to control and limit their risk taking behavior.

The effect of market discipline is extended to insurance companies and there is evidence that information made available to the market, especially credit ratings has influence on the sale of insurance policies (Castagnolo and Ferro 2013, Eling 2012). Epermanis and Harrington (2006) and Eling and Schmit (2012) studied the effect of market discipline on US insurance companies between 1992-1995 and German insurance companies between 1997-2005, respectively. They found that there is decrease in insurance policies purchased during low risk ratings on insurance firms, but increase in ratings does not necessarily yield a corresponding increase in policy purchase. This shows that that information disclosure disciplines not only banks but insurance companies as well.

2.13.1. Safety nets and market discipline

Safety nets provide bailout for distressed banks, which influences both debtors and creditors to ignore banks' behavior toward risks. This could lead to moral hazard where debtors may decide to engage in excessive borrowing and creditors providing more credits without considering risk, with the intention of gaining higher return if banks succeed or bailed out if banks fail. Ioannidou and Penas (2010) studied the risk behavior of Bolivia banks pre and post deposit insurance period. They found that the existence of deposit insurance influences banks to initiate riskier loans compared to periods before the introduction of deposit insurance. Existence of safety nets is justified by regulators on the ground of averting systemic risks. The failure of one bank, if corrective action is not taken, could be contagious, which could disrupt the entire economy (Scott 2004).

Many researchers posit that the existence of safety nets and some forms of guarantees destabilizes the effect of market discipline (Scott 2004, Iannotta 2011, Kwan 2002, Flannery 2001, Demirgüç-Kunt and Huizinga 2004, 1999b, Demirgüç-Kunt and Detragiache 2002). In other words, the ability of the market participants, especially uninsured depositors to discipline banks' risk behavior depends on the degree of government safety net coverage. Wall (1989) argues that removing deposit insurance will induce banks to avoid unnecessary high risky investments also will shift responsibility of losses to the private sector. Such strategy will motivate market participant to search for effective

technique for risk control. Calomiris and Powell (2001) argue that Argentine effectively implemented a regulatory reform that achieved market discipline in the 1990's due the political intervention in limiting the likelihood of government bailout and other government interventions in the banking system.

Hadad et al. (2011) studied the effect of regulatory changes on market discipline between 1995 and 2005 using 104 commercial banks in Indonesia. They found that the adoption of "blanket guarantee scheme" in 1998 and limited guarantee in 2005 weakened the ability of the market to discipline banks. The effect of safety net on the ability of market participant to discipline banks' risk taking behavior is in line with the suggestion that financial liberalization may endanger financial system stability if not checked (Nier and Baumann 2006, Arestis, Nissanke, and Stein 2005, Arestis and Stein 2005). Although Imai (2006) argues that deposit insurance reform enhances market discipline, but the positive effect is off-set by the too big to fail policy.

2.13.2. The use of subordinated debt as a tool for market discipline

The increasing believes in market forces as an effective tool to discipline banks has called for mandatory subordinated debt to be an integral part of banks capital. Some of the recent proposals for mandatory subordinated debt policy include the US and European shadow financial regulation in 2000, Calomiris (1999), and Evanoff and Wall (2001a). The earlier proposals are by Wall (1989), Evanoff (1993) and others. These proposals are based the perception that in some extent subordinated debt is a better source of market discipline than other bank instruments (Levonian 2001). Some of the advocates among many others for the use of subordinated debts include Pop (2006), Sironi (2001), Giammarino, Lewis, and Sappington (1993), Hancock and Kwast (2001), Distinguin (2008), Distinguin, Rous, and Tarazi (2006), (Blum 2002), Evanoff and Wall (2002), Calomiris and Powell (2001), Niu (2008), Herring (2004), Evanoff and Wall (2001a), Evanoff and Wall (2000), Goyal (2005).

The proposal for the mandatory subordinated debt policy (MSDP) requires banks to issue a reasonable amount of subordinated debt relative to banks' total capital. Evanoff and Wall (2001a) and Covitz, Hancock, and Kwast (2004) posit that if banks are only allowed (not mandated) to issue subordinated debts, banks may likely opt out by refusing to roll over matured debts and not introducing new issues. Because subordinated debts are likely to restrict their risk taking behavior and provide regulators with information concerning their level of financial fragility.

The subordinated debt proposal was adopted and released by a group of Shadow Financial Regulatory Committees of US, Japan and Europe in June 1999 it was later reaffirmed in June 2001. A version of this proposal was earlier adopted by the Federal Depository Insurance Corporation "FDIC" as part of the FDIC Improvement Act (FDICIA) of 1991, though it was then commonly called "structured early intervention or prompt corrective action". The MSDP proposal requires that significant portion of bank's minimum required capital be in subordinated debts. The shadow regulatory committee requires that banks with assets value of more than $10 billion be subjected to the subordinated debt policy, with the justification that smaller banks might find it difficult to bear initial high transaction cost for the debt issuance.

There have been so many proposals on subordinated debt requirement before and after the adoption of the policy by shadow regulatory committee, for instance Evanoff (1993) suggests that out of the 8% capital adequacy of Basel I and II, at least 4% should be subordinated debts. Such requirement will allow subordinated debt to serve as capital cushion against losses. Most of the proposals require that only large banks be subjected to this policy, though Calomiris (1999) includes smaller banks in his proposal to account for emerging market banks. Wall (1989) proposes subordinated debts for banks with over $2 billion worth of assets or with more than 50% worth of loan with foreign borrowers.

Calomiris (1999) proposes that 2% of small banks' risky assets should be in form of uninsured time deposits held by large foreign and domestic banks, at initial maturity period of 2 years, with 1/24 maturing each month. Same should be applied to large banks, but should hold their subordinated debt inform of non-tradable certificate of deposit with foreign financial institutions. Reliance on interbank debt rather than market debt will enable banks including the smaller banks to gain easy access to debt market (Calomiris 1999). Also inter bank debts could be more effective in disciplining banks, as banks can easily assess the creditworthiness of each other than creditors.

Evanoff and Wall (2001a) detailed this proposal in three phased-in stages, to allow for both gradual movement into the implementation and gradual adjustment by the Basel capital accord. The first stage is designed to increase the awareness and knowledge on the use of subordinated debt as a risk measure. At this stage supervisors/regulators will monitor subordinated debt prices of 25 largest US banks and bank holding companies and evaluate their financial conditions. The essence of this monitoring and evaluation is to frequently obtain the best possible pricing data, study the value of

information from debt prices, quantities and liquidity, so as to assess the usefulness of subordinated debt as an effective tool for market discipline. After the evaluation, the supervisors will decide if additional authorization is required to mandate banks to issue a minimum amount of subordinated debt, for instance legislative authority. The supervisors will also decide if the prices and quantities of subordinated debt can be used to implement prompt corrective action as stipulated by FDICA.

In stage two, regulators must have been authorized to mandate banks to issue subordinated debts. The observed 25 largest banks will be mandated to issue subordinated debt of 2% relative to their RWA annually with qualifying issues of 3 months apart. The issue should contain some terms explicitly specifying the junior status of the instrument and the facts that holders should not expect any form of guarantee such as the systemic risk clause of too big to fail in the FDICIA. Failure of any bank to comply with the policy triggers assumptions by the market that such bank is undercapitalized.

Evanoff and Wall (2001a) posit that if a bank's subordinated debt is trading below an average price comparable to bonds with similar maturities that are rated Ba or below for two consecutive weeks or longer, it is presumed that such bank is experiencing significant difficulties and probably at the edge of insolvency. At such point supervisors should actively get involved and mandate a prompt corrective action. This theoretically prove that the use of subordinated debt signals as a market disciplinary tool is intended to be a supplement to supervisory oversight not a substitute.

At Stage three, which is regarded by Evanoff and Wall (2001a) as the mature stage of the proposal, it would have become clear that the use subordinated debt is of paramount important in assessing banks' risk taking behavior. The first 25 largest banks in US should issue at least 3% of their risk weighted asset in subordinated debt, with minimum of initial maturity period of 5 years. Qualifying issue at this stage is semi-annually of 2 months apart. The increased percentage of issue is to allow an opportunity for subordinated debt holders to exercise direct market discipline on banks, while the 5 year maturity period is assumed short enough to allow for more frequent issues and long enough to tie debt holders to the bank as to limit the level of "unnecessary" bank runs.

Thus, the US Shadow Financial Regulatory Committee endorses an aggressive but an acceptable plan for implementing MSDP into US regulatory process. The committee mandated that banks with assets over $10 billion to hold 2% of their RWA as a minimum ratio for subordinated, at initial maturity period of 1 to 2 years, with 10% maturing each quarter. The justification is that 2% is very

close to the average outstanding subordinated debt already issued by large banks and their holding companies. Also that 2% should be adequate to maintain a required level of liquidity in the secondary market, as sufficient liquidity is required for a quality and clear price signal to avoid false negative market reaction due to false signal (Lang and Robertson 2002). The committee posits that if a bank's subordinated debt is trading at a price that the yield is above the prevailing premium on BBB-rated securities with similar securities for three consecutive months or longer, it is presumed that such bank has violated the subordinated debt requirement (Herring 2004).

Such bank would be required to correct the problem, face some inspections, and may be required to pay higher insurance premium under Deposit Insurance Corporation. The bank may also be required to submit planned strategy it seems adequate for restoring market confidence. Such strategy will include efforts to reduce the spreads to a level similar to the spreads from securities of comparable maturity. Prior to restoring market confidence, such bank will be subjected to regulatory sanctions for undercapitalized banks laid down by the FDICIA. Such sanctions include restrictions on the interest rate to be offered to its depositors and the amount of dividends to be distributed to its shareholders.

Subordinated debt if consistently enforced will act as market disciplinary tool on banks. According to Herring (2004), the disciplinary process of subordinated debt is explained as follows. If a bank is exposed to high insolvency, such bank will find it difficult to effectively price subordinated debt. If the perceived default probability persistently increases, such bank may not be able to offer a favorable interest rate to the investors, therefore may find it difficult to issue new subordinated debt. Under such situation, the bank will have no other option than to reduce its risk exposures or shrink its assets so as to be able to meet with the 2% minimum requirement by rolling over matured exiting subordinated debt (Calomiris 1999). The bank will continue in such process until it is able to assure a rate of interest that is attractive to investors.

The advocates for subordinated debts still disagree on a suitable maturity period to ensure effective market discipline. Appropriate maturity period is necessary because it determines the ability of the debt holders to detect and flee from potential loss. Promoters of longer maturity believe that longer maturity increases the ability of subordinated debt holder to monitor the banks because they have a lengthy time of risk exposure. Others argue that short-term debt may better discipline banks because bank with short-term debt will be more concerned with its inability to rollover compared to a bank

with long-term debt (Lang and Robertson 2002). A debt with relatively long-term maturity period seems to be better; first, rollover cost is minimized with long-term debt. Second, it has a longer term horizon to provide adequate information. Third, it prevents irrational short-term run, that may be due to false price signal (Lang and Robertson 2002). A long-term subordinated debt can be comfortably regarded as a supplementary capital if it has at least an average maturity period of seven years (Evanoff 1993).

2.13.3. Why use Subordinated Debt as a market disciplinary measure

Subordinated debt is seen to be eligible as market discipline instrument due to the holders' exposure to high risk of loss in the event of banks' failure, but equity holders have a higher chance of pay-off, therefore higher risk level will be beneficial them. Second, subordinated debt is a junior liability compared to other liabilities, therefore it is more sensitive to risk (Iannotta 2011), and will provide an ideal way for market discipline. Third, mandatory subordinated debt policy will provide an ideal incentive for banks to effectively disclose required information to the public.

Fourth, given that interest on debt is tax deductible, the cost of banks' capital will decrease if the restrictions on subordinated debts to be qualified as capital are waved (Evanoff and Wall 2001a). The restrictions impede the ability of subordinated debts to enhance market discipline and make debts less attractive to banks. Fifth, subordinated debts instruments with a long maturity period, are perceived as stable sources of funds that could mitigate the risk of bank runs and systemic risk (Sironi 2001, Evanoff 1993, Lang and Robertson 2002). If banks should be required to issue a minimum amount of uninsured subordinated debts, regulators will be able to obtain a disciplinary tool as well as information tool for an effective regulatory framework (Benink and Wihlborg 2002).

Inconclusive discussions still exist on the extent of important of subordinated debt as market disciplinary tool, but most researchers are on the positive empirically. Avery, Belton, and Goldberg (1988), using 1983 and 1984 year-end yields on subordinated note debenture of 100 largest US banks, postulate that the possibility of market discipline to effectively supplement regulatory controls through subordinated debt is very weak, because the market participants and regulators seem to have different objectives. They also posit that the pricing signal from the market seems odd with regulators' interests.

This argument is disputed by some studies. Cannata and Quagliariello (2005) provide evidence that market information is essential for supervisory purposes, using data from Italian banks between

1995 and 2002. While Jagtiani and Lemieux (2001) suggest that bond spreads provide warning signal from the financial market prior to financial crisis; therefore, it could serve as a potential useful tool for bank supervisors. Also even if some of the objectives of market participants and regulators differ in some aspects, the primary aim of both investor and regulators is to ensure financial system stability for a stable and improved economic growth.

Gorton and Santomero (1990) argue that relying on subordinated debt as a tool to discipline banks may be confusing. If there is high probability that subordinated debt-holders will lose their investment in the event of bank failure, such prediction could raise the value of their investments. Therefore under such situation, subordinated debt-holders will expect the same pay-off with that of equity holders in the event of high probability of bank failure.

Contrarily, Benink and Wihlborg (2002) argue that allowing a minimum acceptable equity base along with issuance of subordinated debt could curtail such problem raised by Gorton and Santomero (1990). Also such problem could be minimized by early intervention by regulators in banks' operations when bankruptcy risk is suspected to be high and has reached a certain level. Other studies not fully in support of the use of subordinated debt include Levonian (2001) and Osterberg and Thomson (1991). Levonian (2001) argues that both equity and junior debt have the same level of mitigating effect against losses, also that high debt spreads could either mean high or low probability of default. Nivorozhkin (2005) explores this issue further by incorporating bankruptcy costs. He found that information from subordinated debt yields could be a supplement to information from other securities, especially if bankruptcy costs are unknown and subordinated debt holders expect some pay-off in the event of bank failure.

Subsequent studies revealed that bond investors react to banks' risk taking behavior and debt yields accurately reflect the level of banks' risk (DeYoung et al. 2001, Birchler, Hancock, and Nationalbank 2004, Covitz, Hancock, and Kwast 2004, Flannery and Sorescu 1996, Hancock and Kwast 2001, Jagtiani, Kaufman, and Lemieux 2002, Bongini, Laeven, and Majnoni 2002, Cannata and Quagliariello 2005, Sironi 2003, Evanoff, Jagtiani, and Nakata 2011).

Evanoff and Wall (2001b) carried an empirical analysis to find out between subordinated debt yields and various capital ratios, which of them accurately predicts banks' risk conditions. They used subordinated debt yields data of 100 largest banks from 1985 to 1999. Their findings suggest that subordinated debt yield spreads are important triggers for prompt corrective action by regulators.

Flannery and Sorescu (1996) carried out analysis on the relationship between bank risk taking and subordinated notes debenture pricing, using subordinated debentures issued by 83 US banks amounting to 422 issues between 1983 and 1991. They found that bank-specific risk measures reflect on the debenture prices over the entire period of study, especially during the last three years of the study. This result is consistent with the adoption of federal deposit insurance improvement act in 1991, which abolished the bailout policy for many US bank debentures. They conclude that existence of government guarantees affects investors' incentive to effectively price banks' securities.

Lang and Robertson (2002) analyzed the rationale underpinning the proposal for mandatory subordinated debt policy using 8,817 US banks between 1991 and 1999. They confirmed other researchers' findings that banks issuing subordinated debts are more sensitive to risk compared banks that do not. Also yields on debts provide market signals for required regulatory actions.

Sironi (2001) analyzed the implication of mandatory subordinated debt policy using over 1800 European banks' debenture prices between January 1998 and March 2000. He argues that subordinated note debenture spreads will act as a strong signal of bank soundness for bank supervisors. In his second paper (Sironi 2003), his findings conclude that debenture spreads reflect the risk sensitivity of European banks. This evidence suggests that subordinated debt may work well as a regulatory in Europe just as in US banking industry. Sironi (2003) finally added that subordinated debt holders might not be effective in disciplining European public sector, due to lower subordinated notes and debenture spreads from such banks.

For subordinated debt to be an effective tool, Lang and Robertson (2002) posit that several conditions should be included in the debt contract. First, the subordinated contract should include covenant concerning loss of principal in the event of banks' failure (Goyal 2005). If subordinated debt is issued without restrictive covenants, outside investors are unlikely to participate in banking regulation through market discipline. Lack of such protection creates high probability of runs by existing outside investors in the event of distress, by declining in debt rollover, making it more difficult for banks to recover from distress, and increasing the probability of banks becoming distressed (Ashcraft 2008). Second, subordinated debt holders should have the motive to monitor banks and react according to banks' risk level, because if there is no reaction despite information being available, market discipline will not take place. Bank regulators should also monitor

subordinated debt prices to avoid or minimize the ability of the market participant reacting to false signals from the market.

Dilemma still exists in the use of subordinated debt as a market disciplinary tool in emerging market banking industry. Comments on Sironi (2000) conference paper by Karacadag (2001) expresses concern that the use of subordinated debt and debenture as market disciplinary tool could be problematic in emerging economy. In developed countries, domestic capital markets are developed and more liquid with relatively large issuance of subordinated debts unlike in emerging market. Emerging market with underdeveloped capital markets may be too underdeveloped in terms of size, plumbing and housekeeping as measures of investability (Ladekarl and Zervos 2004). The volume of subordinated debt issue may be too small to worth trading, therefore continuous and meaningful subordinated debt prices and spreads cannot be generated for proper analysis. At such situation, investors' ability to perceive the risk exposure of their investment is too thin (Karacadag 2001).

Another important issue raised by (Karacadag 2001) is that too many emphasis is placed on the suppliers of subordinated debts. Supply of subordinated debt might be adequate but the demand might be low due to investors' lack of financial incentives and resources to independently monitor banks in emerging markets. Calomiris and Powell (2001) posit that though market discipline worked for Argentina in the 1990's in punishing and rewarding banks depending on the perceived risk of banks failure, emerging market countries still need improved technicalities on how to design effective regulatory system as well as sound political condition that will foster the credibility of such system. These dilemmas express the argument of this study, "what is the appropriate financial regulatory structure in emerging market banking industries"?

2.13.4. Conditions for effective market discipline

A number of options and strategies should be employed by regulatory authorities if market discipline should achieve its' role in financial regulation. To increase the effectiveness of market discipline, regulators should eliminate or place some limits on safety nets and guarantees provided to bank investors. Limiting safety nets may result in increased systemic risk, which is one of the justifications for existence of safety nets. But such risk could be reduced through other actions like the use of real-time settlement system instead of end-of-day net settlement system which accentuates systemic risk transfer among banks. Elimination of safety nets would result in accurate pricing of risk, as investors will be fully aware of their level of risk exposure (Kwan 2002, Scott 2004).

Another important measure is to mandate banks to issue more instruments that are not protected by bail out, like the use of subordinated debts, but policy makers should make such instruments accessible to both bigger and smaller banks. In fact, For market discipline to be an effective tool for assessing banks' risk level, creditors should not expect any form of bailout or government guarantees, for instance the too big to fail policy, because it reduces if not eliminates the motivation for depositors and investors to monitor banks (Iannotta 2011, Balasubramnian and Cyree 2011, Flannery and Sorescu 1996, Lane 1993, Morgan and Stiroh 1999).

Market discipline principle requires an open market to effectively regulate financial institutions (Lane 1993). If competition is legally restricted among financial institutions, market discipline is rendered ineffective. For instance if financial institutions are given particular scope of activity geographically or operationally, such may give some institutions more market power than others, thereby increasing the inability of market participant to discipline banks effectively. An example of such instance is when some financial institutions are politically required to issue loan to particular set of organizations not regarding their credit status. At such situation, the market may be unable to differentiate between stable and unstable financial institution. This is in line with Llewellyn (1999) economic rationale for financial regulation, that effective regulation is required to boost consumers' confidence on financial institutions.

Complete, quality, and timely information on both banks' and investors' risk profile is necessary for effective market discipline principle (Carletti 1999, Sironi 2003, Lane 1993). This condition reflects financial intermediation theory, that transaction cost and information asymmetry are the major limitations to financial intermediation (Diamond 1984, Allen and Santomero 1997). Information disclosure is the only condition specified by Basel capital accord for in its proposal for market discipline, that banks should be transparent enough to allow accurate and timely investment decision by market participants. The major constraint to information disclosure is that banks are opaque in nature and naturally avoid excessive disclosure (Morgan 2002). The only way to mitigate this constraint is to mandate financial institutions to be as transparent as possible, just as Basel II did. But such mandate which fully address the problem of intentional concealment of "relevant" information by financial institutions (Lane 1993).

Another condition for an effective market discipline is that banks should appropriately respond to market signals and adjust their risk level for the interest of the shareholders and customers (Sironi

and Zazzara 2003, Sironi 2003). For instance a borrowing bank should respond to high interest rate by reducing borrowings (Lane 1993), to reduce the possibility of transferring high transaction cost to customers and reducing shareholders' benefits. This condition could be rendered ineffective if such borrowing bank has no motive of maximizing risk adjusted profit, or if the investors reactions are not strong enough to discipline banks' risk behavior (Sironi 2003). On this regard Lane (1993) recommends that direct administration control is essential where market discipline could not effectively influence banks' incentive to engage in high risk.

From the above points, it could be read that four conditions are required for an effective market discipline principle. Only information disclosure has been proposed by Basel capital accord, tested and arguably proved by some researchers to be an adequate tool for market discipline. The other conditions were left unattended to (Sironi 2003, Sironi and Zazzara 2003). Policy makers should bear in mind that the fact the market participants can simply influence the prices of securities as compensation for higher risk does not imply that they can really influence banks' risk behavior (Sironi 2003, Kwan 2002).

2.13.5. Potential Benefits of market discipline

Effective market discipline may reduce the effect of moral hazard from safety nets and other forms of guarantees by penalizing banks by eliminating or reducing bank's incentive to take excessive risk (Martinez Peria and Schmukler 2001). An effective market discipline will reflect investor's risk preference in the price of loan and other securities.

The use of market force could be a tool to differentiate 'good' from 'bad' banks, this could improve bank's management efficiency, create a competitive environment for banks, as well reduce regulatory monitoring costs. Market discipline as a regulatory tool is difficult to "capture", due to the anonymous nature of market participants (Martinez Peria and Schmukler 2001, Baxter 2011). Market reaction is quicker in imposing penalty in excessive risk-taking banks than regulators, thereby reducing systemic risk and claims from deposit insurance funds (Wall 1989, Evanoff 1991).

In a rule-based regulation, rules do not effectively relay the actual risks taken by banks, therefore, regulators find it difficult to measure the costs and benefits of sanctions imposed on defaulted banks (Lang and Robertson 2002). In a Market-based regulation like market discipline, the prices of banks' securities reflect the level of risk-taking. Bank management could also rely on market discipline to oversee banking activities, instead of depending solely on the directives from financial regulatory

authorities. Also through market prices of banks' securities, regulatory bodies could extract information useful as a warning or to initiate banks' examination. This also induces regulators to take early corrective measures, as they may not be able to claim ignorance of bank risk-taking behavior, (Hamalainen 2006).

2.13.6. Potential Costs/limitations of market discipline

Market discipline seems to be more effective in a relatively perfect and well informed market (Scott 2004), which is rare in the real world. Market discipline practice in a market with information asymmetry and externalities signals bank runs and destabilizing effects in the financial system (Diamond and Dybvig 1983, Goodhart et al. 2013). This raises a concern on the effectiveness of market discipline as a regulatory tool in an emerging market economy.

The key objective of using market discipline as a regulatory framework is to curtail risk-taking incentive of banks by imposing higher financing cost on riskier securities used by market participants. In most cases higher financing cost does not necessarily curtail risk taking incentive because a profit maximizing bank trades off risk for higher return. In this case, market participants enjoying higher returns from banks may be reluctant to discipline banks through investment withdrawal or attracting regulators attention (Kwan 2002). Also this key objective of market discipline contradicts the objective of regulatory authorities in sustaining and improving the level of credit supply. If banks should refrain from risk taking, it means reducing credit supply to riskier clients (Calomiris 1999).

Complying with the conditions for effective market discipline might also generate excessive cost in the banking industry (Hamalainen 2006), for instance maintaining an open market, sourcing for accurate and reliable information, and existence of systemic risk due to elimination of bail out and guarantees. Also the use of mandatory subordinated debt as an instrument of market discipline may not be challenging for larger banks but it could be a burden for smaller banks (Committee 2000). Subordinated notes and debts are scarce in the hand of market participants, they are mostly held by holding companies, the few traded in the public are issued by bank holding companies not subsidiaries (Kwan 2002). Though financial regulatory authorities are making policies to increase issuance of subordinated debts by banks, for instance the Gramm-Leach-Bliley financial modernization act of 1999, subordinated debt instrument is still a burden to smaller banks. Using subordinated debt held and issued by holding companies as target for market discipline could be

noisy, depending on the level of nonbanking activities carried in the organization. It could also imply that regulators are more concerned about the safety and soundness of the holding companies rather than banks.

The use of market discipline largely depends on the signal from market prices, false signals could occur, leading to misguided regulatory actions and ineffectiveness of a regulatory regime (Committee 2000). Investors depend on information perceived to be predominant and important in banking environment, information from financial regulators is seemed to be predominant and important. Such believe and perception could lead to herd behavior where large number of investors would relax from monitoring the market, thereby instead of market discipline stabilizing the financial system, could generate destabilizing effect.

2.13.7. Suggested Recommendations on the use of market discipline as a regulatory tool

Based on the comparative study of costs and benefits of marker discipline, the question then is "what is the appropriate structure for an effective financial regulation"? Some researchers (Dhumale 2000, 2001) argue that market discipline cannot be seen as an exclusive tool for financial regulation, it might render the operations and stability of the financial sector ineffective. In the same angle, Linnell (2001) argues that effectiveness of market discipline is still questionable as the level of information disclosure by banks still remains poor, that false information from the market could lead to poor decision making by the regulatory authorities. Prowse (1997) suggests that regulatory force is an appropriate tool to discipline banks managers.

On the contrary, many researchers have blamed the reoccurrences of financial crises on the inability of the financial regulators to come up with a sound regulatory policy (Allen and Carletti 2013a, Llewellyn 2000, Lindgren, Garcia, and Saal 1996). Demirgüç-Kunt and Detragiache (2002) carried out a study on 61 countries, and found that 66% of the countries have experienced major financial crises between 1980 and 1997. They placed the blame on inadequate prudential regulation and supervision by the government.

The savings and loan crisis and the criticisms of the Basel I capital accord has indicated that an absolute rule-based regulatory oversight may not be appropriate for an efficient regulation. For instance deposit insurance and central banks bail out have been criticised for unintentionally creating moral hazards and adverse selection (Dowd 1996, Demirgüç-Kunt and Huizinga 2004), while Basel I minimum capital requirement among other things have been accused of causing regulatory arbitrage

(Benink and Wihlborg 2002), whereby banks engage in loan securitisations, and shift their portfolios to lower quality assets. Evanoff and Wall (2001b) argue that banks have become experts in capital arbitrage to the extent that capital requirement is no more seen as a tool against systemic risk but as a mandatory requirement to be complied with. This notion arguably has made banks to perceive regulators as monitors, rule enforcers rather than supervisors (Hamalainen 2006).

Llewellyn (2000) calls for a regulatory framework that could integrate proper incentives for market participants after his considerations on detailed prescriptive rules and creation of incentives for appropriate conducts in the financial institutions. That does not imply that all rule-based financial regulation is sub-optimal, rules are still necessary as they provide certainty which is necessary in regulation (Estrella 1998), especially as regulators have to still monitor banks' risk management strategies and control systems. Also information from the market forces can be useful to regulators for speedy corrective actions where necessary (Flannery 2009). What is required is a regulatory approach that could be flexible and as well accommodate banks' specific operations especially the smaller banks in emerging markets.

Cost benefit analysis of market discipline indicates that there is a limited level for the use of market discipline as a financial regulatory tool (Forssbæck 2011). Market discipline is unlikely to be a substitute for a rule-based regulation if insured funds still exist in banking operations and there is still a possibility for systemic risk (Hamalainen 2006, Lang and Robertson 2002). Operating with insured funds indicates that rule-based regulation is required to ensure that banks do not engage in excessive risk exposure that is contrary to customers' will. Though some argue that such protection literally means creating the actual problem one is intending to resolve (Dowd 1996). Nevertheless, customers equally need some degree of protection (Llewellyn 1999), but should be made to understand that they are responsible for their personal financial decisions, which implies that customers should follow up with banks' risk behavior. This is in line with one of the conditions of an effective market discipline, that investors should be aware of their risk exposures with banks (Morgan and Stiroh 2001).

Absolute reliance on market discipline should raise some concern on regulatory structure. Because regulatory authorities and market participants may have slight differences regulatory objectives, both regulators should have different information needs and regulatory tools (Flannery 1998, Briault 2002), all for the purpose of financial stability. In the same line different market participants have

different information needs due to differences in their risk and return profile, on the note Hamalainen (2006) argues that market discipline should be a complementary regulatory tool to regulatory authorities. This opinion is supported by Bruni and Paternò (1995), that the two kinds of regulation "market discipline and rule-based regulation" are deeply related but market discipline cannot be separated from regulation. Though some aspect of regulatory rules could be replaced by market discipline, but market force is meant to complement the efforts of the regulatory authorities (Gilbert 1990, Lane 1993), especially during a financial meltdown (Hadad et al. 2011).

Flannery (2001) posits that both investors and supervisors have comparative advantage in disciplining financial institution. While investors have the advantage of monitoring, supervisors have the advantage of influencing financial institutions. This primarily implies that supervisors should use price signals from investors as a base to provide prompt corrective action to perceived failing institutions. For this reason, one of the conditions for effective market discipline is that regulators should apply some degree of monitory to ensure effectiveness where market discipline could not effectively influence banks' risk behavior (Lane 1993). This proposes that market-based regulatory framework needs some rules before a conducive environment can be provided for effective supervision.

Hamalainen (2006) suggests an approach where the regulators will impose some rules such as issuance of operating license, which will be complemented by market forces by determining the level of banks' risk taking. Lang and Robertson (2002) add that regulators will perform better if they can take full advantage of free market signal in policy formulation. As many researchers have the view that mixed regulatory framework of market discipline and regulatory authorities may be the best solution for financial regulation, the remaining issue then is what is the optimal mix for market-based and rule-based regulatory oversight?

2.14. The Twin-Peaks Regulatory Model

Twin-peaks regulatory model is an integrated system of regulation, which entails that regulators with different objectives require different approaches and strategies (Pan 2010). It is a global financial regulatory reform wherein prudential supervision is separated from market conduct supervision of the financial sector. Under the twin-peaks model, the financial services firms will have two regulators: a prudential regulator and a market-conduct regulator. This system is meant to make

regulation more effective and lessen potential systemic risks that can arise due to innovation and possible regulatory redundancy or failure.

The two independent regulators will specifically focus on achieving regulatory objectives by managing risks that could arise from similar functions and activities of financial institutions, while at the same time fostering policies that maintain overall financial system stability. That is, twin-peaks model focuses regulation/supervision on functions and activities of financial services firms rather than on the form (i.e., their industry or sector classification in the earlier section of this chapter).

Traditionally, financial regulation has been a sector-based regulation up until 1990s. In such regulatory approach, regulators focus on the three basic financial sectors — banks, insurance companies and security firms (Herring and Carmassi 2008, Pan 2010, Di Giorgio, Di Noia, and Piatti 2000) (see structure of financial regulation). Prior to late 1990s, different financial sectors specialize in distinct financial products and services, with different accounting practices, business practices and risk profiles; therefore, they all had different regulatory objectives (Herring and Carmassi 2008). The regulatory objective for banks has always been to mitigate systemic risk, due to the effects of bank runs in the event of financial panics. While that of insurance and security firms has been to protect policy holders and investors, as well as ensure market efficiency, without having the concern of systemic risk (Allen and Herring 2001, Herring and Carmassi 2008).

In recent times, the three basic financial sectors no longer specialize in distinct businesses or operations but have become conglomerates (Botha and Makina 2011, Čihák and Podpiera 2008, Herring and Carmassi 2008, Borio and Filosa 1994), where a financial institution, for instance a bank, engages in multiple business activities to include insurance and security issuance. Many financial institutions now provide products and services that cut across the three traditional industries of the financial sector, thereby making it difficult for consumers to distinguish between financial products the originated industry (Demaestri and Guerrero 2003). Such business strategy could cause regulatory redundancy, overlapping, and regulatory gaps. For instance, different regulatory conducts could be given to similar products just because different financial sectors separately offer the products (Herring and Carmassi 2008).

The diminishing importance of industry based financial institutions relates to the fact that as of 2008, on average according to market share, financial conglomerates consist of 60% insurance business, 70% security issuance, and 90% traditional banking business in Netherlands (Kremers,

Schoenmaker, and Wierts 2003). In such a situation, industry-based regulation will be ineffective as one financial institution will be required to report to three different regulators specializing in three different financial industries (Botha and Makina 2011, Pan 2010). This situation creates opportunity for regulatory arbitrage where financial institutions move business from units with tighter regulation to less regulated units. The less regulated unit therefore could be a source of instability to the entire financial institution which could in turn pose systemic risk to the entire financial system (Botha and Makina 2011).

Due to the above mentioned reasons, there comes a need for integrated or unified financial regulation and supervision across the financial sector (which contains distinct industries) (Kremers, Schoenmaker, and Wierts 2003, Herring and Carmassi 2008, Taylor and Fleming 1999a, Briault 2002, Garicano and Lastra 2010, Wymeersch 2007, Taylor and Fleming 1999b). There is a unique difference between integrated and unified financial regulation. A unified financial regulation is such regulatory framework where a single regulatory agent is responsible for both prudential and market conduct regulation (see objectives of financial regulation section). An integrated regulation on the other hand requires that two separate regulatory agents independently oversee prudential and market conduct regulations of all financial institutions (Llewellyn 2006, Herring and Carmassi 2008). Twin-peaks regulatory model is an example of an integrated system of financial regulation.

There has been an argument that unique differences in risk profile and accounting practices of banks, insurance companies and security firms will render integrated financial regulation ineffective (Demaestri and Guerrero 2003). But it should be recalled that these different industries no longer specialize in distinctive business activities, but integrate different and a variety of financial products and services as conglomerates. Despite the said differences in industries of the financial sector, Australia and Netherlands have successfully implemented twin-peaks system of financial regulation since 1998 and 2002, respectively (Bakir 2003, Ilie and Guţu 2013). Many other countries including emerging countries are driving towards implementing twin-peaks regulatory model. Belgium and UK proposed for the twin-peaks model in 2011, South Africa in 2013. While France, Spain, Italy and US are all recently proposing adoption of the twin-peaks system of financial regulation, though with US differently proposing multiple prudential regulators in the mix. The major motivation for most countries, especially the European Union to call for regulatory reform is due to reoccurrence of financial crises, as most countries started moving towards twin-peaks only after the 2007/2008 global financial crisis, with the exception of Australia and Netherlands. The rationale for combining

macro and micro prudential regulation under one regulatory body is to ensure stability of the entire financial system, regulators should understand the behavior of individual financial institutions towards risks especially the SIFIs (Kremers and Schoenmaker 2010) and their ramifications for the overall system.

The major aim of twin-peaks is to introduce clearer lines of regulatory responsibilities by allowing two regulatory bodies to independently be responsible for the prudential and market conduct objectives of financial regulation. The prudential regulators are meant to identify and mitigate any systemic risk as a result of one financial institution's failure, they set rules and standards, maintain and monitor adherence to the rules. Should a financial institution fail or unable to adhere to regulation, the prudential regulator has the authority to liaise with the financial institution to agree on possible resolutions (Pan 2010). The prudential regulator has the right to impose corrective measures if mutual agreement could not be reached. With respect to the roles of prudential regulators, they are assumed to have more corporate relationship with financial institutions.

On the other hand, market conduct regulators relatively monitor financial institutions with the sole aim of protecting consumers' interests. They effectively represent financial institutions' customers and investors; for instance, ensuring adequate organization of the securities market, efficient execution of orders, and elimination of unfair clauses on financial contracts (Wymeersch 2007). They require financial institutions to meet up with regulatory requirements in favor of market participants; for instance, public disclosure of financial institutions' level of stability and risk management strategies. Market conduct regulators have the authority to discipline financial institutions that fail to adhere to their minimum regulatory requirements.

There is a seeming conflict of interest between the prudential and market conduct objectives of financial regulation (Wymeersch 2007). The prudential objective is to ensure the safety and soundness of the financial institutions, while the market conduct objective is to ensure consumer protection and confidence. For instance, if a bank is becoming less profitable, or incurring losses, it is required under market conduct objective that such information is made public to protect consumers. But disclosing such information could lead to bank runs (Rochet and Vives 2004), hence threatening the safety of such bank and other interconnected banks. Pan (2010) posits that a single regulator cannot simultaneously carry out these objectives, without contradicting regulatory objectives.

Therefore, there is a concern over the ability of a single regulator to effectively strike non-conflicting balance between the prudential and market conduct regulation. Evidence of the struggle to adequately combine prudential and market conduct objectives was noticed in UK's Financial Services Authority (FSA) as a singly regulatory body. FSA was simply tasked with many conflicting functions to be performed all at the same time (Taylor 2009).

Cultural conflict could also exist in a single regulatory model. Lawyers tend to dominate in market conduct, while economist tend to dominate in macro prudential regulation (Herring and Carmassi 2008, Kremers and Schoenmaker 2010). These two groups have different interests and concerns towards economic development; therefore will be struggling to shape the regulatory process to suit their different interests or perspectives. The US experience with Security and Exchange commission (Cubillas, Fonseca, and González), which is in charge of security firms under industry-based regulation, revealed that when the primary objective focuses on market conduct, lawyers intend to shape the regulatory process and control the agenda and other information necessary to formulate a regulatory policy (Herring and Carmassi 2008). This conflict of interest and culture is what twin-peaks model attempts to resolve by keeping prudential and market conduct regulations separate and independent so as to effectively promote financial system stability and ensure adequate consumers protection.

2.14.1. Arguments in favor and against the twin-peaks model

Prior to UK's 1997 regulatory reform (single regulatory model), twin-peaks reform has been actively debated and attracted supports, but the bank of England strongly opposed it with the intention that its regulatory responsibilities will be stripped off by twin-peaks model (Taylor 2009). The advocates of single regulatory model argue that the line of distinction between prudential and market conduct regulation is not so clear, therefore there is no so much importance in assigning two separate regulators (Briault 1999). The above argument is made clearer in Davies and Green (2013), that the fundamental goal of financial regulation is to provide adequate financial services and investment opportunities to financial consumers and investors. Therefore, splitting the goal into consumer protection and prudential regulation could generate a wide loss of confidence in the type of financial products/services and the type of firm (banks, insurance and security firms) that provide the products and services.

Briault (1999) posit that in practice, related and similar issues are examined by both prudential and market conduct regulators, for instance, proper allocation of management responsibilities, ensuring regulatory compliance, adequate internal system controls. Therefore there exists a substantial overlap rather than conflict of interest between the two regulatory agencies; on that note, such responsibilities are best administered by single regulatory agency. This argument neglected the possibility that one regulatory group could dominate the regulatory process in a single regulatory model due to political or cultural processes (Herring and Carmassi 2008).

Notwithstanding the rationales for single regulatory model, the 2007/2008 global financial crisis has changed UK's perspective on a single regulatory model. Both the UK government and the London Financial Services Authority (FSA) have acknowledged that due to adoption of single regulatory model, market conduct objective has been carried out at the detriment of prudential regulation, instead of creating a balance between the two (Turner 2009, Taylor 2009). This confirms the argument by Herring and Carmassi (2008) that when the primary objective focuses on market conduct, lawyers who dominate the market conduct regulation tend to dominate regulatory process and control the agenda and other information necessary to formulate a regulatory policy.

Mortgage Bank Northern Rock was the first UK's casualty of the 2007/2008 financial crisis [see Milne and Wood (2009); Mayes and Wood (2009); Keasey and Veronesi (2008)]. In FSA's supervision of the Northern Rock, more emphasis was placed on market conduct regulation (fair treatment of customers), but there was deficiency in prudential monitoring like capital and liquidity regulation (Taylor 2009). Northern Rock was subjected to a major prudential meeting only once in three years. On trying to identify the reason why FSA placed more emphasis on market conduct regulation, the committee on economic affair16 found that, FSA assumed that market conduct regulation is politically sensitive, therefore appears more important. On a natural basis, a regulator with dual responsibility will concentrate more on a responsibility that is considered politically sensitive, which is assumed to have greater political impact. In contrast, prudential regulation which arguably is more important was assumed to have less political impact, therefore was given less attention. Prudential regulation could most at times have less political impact than market conduct regulation, but in times of crisis, like the 2007/2008 economic crisis, its impact on the economy, businesses, and individuals, is much greater than the market conduct regulation.

[16] House of Lords, Select Committee on Economic Affairs, Banking supervision and regulation, 2008-09. Available at http://www.publications.parliament.uk/pa/ld200809/ldselect/ldeconaf/101/101i.pdf.

More concerns over the adoption of twin-peaks regulatory model is revealed in a survey conducted in 2012 by BDO (a UK accountancy and professional service firm) and DLA PIPER (a partnership of UK and US leading international business law firms, with many offices in Africa, Europe, United States, Asia pacific and the Middle East). There are signs that financial services firms are already struggling to manage the weight of regulatory activities, raising concerns that moving to the twin-peaks system of supervision could exacerbate existing difficulties about identifying and prioritizing regulatory developments by mudding the water further. In the United Kingdom, there are worries that the prudential regulators and the market- conduct regulators will not operate together with a consistent approach; thus, such lack of co-operation might escalate the potential detrimental impact on the UK financial services industry.

The survey by BDO and DLA PIPER revealed that there is a fear that a disjointed regulatory system will add to time and overhead spent by regulated firms. To prevent disjointed regulation in twin-peaks model, Pan (2010) posit that a coordination strategy should accompany twin-peaks model, where any conflict between the separate independent regulators will be resolved by another independent body. He went further to argue that an elected government official should not carry out the coordination obligation, as that may politicize regulatory objectives. Despite the worries about twin-peaks model implementation, positive signs do exist. The survey results from BDO and DLA PIPER also shows that a large majority of firms (e.g., 79%)[17] believe that changes to this regulatory system will result in an improved effectiveness, which can be expected to contribute to promoting the UK as a global hub for the financial sector.

Empirically, Čihák and Podpiera (2008) posit that integrated financial regulation improves supervisory quality in financial institutions. Čihák and Podpiera carried out study on the effect of supervisory structure on quality of supervision, using 84 countries around the globe. Quality of supervision is measured based on compliance with international accepted standards for banking, insurance and security regulation as detailed by IMF-World Bank assessment on regulatory compliance. As for the banking sector, the internationally accepted regulatory standard is the Basel Core Principles for effective banking supervision (BCP).

[17] The research conducted by Coleman Parkes, for and on behalf of BDO and DPLA Piper, had 350 respondents who were key business leaders from a wide range of financial services sectors.

Relative to various types of regulatory integration (full sectorial/functional, full sectorial/partial functional and twin-peaks integration)[18] in financial sector, Čihák and Podpiera found that in the banking sector, twin-peaks model has relatively higher qaulity of supervision. This result is still significant even after adjusting for cross country differences in economic development using GDP per capital. Their result is driven by relatively better regulatory practice and prudential framework employed by twin-peaks model. They also found that the quality of supervision is consistent in integrated regulatory model across the financial sectors. Their result is partially supported by Podpiera and Cihak (2006), who found that high compliance with BCP is correlated with lower ratio of non-performing loan relative to banks' total loans.

2.14.2. The central banks' stake in regulatory integration.

One interesting issue with twin-peaks is that whether the prudential regulation is carried out by the central bank or not, is not an issue of serious consideration. Some countries like Netherlands, UK, and Switzerland have their prudential regulation integrated with the central bank, while Australia, Belgium, and Canada do otherwise. Australia argue that the central bank can perform some of the roles of the Financial Services Council (which is in charge of the prudential regulation) but not the prudential regulatory role (Taylor 2009).

The argument on whether the central bank should get involved in financial regulation and supervision and the extent of its involvement have been summarized for instance in Goodhart and Schoenmaker (1992, 1995) and Goodhart (2002), Akinbami and Ngwu (2016). Ely (2008) argues that financial regulatory failure may be due to government monopoly in formulating financial regulatory policies. He suggests that its time financial institution regulation is privatized. On the other hand, Ferguson (1999) argued that regulation from both market and authorities is important in the world of financial modernization and innovation, and that the central bank has earned and need a place as regulators of banking related entities.

Some of the argument for delegating some, if not all, the financial supervisory power to central banks are traced to issues of safety and soundness of banks and efficient resource allocation. Central banks need to assess the solvency and liquidity of banks for easy execution of duty as the lender of last resort. Having access to such information is necessary especially during the financial crisis,

[18] In full sectorial/functional integration, the regulatory agent is responsible for both prudential and market conduct regulation of all financial institution. This is also referred to as single regulatory model. In full sectorial/partial functional integration, some of the regulatory functions are shared with various regulatory agents, mostly the central banks or other regulatory agencies.

which will enable the central bank to effectively employ adequate monetary policy instrument (Goodhart and Schoenmaker 1995, Haubrich 1996).

Peek, Rosengren, and Tootell (1999) argue that timely access to banks' confidential and accurate information enhances the ability of the central banks to accurately forecast macroeconomic stability. But Feldman et al. (2003) disputed Peek et al's findings, that there is no enough empirical evidence to support their argument on access to supervisory information by the central banks and forecasting of macroeconomic stability. Haubrich (1996) also adds that central banks could have access to timely and accurate supervisory information through independent bank supervisory authorities rather than directly from the banks.

Banks' supervision requires independent authority (Dincer and Eichengreen 2012), therefore the independence nature of central banks enhances their capability to enforce regulatory actions on banks. But Briault (1999) argues that widening the role of central banks subjects them to political pressure, which questions their independence in monetary policy implementations. Moreover, if bank failures occur while banks are being regulated by the central banks, central banks credibility could be undermined by the whole public, which will have a negative impact on the financial system as a whole (Haubrich 1996, Briault 1999).

Another argument against delegating supervisory authority to the central bank is related to the issue of conflict of interest in regulatory and monetary policy objectives. Where the central bank is faced with conflicting role of monetary policy and banking supervision, it may decide to embark on too loose monetary policy to avoid adverse effect on credit quality (Briault 1999, Haubrich 1996, Goodhart and Schoenmaker 1992, 1995). Because there are also argument in favor of combining banking regulation with monetary policy, the main issue is no more whether there are conflicting interest in doing so, but to know if the conflicts are more or less compared to the disadvantages from choosing alternative approaches (Briault 2002), that is excluding central banks from financial regulation.

Many recent studies are still finding conflicting results on central banks and government participation in financial regulation and supervision. Masciandaro, Quintyn, and Taylor (2008) analyzed the determinants of financial supervisory governance inside and outside the central bank using 55 countries. They found that financial supervisory arrangement situated outside the central bank is likely to be more suitable for financial supervision. Taking into account the global financial

crisis of 2007/2008, Masciandaro, Quintyn, and Pansini (2011) posit that the involvement of central bank in financial regulation has no significant impact on economic resilience after analyzing the supervisory architecture and governance of 102 countries. while Čihák and Podpiera (2008) found that whether supervision is within or outside the central bank does not significantly relate to supervisory quality. In analyzing the impact of supervisory structure on banks' performance, Barth et al. (2003) did not find any effect of central banks involvement in banking supervision. But they found that the higher the country's economic development the more the regulatory authorities are independent of the government.

With a sample of 380 countries between 1998 and 2010 Dincer and Eichengreen (2012) found that a country where the central bank is not the lead supervisor and regulatory agency is independent of the government, non-performing loans are lower. But there is a trade off in their findings, because they also found that countries with central banks rather than another agency as financial regulator tend to have higher capital ratios. Their finding concerning the non-performing loans is consistent with Barth, Caprio Jr, and Levine (2004), that countries with private bank monitors tend to have low ratios of non-performing loan.

2.14.3. Country case study

Prior to the 2007/2008 global financial crisis, many countries had been contemplating reforming their regulatory structure, either for single or multiple regulatory structures. Several countries especially in the Europeans zone, even the entire European Financial Supervision, have made proposals for twin-peaks regulatory model (Masciandaro 2009). Fischer (2009), group thirty 2009[19], and US blueprint recommended twin-peaks system of regulation. In the Euro area, many countries including Netherland, France, and Belgium have fully implemented twin-peaks, while countries like Spain, Portugal and Italy already have features of twin-peaks[20]. It was only Australia and Netherlands who made bold steps towards twin-peaks regulatory structure in 1998 and 2002 respectively, before the 2007/2008 financial crisis. The severity of the financial crisis was less in those two countries. Lui (2013) compares the performance of four big UK and four big Australian banks between 2004 and 2009, and found that Australian banks never required government bailout during the financial crisis, unlike UK banks. He recommended macro prudential changes for the UK banks. Due to the

[19] Group thirty financial reform: a frame work for financial stability. Available at http://fic.wharton.upenn.edu/fic/Policy%20page/G30Report.pdf

[20] See European Central Bank: Recent development in supervisory structures in the EU member countries (2007-2010). Available at https://www.google.co.za/?gfe_rd=cr&ei=E6NdU46YD4Pd8gfR_YDgAw#q=european+central+bank+and+twin+peaks

significant positive effects of twin-peaks model, it has attracted the attention of many other countries including US and UK, and other emerging market countries like South Africa. Explained below are regulatory structures of some of the countries with twin-peaks model.

2.14.3.1. Australian Regulatory Structure

Australia implemented twin-peaks regulatory model in 1998. Prior to that, the country was operating an institutional-based regulatory structure (Bakir 2003). Australia's change in financial regulatory structure was based on the Wallis inquiry report in 1997. In 1996, a financial system inquiry was established to undertake financial system inquiries, including recommending an appropriate structure to accommodate the rapid evolution of Australia's financial system. Stan Wallis was the chairman of the inquiry, thereby generally referred to as Wallis Inquiry (Harper 1997, Bakir 2003, Carmichael 2004). One of Wallis's recommendations was a revised financial system to promote competition among international financial institutions without a compromise to financial system's safety and soundness.

At the time of Wallis's report, the regulators of Australia's financial industries were Reserve Bank of Australia (RBA), Australia Financial Institution Commission (AFIC), and Insurance and Superannuation Commission (ISC). Responding to Wallis's report, Australian government decided to create the Australian Prudential Regulation Authority (APRA), a single prudential regulator to take over the prudential authority of RBA, AFIC, and ISC. A second peak, Australian Securities and Investment Commission (ASIC) takes charge of market conduct regulation, with the responsibility of protecting consumers and investors' interests. The RBA was delegated with monetary policy issues and overall payment system, while the treasury provides financial advice to the government[21]. For proper coordination among the regulatory agencies, representatives from RBA, APRA, ASIC, and the treasury formed a council for financial regulators (Pan 2010).

2.14.3.2. The Netherlands' Regulatory Structure

Up till 1990's the regulatory structure of Netherland has been the traditional way of separate regulators for the three separate financial sectors. The De Netherlandsche Bank (DNB; the Netherland Central bank), Insurance Supervisory Authority, (ISA) and the Authority for the Financial Markets (AFM) were responsible for banking, insurance, and financial market regulation respectively (Prast and van Lelyveld 2004). In 2002 the Netherlands proposed for an integrated regulatory structure. The rationale for the proposal was based on the fact the Dutch financial system

[21] IMF country report; Australia: Financial System Stability Assessment, November 2012, No 12/308.

was perceived unable to handle the tremendous rise and conglomerate nature of financial sector activities. Also the growth of cross-border market was on the rise (Pan 2010). Out of the various forms of integrated regulatory system, Netherlands choose the twin-peaks, to separate prudential and market conduct regulation under different regulatory agencies.

The rationale for choosing twin-peaks is first; Netherland recognized the fact that prudential and market conduct regulators need different skills to achieve their different objectives despite any level of synergies between them[22]. Second, it was believed that minimizing the number of regulatory authorities will reduce the probability of regulatory arbitrage. Third, due the above two reasons, twin-peaks was expected to be more effective in supervising financial conglomerates across the financial sectors (Pan 2010).

Prior to 2004, Netherlands' prudential regulation was delegated to the DNB and PVK (Pensioen en Verzekeringskamer), the prudential regulator for insurance and pensions, while the AFM was responsible for market conduct regulation. In 2004, the Netherlands decided to merge PVK into DNB, making DNB the first peak and the sole prudential regulator, while AFM remains the market conduct regulator (the second peak)[23]. Netherlands unlike Australia and France chose to invest the prudential regulation on the DNB due the synergies between the monetary and prudential policies, as well as the close relationship between financial and macroeconomic stability. Second, they expect that macroeconomic analysis of the central bank could benefit the prudential regulator. Third, to delegate a new responsibility to the central bank, as the monetary policy decisions have been under the European central bank. On that note the conflict of interests between monetary policy and financial stability decision is minimized. The third point was what France failed to recognize that led to the rejection of twin-peaks proposal by the Banque de France in 2002.

The Dutch government fully implemented twin-peaks in 2007. Although the Dutch financial sector was affected by the global financial crisis, the "twin-peaks" model remained effective for the Netherlands. The DSB (Dirk Scheringa Beheer) bank, a systemically important financial institution, failed in 2009; Fortis, a Dutch- Belgian bancassurance firm, collapsed following its participation in the takeover of ABN Amro. Despite that, the "twin-peaks" model was effective during the crisis because it was possible for the regulators to make timely and accurate decisions to make changes in

[22] IMF country report; Kingdom of Netherlands-Netherlands: financial system stability Assessment, June 2011, No 11/144. Available at http://www.imf.org/external/pubs/cat/longres.aspx?sk=24986.0

23 IMF country report; Kingdom of Netherlands-Netherlands: financial system stability Assessment, September 2004, No 04/312. Available at http://www.imf.org/external/pubs/cat/longres.aspx?sk=17756.0

regulatory plans to accommodate the banking crisis. The change of plans was easy because the laws of twin-peaks model permit information sharing and policy adjustments[24]. The Dutch financial sector has continued to grow both in capital ratio and international perspective. The risk weighted core capital ratio as at 2012 according to Basel III calculation method is between 9.5% and 11.5%. Though Basel III capital ratio will not be fully implemented until 2019, but investors are already using it as a measure of investability and stability[25]. Dutch government has actually proved that when designed properly, twin-peaks is doable and efficient (Kremers and Schoenmaker 2010).

Table 2.5: The Dutch Twin-Peaks Model

<table>
<tr><td rowspan="2"></td><td colspan="2">Financial stability</td><td rowspan="2">Conduct of business</td></tr>
<tr><td>Macro prudential</td><td>Micro prudential</td></tr>
<tr><td>Banks</td><td colspan="2" rowspan="3">DNB</td><td rowspan="3">AFM</td></tr>
<tr><td>Insurance companies</td></tr>
<tr><td>Security firms</td></tr>
</table>

2.14.3.3. France Regulatory Structure

France has previously planned to propose for twin-peaks system of financial regulation in 2002, with the aim of setting a prudential regulator outside the central bank. But Banque de France resisted delegating its primary role of financial regulation to another authority. The reason was that Banque de France has no responsibility over the country's monetary policy which is in the hand of European central bank. The French government was only able to implement the second peak (Market conduct regulation) in 2003, under the authority of Autorité des Marchés Financiers (AMF) (Antipa, Mengus, and Mojon 2010). AMF was invested with three responsibilities of ensuring safe investment in financial instruments, accurate information available for investors, and orderliness in financial market[26].

Prudential regulation was shared among different regulatory agencies. The Commission Bancaire in the Banque de France are responsible for banking prudential regulation, while The Autorité de

24 IMF country report; Kingdom of Netherlands-Netherlands: Publication of financial sector Assessment program documentation: The twin-peaks July 2011 No 11/208. Available at http://www.imf.org/external/pubs/cat/longres.aspx?sk=25088.0

25 Overview Financial Stability, Autumn 2013. Available at http://www.dnb.nl/en/binaries/OFS_Autumn_2013_EN_WEB_tcm47-297685.pdf

26 See The AMF, Duties and powers, who are we. available at http://www.amf-france.org/en_US/L-AMF/Missions-et-competences/Presentation.html

Contrôle des Assurances et des Mutuelles is responsible for insurance companies prudential regulation. A separate board coordinating the regulatory agencies exists, which include the heads of various regulatory agencies, but this group lacks any formal authority (Davies and Green 2013, Pan 2010, Alford 2005). From the above literature, it could be concluded that France's regulatory structure before adopting twin-peaks model was a lead regulatory model.

In the aftermath of the 2007/2008 global financial crisis, French authorities took bold steps to strengthen their regulatory oversight framework. In January 2010, the country adopted the twin-peaks financial regulatory model. The Commission bancaire (banks' prudential regulator) and the Autorite decontrole des assurances et des mutuelles (insurance prudential regulator) were merged into a single prudential regulator to form Autorité de Contrôle Prudentiel (ACP). The ACP foresees the prudential regulation of banks, insurance companies, investment services and market infrastructure providers. The second peak, Autorité des Marchés Financiers (AMF) retained its responsibility of market conduct regulation in conjunction with ACP, but with a joint unit (Pôle commun). ACP is closely associated with the Banque de France; the chairman of the ACP is the governor of the Banque de France, with its daily management posed under a secretary general.

Table 2.6: France Regulatory structure

<table>
<tr><th></th><th>Insurance</th><th>Banking</th><th>Investment Services providers</th><th>Market Infrastructure providers</th><th>Asset Management</th></tr>
<tr><td>Regulation</td><td colspan="2" rowspan="4">Minister of finance</td><td colspan="3" rowspan="2">AMF</td></tr>
<tr><td>Rules of conduct</td></tr>
<tr><td>Prudential regulation</td><td colspan="3" rowspan="3">ACP</td></tr>
<tr><td>Licensing</td></tr>
<tr><td>Consumer protection</td><td colspan="5">ACP and AMF (joint unit - Pôle commun)</td></tr>
</table>

Source: IMF Country Report No. 12/341, December 2012

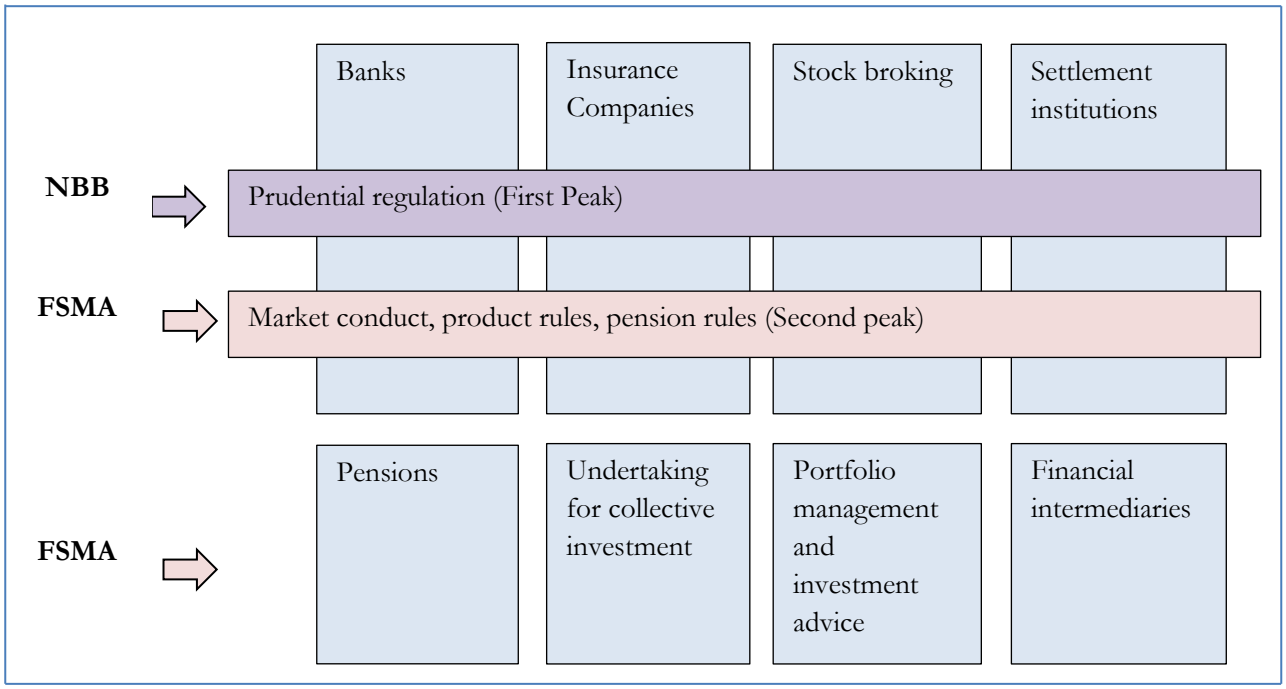
2.14.3.4. Belgium Regulatory Structure

Up till 2003, Belgium financial regulation has been sector-based but banking and securities supervision was grouped under one agency (the banking and finance commission), while insurance companies have a separate agency (the insurance supervision). From January 2004, the banking and

finance commission and the insurance supervision were merged to form an integrated regulator, the Commission Bancaire, Financière et des Assurances (CBFA) known as the Banking, Finance and Insurance commission. The CBFA carries out the micro prudential regulation of all financial institutions, including market conduct regulation, while the Nationale Bank van België (NBB; National Bank of Belgium) oversees the macro prudential regulation.

In April 2011, the Belgian government adopted the twin-peaks regulatory model by allocating all prudential regulation to the NBB, while forming another body, the Financial Services and Markets Authority (FSMA), to take charge of the market conduct regulation, consumer protection, registration of financial intermediaries, and other financial market issues. According to Belgium government, twin-peaks structure inspires clear supervisory directives and improves checks and balances. The key success factor for twin-peaks is effective communication and coordination[27].

Table 2.7: Belgium Twin-Peaks model



Source: IMF Country Report No. 13/134, May 2013

2.14.3.5. South Africa Proposed Regulatory Structure

South African financial regulatory structure moved from institutional approach in the 1980s to functional approach in the 1990s, with partial integrated approach (Botha and Makina 2011).

[27] IMF country report; Belgium: Financial System Stability Assessment., May 2013, No. 13/124. Available at https://www.imf.org/external/pubs/ft/scr/2013/cr13124.pdf

Banking supervision department of the South African Reserve Bank (SARB) regulates the banking sector, while the Financial Services board (FSB) independently regulates other non-banking financial institutions but accountable to the National Treasury. Many other financial regulatory duties for some industries are split across so many regulatory bodies. For instance, the National Credit Regulator (NCR) regulates the credit industry with the aim of ensuring fairness, competiveness and consumer protection in the credit industry. Presently, South African financial regulatory system has different regulators being coordinated by different regulatory, statutory, and advisory bodies, therefore could be classified as functional and horizontally split approach (Botha and Makina 2011).

Following the IMF and World Bank financial system assessment program, though South Africa was one of the countries with modern and effective financial regulatory framework, there is need to reform the financial regulatory system, with priority given to prudential and market conduct regulation[28]. South African government issued a National treasury policy document in February 2011 (a safer financial sector to serve South African better) setting out proposals to strengthen the regulatory system, with major emphasis on twin-peaks regulatory model. In February 2013, the financial regulatory reform committee issued a document, proposing for the twin-peaks regulatory model and setting out strategies for its adoption in 2014. The document is an evidence of strong relationship between the SARB, FSB, the national Treasury and the NCR to ensure a stronger, better, safer, and more inclusive financial system to serve South Africans.

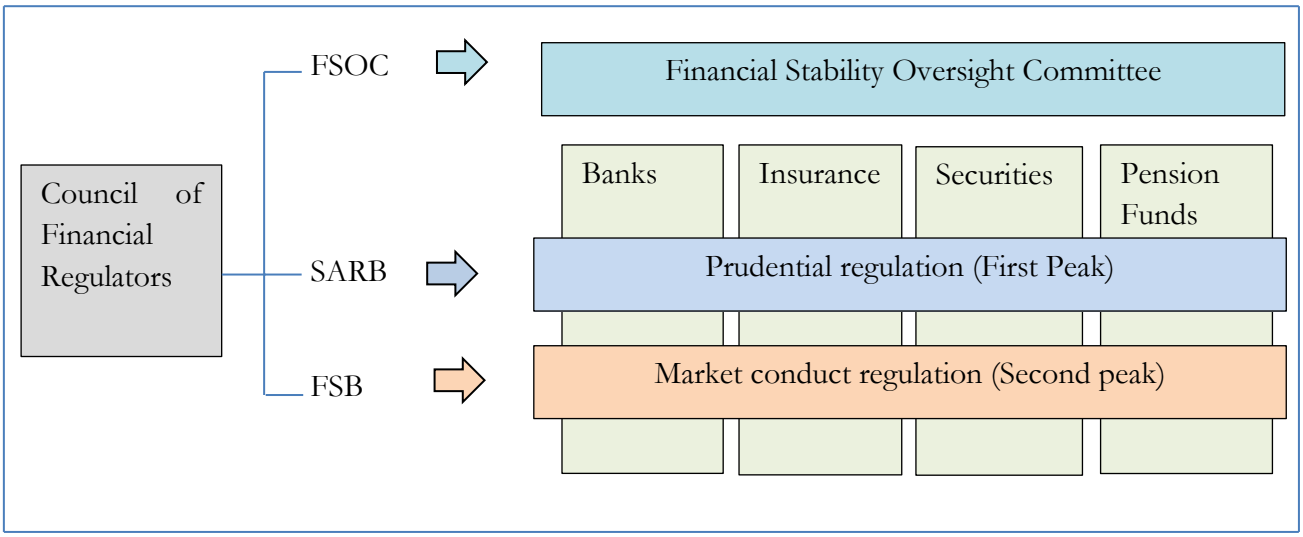
Under South African twin-peaks model, the prudential regulation will be carried out by a prudential regulator which will be part of SARB, while the FSB will carry out the market conduct regulation ensuring customer protections. To ensure coordination between the prudential and market conduct regulator, Financial Stability Oversight Committee (FSOC) will be formed to provide legislative backing to SARB and FSB. FSOC will also ensure financial system stability and mitigation of systemic risks. FSOC membership comprises representatives from both prudential and market conduct regulators and National Treasury. The chairman of FSOC will be the governor of the SARB.

South Africa believes that the twin-peaks model will strengthen South Africa's approach to market-conduct regulation and develop a more reliable, strong, and stable financial system. South Africa also believes that a dedicated focus on financial stability will help prevent crisis from developing and/or

[28] See IMF country report; South Africa: Financial System Stability Assessment, October 2008, No 8/349. Available at https://www.imf.org/external/pubs/ft/scr/2008/cr08349.pdf

more effectively resolve those that may occur, at a lower cost to consumers and taxpayers (Botha and Makina 2011). Among many options[29] about financial reform considered by South Africa, the twin-peaks model was seen to be the least disruptive that would offer the most benefits because it would be able to leverage off existing strengths in both the Financial Services Board and South African Reserve Bank.

Table 2.8: Proposed South African Twin-Peaks model



2.15. Chapter Summary

This chapter focused on providing the relevant theories that underpin regulation, focusing on financial regulation, the general overview of financial regulation and the most recent financial regulatory policies proposed by financial regulators. The theories identified by this study focused on justifying the rationales for efficient financial regulation.

Public interest theory assumes that for efficient allocation of resources, government should propose regulatory framework for the interest of the public. Private interest theory assumes that regulation should be put in place for the interest of the industry being regulated. Private interest theory is further divided into two: capture and Chicago theories of regulation. Institutional theory assumes that organizational and social setting could also drive and shape regulation, not just public or private pressures. Financial liberalization theory assumes that the more the financial system is liberalized the more the resultant economic growth.

[29] Alternative policy options considered by South Africa are: (1) Do nothing (retain the status quo). (2) Move towards a single regulator responsible for finnacial regulation. (3) Move towards a twin-peaks model.

This study takes a contrary view to that of liberalization theory; it argues that efficient financial regulation instead of deregulation is required for financial system stability. Information asymmetry theory assumes that information differences between lenders and borrowers hinders efficient allocation of scares resources, impact negatively on the price and quality of good and services in the market. Financial intermediation theory assumes that information asymmetry and transaction cost should be mitigated if not eliminated for efficient financial intermediation. Financial innovation and its level of fluidity in financial markets require that financial regulation is needed to create a favorable environment that would drive financial innovation development as well as manage its effects. The essence of this is to mitigate exploitation by financial institutions from flooding the market with products and services with little substance or destructive effects.

This chapter also elaborated on general overview of financial regulation, ranging from societal rationales for financial regulation to financial regulatory objectives with focus on prudential and market conduct objectives. Prudential objectives deal with the financial regulatory approach of focusing on the safety and soundness of the financial system as whole (macro) instead of focusing on individual financial institutions (micro). While market conduct regulation focuses on the safety individual financial consumers, to reduce or eliminate exploitation from financial institutions.

Different financial regulatory policies were also discussed, the Basel capital accord (Basel I, II, and III), focusing on their market discipline plank, which is one of the major pivot of this study. Twin-peaks financial regulatory reform (second concept pivot of this), was also discussed. With regard to many literatures reviewed, we have identified that the market discipline principle and the twin-peaks regulatory framework are relevant and quite contemporary tools for financial regulation. In the next chapter (chapter 3), we will discuss the relevant methods applied in testing for the effectiveness of market discipline and test of twin-peaks regulatory structure in emerging market countries.

Chapter Three

3. METHODOLOGY

3.1. Introduction

This section details the set of methodological approaches used in examining the research objectives and answering questions of this study. It explains the research paradigms underpinning the method of analysis. Further, the research design, population and sampling methods used in the study are explained along with data collection method and techniques used to test the relationships between the research variables.

3.2. Research Paradigm

A research paradigm is a viewpoint from which research is being conducted (Deshpande 1983, Healy and Perry 2000). There are several different research paradigms; positivism, interpretivisim, critical theory, constructivism, and realism. All of these can also be grouped into three perspectives: ontology, epistemology and methodology (Mingers, Mutch, and Willcocks 2013). Ontology is the facts being researched; epistemology is the relationship between the researcher and the facts, while methodology is the practices and procedures applied in the course of the research.

Positivism underlines empirical research approach based on observation and measurement of research variables, using deductive and hypothetical models. A positivist researcher plays the role of a detached observer, therefore, has limited bias throughout the research process (Brannick and Coghlan 2007, Coghlan and Brannick 2014). The aim of a positivist is to analyze, discover and document laws that could generally be applied to a large population by testing hypothesis and carefully analyzing and measuring numbers (Turner 1985).

This study quantitatively measured independent facts and tested for a regulatory model that would be effective for emerging market countries, therefore, its paradigm is positivistic in nature. In other words, the research topic, the data used in the research and its analysis are value-free and independent of the researcher. That means the researcher's personal values and perceptions did not affect both the variables and the research outcome (Healy and Perry 2000). As this research was conducted with limited bias or influence from both the researcher and the participants, the findings are considered reliable, and will enhance verification and amendments of financial regulatory policies and theories.

3.3. Research Design

This is a quantitative research that applies detailed descriptive statistics, event study, difference-in-differences; regressing variables of interest using a dynamic panel data methodology of Generalized Method of Moments (GMM). The choice of dynamic panel data methodology relies on the time varying behavior of market discipline and other economic and bank-specific variables relevant to this study. In order to properly estimate the dynamic relationship between the dependent and independent variables, Arellano and Bond (1991) GMM estimator was applied, using two step GMM, which finds asymptotically an efficient GMM estimator . Many studies in financial regulation, focusing on market discipline applied similar methods[30].

The major drawback of differenced GMM is that it has bias and poor impression in terms of finite sample properties, especially when the available time series are smaller than the number of individual units (T < N)(Blundell and Bond 1998). Also the lagged levels equation in differenced GMM could be a poor estimation method for first-differenced variables, especially if the variables are approaching a random walk (Hadad et al. 2011). To account for the first draw back, the number of past lags used may be restricted to a limit option of not more than 7 lags. In this study the lags are restricted to lag limit option of between 2 to 5 lags. However, system GMM is also applied in the analysis of the evolution of market discipline, proxied by date/year of implementation; no significant difference is found, hence the decision to retain usage of difference GMM estimation.

After choosing between differenced or system GMM estimators, another choice between one-step and two-step estimator is considered. One-step estimator is based on the assumption that there is a known weighting matrix. It is also efficient under the assumption of homescedastity and no correlation of error terms. The two-step GMM uses a consistent estimator of the weighting matrix, using the residual from one-step estimate (Presbitero 2006, Davidson and MacKinnon 2004). In the presence of heteroscedasticity and serial correlation, which is a major concern in panel data analysis, an efficient GMM estimator requires the two-step. Base on that, this study applied two-step GMM estimator throughout the regression analysis.

[30] Cubillas, Fonseca, and González (2012) applied dynamic panel data GMM in analyzing international evidence of banking crises and market discipline from 1989 to 2007. Hadad et al. (2011) used GMM in examining impact of regulatory changes on market discipline in Indonesian banks between 1995 and 2009. Maechler and McDill (2006) used it on banks' dynamic response to depositors' discipline in U.S banking industry from 1987 to 2000. While De Mendonça and Loures (2009) applied both dynamic and static panel analyses in analyzing the existence of market discipline in the Brazilian banking industry between 2001 and 2007.

3.4. Population and Sample Size

3.4.1 Research Population

The population of this study is all operational banks in the emerging market economy as well as benchmark developed market economies that have adopted the relevant regulatory models (market discipline and twin-peaks).

3.4.2. Research Sample

For the purpose of an effective research, this study needs to balance the need for representative data sample with availability of data. Non-probability sampling is therefore applied, using purposive sampling method. Purposive sampling is chosen because the research intends to use samples with available and reliable data to ensure reliable research findings, especially because banks in emerging market countries do not have the data required for the analysis. This study uses data of 20 emerging market countries (Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Kuwait, Malaysia, Mexico, Morocco, Namibia, Nigeria, Peru, Philippine, Russia, South Africa, Thailand, Turkey, and Zambia). The intention was to extract minimum of 10 banks from each country, but Kuwait, Morocco, and Namibia have less than 10 banks. Every other country in the sample has more than 10 banks, with Russia boasting 80 banks, followed by Brazil with 68 banks. The total number of banks used in this study came to 611 banks (see Table 3.1), for the period of 15 years (2000 to 2014)[31].

Eighteen of the emerging market countries chosen for this research are among the 22 countries listed by Bloomberg Market in 2013 and 2014[32] as the most attractive emerging markets for investors, based on GDP growth, inflation rate stability, government debt as a percentage of GDP, and ease of exploring business opportunities. This selection is therefore based on the likelihood of more functioning banks as well as required data for the study compared to other developing countries. Kuwait was chosen to represent Middle East, which region not represented in the Bloomberg list, and Nigeria was chosen due its large market size in Sub-Saharan Africa. For benchmarking purposes, four developed countries that have adopted the market discipline and twin-peaks models were also included in the sample namely, Australia, Netherlands, France and Belgium making it approximately 24 countries in the sample.

[31] It is almost an empirical regularity that banking industries (especially those in emerging and frontier market economies) have high concentration, where 10 or fewer top banks command upwards of 60-90% of industry's market share, deposits, assets etc. (Rose and Kolari 1995, Saunders 2006). The period of 2000 to 2014 contains years during which regulatory frameworks under consideration have become important.

[32] http://www.businessinsider.com/bloomberg-presents-the-22-most-attractive-emerging-markets-for-investors-2013-1?IR='T

Table 3.1: Research sample and sub samples

	Countries	Number of Banks per country (Sample 1)	Countries/Banks that implemented Mkt Discipline (Sample 2)	Year of Implementation	Implementation Score[33]	Countries/Banks that adopted Twin-peaks Features(Sample 3)	Year of Adoption	Countries/Banks that implemented Twin-peaks from year 2000 (Sample 4)	Countries/Banks that implemented Twin-peaks (Sample 5)	Year of Implementation
	Emerging Markets									
1	Brazil	68	68	**2006**	**4**					
2	Chile	21		**2017**	1	21	2000			
3	China	63	63	**2007**	4	63	2003			
4	Colombia	14		**2015**	4					
5	Egypt	21	21	**2012**	4					
6	India	47	47	**2009**	4					
7	Indonesia	47	47	**2013**	4					
8	Kuwait	5	5	**2005**	4					
9	Malaysia	22	22	**2010**	4					
10	Mexico	22	22	**2010**	4	22	2000			
11	Morocco	8	8	**2007**	4					
12	Namibia	5	5	**2014**	4					
13	Nigeria	14	14	**2010**	2					
14	Peru	11		**2015**	1					
15	Philippines	21	21	**2007**	4					
16	Russia	80	80	**2014**	4					
17	South Africa	13	13	**2008**	4	13	2000			
18	Thailand	15	15	**2008**	4					
19	Turkey	23	23	**2011**	4					
20	Zambia	11	11	**2013**	2					
	Developed Markets									
21	Australia	15	15	2008	4				15	1998
22	Belgium	19	19	2007	4	19	2004	19	19	2011
23	France	28	28	2007	4	28	2003	28	28	2010
24	Netherlands	18	18	2011	**4**			18	18	2002
	Total Banks	**611**	**565**			**166**		**65**	**80**	
	Total Obs. (banks per year).	**9165**	**8475**			**2490**		**975**	**1200**	

[33] 1 = draft regulation not published,
2 = draft regulation published,
3 = final rule published,
4 = final rule in force.

3.5. Unit of Analysis

The principal unit of analysis in this research is the emerging market countries' banking industries, though some of the developed countries will be used as benchmarks in assessing the effects of the relevant regulatory policies. Sub-units include sets of individual countries in emerging markets, as well as individual banks in those countries.

3.6. Data Collection

The data used for this research are secondary data. Largely financial information associated with sampled banks (bank-specific data) extracted from the BankScope; each country's macroeconomic data collected from the World Development Indicators (WDI); each country's institutional variables collected form World Bank database, based on Worldwide Governance Indicators (WGI); financial regulatory structures of each country extracted from the IMF Country Report on Financial Stability Assessment; and quality of banking supervision based on the Basel Core Principles for Effective Banking Supervision (BCP) by IMF, also extracted from the IMF Country Report on Financial Stability Assessment .

3.6.1. Brief description of Institutional variables from World Governance Indicators

Institutional variables were collected form World Bank database, based on Worldwide Governance Indicators (WGI) (Kaufmann, Kraay, and Zoido-Lobatón 1999, Kaufmann, Kraay, and Zoido 2002, Kaufmann, Kraay, and Mastruzzi 2004, 2005). Though WGI has been criticized on grounds that it could not be applied across countries and over time (Christiane 2006, Knack 2006, Langbein and Knack 2010, Thomas 2010), it has been acknowledged in the literature that WGI is a carefully constructed governance indicator and is widely used by policy makers and academics (Kaufmann, Kraay, and Mastruzzi 2007c, Christiane 2006).

For instance, it is applied by the United Sates Millennium Challenge Account for aids programs (Kaufmann, Kraay, and Mastruzzi 2007c, Thomas 2010). Indicators from WGI have been used by Dincer and Eichengreen (2012) to measure the effect of governance in supervisory arrangement of financial supervision. WGI covers over 200 countries, measuring dimensions of governance since 1996, and it is updated annually (Kaufmann, Kraay, and Mastruzzi 2006, 2007c, b, a, Kaufmann and Kraay 2008).

WGI is based on numerous individual variables from a wide variety of data sources, reflecting the opinions of public and private sector experts on governance surveyed globally (Apaza 2009). The

indicator reports margins of error accompanying individual countries' estimate, which is an inherent problem in measuring governance indicator using any type of data. Despite the margins of error, WGI could effectively provide cross-country comparison of relative effective governance and over time (Kaufmann, Kraay, and Mastruzzi 2011).

In this study, we deployed all the six institutional variables developed by Kaufman et al. They are as follows: **Political stability** (measures government level of instability due to unconstitutional or violent events). **Voice and accountability** (measures the extent of citizens' participation in government selection and changes as well as freedom of expression. **Government effectiveness** (determines the quality of public and civil services and level of independence from political pressures). **Government regulatory quality** (measures the ability of the government to formulate and implement sound regulatory policies).

Rule of law (measures the quality and accuracy of contract enforcement, property rights, police services and court order implementation), and **Control of corruption** (captures the perception of how public power is exercised for private gain). These variables are coded to fall between -2.5 (representing less efficiency) to 2.5 (representing higher efficiency. Due to high correlation among the institutional variables, also to capture the differential effects of political and legal institutions on regulatory implementation, we follow Godspower-Akpomiemie and Ojah (2017)'s approach. The six institutional variables were divided into two groups: [political institutions (infrastructures) and legal institutions (infrastructures)]. The political infrastructure is defined as the average of control of corruption, government effectiveness, and political stability; while the legal infrastructure is defined as the average of regulatory quality, rule of law, and voice and accountability.

3.6.2. Brief description of financial regulatory structure variables

These variables are chosen to reflect the effect of twin-peaks, which advocates for a hitherto more appropriate choice of regulatory structure (two independent regulators focusing on functioning and forms respectively), while regulating the functions and activities of conglomerates of financial institutions. Such variables captured the effects of regulatory structure on banks' performance and stability; for instance, the effect of adopting single, twin or multiple regulatory structures. They also captured the effects central banks' involvement in financial regulation has on banks' performance and stability. This study considers the following (dummy) variables which were similarly deployed by

some researchers (Barth, Caprio, and Levine 2001, Barth et al. 2003, Barth, Caprio Jr, and Levine 2004) in measuring cross-country regulatory structures.

1. Proxy for one or more regulatory bodies (SINREG); 1 if country has one regulatory body, 0 if otherwise
2. Proxy for countries that adopted twin-peaks regulatory policy or its features, where central bank is one of the peaks among the two regulatory bodies (TwinCB). Value of 1 if central bank is one of the peaks and 0 if otherwise
3. Proxy for countries where the two peaks (regulatory bodies) involved in twin-peaks are independent of the central banks (TwinInbody). Value of 1 if the two peaks are independent of central bank and 0 if otherwise

The above proxies along with macroeconomic and environmental/institutional variables are considered the determinants of banks' supervisory structures. Some of these variables were also used by Dincer and Eichengreen (2012); Barth et al. (2003); and Masciandaro, Quintyn, and Taylor (2008) in conducting cross-country analyses of bank regulatory frameworks.

3.6.3. Brief description of Basel Core Principles (BCP) for Effective Banking Supervision

The BCP contains 29 Core principles (CP), which include a wide range of supervisory issues, ranging from objectives, responsibilities and powers of supervisors (CP 1), through supervisory approach, techniques, and reporting (CPs 8, 9 and 10), risk management, capital adequacy (CPs 15 and 16), to disclosure and transparency, and misuse of financial services (CPs 28 and 29). The BCP data are unique; they contain extensive regulatory laws, overseen by a team of global regulatory experts from IMF and World Bank. BCP compliance by each country is measured on a 5-point scale (see Table 3.2). The last scale (0) is not generally applicable as the CPs is designed to reflect global regulatory issues and requirements across all countries. In that regard, this research applied the first 4-point scale, and aggregate BCP as an average of the 29 CPs. BCP has been used by some researchers in testing the effects of financial regulatory structures (Podpiera and Cihak 2006, Čihák and Podpiera 2008).

Table 3.2: Basel Core Principles (BCP) 5-Point Scale

Scales	Compliant	Largely compliant	Materially non-compliant	Non-compliant	Non-applicable
Scale Values	4	3	2	1	0
Criteria for measurement	All criteria complied to	Minor shortcomings	Severe shortcomings	Not substantially implemented	Criteria would not relate to the countries circumstances

3.7. Measurement of Variables

3.7.1. Dependent variables

Different dependent variables are used in different models, depending on what is being tested. The dependent variables include bank performance measures, stability measures, market discipline constructs, dummy for implementation of market discipline (value of 1, if a country has implemented market discipline and 0 if otherwise), and dummy for adoption of twin-peaks (value of 1, if a country has adopted twin-peaks and 0 if otherwise) regulatory policies. Some of these dependent variables also served as independent variables in some other models of this study.

3.7.1.1: Performance variables (Perf)

Traditionally, performance could be measured as level of cost minimization or profit maximization (Hughes and Mester 2013). This study applied profit maximization as a measure of performance, using net interest margin (MIM), pre-tax profit (PreTaxP), and return on asset (ROA). The choice of ROA is based on the fact that a higher value of banks ROA indicates higher profitability therefore better performance as well as low default risk (Sironi 2003), while banks' profit and NIM are chosen based on the fact that banks' major business is transformation of loanable funds (intermediation); therefore are affected by the interest received and paid by depositors and lenders, respectively (Rose and Kolari 1995, Demirgüç-Kunt and Huizinga 1999a, Demirgüç-Kunt and Huizinga 2000).

3.7.1.2: Stability variables (Stab)

According to Crockett (1996), portfolio of commercial banks could remain stable if depositors only withdraw at random over time. If deposit base is stable, a commercial bank can be deemed to reflect sufficient liquidity to sustain normal withdrawals. But if eventually deposit withdrawal is accelerated (bank runs), banks may be induced to sell illiquid assets, which in turn leads to loses and capital erosion.

Stability can also be traced to banks' ability to hold assets to maturity. What really causes loss of depositors' confidence, which eventually leads to bank runs, is deterioration of asset quality. Bank lending is used to finance investments that could generate attractive returns in good and not-so-good economic times. But such investments could turn out to be vulnerable during economic downturn. Such a situation could lead a bank to sit with a portfolio full of non-performing loans, which is often the genesis of asset quality deterioration.

Excessive competition can also lead to instability in financial institutions. Some big financial institutions may not factor in adverse outcomes while pricing loans. Such institutions will outperform those that do. Due to herd behavior, which is prevalent in financial institutions, the later will be forced to compete and eventually drop out of the market (Crockett 1996, Llewellyn 1999, Acharya and Yorulmazer 2008, Ely 2009).

In addition to the above mentioned stability measures, a popular measure of stability at individual bank level is the Z-Index, which is also referred to as Z-Score by some researchers. Z-Index is an inverse measure of bank risks. A higher Z-Index therefore implies a lower probability of bank failure, thus it is used as a direct measure of stability. It was first developed by Roy (1952), and has been applied in several empirical financial studies (Berger, Klapper, and Turk-Ariss 2009, Fernández and Garza-García 2017, Ariss 2010, Hope, Gwatidzo, and Ntuli 2013, Demirgüç-Kunt and Detragiache 2011), and many others.

Based on the above literature on financial instability, this study employed the following variables as stability measures at intervals; Equity ratio (EQR), ratio of nonperforming loans to total loans (NPLTL), liquidity ratio (LDR), Z-Index, and level of competition (measured as H-statistics, see explanations below), Level of competition are included to account for the effect of too big to fail concept. With the concept of too big to fail, depositors may have the notion that either government would not allow SIFIs to fail, or they will be compensated by government implicit guarantee in the event of difficulties.

Z-Index

$$Z_{it} = \frac{\overline{ROA}_{it} + \overline{ETA}_{it}}{\sigma ROA_{it}} \quad \text{.....1}$$

Where Z_{it} (Z-Index) is the inverse probability of bank *i* failing at time *t*. $\overline{ROA}_{it}$ is 3-year rolling average of return on asset of bank *i* at time *t*, $\overline{ETA}_{it}$ is 3-year rolling average of equity to total asset of bank *i* at time *t*, while σROA_{it} is 3-year rolling standard deviation of return on asset. The choice of 3-year rolling average is based on the argument that rolling average captures the varying aspects of bank stability (Čihák et al. 2009, Schaeck et al. 2011, Fernández and Garza-García 2017). Higher Z-Index for a bank represents higher capitalization, thus a more stable bank, lower Z-Index representing unstable earnings, thus indicating instability.

While some studies, advocate for the use of log Z-Index (Lepetit and Strobel 2015, Demirgüç-Kunt and Detragiache 2011), some early researchers still applied unlogged Z-Index in financial studies (Hope, Gwatidzo, and Ntuli 2013, Fernández and Garza-García 2017). Z-Index is highly skewed, with very high values at some point, to smoothen its higher values, and to avoid pruning the dependent variable at zero, we adopted similar approach used by Demirgüç-Kunt and Detragiache (2011), where Z-Index is measured as Log(1+Z-Index)

H-Statistics

There are two generally accepted methods (structural and non-structural) of measuring competition in the banking industry. Structural methods include level of concentration, number of banks, market etc. Non-structural methods include H-statistics of Panzar and Rosse (1987) and Lambda statistics of Bresnahan (1982). Many authors have criticized the use of structural methods (Demsetz 1973, Berger 1995). Demsetz (1973) argues that high concentration does not necessarily imply lack of competition. More so, perfect competition can be achieved even with existence of only two big firms in the market (Tirole 1988). Due the draw backs on structural methods, and following recent literatures on banking competition (Bikker, Shaffer, and Spierdijk 2012, Schaeck and Cihak 2012, Simbanegavi, Greenberg, and Gwatidzo 2015), in this study, we adopted a non-structural method (H-Statistics) of measuring competition in the banking industry.

H-statistics is a general test for ascertaining a banking industry's dominant market structure, developed by Rosse and Panzar (1977) and Panzar and Rosse (1987), used in measuring the degree of competition by assessing how banks' revenues react to variations in input prices. This model is based on the assumption of profit maximization equilibrium to determine the relationship between revenues and costs, to determine market structure: monopoly, monopolistic competition and perfect competition. Profits are maximized when marginal revenue (R) equals marginal cost (C)

$$R_i(x_i, n_i, z_i) - C_i(x_i, w_i, t_i) = 0 \quad \text{.....2}$$

Where R_i and C_i are the revenue and cost function of individual banks, respectively. R_i is a function of its output price (x_i), vector of other factors that could affect output (z_i) for individual banks, and the number of banks (n), C_i is also function of its output (x_i), and vector of input prices (w_i), and vector of other factors that shift the cost a function (t_i) for the individual banks. To maintain the equilibrium condition, equation 2 takes on the form:

$$R_i^*(x_i^*, n_i^*, z_i) - C_i^*(x_i^*, w_i, t_i) = 0, \quad \text{.....3}$$

where * represents equilibrium values.

H-statistics measures competition using the degree to which variations in vector of input prices (w_i), transform into equilibrium revenue, R_i^*, using reduced form equation. Hence H is represented as follows:

$$H = \sum_{k=1}^{m} \left[\frac{\partial R_i^*}{\partial w_{ki}} . \frac{\partial w_{ki}}{\partial R_i^*} \right] \quad \text{.....4}$$

At equilibrium, revenue is expected to change at the same magnitude with cost, hence

Table 3.3: Profound power of 'H' in H-Statistics

Values of H	Operating environment
H=1	Indicates perfect competition (or long run competitive equilibrium)
H ≤ 0	Indicates either, monopoly, profit maximising oligopoly behaviour, cartel, or short run oligopolistic competition
0<H<1	Indicates monopolistic competition. Higher values indicate less market power.

We estimate the competition with panel data, comparing the properties of each bank over time using the reduced form equation. Following Bikker, Shaffer, and Spierdijk (2012), Schaeck and Cihak (2012), Sun (2011), Simbanegavi, Greenberg, and Gwatidzo (2015), the reduced form revenue equation following the H-statistics theory, is as follows:

$$\ln \mathrm{P_r} = \alpha + \beta_1 \ln(W_1) + \beta_2 \ln(W_2) + \beta_3 \ln(W_3) + \gamma_1 \ln(Y_1) + \gamma_2 \ln(Y_2) + \gamma_3 \ln(Y_3) + \theta t + \varepsilon \text{.....5}$$

$\mathrm{P_r}$ is the total interest income to total asset (proxy for banks' output price), W_1 is the ratio of total interest expenses to total deposit and money market funding (proxy for input price of deposit), W_2 is the ratio of personnel expenses to assets (proxy for input price of labor) W_3 is the ratio of other operating expenses to total asset, (proxy for input price of equipment and other fixed assets). $Y_1, Y_2, and\ Y_3$ are control variables (banks-specific factors) that could affect banks' revenues. They represent the ratio of net loan to total asset, equity to total asset, and total assets, respectively. All variables in the model are logged. From the parameters of equation 5,

H-statistics (H) = $\beta_1 + \beta_2 + \beta_3$

Empirically, to test for long run equilibrium, the dependent variable (ratio of total interest income to total assets) is replaced with return on asset. If H-statistics equals zero, equilibrium assumption is established. An alternative approach is to assume that competition gradually changes over time; therefore, one would need to estimate H-statistics year by year (Bikker and Groeneveld 1998, Bikker and Haaf 2002, Bikker and Spierdijk 2008). To account for the effect of the dynamic nature of competition over time, we deployed an approach applied by Simatele (2015), where a time-dependent coefficient θ is included in the model. If the value of $\theta = 0$, it means there is no change

in competition over time, meaning that H-statistics of equation 5 remains time invariant. Where$\theta > 0$, it implies there is increase in the level of competition among banks over time. Equally, where$\theta < 0$, indicates decline in competition among banks as time passes.

3.7.1.3: Market Discipline Proxies

Other dependent variables are the market discipline constructs, which were derived by using principal component analysis (PCA), so as to account for multicollinearity among the variables used as market discipline proxies, PCA also aided avoidance of dummy trap. PCA is used to decompose closely related variables into principal factors and extract most important information from the data set (Abdi and Williams 2010, Zou, Hastie, and Tibshirani 2006). This also helps to capture as much variance as possible between the related variables to explain their effects on the market discipline regulatory framework in emerging market economies. Varimax orthogonal rotation was used to extract the factors most suitable for explaining market discipline as we clarify the underlying relationship. Kaiser-Meyer –Olkin (KMO) was used to measure the sampling adequacy, overall KOM higher than 0.5 is acceptable. It entails that the overall variables have much in common to warrant a PCA.

In applying the PCA, market discipline is believed or assumed to be a the function of the following variables: **1.** Interest spread (SP), which is measured as difference between interest incomes and interest expenses of banks, referred to as net interest income. Spread captures the aspect of market discipline in the form of depositors' willingness to fund banks. **2.** Interbank rate (IntBR), which captures other banks' role in disciplining risky counterparts (Önder and Özyıldırım 2014). Higher interbank rate indicates perceived increase in banks' risky activities in the aggregate, which will affect banks' stock prices and returns. **3.** Long term credit ratings (LTR). **4.** Viability ratings (ViaR); these ratings (LTR and ViaR) capture the effect of credit risk level and financial strength of banks/countries due to likelihood of external stakeholders' enforcement of market discipline. **5.** Dummy for outstanding shares (DummyOutSh) with the value of 1 if a bank has outstanding shares in the balance sheet during the period under review and value of 0 if otherwise.

Banks with unsold shares will likely avoid excessive risk-taking and inefficient activities to avoid disciplinary action from market forces that could negatively affect the price of the shares if and when they venture to sale them off. **6.** Dummy for subordinated debts (DummySubD), with the value of 1 if banks issue subordinated debt, and 0 if otherwise, during the period under review. The subordinated debt variable captures the market discipline from external security holders, especially

with a form of residual risk holding. **7.** Dummy for government implicit guarantee (GIG), which captures the effect of existence of any government implicit guarantee to particularly or fully bail out banks should they experience financial distress. We assigned the value of 1 if there is implicit guarantee and 0 otherwise. **8.** Dummy of deposit insurance scheme (DISC), with value of 1 if a country has deposit insurance scheme and 0 if otherwise.

This index approach is likely to provide construct/constructs better reflective of market discipline than any single variable that is popularly in use in developed country based studies. Therefore, the following general forms capture the market discipline construct. Hence, using principal component analysis,

Market discipline =f(SP, IntBR, LTR, ViaR, DummyOutSh, DummySubD, GIG, DISC)……6

3.7.2. Independent (control) variables

The independent variables include bank-specific factors that could affect banks' performance and stability, and not just the market forces disciplining banks by reacting to the regulatory policy implementation. Most of these variables have been used by similar studies (e.g., Sironi (2003), and measures of financial soundness by the IMF (see IMF Financial Soundness Indicators database). Country specific macroeconomic and institutional variables are also included as control variables to control for variation in economic development and differences in institutional factors across countries. Detailed descriptions of these variables are in Table 3.5.

Table 3.4: Cardinal values for Ratings

Traditional credit ratings (S&P, Moody's, and Fitch–IBCA)				**Bank financial strength and individual bank-specific ratings**		
Cardinal value	**S&P**	**Moody's**	**Fitch**	**Cardinal value**	**Moody's Baseline**	**Fitch Viability**
1	AAA	Aaa	AAA	1	aaa	aaa
2	AA+	Aa1	AA+	2	aa1	aa+
3	AA	Aa2	AA	3	aa2	aa
4	AA-	Aa3	AA-	4	aa3	aa-
5	A+	A1	A+	5	a1	a+
6	A	A2	A	6	a2	a
7	A-	A3	A-	7	a3	a-
8	BBB+	Baa1	BBB+	8	baa1/	bbb+
9	BBB	Baa2	BBB	9	baa2	bbb
10	BBB-	Baa3	BBB-	10	baa3	bbb-
11	BB+	Ba1	BB+	11	ba1	bb+
12	BB	Ba2	BB	12	ba2	bb
13	BB-	Ba3	BB-	13	ba3	bb-
14	B+	B1	B+	14	b1	b+
15	B	B2	B	15	b2	b
16	B- CCC, CC, C	B3, Caa, Ca, C	B-, CCC, CC, C	16	b3, ca, c	b-, ccc, cc, c
17	NR, WD	NR, WR	NR, WD	17	F, NR, WD	F, NR, WD
18	Empty	Empty	Empty	18	Empty	Empty

Table 3.5a: Definition of Banks specific variables

Acronym	Full name	Definition
NIM	Net Interest Margin	Net interest income as a % of average earning asset. Higher value indicates better performance
LogPreTaxP	Pre-tax profit	Banks' profit before tax, to measure the profit made by banks, and avoids the effect of tax policy across different countries. This variable is logged
NPLTL	Ratio of non-performing loan to total loan.	Higher value implies higher default risk
ROA	Return on asset of each bank	Ratio of net income to total asset, higher value indicates better performance and low default risk.
TdepStdv	Standard deviation of total customer deposit	Measured as 3 year rolling standard deviation of total customer deposit.
EQR	Equity ratio	Measured as shareholder's equity divided by total asset. This measures the level of equity used by banks to finance assets
LogTA	Total Asset	Logarithm of banks' total asset, to measure the stability of banks' assets. This variable captures the extent of banks' level of stability. It also captures the level of competition among banks.
LDR	Liquidity Ratio	Ratio of liquid asset to total deposit and short term funding. Higher value than 1 indicates higher creditworthiness.
CAPR	Capital Ratio	The is the regulatory capital ratio, measured as ratio of regulatory capital to risk weighted assets of each bank
INTL	Intermediation level	Measured as ratio of net loan to total deposit of each bank
TLTA	Asset composition, it could also be referred to as intermediation level	This is measured as ratio of total (gross) loan to total asset of each bank
OPE	Operating efficiency	Measured as non-interest expenses as a percentage of earning asset of each bank
LogZ-Index	Stability measure	Z-Index is measured as 3 year rolling average of ROA plus 3 year rolling average of EQR divided by 3 year rolling standard deviation of ROA.
H-Statistics	H-Stat	Measure of competition. It is used to determine different market structures: monopoly, monopolistic and perfect competition

Table 3.5b: Definition of regulatory and country specific variables

BCP	Basel Compliance Principle	BCP contains 29 Core principles (CP), rated between 0 and 4 (see table 3.2)
DummyMkD	Dummy of implementation of market discipline	This variable has the value of 1 if a country implemented market discipline and value of 0 if otherwise.
DummyTwin	Dummy of implementation of market discipline	This variable has the value of 1 if a country implemented twin-peaks and value of 0 if otherwise.
TwinCB	Countries with twin-peaks features or implemented twin-peaks with central banks as one of its peaks	Dummy of 1 if a country has central bank as one of the peaks, 0 if otherwise.
TwinInBody	Countries with twin-peaks features or implemented twin-peaks with independent bodies as both peaks	Dummy of 1 if a both regulatory bodies (both peaks) of banks in a country are independent of the central bank, 0 if otherwise.
SINREG	Single regulatory body	Dummy of 1if a country has only one regulatory body for banks , 0 if otherwise
SINREG*MkD	Single regulatory body interacting with market discipline implementation	Dummy of 1 if a country has only one regulatory body for banks and has implemented Market discipline
GDPGrowth	GDP growth	Growth rate of GDP of each country
Lending Rate	Interest rate	The lending interest rate of each country
CVInflation	Coefficient of variation of inflation	It is used as a measure of uncertainty (Jha and Dang 2012, Önder and Özyıldırım 2014). Measured as 3 year rolling standard deviation as percentage of the 3 year rolling of the mean.
Political	Political infrastructure	Average of three of the six governance indicators (control of corruption, government effectiveness, and political stability and absence of violence/terrorism) of each country. Extracted from Worldwide governance indicators.
Legal	Legal infrastructure	Average of remaining three governance indicators (regulatory quality, rule of law, voice and accountability) of each country. Extracted from Worldwide governance indicators.

Table 3.5c: Definition of Market discipline Proxies used for PCA

SP	Spread	Difference between interest income and interest expenses of banks
IntBR	Interbank ratio	The money lent to other banks divide by money borrowed from other banks. If greater than 100it indicates that the bank is a placer rather than a borrower of funds in the market place…therefore more liquid.
LTR	Long term credit rating	Average of long term credit rating by S&P, Moody and Fitch The ratings are converted to cardinal values following (Pop 2006). See Table 3.4. Higher rating would attracts more debt funding, especially public debt (Diamond 1991).
ViaR	Viability rating	Average of baseline credit assessment (BCA) by Moody, and Viability Ratings (ViaR) by Fitch. Measures Moody's opinion of an issuer's standalone financial strength. Which is the extent an issue requires extraordinary support from affiliates to avoid default on its debt obligations. ViaR measures the intrinsic creditworthiness of a financial institution (FI), and reflect Fitch's opinion on the likelihood that the entity will fail. See Table 3.4.
DummyOutSh	Dummy for outstanding shares	Value of 1 if a banks has outstanding shares in the balance sheet, 0if not.
DummySubD	Dummy for subordinated debts	Value of 1 if a banks has subordinated debt in the balance sheet, 0 if not.
GIG	Govt. Implicit guarantee	Value of 1 if a country has any form of government implicit guarantee, 0 otherwise.
DISC	Deposit Insurance scheme	Value of 1 if a country has deposit insurance scheme, 0 otherwise.

3.8. Validity and Reliability

The process of data collection, editing, verification, capturing and interpretation were carried out in ways that ensure data accuracy. Being primarily a times-series and panel data analysis, many preliminary diagnostic tests were conducted and controlled for in order to avoid spurious regression results. Such tests include unit root, autocorrelation and multicollinearity tests. Unit root test was conducted to test for the stationarity of the data, using Dickey-Fuller and Argumenta Dickey Fuller (ADF) unit root tests (Dickey and Fuller 1979). Autocorrelation leads to less efficient results, as observations may cross-correlate due to the function of time between them (Drukker 2003).

Multicollinearity poses a problem of one variable being predicted by another with no assured accuracy of estimated coefficient. Multicollinearity occurs when a linear relationship exists between one or more variables (Brooks 2008, Greene 2007, Grewal, Cote, and Baumgartner 2004). It

imposes inaccurate estimation of coefficients and standard errors in the model (Mason and Perreault Jr 1991, Jagpal 1982, Grapentine 2000).

Multicollinearity was avoided by calculating the correlation matrix of all the variables of interest, highly correlated variables were introduced differently in different models. Using GMM in the analysis, it mitigates effects of stationarity and endogeneity present in the data, it also corrects heteroscedasticity (Smith and Wickens 2002). Arellano-Bond test was used to ensure zero autocorrelation in all the models. The effectiveness of the GMM model was checked by using *j*-statistics of Hansen (1982) for over-identification of restrictions. Many studies on economic growth, financial crises and regulatory issues that applied a GMM estimator conducted similar checks for model validity (Hadad et al. 2011, Siddiqui and Ahmed 2013, Cubillas, Fonseca, and González 2012). These validity checks are to ensure that the outcomes from this research truly represent the data and models specified.

Regulatory structure variables are all dummy variables which can pose a problem of dummy variable trap. Dummy variable trap is a scenario in which there is perfect multicollinearity among the independent variables (Brooks 2008, Greene 2007). This problem was avoided by applying different dummies in different models, at different times where they are most suitable.

3.9. Test of Hypothesis

To address the research objectives and problems, per the introduction section, the following alternative hypotheses are tested.

Market discipline:

H1: Market discipline principle exists in emerging market country's banking industry.

H2: Implementation of market discipline has influence on banks' performance and stability.

H3: Economic and environmental factors contribute to the implementation of market discipline framework in the emerging market country's banking industry.

Twin-peaks

H4: Adoption of features or full implementation of twin-peaks regulatory reforms affects banks' performance and stability.

H5: Economic and environmental factors contribute to the adoption of twin-peaks regulatory reforms in the emerging market country's banking industry.

H6: Choice of twin-peaks regulatory structure has effects on banks' performance and stability

General

H7: Structure of financial regulation has influence on banks' performance and stability

H8: Market discipline framework and twin-peaks regulatory model would substitute or complement each other as regulatory frameworks in emerging markets

H9: Overall quality of regulation has effect on banks' performance and stability

3.10. Methods of Data Analysis

3.10.1. Descriptive Statistics

A detailed descriptive statistics analysis is deployed in this study to describe and evaluate the relationships between the variables relevant to the study. The changes in the variables pre and post policy implementation for each country are analyzed and documented. To assess whether or not there has been a change on these variables of interest, following event study models applied by some researchers (Henry 2000a, b, Ojah and Pillay 2009), the mean and standard deviations[34] of each relevant variable are calculated pre and post policy implementation periods, to understand the actual changes on banks' performance and stability due to financial regulatory policy implementation.

3.10.2. Event Study

Event study econometric technique is used mainly to assess the effect of relevant event announcements on stock returns, but it has also been used to measure the effect of regulation on the value of firms (Schwert 1981, Binder 1985, Prager 1989). Recently, both IMF and BIS have applied event study approaches to test the effect of macro-prudential regulatory policy tools in the economy (Hilbers et al. 2005, Crowe et al. 2013, Lau and Terrier 2011, Montoro and Moreno 2011).

This current research focuses on banks' performance and stability pre and post implementation of market discipline principle regulatory framework and the twin-peaks financial regulatory model. Following the studies by Demirgüç-Kunt, Detragiache, and Gupta (2006), Ojah, Muhanji, and Myburg (2008), Allen, Gu, and Kowalewski (2012), a simple test of whether the implementation of market discipline and twin-peaks are associated with significant changes in the performance of banks

[34] We reported mean and standard deviation of each variable of interest, tthough, most of researchers reported mean and median.

is conducted. While, Ojah et al employed generalized least square regression, using fixed effect, Demirgüç-Kunt et al and Allen et all used ordinary least square regression analysis. The current study deploys GMM estimation which is generally deployed in the context of panel data analysis.

To determine the evolution of market discipline principle after implementation, we estimate regression model of each market discipline constructs generated using principal component analysis, on six time dummies. One dummy for the year of implementation and one dummy each for five years following year of implementation. Similar approach is also applied to the performance and stability variables to ascertain whether or not implementation of market discipline and twin-peaks are associated with significant changes in the behavior of these variables.

$Y_{ijt} = \alpha_i + \varepsilon_{it}$, for t=T, T-1, T-2,…, T-5, i=1,….,N……..…….7

and

$Y_{ijt} = \alpha_i + \beta_t + \varepsilon_{it}$, for t=T, T+1, T+2,…, T+5, i=1,….,N……..……..8

Y_{ijt} is the observation for each dependent variable for bank i in country j at time t, ε_{it} is the error term, α and β are the coefficients, T is the year of policy implementation, and N is the number of banks in country j. If the estimated coefficients are significantly different from zero, it indicates that the behavior of such variable is different during the pre-implementation period. Also, comparing the coefficients of the time dummies across time traces the changes in the evolution of the variables over the post-implementation periods.

The evolution viewpoint is vital in this case as regulatory implementation has gradual impacts rather than immediate effect, also most times, implementation of regulatory policies takes a phased process. Though, longer period may introduce other events that could affect banks' performance and stability, on the other hand, the use of longer period (e.g., six years) permits capture of the gradual effect of policy implementation which may not have an immediate impact during the time of implementation.

3.10.3. Difference-in-Differences (DID)

Though a rare identification in event studies, but comparing pre and post effect on individuals or groups exposed to treatment or policies may be confounded by trends in the outcome variables or by other events that occurred at the same time of policy implementation other than the policy itself (Abadie 2005). The difference-in-differences (DID) methodology introduces another group not

exposed to the treatment or policy to be used as a control group to account for variations in outcomes that are not due to the event under study. DID measures the difference in outcome over time for the treatment/participating[35] and control groups, compares the outcomes, and identifies any variations (Ai and Norton 2003, Conley and Taber 2011). DID estimator allows for unobserved heterogeneity (unobserved differences in outcomes between participating and control groups) that may cause bias during selection. It assumes that unobserved heterogeneity does not vary over time; therefore, the bias cancels out through differencing. This means that outcome changes in the control group reveal the counterfactual outcome changes in the participating groups.

Though difference-in-differences is mostly applied in health policy and education intervention research, it has increasingly become one of the popular and important identification approaches in economic research (Angrist and Krueger 1999, Athey and Imbens 2006, Bertrand, Duflo, and Mullainathan 2002, Blundell and Dias 2002, 2009, Heckman, LaLonde, and Smith 1999, Lechner 2011, Meyer 1995, Donald and Lang 2007). Many economics and finance researches on policy effects (Meyer, Viscusi, and Durbin 1995, Card 1990, 1992, Card and Krueger 1994, Garvey and Hanka 1999, Khandker, Bakht, and Koolwal 2006) have been based on difference-in-differences estimation. Kaminsky and Reinhart (1999) applied similar methods in their empirical analysis of banking crisis. They examined pre and post observations of the study periods to identify anomalous behavior before and after financial crisis.

DID compares the changes in outcome of participating and control groups, over time, relative to observed outcomes for a pre-policy period. For instance, let t=0 before the policy and t=1 after the policy implementation, Y_t^T and Y_t^C are outcomes for policy participants and non-participants in time t respectively. While T_1=1 is the presence of the policy at t=1, and T_1=0 is the non-policy periods.

$$DID = E(Y_1^T - Y_0^T | T_1 = 1) - E(Y_1^C - Y_0^C | T_1 = 0) \quad \text{.....9}$$

With a regression framework, the estimation equation will be as follows:

$$Y_{it} = \alpha + \gamma T_{i1} t + \beta_1 T_{i1} + \beta_2 t + \varepsilon_{it} \quad \text{.....10}$$

γ is the coefficient of interaction term between the post policy participating variables (T_{i1}) and time (t=1….T). It estimates the policy effect, which is simply the incremental effect of γ. The policy

[35] Note that the 'treatment and participating' group, which stand for similar connotation, are used interchangeably in the study.

effect is not just the cross difference between policy participants and non-participants. It is the cross difference of the expected observed outcome from participating Y^T minus the cross-difference of the expected counterfactual outcome from non-participating group Y^C (Puhani 2012). Apart from this interaction term between participating variables and time, the variables T_{i1} and *t* are treated separately to account for any separate mean effect of time as well as participating or not participating that could affect the outcomes.

DID estimator assumes that the error term is not correlated with any other variable in the model; that is, $Cov(\varepsilon_{it}, T_{i1}) = 0$; $Cov(\varepsilon_{it}, t) = 0$; $Cov(\varepsilon_{it}, T_{i1}\, t) = 0$. It means that unobserved features affecting policy participation is invariant over time with participation status (Khandker, Koolwal, and Samad 2010). Applying panel-fixed effect model, DID controls not only for unobserved time invariant heterogeneity but also heterogeneity in the observed variables over multiple periods of time.

$$Y_{itj} = \gamma T_{itj} + \beta X_{itj} + \eta_i + \mu_i + \varepsilon_{it} \quad \text{.....11}$$

$\boldsymbol{Y_{it}}$ is regressed on $\boldsymbol{T_{it}}$, time varying variables $\boldsymbol{X_{it}}$, unobserved individual banks heterogeneity $\boldsymbol{\eta_i}$ and unobserved country heterogeneity $\boldsymbol{\mu_i}$, which may be correlated with the policy or other unobserved events or actions $\boldsymbol{\varepsilon_{it}}$. γ is an unbiased effect of the policy program.

Differencing the two sides of the equation for the two time period (pre and post policy implementation), the following equation will be obtained:

$$(Y_{itj} - Y_{itj-1}) = \gamma(T_{itj} - T_{itj-1}) + \beta(X_{itj} - X_{itj-1}) + (\eta_i - \eta_i) + (\mu_i - \mu_i) + (\varepsilon_{it} - \varepsilon_{it-1}) \quad \text{.....12}$$

$$\Delta Y_{itj} = \gamma \Delta T_{itj} + \beta \Delta X_{itj} + \Delta \varepsilon_{itj} \quad \text{.....13}$$

For an effective DID estimation, the participating and control groups should have similar features. To ensure such similarity, propensity score matching (PSM) is used to match the participating and control groups before applying the DID estimation. PSM designs a comparison group by modelling the probability of participating or not participating in the policy program, based on the features of the groups not affected by the policy under review (Khandker, Koolwal, and Samad 2010). Participants are then matched with the non-participants based on this probability or propensity score. This study applied Caliper matching, where a limit is imposed on a maximum distance between the propensity scores of participating and non-participating group. This is to avoid bad matches, and to reduce the chances of eliminating good matches.

$C(P_{rT}) = P_{rC} \|P_{rT} - P_{rC}\| < \varepsilon$, where P_{rT} is the propensity score for participating group, P_{rC} is propensity score for non-participating group, and ε is the limit level between the two.

3.10.4. Logistic Regression

Another empirical method applied in this study is logistic regression analysis. This method is used to assess the factors that could contribute to the adoption of the regulatory policies under review in this study (market discipline principle and twin-peaks regulatory model). Logistic regression is a suitable analysis when the dependent variable is a binary or dichotomous variable (Hosmer Jr, Lemeshow, and Sturdivant 2013). In our own case, the dependent variable is a dummy of market discipline implementation, which is a value of 1 if a country implemented market discipline principle and value of 0 if otherwise.

The same applies to adoption of twin-peaks regulatory mode, value of 1 if a country has adopted twin-peaks model or features of twin-peaks, and value of 0 if otherwise. We propose that country specific macroeconomic and institutional variables could possibly contribute to the implementation of regulatory policies by a country. Included in the independent variables are some banks-specific variables that could facilitate adoption of regulatory policies.

Being a panel analysis, fixed effect panel logistic regression is applied, using Hausman test to decide which model is suitable between fixed and random effects. Just as in any other regression analysis, logistic regression does not allow for inter-correlated variables to be fitted in a model, with the use of correlation matrix, all the variables used in testing for factors that contribute to the implementation of regulatory policy are not correlated.

3.11. Empirical model specification for the regression analysis

We estimate the empirical models for this study as per the objectives in chapter one and hypotheses in section 3.9. We use different regression models to capture the evolution of market discipline principle; to view the dynamic changes in the variables of interest over the period of regulatory policy implementation; to assess the impacts of the market discipline principle on the performance and stability of financial services industries, focusing on commercial banks; and also to assess factors that contribute to the implementation of market discipline principle especially in emerging market economies. Same approaches also apply to the twin-peaks financial regulatory model, assessing the behavior of variables of interest over the periods of its adoption, its impact on banks performance and stability, as well as factors thwarting its adoption in emerging market economies.

3.11.1. Testing for the evolution of market discipline

The first empirical objective of this study is to investigate the existence of market discipline in the emerging market banking industry, which is represented by the first hypothesis. To test for the evolution of market discipline (proxied by year of market discipline implementation) the market discipline constructs generated using principal component analysis are estimated over the six time periods (T to T+5) explained in section 3.10.2. The constructs are represented by MkDs (MkD1 through MkD5 and OvMkD). Hence, from equation 8 we have;

$$MkDs_{ijt} = \alpha_i + \beta_t + \varepsilon_{it}, \text{ for } t\text{=T, T+1, T+2,…, T+5, } i\text{=1,….,N}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 14$$

All the variables used in generating the market discipline constructs are also regressed over the same time period; this enables us to estimate the individual evolution of those variables during the period and post periods of market discipline implementation. In the same manner, performance and stability measures are also estimated over the same time periods in other to understand their evolution over the years.

3.11.2. Testing for effect of market discipline principle on bank performance and stability.

This is the test of hypothesis two. The major essence of enforcing regulatory polices is to strengthen individual bank's soundness and that of financial system as a whole. But sometimes, the implementation of these policies could throw up unintended consequences in the financial system (Brealey 2006, Hanson, Kashyap, and Stein 2011). Also, sometimes, the globally required regulatory policies in place might not be suitable for all market structures and sizes, considering the differences between developed and developing economies, just as Scott (2004), posits that market discipline principle would appear more effective in relatively perfect and well informed market. Based on these concerns, we empirically define the effect of market discipline principle and twin-peaks on bank performance and stability using the models below.

$$Perf_{ijt} = \alpha + \beta_1 MkDs_{ijt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt}\ldots\ldots\ldots\ldots\ldots\ldots 15$$

$$Stab_{ijt} = \alpha + \beta_1 MkDs_{ijt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt}\ldots\ldots\ldots\ldots\ldots\ldots 16$$

Where, ***Perf*** and ***Stab*** are bank performance and stability measures, respectively. ***MkDs*** represents market discipline constructs ***(OvMkD, MkD1*** to ***MkD5***) generated using principal component analysis, ***Bank*** denotes bank specific control variables, ***Macro*** and ***Inst*** denote macroeconomic and institutional variables, respectively; *i* represents individual banks in country j, at time *t*. However,

MkD1 to ***MkD5 and OvMkD*** are also individually fitted into the model to account for their individual effects on both performance and stability.

For validation purposes, the dummy of implementation of the market discipline principle is also estimated for performance and stability in equations 17 and 18. ***DummyMkD*** represents implementation of market discipline. The essence of this estimation is to find out if the probability of implementing market discipline affects performance and stability.

$$Perf_{ijt} = \alpha + \beta_1 DummyMkD_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \ldots\ldots\ldots\ldots 17$$

$$Stab_{ijt} = \alpha + \beta_1 DummyMkD_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \ldots\ldots\ldots\ldots 18$$

3.11.3. Testing for Factors that affect Implementation of Market Discipline Principle

This model intends to find out whether or not some factors, both macro and institutional, affect the implementation of the market discipline principle in the emerging market banking industry. It is estimated using logistic regression because the dependent variable. $DummyMkD$ is a dichotomous variable for implementing market discipline principle.

$$DummyMkD_{jt} = \alpha + \beta_1 Bank_{ijt} + \beta_2 Macro_{jt} + \beta_3 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \ldots\ldots\ldots\ldots 19$$

3.11.4. Testing for effect of twin-peaks regulatory model on bank performance and stability.

There is no proxy to measure twin-peaks regulatory model, so the dummy of implementation/ adoption of twin-peaks is estimated on performance and stability measures. ***DummyTwin*** represents the dummy for twin-peaks regulatory model adoption/ implementation.

$$Perf_{ijt} = \alpha + \beta_1 DummyTwin_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \ldots\ldots\ldots\ldots 20$$

$$Stab_{ijt} = \alpha + \beta_1 DummyTwin_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \ldots\ldots\ldots\ldots 21$$

In the same manner as in the case of market discipline, we also adopt equation 14 and estimate the evolution of performance and stability measures over the six year period (T to T+5), T representing the year of adoption of twin-peaks features or the year of actual implementation of twin-peaks regulatory model.

3.11.5. Testing for Factors that affect adoption of twin-peaks financial regulatory model.

This model intends to find out if some factors, both macro and institutional, affect the adoption of the twin-peaks financial regulatory model in the emerging market banking industry. Just as in section

3.11.3, this model is also estimated using logistic regression because the dependent variable $DummyTwin$ is a dichotomous variable representing adoption of twin-peaks regulatory model.

$$DummyMkD_{jt} = \alpha + \beta_1 Bank_{ijt} + \beta_2 Macro_{jt} + \beta_3 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....22}$$

$$DummyTwin_{jt} = \alpha + \beta_1 Bank_{ijt} + \beta_2 Macro_{jt} + \beta_3 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....22}$$

3.11.6. Testing for effect of twin-peaks structure on bank performance and stability.

Recall from literature that twin-peaks is a financial regulatory model where two independent regulatory bodies oversee the prudential and market conduct regulation of the financial system. Some countries adopt the supervisory function of the central bank as one of the regulatory peaks (bodies), while some countries choose two independent regulatory bodies outside the central bank. In this model we test the effect of this later choice in the performance and stability of banks in these countries. The essence of this model is to test the significance of the central banks in the twin-peaks regulatory model.

$$Perf_{ijt} = \alpha + \beta_1 TwinCB_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....23A}$$

$$Stab_{ijt} = \alpha + \beta_1 TwinCB_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....23B}$$

$$Perf_{ijt} = \alpha + \beta_1 TwinInBody_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....24A}$$

$$Stab_{ijt} = \alpha + \beta_1 TwinInBody_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....24B}$$

$TwinCB$ represents those countries with central banks as part of the two pillars of twin-peaks; $TwinInBody$ is dummy for countries where the two pillars of twin-peaks are independent of the central banks.

From the literature there is little empirical evidence on the effect of regulatory structure on financial industries' performance. Also conflicting results exist on the importance of central bank as part of the main regulatory organs of countries. One would expect banks' performance to improve due to central bank's (CB) involvement because it could easily attract supervisory experts than non-central bank regulators. On the other hand, conflict of interest in CB's role of monetary policy and bank supervision could exist, thereby could affect CB's regulation of banks. Barth et al. (2003) did not find any effect on banks' performance that is due to CB's involvement in financial supervision, while Dincer and Eichengreen (2012) find that CB involvement reduces non-performing loans. Based on the foregoing, the above model is also an alternative way of measuring the effect of CB involvement

in financial regulation on banks' performance and stability. On that note, expected effect of these variables is an open empirical question.

3.11.7. Testing for effects of single regulatory structure on bank performance and stability.

This model is an extension of model 3.11.6, by looking at the overall financial regulatory structure of a country, not just limited to twin-peaks adoption as a specific aspect of regulation (hypothesis 7). Here we look at the impact of single financial regulatory structure of a country on bank's performance. This estimation will serve as confirmation of motivating for implementation of twin-peaks regulatory structure by countries. Hence this model will serve a robustness check on the effect of twin-peaks regulatory model.

$$Perf_{ijt} = \alpha + \beta_1 Regstrct_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....25}$$

$$Stab_{ijt} = \alpha + \beta_1 Regstrct_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....26}$$

Here ***Regstrct*** denotes regulatory structure variables of single regulatory body (SINREG), which is later interacted with market discipline implementation dummy variable to see its effects where a country happens to implement market discipline as well.

Single (SINREG) versus multiple regulatory structures could affect banks' performance. A single regulator may be perceived to be able to take more coordinated action compared to multiple competing regulators; on the other hand, multiple regulators may handle more effectively potential excessive concentration of power, regulatory burdens and abuse that may be imposed by single regulatory body. Just as in the twin-peaks structure variables, the expected sign in SINREG is also an open question. In summary, there is no prior expected sign on the relationship between performance and regulatory structures; based on this conclusion, the result from this empirical analysis will show the effects of regulatory structures on banks' performance and stability.

3.11.8. Testing whether market discipline framework and twin-peaks regulatory model are substitutes or complements

There have been some concerns that exclusive reliance on market discipline could render the financial sector ineffective due to the opaque nature of banks and the release of incomplete or erroneous information to the market, which can lead to false market reaction (Dhumale 2000, 2001, Linnell 2001, Prowse 1997, Morgan 2002). In a market with information asymmetry and externalities, like emerging markets, market discipline behavior (implementation) could trigger bank runs, which can destabilize the financial system (Diamond and Dybvig 1983, Goodhart et al. 2013).

But other researchers argue that market discipline as an incentive-based regulation should be a complementary regulatory tool but not a substitute to rule-based regulation (Hamalainen 2006, Bruni and Paternò 1995).

Based on the above argument, we test also the effect of interaction of twin-peaks model and market discipline principle on emerging market banking industries. We interact overall market discipline variable (***OvMkD)*** with the dummy variable of twin-peak (***dummyTwin***), and regress performance and stability variables against it, while including other bank-specific, country-specific and institutional factors in the model. This interaction produce a variable named ***Twin*MkD.*** The overall market discipline variable is generated using principal component analysis.

$$Perf_{ijt} = \alpha + \beta_1 \text{TwinMkD}_{ijt} + \beta_2 OvMkD_{jt} + \beta_3 DummyTwin_{jt} + \beta_4 Bank_{ijt} + \beta_5 Macro_{jt} + \beta_6 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....27}$$

$$Stab_{ijt} = \alpha + \beta_1 \text{TwinMkD}_{ijt} + \beta_2 OvMkD_{jt} + \beta_3 DummyTwin_{jt} + \beta_4 Bank_{ijt} + \beta_5 Macro_{jt} + \beta_6 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....28}$$

3.11.9. Testing for effect of quality of regulation on banks' performance and stability

This model intends to find out the effect of regulatory quality on bank performance and stability. Regulatory quality is measured using the Basel core Principle (BCP), as was explained in section 3.6.3.

$$Perf_{ijt} = \alpha + \beta_1 BCP_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....29}$$

$$Stab_{ijt} = \alpha + \beta_1 BCP_{jt} + \beta_2 Bank_{ijt} + \beta_3 Macro_{jt} + \beta_4 \text{Inst}_{jt} + \varepsilon_{ijt} \quad \text{.....30}$$

3.12. Chapter Summary

In this chapter we explained that this study is based on the paradigm of positivism, where the data used and the findings of the research are independent of the researcher. We also explained the research design and method of data analysis, for which we deployed descriptive statistics, event study, logistic regression, and the use of difference-in-differences for robustness checks. The choice of this design depends largely on the objectives of tracing the evolution of market discipline principle in banks' behavior as well as estimating the impact of regulatory policies on banks' performance and stability. Data collection techniques and variable measurements were also detailed in this chapter, as well as hypothesis testing of estimation models. The next chapter presents the detailed results of the empirical analyses, stating from method applied in generating some variables used in the regression analysis to the interpretation of documented results.

Chapter Four

4. MARKET DISCIPLINE PRINCIPLE; ITS EVOLUTION AND EFFECTS ON BANK PERFORMANCE AND STABILITY

4.1. Introduction

In this chapter, we are largely concerned with presentation and interpretation of research analysis results from market discipline implementation. We started by estimating and reporting the level of competition in the banking industry using the Panzer and Rosse model of H-statistics. Next, we generate and define different constructs/dimensions of market discipline by applying identified proxies that reflect market discipline behaviour, using principal component analysis (PCA). Detailed descriptive and summary statistics of the variables of interest are also tabled and explained. Next, using generalised methods of moments (GMM), we estimate the evolution of market discipline effects in the year and five subsequent years after its implementation.

We also estimate the evolution of banks' performance and stability measures during the same periods. Furthermore, we estimate the effects of the different dimensions of market discipline on both bank performance and stability using the overall sample as well as emerging and developed market economies sub-samples, respectively. The factors that determine likelihood of implementation of market discipline are also estimated and explained by using logistic regression. Finally, we apply difference-in-differences (DID) as a robustness check on the overarching of market discipline principle effects on bank performance during the study.

4.2. H-statistics

The first phase of the analysis is to generate H-statistics (H-Stat), a measure of competition. As explained in section 3.7.1, the Panzer and Rosse model of H-statistics is applied, using fixed effect model on equation 5 reported in chapter 3. Ratio of interest income to total asset (proxy for banks' input price) is regressed against ratio of interest expenses to deposits (bank's output price on deposit), personnel expenses to total asset (input price of labor) and other operating expenses to total assets (input price of assets). Other bank-specific factors that could affect revenue are included in the model as control variables. The result is also generated in series for each bank for each country over time, using a Stata command (so as to be fitted in the model as one of the variables of interest). Table 4.1 details the estimation result of the H-statistics.

Table 4.1: Regression output of H-Statistics using Panzar-Rosse methodology

Models:	(1) All Banks	(2) Emerging Market Banks	(3) Developed Market Banks
Variables	Interest income to total asset		
Int. Ex./Deposits	0.246***	0.234***	0.329***
	(0.007)	(0.007)	(0.017)
Personnel Exp./Total Asset	-0.012**	-0.015***	0.044***
	(0.005)	(0.005)	(0.015)
Operating Exp./Total Asset	0.226***	0.231***	0.157***
	(0.007)	(0.007)	(0.023)
Net Loan/Total asset	0.075***	0.061***	0.229***
	(0.008)	(0.009)	(0.023)
Equity/Total asset	0.047***	0.036***	0.130***
	(0.009)	(0.010)	(0.022)
Total asset	0.002	0.000	0.010
	(0.002)	(0.002)	(0.006)
Time	-0.011***	-0.009***	-0.016***
	(0.001)	(0.001)	(0.003)
Constant	-0.519***	-0.523***	-0.271***
	(0.033)	(0.035)	(0.097)
Observations	9,156	7,956	1,200
Number of BankID	611	531	80
R-squared within	0.344	0.330	0.509
R-squared Between	0.705	0.667	0.561
R-squared Overall	0.537	0.500	0.532
F(H0: all coefficients=0)	8.95***	8.63***	8.45***
H-Statistics (H)	**0.46**	**0.45**	**0.53**

*In Table 4.1, H=1 indicates perfect competition (or long run competitive equilibrium). H ≤ 0 indicates, monopoly, profit maximizing oligopoly behavior, cartel, or short run oligopolistic competition. While 0<H <1 indicates monopolistic competition. According to the requirement for calculation of H-Statistics, all variables were entered in logs. Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1*

From Table 4.1, the null hypothesis of H=1 and H<0 indicating perfect competition and oligopolistic market, respectively is ruled out. It is found that both emerging markets and developed country banks operate under monopolistic competition, where H-statistics is less than 1, at 0.45 and 0.53, respectively. This result is the confirmation of other studies' findings on the monopolistic competition nature of banking businesses, both in Africa and developing countries (Sun 2011, Simpasa 2011, Biekpe 2011, Simbanegavi, Greenberg, and Gwatidzo 2015, Simatele 2015). The coefficient that captures the time dynamic effect of H-statistics is negative and significant; this suggests that the level of competiveness in the banking industry decreased over the sampled period. This is in contrast to the South African case, where level of competition seems to be increasing over time (Simatele 2015), with the cited research focused only on the South African banking industry.

4.3. Principal Component Analysis (PCA)

To define the constructs that determine market discipline conduct/behavior, principal component analysis (PCA) is applied on the following identified market discipline proxies: interest spread (SP), Interbank rate (IntBR), long term credit ratings (LTR), viability ratings (ViabR), dummy variable for outstanding shares (DummyOutSh), dummy variable for subordinated debts (DummySubD), dummy variable for government implicit guarantee (GIG), and dummy variable for deposit insurance corporation or scheme (DISC). PCA helps to compress and extract as little as possible any significant information from loaded variables, which could define a particular construct. Component loadings indicate how a component defines a variable loaded in PCA.

The loadings range between -1 and 1, which indicates negative and positive effect, respectively, of a variable in defining the formed construct under review. Loadings close to +/-1 indicate that such component strongly defines the construct positively/negatively, respectively, while loadings close to zero indicate weak definition of the resulting construct. In this study, the component loadings indicate the strength of the loaded variables in explaining market discipline behavior. Components with loadings above 0.5 indicate that a variable has a relatively strong influence in defining market discipline, though some researcher could go below 0.5 in determining a strong effect (Mthanti and Ojah 2017).

In most cases, the choice of number of components to represent a construct depends on the eigenvalues, the higher the eigenvalues (as high as 1), the higher the component's effect. But in some cases, especially with the use of precise data, eigenvalues lower than 1 can be considered real and significant (Bro and Smilde 2014). Another indicator for a choice of number of components to retain is based on the fraction of variation explained/unexplained, as well as the cumulative proportion of the explained variance. From Table 4.2, 8 variables were loaded in PCA. To precisely measure the constructs that explained market discipline, 5 components were chosen based on their eigenvalues ranging from 2.29 to 0.81. The unexplained variances for each of the variables are all less than 40%, while the explained cumulative proportion for the component loading is 85%. The Kaiser-Meyer-Olkin (KMO), which explains sampling adequacy for PCA, is also higher than the required level of 50%.

Looking at the loadings, first, long-term credit rating (LTR) and viability rating (ViabR) loaded clearly into component 1 with loadings of 0.68 and 0.69, respectively; this indicates strong and positive effect on market discipline principle by these two proxies. This supports our intuition that ratings from rating agencies are vital dictators of market discipline, thus reflective of market

discipline from external stakeholders, labeled ***MkD1***. Second, also as expected, component 2 clearly comprised of government implicit guarantee (GIG) and deposit insurance scheme (DISC), loading

Table 4.2: Rotated components using orthogonal varimax rotation

Var./Components	Comp1	Comp2	Comp3	Comp4	Comp5	Unexplained	Kmo
SP	-0.020	0.005	0.039	-0.035	0.967***	0.042	0.804
IntBR	-0.029	0.008	0.050	0.952***	-0.039	0.064	0.722
LTR	0.675**	-0.012	0.057	-0.008	-0.081	0.149	0.603
ViabR	0.691**	0.0230	0.026	-0.064	0.017	0.154	0.612
DummyOutSh	0.082	-0.0181	0.853***	0.113	0.095	0.173	0.738
DummySubD	-0.243	0.0523	0.507**	-0.277	-0.218	0.396	0.808
GIG	0.008	0.696**	-0.070	0.006	0.021	0.122	0.516
DISC	-0.001	-0.715***	-0.052	-0.009	0.010	0.115	0.512
Eigenvalue	2.288	1.781	1.032	0.874	0.810		
Proportion	0.286	0.223	0.129	0.109	0.101		
Cumulative	0.286	0.509	0.638	0.747	0.848		
Overall KMO							0.598

*From the Table, ***, ** and * indicate components loading >0.7, >0.5, and >0.3, respectively.*

at 0.70 and -0.72, respectively. This reflected our intuition on market discipline from government-oriented resolution/policy; we labeled this ***MkD2***. Third, existence of outstanding shares (DummyOutSh) and subordinated debt (DummySubD) in banks' balance sheet also have clean loadings of 0.85 and 0.51, respectively in component 3, reflecting market discipline from security holders (***MkD3)***. Finally, interbank rate (IntBR) and interest spread (SP) loaded individually in components 4 and 5, with high loadings of 0.95 and 0.97, and labeled ***MkD4*** and ***MkD5,*** respectively. Though the last two loadings are below eigenvalues of 1, they are included due to their high component loading of over 90% as well as with the justification of eigenvalues less than 1 which could be real and significant (Bro and Smilde 2014).

Figure 4.1: Eigenvalue plot after PCA

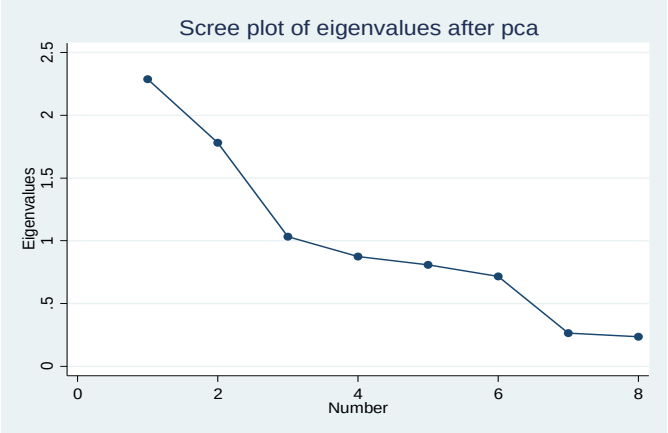


Figure 4.2: Plot of component loadings

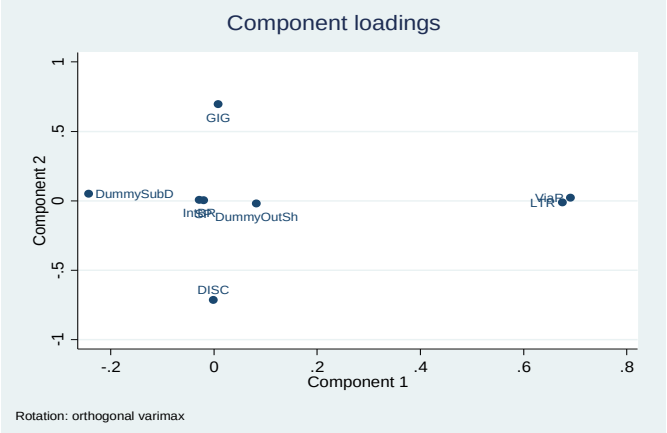


Table 4.3: Explanation of PCA loadings

	Loaded	Name	For short	Label
Comp 1	Long term credit and Viability ratings	Explicit or Likelihood of External stakeholder enforcement of MkD	MkD from External stakeholders	**MkD1**
Comp 2	Govt. implicit guarantee and deposit insurance scheme	Likelihood of internal resolution of slack Discipline	MkD from Govt. resolution/policy	**MkD2**
Comp 3	Outstanding Shares and Subordinated debt	External Security holders scrutiny	MkD from security holders	**MkD3**
Comp 4	Interbank ratio	Market discipline among banks	Internal industry Discipline	**MkD4**
Comp 5	Interest spread	Likelihood of Market discipline from depositors.	Market discipline from market activities	**MkD5**

We further group these dimensions of market discipline into internal and external dimensions. Market discipline from government resolution **(MkD2)** and internal industry market discipline **(MkD4)**, are regarded as internal market discipline. External market discipline include, market discipline from external stakeholders **(MkD1)**, market discipline from security holders **(MkD3)** and market discipline from market activities **(MkD5)**. From these result, we can infer that there are two explicit dimensions of market discipline: internal and external market discipline, which may exhibit different effects on bank performance and stability. These market discipline conduct dimensions are shown in a schematic diagram (Figure 4.3).

4.3.1. Validity of market discipline constructs

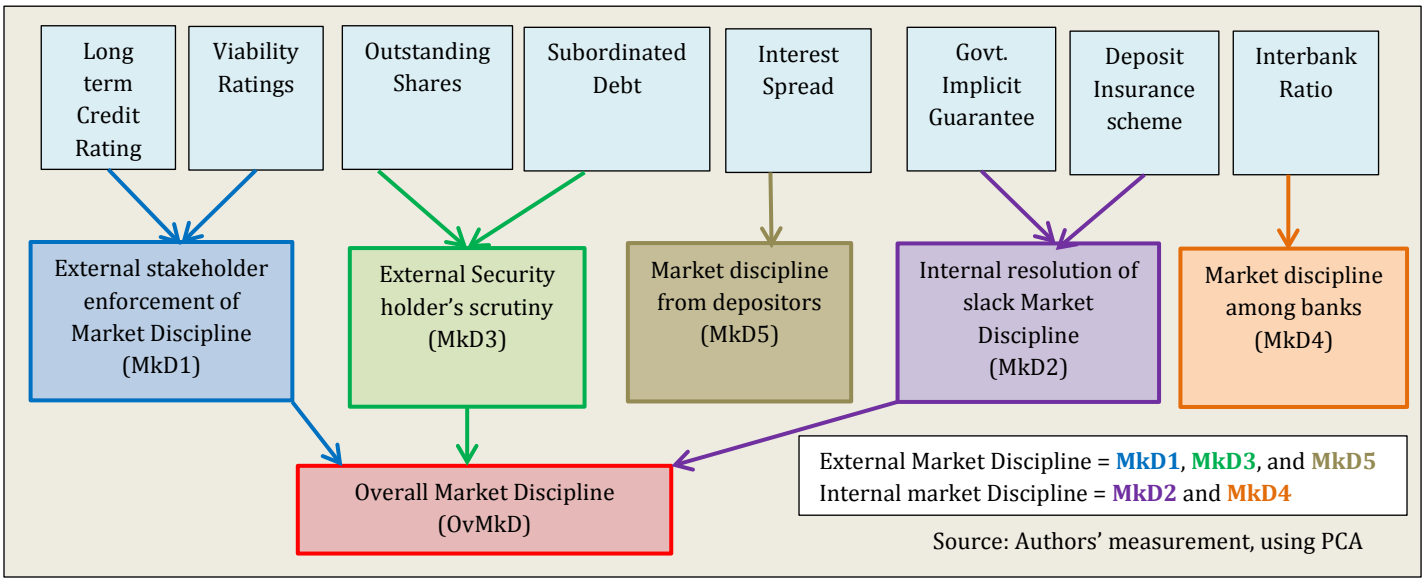
There is need to validate the resultant constructs generated using factor analysis (Hair et al. 2010). Following Mthanti and Ojah (2017), we decided to check the convergence of the first three component loadings, where two variables loaded in each component. Table 4.4 shows the convergence of market discipline from external stakeholders (MkD1) market discipline from government-oriented resolution/policy (MkD2) and market discipline from security holders (MkD3) into the cumulative (overall) market discipline construct ***(OvMkD)***. These three constructs loaded clearly in component 1, though the unexplained variance for MkD2 is relatively high, but still has a loading higher than 0.3 and the overall sampling adequacy (KMO) is also high at 53%.

Table 4.4: Component loadings of market discipline

Variable/Components	Comp1	Unexplained	Kmo
MkD1	0.656**	0.414	0.518
MkD2	0.342*	0.841	0.639
MkD3	0.672**	0.385	0.517
Eigenvalue	1.361		
Proportion	0.454		
Cumulative	0.454		
Overall kmo			0.525

*From the Table, ***, ** and * indicate components loading >0.7, >0.5, and >0.3 respectively.*

Figure 4.3: Dimensions of market discipline



4.4. Descriptive and Summary Statistics

4.4.1. Correlation Matrix

The correlation matrixes of the variables of interest are presented in Tables 4.5. The main essence of the matrix is to identify highly correlated variables and avoid including them in the same model during estimation, this solves the problem of multicollinearity. Multicollinearity exists when a linear relationship exists between two variables, making it difficult to identify which independent variable is influencing the dependent variable.

Another essence of the correlation matrix is to identify preliminary relationships between variable at a glance, which will in turn speak to expected results from model estimations. The focus of this study is on performance and stability of emerging market banking industries as a result of financial regulatory implementation. Therefore explanations of the variables of interest are linked to their association with banking industry's performance, measured as net interest margin (NIM), pretax profit (PreTaxP) and return on assets (ROA); and banking industry's stability, measured as Equity ratio (EQR), ratio of nonperforming loans to total loans (NPLTL), liquidity ratio, Z-Index and H-Statistics.

Tables 4.5a and b describe relationships between banks' performance, stability and market discipline constructs in the emerging and developed market economies, respectively. From these tables, the effects of market discipline constructs are different in emerging and developed market economies.

While the different constructs significantly associate with ROA of developed market banks, there is no significant association of these constructs with ROA of emerging market economies. It could be inferred that different dimensions of market discipline affect bank performance and stability differently, as well as have different effects on different regions (emerging and developed). Therefore, the effects of market discipline should as well be measured from different dimensions rather than solely cumulative (overall), as had been applied in past similar studies. More so, market discipline effects should be studied differently from different regions' perceptive (e.g., emerging and developed markets).

Tables 4.5c and d describe correlation matrix of country-specific variables with banks' performance and stability measures. Surprisingly, GDP growth is negatively associated with banks' performance, but only so for emerging market banks. For developed market banks, GDP growth is significantly and positively associated with bank profit. This adds to the justification of the differences in financial markets of developed and emerging market economies, therefore: the question remains: despite these differences, why is financial regulation globally required to be applied as though all financial markets (or systems) are the same across countries?

Table 4.5a: Correlation Matrix of variables of interest and market discipline constructs-Emerging Market

	NIM	LogPreTaxP	ROA	EquityR	NPLTL	LiquidtyR	LogZ-Index	H-Stat	OverallMkD	MkD1	MkD2	MkD3	MkD4	MkD5
NIM	1.0000													
LogPreTaxP	0.0024	1.0000												
ROA	0.0282***	0.1434***	1.0000											
EquityR	0.1284***	-0.0404***	0.2339***	1.0000										
NPLTL	-0.0771***	0.0204*	0.0293***	-0.0164	1.0000									
LiquidtyR	0.0562***	0.0014	-0.0051	0.0121	-0.0002	1.0000								
LogZ-Index	-0.0852***	0.3547***	0.0628***	-0.0221*	0.0146	0.0100	1.0000							
H-Stat	0.1827***	-0.2775***	-0.0122	0.0427***	0.0386***	-0.0103	-0.2203***	1.0000***						
OverallMkD	0.0672***	-0.2275***	0.0130	0.1040***	-0.0011	0.0260**	-0.1056***	0.1436***	1.0000					
MkD1	0.0862***	-0.2447***	-0.0017	0.0879***	-0.0030	0.0242**	-0.1069 ***	0.1555***	0.7334***	1.0000				
MkD2	-0.1738***	0.0489***	0.0180	-0.0676***	0.0031	-0.0210*	0.0763***	-0.1572***	0.4448***	0.0999***	1.0000			
MkD3	-0.1285***	0.2019***	-0.0136	-0.1340***	0.0010	-0.0338***	0.1244***	-0.1900***	-0.8286***	-0.3538***	-0.1463***	1.0000		
MkD4	0.0155	-0.0417***	-0.0148	0.0030	0.0098	0.0095	-0.0418***	0.0865***	0.1140***	0.1472***	0.0436***	-0.0474***	1.0000	
MkD5	-0.0069	0.1290***	-0.0002	-0.0108	-0.0027	-0.0029	0.0864***	-0.0967	-0.1279***	-0.2132***	0.1583***	0.1190***	-0.0429***	1.0000

***, **, * indicate significant levels at 1%, 5% and 10% respectively

Table 4.5b: Correlation Matrix of variables of interest and market discipline constructs-Developed Market

	NIM	LogPreTaxP	ROA	EquityR	NPLTL	LiquidtyR	LogZ-Index	H-Stat	OverallMkD	MkD1	MkD2	MkD3	MkD4	MkD5
NIM	1.0000													
LogPreTaxP	0.1216***	1.0000												
ROA	0.1394***	0.1461***	1.0000											
EquityR	-0.0549*	-0.0568**	-0.7328***	1.0000										
NPLTL	0.1100***	-0.0990***	0.0532*	-0.0308	1.0000									
LiquidtyR	0.0158	0.0058	0.3459***	-0.2261***	0.0210	1.0000								
LogZ-Index	0.1178***	0.3835***	0.1211***	-0.0145	-0.0632**	0.0038	1.0000							
H-Stat	0.1423***	-0.1106***	-0.1191***	0.2665***	0.1079***	0.0112	-0.0765***	1.0000						
OverallMkD	0.1703***	-0.2001***	-0.0463	0.1802***	-0.0579*	-0.0006	0.0757**	0.0461	1.0000					
MkD1	0.1548***	-0.1976***	-0.0148	0.1962***	-0.0738***	0.0173	0.0927***	0.0349	0.9128***	1.0000				
MkD2	0.0413	0.0738***	-0.0628**	0.0548*	-0.0406	-0.0408	0.0101	0.1587***	-0.0808***	-0.2508***	1.0000			
MkD3	-0.0871***	0.1378***	0.0486*	-0.0237	-0.0256	0.0127	0.0024	0.0421	-0.6776***	-0.3916***	0.2466***	1.0000		
MkD4	-0.0835***	-0.0735**	-0.0580**	0.1264***	-0.0794***	0.0267	0.1050***	0.0231	0.1570***	0.1317***	0.0961***	-0.0703**	1.0000	
MkD5	-0.0741**	0.1303***	0.0068	-0.0304	-0.0248	0.0032	0.0221	0.0067	-0.3840***	-0.3740***	0.1335***	0.2700***	-0.0818***	1.0000

***, **, * indicate significant levels at 1%, 5% and 10% respectively

Table 4.5c: Correlation Matrix of bank- and country-specific factors-Emerging market

	NIM	LogPreTaxP	ROA	EquityR	NPLTL	LiquidtyR	LogZ-Index	H-Stat	GDPGrowth	LendingRate	CVInflation	Political	Legal
NIM	1.0000												
LogPreTaxP	0.0024	1.0000											
ROA	0.0282***	0.1434***	1.0000										
EquityR	0.1284***	-0.0404***	0.2339***	1.0000									
NPLTL	-0.0771***	0.0204*	0.0293***	-0.0164	1.0000								
LiquidtyR	0.0562***	0.0014	-0.0051	0.0121	-0.0002	1.0000							
LogZ-Index	-0.0852***	0.3547***	0.0628***	-0.0221*	0.0146	0.0100	1.0000						
H-Stat	0.1827***	-0.2775***	-0.0122	0.0427***	0.0386***	-0.0103	-0.2203***	1.0000					
GDPGrowth	-0.1040***	0.1243***	0.0036	-0.0544***	-0.0013	0.0061	0.0595***	-0.2146***	1.0000				
LendingRate	0.3694***	-0.1255***	0.0099	0.1013***	0.0007	0.0014	-0.1577***	0.3232***	-0.2362***	1.0000			
CVInflation	-0.0331***	0.0182*	0.0499***	0.0122	-0.0350***	-0.0026	-0.0191*	-0.0577***	0.0880***	-0.0517***	1.0000		
Political	-0.0213*	0.0254*	0.0123	0.0248*	-0.0046	0.0010	0.0413***	-0.0719***	-0.1196***	0.0787***	0.0086	1.0000	
Legal	0.0443***	-0.0033	0.0166	0.0527***	-0.0071	0.0055	0.0176	0.0147	-0.2715***	0.1682***	-0.0557***	0.7915***	1.0000

***, **, * indicate significant levels at 1%, 5% and 10% respectively

Table 4.5d: Correlation Matrix of bank- and country-specific factors-Developed market

	NIM	LogPreTaxP	ROA	EquityR	NPLTL	LiquidtyR	LogZ-Index	H-Stat	GDPGrowth	LendingRate	CVInflation	Political	Legal
NIM	1.0000												
LogPreTaxP	0.1216***	1.0000											
ROA	0.1394***	0.1461***	1.0000										
EquityR	-0.0549*	-0.0568**	-0.7328***	1.0000									
NPLTL	0.1100***	-0.0990***	0.0532*	-0.0308	1.0000								
LiquidtyR	0.0158	0.0058	0.3459***	-0.2261***	0.0210	1.0000							
LogZ-Index	0.1178***	0.3835***	0.1211***	-0.0145	-0.0632**	0.0038	1.0000						
H-Stat	0.1423***	-0.1106***	-0.1191***	0.2665***	0.1079***	0.0112	-0.0765***	1.0000					
GDPGrowth	0.0598*	0.0911***	0.0142	-0.0125	0.0473*	-0.0396	0.0608 **	0.1673***	1.0000				
LendingRate	0.0866***	-0.0012	-0.0113	0.0268	0.0692**	-0.0449	-0.0857***	-0.0128	0.2111***	1.0000			
CVInflation	-0.0146	-0.0709**	-0.0025	0.0041	0.0323	0.0068	-0.1255***	-0.1330***	-0.2519***	0.2706***	1.0000		
Political	-0.0103	-0.0215	-0.0266	0.0050	-0.0008	-0.0213	0.0796***	0.1296***	0.2215***	-0.3983***	-0.2096***	1.0000	
Legal	-0.0449	-0.0045	-0.0196	0.0139	-0.0206	-0.0008	0.0654**	0.0698***	0.1491***	-0.5002***	-0.2359***	0.8590***	1.0000

***, **, * indicate significant levels at 1%, 5% and 10% respectively

4.4.2. The summary statistics

The summary statistics for bank-specific variables of interest for this study are for the two distinct markets (emerging and developed economies) are detailed in Tables 4.6a and b, respectively, while individual countries' statistics are detailed in Tables 4.6c and d. We further summarized the variables on both country and yearly bases. The essence of this block summary is to view the mean differences among sampled countries and the mean differences for each year, tracing the particular year a country implemented market discipline principle or twin-peaks financial regulatory model. The yearly basis summary is represented in graphs in figures 4.4a, b, c, and d.

From Tables 4.6c and d, emerging markets' banks seem to have high profit margin (measured as net interest margin; NIM) with the mean of 5.47, compared to developed market banks with mean of 1.92. Also from stability point of view, equity and liquidity ratios of emerging markets' banks are higher, compared to those of developed markets' banks. But using LogZ-Index as stability measure, developed markets slightly outperformed emerging markets' banks. Looking at individual countries, Brazil and Peru outperformed other emerging market countries with, average NIM of 9.99 and 9.52 respectively; and these two countries also outperformed the best performing country (Belgium) in developed market, with average NIM of 2.16 (see Tables 4.6e and f).

Table 4.6a: Summary statistics of variables of interest-Emerging markets

VARIABLES	N	SUM	MEAN	MIN	MAX	SD	KURTOSIS	SKEWNESS
NIM	7,965	43,593	5.473	-71.67	92.24	6.119	35.26	2.681
LogPreTaxP	7,965	68,956	8.657	-15.92	17.96	6.137	7.311	-2.248
ROA	7,965	89.89	0.0113	-4.657	4.508	0.117	886.3	2.234
LogTotalAsset	7,965	112,721	14.15	-16.05	21.88	4.026	30.70	-4.523
LogZ-Index	7,311	25,317	3.463	-6.900	10.27	1.228	5.931	-0.237
NPL/TotalLoan	7,942	721.4	0.091	-419.8	315.0	7.557	2,134	-19.18
EquityRatio	7,965	1,042	0.131	-14.95	6.538	0.304	879.0	-12.97
H-statistics	7,956	-14,321	-1.800	-4.143	1.890	0.479	5.477	0.848
LiquidityRatio	7,957	6,106	0.767	-43.44	660.3	11.10	2,224	44.63

Table 4.6a shows summary statistics of bank-specific variables of interest for emerging market economies' sub-sample

Table 4.6b: Summary statistics of variables of interest-Developed Markets

VARIABLES	N	SUM	MEAN	MIN	MAX	SD	KURTOSIS	SKEWNESS
NIM	1,200	2,304	1.920	-5.763	10.14	1.635	10.24	1.902
LogPreTaxP	1,200	10,776	8.980	-17.15	16.15	7.068	7.091	-2.272
ROA	1,200	5.553	0.0046	-2.174	0.248	0.065	1,050	-31.26
LogTotalAsset	1,200	19,196	16.00	-16.74	21.47	3.304	42.12	-4.479
LogZ-Index	1,109	3,968	3.578	-0.723	8.190	1.190	3.588	-0.170
NPL/TotalLoan	1,200	136.9	0.114	-3.173	22.36	0.902	358.7	16.63
EquityRatio	1,200	108.7	0.091	-1.322	5.519	0.204	420.5	16.06
H-statistics	1,200	-2,543	-2.119	-3.714	0.151	0.402	8.010	1.148
LiquidityRatio	1,200	344.7	0.287	-52.65	8.845	1.746	729.7	-24.86

Table 4.6b shows summary statistics of bank-specific variables of interest for developed market economies' sub-sample.

Table 4.6c: Summary statistics by country-Emerging Markets

	Brazil		Chile		China		Colombia		Egypt		India		Indonesia		Kuwait		Malaysia		Mexico	
VARIABLES	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**
NIM	9.990	10.73	3.793	3.617	2.600	1.321	6.271	3.334	2.665	1.372	2.949	5.477	5.451	3.573	2.892	0.513	3.062	1.624	4.749	5.472
LogPreTaxP	7.483	7.232	7.762	6.788	10.24	6.239	8.688	6.884	8.741	5.090	10.62	4.295	8.662	5.132	11.41	4.225	10.52	3.975	7.731	7.039
ROA	0.017	0.048	0.017	0.038	0.009	0.218	0.013	0.022	0.010	0.019	0.010	0.008	0.006	0.111	0.016	0.014	0.011	0.010	0.005	0.047
LogTotalAsset	13.61	3.911	14.05	3.491	15.03	6.583	14.80	1.357	14.69	1.335	15.57	2.902	13.65	3.275	16.34	0.700	15.00	3.902	14.21	3.751
LogZ-Index	3.078	1.129	3.511	1.024	3.666	1.287	3.549	1.077	3.645	1.263	3.840	0.971	3.392	1.317	3.822	1.229	3.879	1.042	3.256	1.128
NPL/TotalLoan	0.252	4.035	0.007	0.135	0.426	10.27	0.045	0.047	0.232	0.576	0.080	0.403	0.058	0.171	0.070	0.070	0.064	0.087	0.048	0.279
EquityRatio	0.188	0.241	0.173	0.204	0.054	0.539	0.121	0.037	0.099	0.046	0.076	0.065	0.132	0.297	0.122	0.026	0.118	0.168	0.146	0.179
H-Statistics	-1.490	0.349	-1.965	0.402	-2.025	0.657	-1.811	0.206	-1.767	0.433	-1.889	0.130	-1.806	0.342	-2.350	0.199	-2.303	0.258	-1.081	0.568
LiquidityRatio	1.314	12.11	0.613	1.079	0.298	2.151	0.229	0.144	0.395	0.186	0.110	1.057	0.520	5.048	0.382	0.172	1.749	23.29	1.418	5.768
	Morocco		**Namibia**		**Nigeria**		**Peru**		**Philippines**		**Russia**		**South Africa**		**Thailand**		**Turkey**		**Zambia**	
VARIABLES	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**
NIM	3.820	1.442	6.153	1.944	7.983	2.565	9.516	7.794	5.017	6.138	5.807	4.177	6.463	5.850	2.973	1.295	8.129	8.539	8.660	5.611
LogPreTaxP	11.11	3.091	9.429	3.253	9.046	5.872	8.534	5.683	8.244	5.602	7.328	5.681	7.753	6.813	8.416	6.660	9.240	7.359	5.005	7.127
ROA	0.009	0.010	0.022	0.018	0.017	0.034	0.030	0.362	0.015	0.070	0.014	0.090	0.013	0.037	0.010	0.019	0.016	0.053	-0.052	0.312
LogTotalAsset	15.86	0.889	13.49	0.989	14.53	1.453	12.97	5.247	14.11	1.773	12.49	4.306	13.82	2.936	16.00	1.297	15.04	3.741	11.97	1.284
LogZ-Index	4.327	4.324	4.179	1.190	3.096	1.256	3.781	0.943	3.797	1.255	3.336	1.264	3.350	1.149	3.424	1.356	3.118	1.214	2.632	1.020
NPL/TotalLoan	-0.019	0.244	0.017	0.027	0.254	0.921	0.279	0.635	0.834	12.42	0.114	1.650	0.071	0.294	0.106	0.145	-1.075	22.63	-1.960	25.63
EquityRatio	0.085	0.023	0.218	0.243	0.150	0.097	0.159	0.393	0.142	0.078	0.141	0.392	0.122	0.087	0.125	0.117	0.152	0.140	0.257	0.598
H-Statistics	-2.235	0.132	-1.649	0.254	-1.848	0.284	-1.719	0.496	-2.075	0.300	-1.692	0.391	-1.681	0.348	-2.239	0.190	-1.636	0.362	-1.846	0.519
LiquidityRatio	0.252	0.093	0.749	2.618	2.648	28.89	0.391	1.692	0.371	0.567	0.481	0.595	0.428	0.555	1.695	0.159	2.893	35.73	0.534	0.413

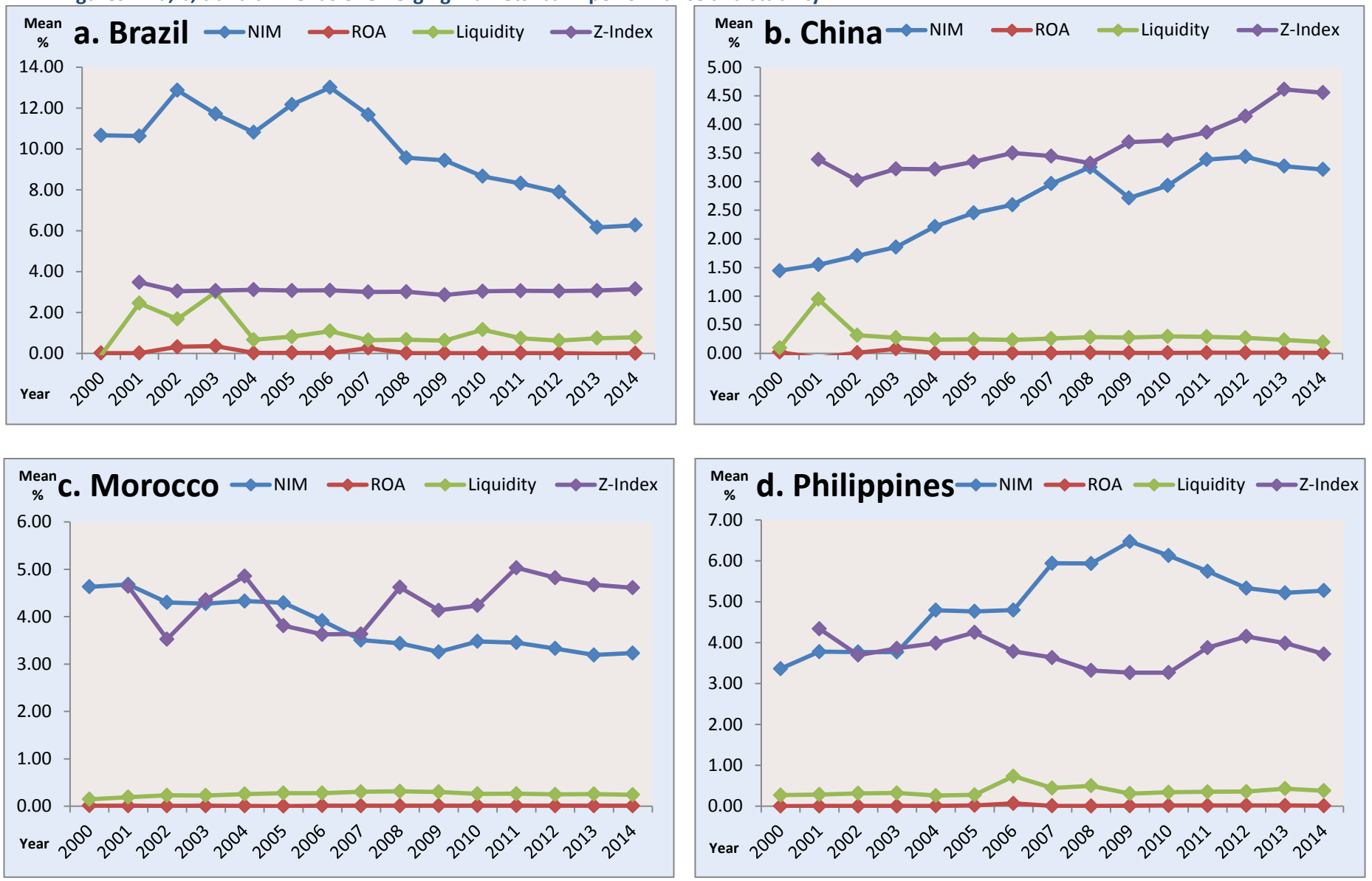
Table 4.6c shows summary statistics of bank-specific variables of interest for emerging market economies' on country basis.

Table 4.6d: Summary statistics by country-Developed markets

	Australia		Belgium		France		Netherlands	
VARIABLES	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**	**MEAN**	**SD**
NIM	2.035	1.429	2.162	1.914	1.850	1.783	1.677	1.118
LogPreTaxP	9.869	6.935	8.123	7.007	9.351	7.226	8.565	6.899
ROA	-0.001	0.148	0.005	0.011	0.007	0.014	0.0050	0.014
LogTotalAsset	15.68	5.441	15.52	2.737	16.78	2.411	15.56	2.358
LogZ-Index	3.642	1.119	3.445	1.316	3.524	1.113	3.748	1.211
NPL/TotalLoan	0.275	1.892	0.100	0.490	0.112	0.438	-0.001	0.248
EquityRatio	0.113	0.396	0.087	0.147	0.085	0.138	0.084	0.054
H-Statistics	-1.978	0.401	-2.285	0.290	-2.088	0.433	-2.110	0.398
LiquidityRatio	0.151	1.687	0.413	3.145	0.467	0.619	0.381	0.264

Table 4.6d shows summary statistics of bank-specific variables of interest for developed market economies' on country basis.

Figures 4.4a, b, c and d: Trends of emerging markets' bank performance and stability



Using individual country and yearly summary statistics (mean), we plot trends of some bank performance (NIM and ROA) and stability (Liquidity and Log Z-Index) measures in Figures 4.4a, b, c, and d for Brazil, China, Morocco, and Philippines, respectively, over the sample period of 2000-2014. These four counties are used for rustiness check on effects of market discipline principle implementation in emerging market economies, using difference-in-differences (DID) estimation in section 4.10. Brazil implemented market discipline principle in 2006, from Figure 4.4a, the graph shows that net interest margin (NIM), liquidity and logZ-Index of Brazilian banks decreased after market discipline implementation. Though ROA increased from 0.03 in 2006 to 0.26 in 2007, but drastically fall back to 0.02 in 2008, though, such decrease could also be attributed to the effect of the global financial crisis of that period.

Figures 4.4b, c and d plot performance and stability trends for China, Morocco and Philippines, respectively, which all implemented market discipline principle in 2007. Similar to Brazil, bank performance and stability measures also declined in these three countries, with exception of increase in NIM and logZ-Index in China and Morocco, respectively, but eventually decreased in subsequent years, immediately after implementation. These results are similar to the results on estimation of evolution of performance and stability variables in section 4.5.2.2.

4.5. Estimation of the evolution of market discipline principle

The evolution of market discipline is assessed by estimating equation 14 in chapter 3, using the GMM technique. The essence of this estimation is to test for hypothesis 1 and partially answer research question 1 (see section 1.5 in chapter 1). The market discipline constructs are regressed over the year of market discipline implementation and five subsequent years thereafter (see Table 4.7, panel A). For robustness check and validation of these constructs, the individual proxies that defined these constructs are also regressed over the same period (panel B). Cumulative market discipline construct (OvMkD) is seen to be significantly negative from the fourth year (MDtplus4), but at 10% significance level. Recall, the cumulative market discipline construct was generated using PCA by combining market discipline from external stakeholders, from government resolution and from external security holders, that is proxied by MkD1, MkD2 and MkD3 respectively. The signs of the coefficients of this overall construct are seen to be similar to its three sub constructs.

The coefficients of MkD1 are also all negative, but significant only in the fourth year. Market discipline proxies that loaded in MkD1 are the long term credit rating and viability rating of credit

worthiness of financial institutions; therefore MKD1 named market discipline from external stakeholders. The higher the ratings, the lower the cardinal points assigned (see Table 3.3 in chapter 3). The negative coefficients of MkD1 imply that the cardinal points of the rating were decreasing, which means, banks were assigned higher ratings after implementing market discipline. This suggests that there was less market discipline conduct/demands from the external security holders, as rating agents rated banks higher during this period.

The coefficients of MkD2, representing market discipline from government resolution are also negative, but only significant in second year (MDtplus2) after the year of implementation. The proxies that loaded in MkD2 are dummy variables representing government implicit guarantee (GIG) and existence of Deposit Insurance Corporation (DISC) in a country during the period under review. Negative coefficients indicate lesser presence of both GIG and DISC after market discipline implementation; though there are some positive coefficients in the first, fourth and fifth years after market discipline implementation, they are of very low magnitude and are not statistically significant. extant literatures argue that existence of safety net like that of GIG and DISC hampers effective vigilance market discipline behavior from depositors and security holders (Iannotta 2011, Scott 2004). Our result with lesser presence of safety nets indicates that governments began pushing responsibilities more to the public to exercise their disciplining power over banks. This action by the government could have resulted to high level of market discipline recorded among banks and from market activities as explained below.

MkD3 (representing market discipline from security holders) also have negative coefficients, but only statistically significant in the third year after implementation. The proxies that loaded in MkD3 are dummy variables for outstanding shares and subordinated debt; hence the construct being named market discipline from security holders. The negative coefficients indicate less outstanding shares and subordinated debt in the banks' balance sheet during the year and subsequent years of market discipline implementation. In line with literature, this result implies that unsecured debtholders (such as subordinated debtholders) are likely to discipline high risk-taking banks, by restricting their risk-taking behavior, and providing regulators with information concerning level of financial fragility, based on such discipline, banks may likely opt out by refusing to roll over matured debts and/or not introducing new issues during market discipline implementation (Covitz, Hancock, and Kwast 2004).

Table 4.7: GMM analysis of the evolution of Market Discipline (proxied by date/ year of market discipline implementation) for the Overall Sample

	Panel A: Target Variables						Panel B: Target Variables			
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Variables	**OvMkD**	**MkD1**	**MkD2**	**MkD3**	**MkD4**	**MkD5**	**LogSP**	**IntBR**	**LTR**	**ViabR**
MDt	-0.002	-0.020	-0.001	-0.006	0.007	-0.002	0.064	-6.058	-0.038	-0.082***
	(0.012)	(0.013)	(0.001)	(0.009)	(0.033)	(0.010)	(0.194)	(7.879)	(0.053)	(0.027)
MDtplus1	-0.015	-0.007	0.000	-0.006	-0.029	-0.004	-0.709***	-14.702*	-0.048	-0.016***
	(0.012)	(0.012)	(0.001)	(0.011)	(0.032)	(0.011)	(0.223)	(7.589)	(0.063)	(0.006)
MDtplus2	-0.015	-0.009	-0.028***	-0.006	-0.006	-0.023*	-0.673***	-13.164*	0.013	-0.063***
	(0.012)	(0.013)	(0.008)	(0.009)	(0.032)	(0.012)	(0.236)	(7.406)	(0.055)	(0.008)
MDtplus3	0.005	-0.001	-0.002	-0.016**	-0.074**	0.010	-0.339**	-19.677***	-0.057	-0.051***
	(0.010)	(0.014)	(0.001)	(0.007)	(0.032)	(0.011)	(0.155)	(7.580)	(0.061)	(0.018)
MDtplus4	-0.024*	-0.061***	0.001	-0.002	-0.010	-0.005	-0.434**	1.560	-0.043	-0.234***
	(0.014)	(0.021)	(0.001)	(0.006)	(0.032)	(0.012)	(0.179)	(7.573)	(0.068)	(0.038)
MDtplus5	-0.028*	-0.013	0.001	0.013	-0.044	-0.020	-0.691***	-13.939*	0.017	-0.312***
	(0.015)	(0.019)	(0.002)	(0.010)	(0.033)	(0.017)	(0.203)	(7.618)	(0.036)	(0.058)
Obs.	5,713	6,228	5,713	6,228	6,744	6,228	5,650	6,281	6,731	6,731
No. of BankID	515	515	515	515	516	515	565	519	561	561
AR2	0.143	0.76	0.19	0.96	0.59	0.13	0.28	0.50	0.49	0.41
Sagan Test	9.82	73.85	37.62	65.89	32.04	14.57	47.77	57.13	28.74	34.20
Sagan P.Value	0.55	0.14	0.23	0.13	0.16	0.27	0.10	0.36	0.15	0.36

Table 4.7 displays evolution of market discipline principle using 21 countries that implemented market discipline before 2014. MkD1 through MkD5 are market discipline constructs computed using PCA on identified market discipline proxies [spread (SP), interbank ratio (IntBR), long term (LTR) and variability ratings (ViabR), as well as individual dummies representing availability of outstanding shares and subordinated debts in the banks' balance sheet, presence of government implicit guarantee, and existence of deposit Insurance Corporation). OvMkD represents overall or cumulative market discipline generated by decomposing MkD1 to MkD3 using the PCA as well. The market discipline constructs serve as dependent variables on the year of market discipline implementation (MDt) and five subsequent years after implementation (MDtplus1 through MDtplus5). The individual proxies (continuous) were later fitted to see their individual evolution over the years (panel B). Using GMM, the dependent variables are at lag1, only spread was estimated with lag of 3 to correct for autocorrelation in the model. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, and 10%, respectively.

MkD4 represents internal industry market discipline (market discipline among banks), and interbank ratio (IntBR) is the only market discipline proxy that loaded in this construct. Internal industry market discipline also have negative coefficients, but only significant in the third year after implementation. This construct could be well explained by looking at the evolution of its proxy; i.e., interbank ratio, in Table 4.7 model 8, has significant negative coefficients from year one after market discipline implementation, and a positive insignificant sign only on the fourth year. Interbank ratio is measured as money lent to other banks as a ratio of money borrowed from other banks. A ratio greater than 1.00 indicates that a bank is becoming more of a lender than a borrower. With the negative and significant coefficients, these results suggest that fewer banks were becoming lenders during the period under review. With the existence of fewer lenders, which would lead to stricter constraints on borrowers, banks could be disciplining each other, especially highly risky banks, through high interbank rate or outright refusals to lend.

MkD5 represents market discipline from market activities, and it records negative coefficients which is only statistically significant in the second year after market discipline implementation. Spread (SP) measured as interest income less interest expenses is the only market discipline proxy loaded in this market discipline construct. The coefficients of spread (LogSP) over the six years in model 7 also have negative signs (except the particular year of implementation); similar to the construct (MkD5), which it measures. The result suggests that one year after market discipline implementation, banks' interest expenses (interest on deposit) increased more than interest received from loans.

This result could have different connotations: first, it could mean that after implementing market discipline, banks were able to increase or maintain existing interest paid to depositors so as to attract more depositors or boost confidence of existing clients towards banks' stability. This is in line with existing literature, that investors discipline banks characterized by excessive risk taking behavior by demanding higher returns on investments or additional collateral for certain credit transactions (Demirgüç-Kunt and Huizinga 1999b, Park 1995, Kwan 2002). Secondly, it could mean that, to avoid being disciplined by the public after implementing market discipline principle, banks reduce interests charged on loans to attract clients, which could lead to less interest income.

It could be inferred from the above result that during the period of market discipline implementation, banks were still rated high by rating agencies. Also there was less presence of safety nets, which must have motivated the public to exercise their disciplining power over banks. This is because, it seems banks experienced more discipline among themselves (MkD4) as well as from market activities (MkD5). Evidence of this discipline is recorded in the coefficients of interbank rate ratio (IntBR) and spread (LogSP), which are the two proxies that loaded in the last two dimensions (MKD4 and MK5). Another interesting discovery is that these five market discipline dimensions recorded their individual highest impacts between second and third years after the year of market discipline implementation, except dimension MkD1 which recorded its highest impact from year four. It suggests that effect of market discipline takes a gradual process and records its peak effects between second and third year after the actual implementation year.

4.5.1. Post effect of market discipline principle on performance and stability

We also assessed evolution of some bank performance and stability measures, post implementation of market discipline principle (see Table 4.8). There are significant changes in both the performance and the stability of banks during the period. Net interest margin (NIM) recorded a significant

positive coefficient in the year of implementation (MkD), but turned negative in subsequent years (though only statistically significant in the second year after implementation). Profit before tax (PreTaxP) in model 2 also recorded marked decline, while return on asset (ROA) in model 3 has showed insignificant positive coefficients.

The stability indicators (reported in Panel B), except liquidity ratio and H-stat, recorded declining coefficients over the years. Interestingly, the ratio of non-performing loans to total loans (NPLTL) (an inverse measure of stability) declined during the post-implementation periods, which implies that banks recorded low level of non-performing (less risk exposure) over the subsequent years. Liquidity ratio also increased over the period, though not statistically significant. H-Stat, a measure of competition among banks also increased, which suggests a declining market power of banks during post-implementation periods (higher value of H-Stat indicates less market power).

It was also noticed that the evolution of these performance and stability measures fluctuate around the first, second and third years after market discipline implementation, but reflected either an

Table 4.8: GMM analysis of the evolution of performance and stability variables (proxied by date/year of market discipline implementation) for the Overall Sample

	Panel A: Performance Measures			**Panel B: Stability Measures**				
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variables	**NIM**	**LogPreTaxP**	**ROA**	**EQR**	**NPLTL**	**Liquidity**	**LogZ-Index**	**H-Stat**
MDt	0.125**	-0.952***	0.002	-0.009***	-0.012**	0.121	-0.114*	0.020*
	(0.060)	(0.256)	(0.004)	(0.003)	(0.005)	(0.271)	(0.063)	(0.011)
MDtplus1	-0.104	-1.082***	0.001	-0.006*	-0.011*	0.519	-0.185**	0.037***
	(0.067)	(0.290)	(0.003)	(0.003)	(0.006)	(0.695)	(0.075)	(0.014)
MDtplus2	-0.136**	-0.671**	-0.001	-0.013***	-0.021**	0.405	-0.061	0.021
	(0.072)	(0.285)	(0.003)	(0.004)	(0.008)	(1.801)	(0.083)	(0.013)
MDtplus3	-0.014	-0.592*	0.001	-0.009***	-0.020**	0.037	-0.114*	0.008
	(0.063)	(0.317)	(0.003)	(0.003)	(0.008)	(1.397)	(0.067)	(0.013)
MDtplus4	-0.016	-0.043	0.002	-0.005*	-0.015*	0.792	-0.016	0.023*
	(0.055)	(0.336)	(0.002)	(0.003)	(0.008)	(1.203)	(0.073)	(0.014)
MDtplus5	-0.094	-0.153	0.001	0.001	-0.004	0.409	-0.033	0.038***
	(0.059)	(0.380)	(0.001)	(0.002)	(0.024)	(0.766)	(0.076)	(0.013)
Obs.	7,345	6,215	6,215	6,215	6,748	6,192	5,470	5,625
No. of BankID	565	565	565	565	565	565	565	565
AR2	0.50	0.33	0.42	0.32	0.15	0.84	0.31	0.42
Sagan Test	70.09	27.97	12.67	10.59	11.39	8.56	10.53	23.01
Sagan P. value	0.11	0.11	0.12	0.22	0.32	0.38	0.23	0.15

Table 4.8 details the evolution of performance and stability measures from the year of market discipline implementation (MDt) through 5 subsequent years after implementation (MDtplus1 to MDtplus5). The dependent variables are net interest margin (NIM), pre-tax profit (PretaxP), and return on assets (ROA), in panel A, are performance measures; while equity ratio (EQR), Ratio of non-performing loan to total loan (NPLTL), Liquidity ratio, LogZ-Index and H-Statistics in panel B are stability measures. NIM is at lag of 1, Pretax P, NPLTL, and Z-Index are at lags of 2, while others are at lags of 3. Standard errors are in parentheses. ***, **, and * represent significant levels at1%, 5%, and 10%, respectively. Note that NPLTL is an inverse measure of stability.

increasing or decreasing at steady rate afterwards, just as observed in the case of market discipline constructs reported in Table 4.7. Net interest margin recorded its highest reduction rate 0.14 in the second year, reduced to 0.014 in the third year, and thereafter, it gradually reduced at an increasing rate until the fifth year post-implementation. In the case of equity ratio, a stability measure, with its highest reduction rate at 0.013 in the second year, reduced only by 0.009 in the third year, and finally had a nonsignificant positive coefficient in the fifth year. It could be inferred that effect of market discipline implementation on bank performance and stability takes effect gradually as the years go by; it reaches a peak, and takes a different trend either in the same or opposite direction.

4.5.2. Emerging and developed markets' perspectives of market discipline

4.5.2.1. Evolution of market discipline effects

Due to differences between emerging and developed market economies, we estimate the evolution of market discipline constructs for these different market regions to find out if different market discipline dimensions have similar or different effects or timing of effects in these two distinct market regions. Tables 4.9a and b detail estimation results for emerging and developed markets, respectively. In emerging market economies, the overall market discipline construct (OvMkD) has a significant negative effect only in the fifth year after market discipline implementation, though the fourth year is marginally significant[36].

The evolution of the overall market discipline construct is similar to the evolution of one of its sub-constructs; market discipline from external stakeholders (MkD1). Negative coefficients of MkD1 means that during the relevant period of market discipline implementation, rating agencies still assigned higher ratings to emerging market banks, indicating lesser market discipline from external stakeholders. This is confirmed by the negative and significant coefficients recorded for viability ratings (ViaBR) in model 10 of panel B (Table 4.9a).

Form developed markets' perspective; there is a higher level of market discipline from external stakeholders (MkD1) than that from emerging markets. The coefficient of MkD1 is significantly positive in the first year after market discipline implementation (though the year of market discipline implementation (MDt) is negative. Its coefficients from second up to the fifth year (MDtplus2 to MDtplus5) are also insignificantly negative (see model 2 of Table 4.9b). Looking at one of the construct's inputs (long-term credit rating (LTR)), its coefficients (in model 9) are significantly and

[36] Marginal significance is defined as coefficients with P. Values of between 11% and 15%.

increasingly positive from the first year through to the fifth year after implementation. The result supports that the rating agencies downgraded long-term credit ratings of developed markets' banks during these periods, suggesting higher levels of discipline over the years from external stakeholders (rating agencies).

Market discipline from the perspective of government resolution/policy (MkD2) also recorded more negative and significant coefficients in developed markets than in emerging markets economies over the sample length of time post-implementation. This implies that during the year and subsequent years of market discipline implementation, the developed market countries recorded lesser presence of government implicit guarantees and deposit insurance activity than emerging market countries recorded. This aspect of government resolution/policy result supports the arguments that less presence of safety nets increases the extent of market discipline investors/depositors and other financial consumers exercise towards banks.

The developed market economies also recorded higher levels of market discipline attributable to external security holders (MkD3), with this variable reflecting negative and significant coefficients in the year and the five subsequent years after implementation of market discipline. This result confirms two arguments in favor of subordinated debt as a market discipline tool. First, subordinated debtholders are likely to discipline banks more, due to holders' highest likelihood of loss than other class of creditors in the event of bank failure. This argument has steered regulators and researchers to propose for mandatory issuance of subordinated debt by all banks, in order to allow more market discipline from debt holders. In the US and European shadow financial regulation in 2000, Calomiris (1999), and Evanoff and Wall (2001a) are among earlier advocates of mandatory subordinated debt policy, first proposed by Wall (1989), Evanoff (1993) among others and others.

Secondly, this result confirms the argument that market discipline through subordinated debtholder is not feasible in emerging market economies due to the nature and size of emerging markets' financial market. Based on that argument, it is believed that most emerging market banks do not maintain the level of subordinated debt required for an effective market discipline. It was in favor of these arguments that we measured market discipline using variety of proxies, without exclusively relying on subordinated debts. And the results reveal that market discipline through subordinated debt is of lesser no importance in emerging market than in developed market economies.

Developed market economies also recorded higher levels of market discipline emanating from among banks (MkD4), with increasingly negative and significant coefficients all through the years (model 5 of Table 4.9b). Comparing this result to the result of emerging market economies (without any significant coefficients in that regard, in model 5 of Table 4.9a), it shows that lesser market discipline was witnessed in emerging market economies during this period from this dimension. Further result focusing on interbank ratio (IntBR) confirms this result, with developed market economies recording increasingly negative and significant coefficients throughout the years (model 8 of Table 4.9b). This suggests that during the year and subsequent years of market discipline implementation, fewer interbank lenders were recorded in the developed market economies, thereby disciplining high risky bank-borrowers with high interbank rates or outright refusal to engage in interbank transactions.

Looking at market discipline from market activities (MkD5), both emerging market and developed market economies reflect market discipline effects from this dimension. But the result shows that developed market economies recorded more of negative and significant coefficients during the years, though the first year after year of implementation (MDtplus1) has a positive coefficient (model 6 of Table 4.9b). This suggests that developed market economies experienced decline in spread (which is the proxy that loaded in this market discipline dimension). This in turn means that investors, depositors and other financial consumers demanded higher compensation from developed market banks during this period, than was the case in emerging market economy banks.

In a nutshell, from Tables 4.9a and b, the developed market economies recorded higher levels of discipline based on all dimensions of market discipline (having more statistically significant coefficients compared to emerging market economies). This could be attributed to relatively inadequate presence of safety nets i.e., effective institutions in developed economies during the sampled period of this study.

Table 4.9a: GMM analysis of the evolution of Market Discipline in Emerging Markets

	Panel B						Panel B			
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Variables	**OvMkD**	**MkD1**	**MkD2**	**MkD3**	**MkD4**	**MkD5**	**LogSP**	**IntBR**	**LTR**	**ViabR**
MDt	-0.002	-0.023*	0.000	0.007	0.021	0.002	0.124	6.406	-0.044	-0.066***
	(0.014)	(0.014)	(0.002)	(0.014)	(0.039)	(0.008)	(0.201)	(10.33)	(0.056)	(0.009)
MDtplus1	-0.021	-0.047***	0.002	0.022	-0.040	-0.003	-0.918***	-6.918	-0.020	-0.055***
	(0.017)	(0.017)	(0.002)	(0.017)	(0.037)	(0.010)	(0.221)	(9.409)	(0.073)	(0.009)
MDtplus2	0.001	-0.001	0.001	0.016	-0.019	-0.018*	-0.646**	-6.949	0.018	-0.023***
	(0.013)	(0.016)	(0.002)	(0.013)	(0.039)	(0.010)	(0.260)	(9.496)	(0.063)	(0.008)
MDtplus3	0.009	0.005	-0.003*	-0.017	-0.057	0.018**	-0.301*	-16.326*	-0.040	-0.035***
	(0.012)	(0.018)	(0.001)	(0.011)	(0.040)	(0.009)	(0.174)	(9.796)	(0.071)	(0.013)
MDtplus4	-0.021	-0.057***	0.002	0.013	0.026	-0.004	-0.419**	6.087	-0.055	-0.133***
	(0.015)	(0.022)	(0.002)	(0.011)	(0.037)	(0.009)	(0.176)	(9.529)	(0.085)	(0.023)
MDtplus5	-0.035**	-0.006	0.002	0.027*	-0.030	-0.028**	-0.648***	-5.913	0.023	-0.261***
	(0.017)	(0.022)	(0.002)	(0.016)	(0.037)	(0.014)	(0.251)	(9.232)	(0.040)	(0.048)
Obs.	4,815	5,254	4,815	5,254	5,254	5,254	4,850	5,293	5,784	5,784
No of BankID	439	439	439	439	439	439	485	442	482	482
AR2	0.26	0.13	0.23	0.85	0.50	0.56	0.46	0.47	0.31	0.53
Sagan Test	9.12	42.11	8.81	14.57	16.82	37.37	44.62	6.66	10.81	42.36
Sagan P. value	0.61	0.19	0.64	0.27	0.16	0.36	0.16	0.88	0.46	0.11

Table 4.9a shows the evolution of market discipline constructs in the emerging market economies. OvMkD represents cumulative market discipline generated from the first three constructs of market discipline. MkD1 through MkD5 are the market discipline constructs generated using PCA on the identified market discipline proxies (see foot note of Table 4.7). All the dependent variables are in lag of 1, except spread which is at lags of 3. Standard errors are in parentheses. ***, **, and * represent significant levels at1%, 5%, and 10%, respectively.

Table 4.9b: GMM analysis of the evolution of Market Discipline in Developed Markets

	Panel A						Panel B			
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Variables	**OvMkD**	**MkD1**	**MkD2**	**MkD3**	**MkD4**	**MkD5**	**SP**	**IntBR**	**LTR**	**ViabR**
MDt	-0.016	-0.064*	-0.003***	-0.014***	-0.034**	-0.023**	0.296	-24.611***	-0.002	-0.021
	(0.019)	(0.037)	(0.001)	(0.005)	(0.017)	(0.010)	(0.482)	(7.706)	(0.025)	(0.064)
MDtplus1	0.039**	0.058***	-0.003	-0.007	-0.031***	0.044***	1.163*	-31.429***	0.078*	-0.015
	(0.019)	(0.020)	(0.002)	(0.006)	(0.012)	(0.009)	(0.636)	(10.287)	(0.041)	(0.074)
MDtplus2	-0.064**	-0.048	-0.218***	-0.021***	-0.030***	-0.014	-0.350	-25.788***	0.025	-0.116
	(0.026)	(0.033)	(0.055)	(0.004)	(0.011)	(0.008)	(0.556)	(8.642)	(0.058)	(0.120)
MDtplus3	0.001	-0.012	-0.004	-0.011***	-0.041***	-0.029***	-0.104	-31.475***	0.038	-0.114
	(0.011)	(0.014)	(0.002)	(0.004)	(0.013)	(0.006)	(0.217)	(9.874)	(0.028)	(0.125)
MDtplus4	-0.032	-0.030	-0.007***	-0.008*	-0.041***	-0.028***	-0.448	-41.329***	0.195***	-0.660*
	(0.038)	(0.046)	(0.003)	(0.005)	(0.015)	(0.007)	(0.384)	(12.607)	(0.041)	(0.357)
MDtplus5	0.022	-0.025	-0.005*	-0.026**	-0.026***	0.004	-0.170	-44.561***	0.066***	-0.335
	(0.026)	(0.042)	(0.003)	(0.013)	(0.010)	(0.011)	(0.158)	(10.845)	(0.021)	(0.258)
Obs.	974	898	898	974	1,050	898	960	988	1,026	947
No of BankID	76	76	76	76	76	76	80	77	79	79
AR2	0.19	0.52	0.40	0.29	0.75	0.29	0.25	0.62	0.15	0.90
Sagan Test	15.89	14.02	14.13	27.55	35.95	29.36	9.18	14.01	32.22	9.19
Sagan P. value	0.20	0.17	0.22	0.28	0.52	0.13	0.61	0.30	0.12	0.98

Table 4.9b shows the evolution of market discipline constructs in the developed market economies. OvMkD represents cumulative market discipline generated from the first three constructs of market discipline. MkD1 through MkD5 are the market discipline constructs generated using PCA on the identified market discipline proxies (see foot note of Table 4.7). All the dependent variables are in lag of 1, except MkD1 and MkD5 which are at the lags of 2. Standard errors are in parentheses. ***, **, and * represent significant levels at1%, 5%, and 10%, respectively.

4.5.2.2: Post effect of market discipline on performance and stability

In Tables 4.9c and d, we report trends of banks' performance and stability during the year and five subsequent years following market discipline implementation in emerging and developed market economies, respectively. In the emerging market context, net interest margin (NIM) has a positive and significant effect only in the year of market discipline implementation (MDt) but recorded negative insignificant coefficients in subsequent years. Pretax profit has consistent negative and significant coefficients throughout the years (except the fourth year after implementation), while return on asset (ROA) recorded positive but insignificant coefficients in the years after implementation.

Stability measures (Panel B) also recorded more of negative coefficients during the estimated period, except H-Sat. Interestingly, non-performing loans (NPLTL) which inversely measures stability recorded negative coefficients. This indicates that during the periods of market discipline implementation, emerging market economies were less exposed to credit risk, while other dimensions of stability experienced declining trend.

From Table 4.9d, developed market economies, more clearly than emerging economies, recorded weakening trend in performance during the period, though pretax profit and ROA were insignificant and eventually recorded positive coefficients at the fifth year after implementation. Stability measures in the estimation also experienced stronger declining movements during the periods, except liquidity ratio with marginally significant positive coefficients until year three, and H-Stat, which recorded positive coefficients up to year two after implementation. Surprisingly, and in contrast to the case of emerging market economy banks, nonperforming loans (NPLTL) increased during the period though only significantly so in the second year after implementation.

Analytically, these results indicate that during the year and five subsequent years after market discipline implementation, both emerging and developed market banking industries experienced waning performance and stability trends. But interestingly, there was reduction in the level of risk-taking in emerging market economies which is the major aim of market discipline principle of Basel II capital accord. Also comparing Tables 4.9c and d, the magnitude of the decline in permanence and stability was larger in developed market economies than in emerging market economies. These results confirm the evolution of market discipline principle in both markets, where all the different dimensions of market discipline, as well as the overall market discipline were found to be more substantially present in developed markets than emerging market economies.

Table 4.9c: GMM analysis of the evolution of performance and stability variables for Emerging Markets banks

	Panel: Performance Measures			Panel B: Stability Measures				
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variables	**NIM**	**LogPreTaxP**	**ROA**	**EQR**	**NPLTL**	**Liquidity**	**LogZ-Index**	**H-Stat**
MDt	0.277**	-0.583**	0.001	-0.009***	-0.012**	-0.078	-0.089	0.020
	(0.140)	(0.267)	(0.004)	(0.003)	(0.005)	(0.592)	(0.080)	(0.015)
MDtplus1	-0.097	-0.689**	0.001	-0.004	-0.006	-0.165	-0.190**	0.018
	(0.169)	(0.279)	(0.003)	(0.004)	(0.007)	(1.074)	(0.080)	(0.027)
MDtplus2	-0.217	-0.932***	0.001	-0.012***	-0.021*	-0.220	-0.004	0.020
	(0.156)	(0.332)	(0.003)	(0.004)	(0.011)	(1.812)	(0.082)	(0.027)
MDtplus3	-0.050	-1.004***	-0.001	-0.007**	-0.020*	-1.705	-0.139*	0.025
	(0.167)	(0.360)	(0.003)	(0.004)	(0.011)	(4.159)	(0.080)	(0.026)
MDtplus4	0.054	-0.236	0.001	-0.003	-0.015	2.655	0.017	0.028
	(0.129)	(0.405)	(0.002)	(0.003)	(0.012)	(9.510)	(0.084)	(0.031)
MDtplus5	-0.101	-0.802*	0.001	0.003	0.000	0.831	-0.015	0.043*
	(0.114)	(0.412)	(0.001)	(0.003)	(0.034)	(2.989)	(0.088)	(0.024)
Obs.	5,820	4,850	5,335	5,335	5,788	5,312	3,706	4,825
No. of BankID	485	485	485	485	485	485	484	485
AR2	0.13	0.69	0.60	0.15	0.15	0.34	0.92	0.14
Sagan Test	12.04	8.62	14.01	12.20	12.53	7.96	21.37	3.10
Sagan P. value	0.36	0.28	0.11	0.14	0.25	0.63	0.44	0.88

Table 4.9c details the evolution of performance and stability measures from the year and five subsequent years following market discipline implementation in **emerging market economies only**. Panel A contains performance measures results, while panel B contains stability measures results. NIM and liquidity ratio are at lag of 1, NPLTL is at lag of 2, while others are at lags of 3. Standard errors are in parentheses. ***, **, and * represent significant levels at1%, 5%, and 10%, respectively.

Table4.9d: GMM analysis of the evolution of performance and stability variables for Developed Markets banks

	Panel: Performance Measures			Panel B: Stability Measures				
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variables	**NIM**	**LogPreTaxP**	**ROA**	**EQR**	**NPLTL**	**Liquidity**	**LogZ-Index**	**H-Stat**
MDt	-0.150***	-1.312	-0.001	-0.001	0.001	0.059	-0.231**	0.075***
	(0.036)	(0.854)	(0.001)	(0.002)	(0.001)	(0.038)	(0.110)	(0.021)
MDtplus1	-0.094**	-2.914***	-0.004***	-0.005***	0.003	0.056	-0.322**	0.090***
	(0.041)	(0.909)	(0.001)	(0.001)	(0.002)	(0.039)	(0.150)	(0.033)
MDtplus2	-0.051	-1.103	0.000	-0.002	0.006**	0.043	-0.364**	0.002
	(0.040)	(0.836)	(0.001)	(0.002)	(0.003)	(0.040)	(0.178)	(0.041)
MDtplus3	-0.060*	-0.450	-0.000	-0.005***	0.001	0.023	-0.270	-0.047
	(0.035)	(0.996)	(0.001)	(0.001)	(0.002)	(0.026)	(0.198)	(0.036)
MDtplus4	-0.059*	-0.056	-0.001	-0.007***	0.001	0.021	-0.113	-0.036
	(0.036)	(1.193)	(0.001)	(0.001)	(0.002)	(0.016)	(0.171)	(0.024)
MDtplus5	-0.060**	0.120	0.000	-0.005***	0.000	-0.000	-0.085	-0.033*
	(0.030)	(0.962)	(0.001)	(0.002)	(0.001)	(0.007)	(0.140)	(0.020)
Obs.	1,040	880	880	880	880	1,040	789	800
No. of BankID	80	80	80	80	80	80	80	80
AR2	0.48	0.93	0.41	0.45	0.95	0.22	0.24	0.33
Sagan Test	27.12	10.68	9.95	34.62	12.78	12.39	9.41	11.50
Sagan P. value	0.30	0.30	0.35	0.26	0.17	0.42	0.22	0.12

Table 4.9d details the evolution of performance and stability measures from the year and five subsequent years following of market discipline implementation in **developed market economies only**. Panel A contains performance measures results, while panel B contains stability measures results. NIM and liquidity ratio are at lag of 1, Z-Index and H-Stat are at lags of 3, while others are at lags of 2. Standard errors are in parentheses. ***, **, and * represent significant levels at1%, 5%, and 10%, respectively.

4.6. Further exploration of Market discipline and bank performance /stability

In previous section, we only estimated the evolution of different constructs/dimensions of market discipline, as well as the evolution of bank performance and stability measures, during the year, and five subsequent years following market discipline implementation. In this section, we estimate the effects of different dimensions of market discipline on bank performance and stability, along with other country and bank-specific factors that could affect bank's performance and stability. We estimate two models for each dependent variable, where we introduce political and legal institutions at separately, due to high level of correlation between them.

From the results (Table 4.10, Panel A and B), we found that different dimensions of market discipline have different effects on the different measures of bank performance and stability. We also found that internal dimensions of market discipline (MkD2 and MkD4) have related effects on performance and stability, and that external dimensions (i.e., MkD1, MkD3 and MkD5) exhibit similar effects. Streamlining our measures of performance to net interest margin (NIM) and return on asset (ROA); as well as stability measures to equity ratio (EQR), nonperforming loans (NPLTL), liquidity ratio, and Z-Index[37], effects of these different dimensions are tabulated in Figures 4.5-4.10.

Internal dimensions of market discipline; MkD2 and MkD4 reduce ROA and NIM (banks performance) respectively, though MkD4 turned out to increase ROA. External dimensions also affect bank's performance positively, where MkD1 and MkD5 increase NIM while MkD3 increases ROA. From stability point of view, we found that both internal and external dimensions of market discipline increase bank stability. MkD2 increases EQR and Z-Index; while MkD4 increases EQR and liquidity; whereas all external market discipline dimensions (MkD1, MkD3, and MkD5) increase EQR (see Figures 4.5 and 4.6).

For further checks, we estimate these individual dimensions of market discipline along with their interactions with legal infrastructure (institution) on performance and stability measures (See Figure 4.6, and Tables A1 to A8 in the appendix). The rationale behind this estimation is to ascertain whether effective legal infrastructure in a country could strengthen or weaken the effects of market discipline. We found that internal market discipline dimension (MkD2), which reduced performance (ROA) on its own alone, jointly with effective legal infrastructure increases performance (NIM and

[37] Though most of the dimensions of market discipline have no significant effect on NPLTL and Z-Index, we noticed significant effects on both variables when we estimate effects of market discipline on different market regions (emerging and developed markets). More so, though nonperforming loans are not comprehensive measure of stability, they capture the level of credit risk exposure in the banking industry, which in turn exposes banks to instability.

ROA). An interesting effect is recorded by MkD4; on its own it reduces NIM, but its interaction term with legal institution increases NIM, though not significantly (see Table A1). External dimensions of market discipline are shown to reduce performance upon being interacted with legal institution; for instance, MkD1 reduces NIM, while MkD5 reduces both NIM and ROA during interaction.

From stability point of view, internal market discipline proxies retained their incremental effect on performance upon interacting them with legal institution. For instance, the interaction term of MkD2 and legal institution increased EQR, while MkD4 retained its incremental effect though not significantly so. External market discipline dimensions are found to exhibit mixed effects on stability when interacting with legal institutions (Figure 4.6). The interaction of legal institution and MkD1 and MkD3 increase Z-Index and liquidity, respectively; while MkD1 and MkD5 reduce liquidity and EQR, respectively when interacted with legal institution. However, it is interesting to notice that MkD3 reduces liquidity on its own but its interaction term with legal institution increases liquidity.

Based on the above results, we can infer that different dimensions of market discipline have different individual effects on both bank performance and stability, but these effects become stronger or even favorable when those different dimensions are interacted with a country's quality legal institution. We specifically notice that internal market discipline proxies reduce performance, but when quality legal institutions are considered jointly with them, they increase performance. We also notice that market discipline that originate from market activities (MkD5); an external market discipline has negative effect on banks' performance and stability measures (except liquidity ratio) only when interacted with quality legal institution.

Recall that market discipline from market activities represents the discipline banks receive from depositors; that is demonstrated when depositors or other financial product consumers ask for higher returns, or demand for more compensation when banks engage in risky activities. Theoretically, this scenario could lead to lesser profit being made by banks, after compensating depositors with higher deposit rate, without corresponding high interest being received from earning assets. This suggests that depositors could not effectively discipline banks without the support of quality legal institutions. That is, in order for both external and internal stakeholders to discipline banks effectively, an enabling legal environment is required.

Table 4.10: Overall Sample_ GMM Analysis of effect of market discipline constructs on performance and stability

	Panel A: Performance Measures						Panel B:Stability Measures									
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
MkD1	0.051	0.052	0.345	0.352	0.001	0.001	0.005*	0.005*	0.030	0.030	-0.010	-0.011	-0.057	-0.055	-0.066***	-0.065***
	(0.100)	(0.099)	(0.315)	(0.316)	(0.001)	(0.001)	(0.003)	(0.003)	(0.044)	(0.044)	(0.018)	(0.018)	(0.075)	(0.075)	(0.018)	(0.018)
MkD2	0.152	0.159	1.146**	1.188**	-0.004**	-0.005***	0.009**	0.009**	-0.029	-0.028	0.005	0.006	0.181	0.181	0.030	0.027
	(0.275)	(0.278)	(0.468)	(0.477)	(0.002)	(0.002)	(0.005)	(0.005)	(0.078)	(0.077)	(0.032)	(0.032)	(0.136)	(0.136)	(0.049)	(0.049)
MkD3	-0.128	-0.133	-0.023	-0.038	0.004*	0.004*	0.006	0.006	-0.101	-0.100	-0.073*	-0.073*	-0.032	-0.035	0.010	0.007
	(0.147)	(0.148)	(0.363)	(0.363)	(0.002)	(0.002)	(0.005)	(0.005)	(0.096)	(0.096)	(0.041)	(0.041)	(0.075)	(0.075)	(0.023)	(0.023)
MkD4	-0.123*	-0.121*	0.269*	0.265*	0.001*	0.002**	0.003***	0.003***	-0.112	-0.112	0.002	0.002	-0.005	-0.004	-0.003	-0.002
	(0.066)	(0.066)	(0.160)	(0.160)	(0.001)	(0.001)	(0.001)	(0.001)	(0.106)	(0.106)	(0.008)	(0.008)	(0.030)	(0.030)	(0.007)	(0.007)
MkD5	0.169**	0.172***	-0.044	-0.054	0.001	0.001	0.003*	0.003*	0.013	0.014	-0.010	-0.010	-0.029	-0.030	0.029**	0.028**
	(0.067)	(0.066)	(0.383)	(0.382)	(0.001)	(0.001)	(0.002)	(0.002)	(0.027)	(0.027)	(0.022)	(0.023)	(0.041)	(0.042)	(0.011)	(0.011)
H-Stat	-0.101	-0.089	-1.213**	-1.187**	0.025**	0.031***	0.030**	0.030**	0.055	0.051	0.120	0.116	-0.171*	-0.170*		
	(0.173)	(0.172)	(0.599)	(0.600)	(0.011)	(0.011)	(0.014)	(0.014)	(0.126)	(0.127)	(0.083)	(0.084)	(0.097)	(0.097)		
CAPR	0.002	0.002	0.031***	0.031***	0.001	0.001	0.001***	0.001***	0.001	0.001	0.001**	0.001**	0.003***	0.003***	0.000	0.000
	(0.007)	(0.007)	(0.011)	(0.011)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
INTL	0.002**	0.002**	0.005	0.004	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-0.000	-0.000	-0.000*	-0.000*
	(0.001)	(0.001)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
TLTA	0.529	0.654	0.671	0.589	-0.032*	-0.031*	0.027	0.027	0.124	0.128	-1.335***	-1.337***	-0.080	-0.081	0.411***	0.401***
	(1.015)	(1.024)	(1.304)	(1.306)	(0.017)	(0.018)	(0.027)	(0.027)	(0.238)	(0.238)	(0.213)	(0.212)	(0.228)	(0.230)	(0.075)	(0.075)
OPE	0.014	0.014	-0.066***	-0.066***	-0.001	-0.001	0.001**	0.001**	0.005	0.004	0.004*	0.004*	-0.006*	-0.006*	0.008***	0.008***
	(0.013)	(0.013)	(0.023)	(0.023)	(0.000)	(0.000)	(0.001)	(0.001)	(0.006)	(0.006)	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)
LogTA	0.010	0.010	0.154*	0.150*	0.007***	0.007***	0.013*	0.013*	-0.010	-0.009	0.034*	0.034*	0.063	0.062	-0.096***	-0.097***
	(0.016)	(0.016)	(0.083)	(0.083)	(0.002)	(0.002)	(0.007)	(0.007)	(0.035)	(0.035)	(0.018)	(0.018)	(0.054)	(0.053)	(0.022)	(0.022)
Lending Rate	0.048**	0.047**	0.050	0.046	-0.001	-0.001	-0.001*	-0.001*	-0.013	-0.013	0.004	0.004	-0.005	-0.006	0.014***	0.014***
	(0.022)	(0.023)	(0.049)	(0.049)	(0.000)	(0.000)	(0.000)	(0.000)	(0.015)	(0.015)	(0.005)	(0.005)	(0.009)	(0.009)	(0.002)	(0.002)
GDPGrowth	0.041***	0.041***	0.051	0.050	-0.001	-0.001	0.001	0.001	-0.003	-0.003	0.001	0.001	-0.000	-0.000	0.012***	0.012***
	(0.013)	(0.013)	(0.036)	(0.036)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.004)	(0.002)	(0.002)	(0.006)	(0.006)	(0.002)	(0.002)
CVInflation	0.001	0.001	0.001	0.001	0.001	0.001	-0.002	-0.001	0.001	0.001	0.002**	0.001**	0.001	0.001	-0.001	-0.002
	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	0.002		-1.977*		-0.010		0.005				0.006		-0.089		-0.016	
	(0.313)		(1.151)		(0.007)		(0.009)				(0.093)		(0.226)		(0.055)	
Legal		0.182		-0.372		0.010*		0.000		-0.103		-0.059		0.048		0.179*
		(0.436)		(1.213)		(0.006)		(0.013)		(0.292)		(0.116)		(0.331)		(0.093)
Obs.	5,662	5,662	4,867	4,867	5,586	5,586	4,815	4,815	4,414	4,414	5,264	5,264	3,902	3,902	4,006	4,006
No. of BankID	466	466	466	466	466	466	466	466	463	463	466	466	462	462	464	464
AR2	0.17	0.17	0.92	0.91	0.93	0.91	0.35	0.35	0.25	0.25	0.23	0.22	0.81	0.79	0.64	0.66
Sagan test	17.80	18.04	19.83	19.89	29.56	29.98	27.08	27.05	10.04	9.91	13.86	13.76	31.95	32.15	32.31	32.43
P. Value Sagan	0.12	0.12	0.47	0.47	0.20	0.19	0.13	0.13	0.18	0.19	0.18	0.18	0.13	0.12	0.12	0.12

Table 4.10 details the effect of market discipline constructs on performance and stability measures of the sample banks. The performance measures (panel A)are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA), while stability measures (panel B) include equity ratio (EQR), ratio of non-performing loan to total loan (NPLTL), competition (H-Stat), Z-Index and liquidity ratio (ratio of liquid asset to total deposit and short term funding). NIM and ROA are at lag of 1, pretax P, EQR and liquidity ratio are at lags of 2, while others are lags of 3.The independent variables are MkD1 to MkD5 which are market discipline constructs generated using PCA. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, 10%, respectively.

Figures 4.5 and 4.6: Schematic diagram of effects of market discipline on overall sample

Figure 4.5: Overall Sample: Market Discipline Dimensions and Effects on Bank Performance and Stability

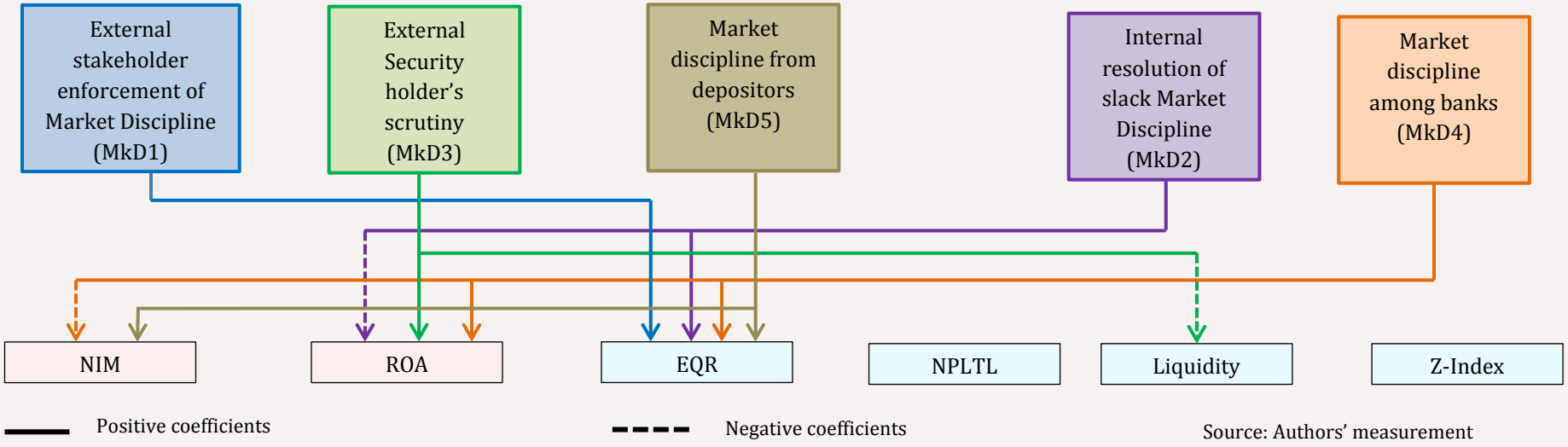
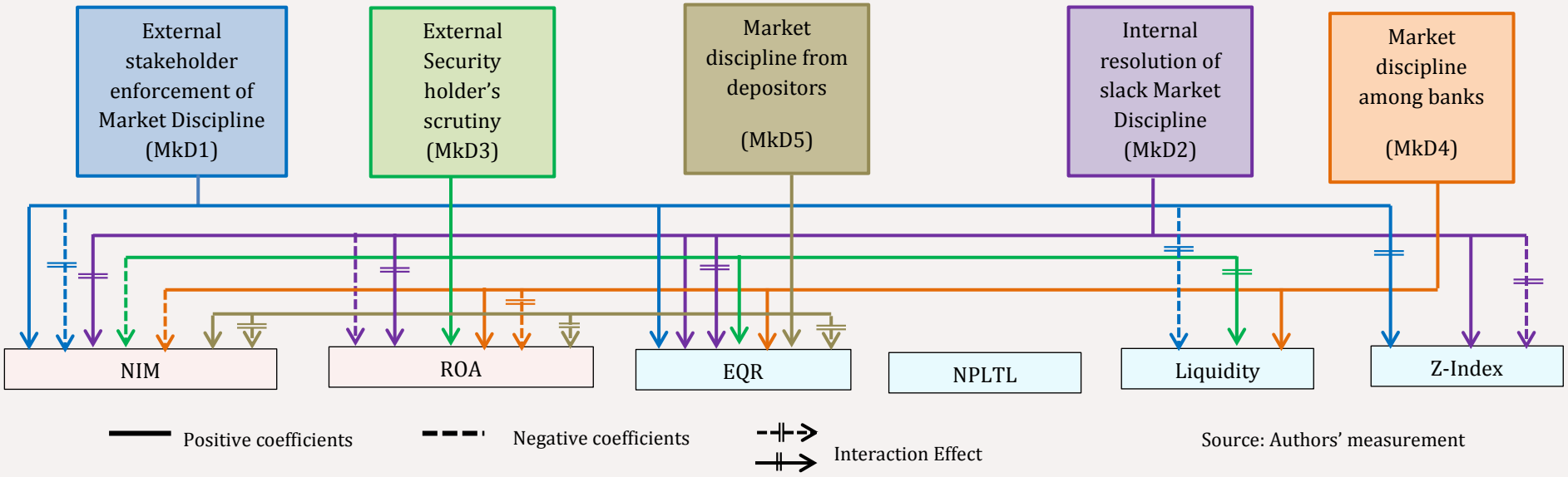


Figure 4.6: Overall Sample: Market Discipline Dimensions; Interaction with legal institution and effect on bank performance and stability



4.7. Effects of Market discipline; different markets perspective

Drawing from the objective of this study (effective market discipline for emerging market economies), we estimate differently the effect of market discipline on bank performance and stability of emerging and developed market economies. In the emerging market context (Table 4.11a, Figures 4.7, and 4.8), we find that increased internal market discipline reduces bank performance; where MkD2 and MkD4 reduce ROA and NIM, respectively. External market discipline has incremental effect on performance, with MkD1 and MkD3 reflecting positively to NIM and ROA correspondingly, while MkD5 is associated with increase both NIM and ROA. Turning attention to stability measures, both internal and external market discipline dimensions appear to increase bank stability. We find that MkD2 and MkD4 (internal market discipline proxies) increase both EQR and liquidity, while MkD1, MkD3 and MkD5 (external proxies) also increase EQR and liquidity (though only MkD3 increase liquidity).

Looking at the joint (interaction) effects of market discipline dimensions and legal intuitions of emerging market economies, internal market discipline (MKD2 and MkD4) joint with quality legal institution enhances bank performance. Surprisingly, externally originated market discipline which increased performance independently, reduce performances when considered jointly with legal institutions (see Figure 4.8 and Tables A9 to A16). Similar conflicting result is noticed on the interaction effect of internal market discipline and legal institution on bank's stability. Independently, internal market discipline increases stability, but when interacted with legal institution, stability is reduced; where MkD2 and MkD4 reduced liquidity, though MkD2 also increased EQR. However, external market discipline retains its incremental effect on bank stability when interacted with legal institution: where MkD1, MkD3, and MkD5 increase Z-Index, Liquidity and EQR, respectively (see Figure 4.8).

From developed countries' point of view (Table 4.11b, Figures 4.9 and 4.10), more dimensions of market discipline recorded statistically significant favorable effects, on banks performance and stability than was the case for emerging market countries. For instance, both internal-and external-originated market disciplines increase stability of banking industry of developed market. We find that MkD2 and MkD4 (internally originated market discipline) increase EQR, liquidity, and Z-Index, as well reduce non-performing loans. From external market discipline point of view, MkD1, MkD3, and MkD5 increase EQR and liquidity ratio (where only MkD5 increase Z-Index and reduce

nonperforming loans). External market discipline also recorded incremental effects on bank performance: it increased NIM and ROA. However, internal market discipline has reduction effect on bank performance.

Interestingly, looking at interaction of market discipline dimensions with legal institution, both internal-and external-originated market disciplines significantly favor both bank performance and stability of developed market countries. We find that MkD2 and MkD4 (internal originated discipline) increase ROA, while MkD1 and MkD5 increase both NIM and ROA when interacted with legal institution. Looking at stability measures, MkD2 and MkD4 (internal originated discipline) increase EQR, liquidity and Z-Index when interacted with legal institution; when quality institutions are interacted with MkD1, MkD3, and MkD5, they jointly increase EQR liquidity, Z-Index, and reduce nonperforming loans (see Figure 4.10 and Tables A17to A24).

We find that effects of interaction between dimensions of market discipline and legal institutions have more expected and robust effects in developed than in emerging markets' bank performance and stability (see Figure 4.10 and Table A9 to A24 in the appendix). In most cases in developed market, the effects of individual market discipline dimensions are improved or retained when interacted with legal institution, though there are few exceptions. For instance, in developed market, MkD1 on its own significantly increases NIM at the 5% significant level (Table A17), but when interacted with legal institutions, the incremental effect increased to 1% level.

4.7.1. Robustness Check of effects of market discipline in varying markets

To further check robustness of the above results, we also look at the effect of the overall market discipline construct and its interaction with legal institution in both emerging and developed market economies (see Table 4.12 a, b c, and d). The overall market discipline (OvMkD) significantly and positively affect both developed markets' bank performance and stability, and retains its effects upon being interacted with legal institution variable; however, there is no much significant effects in emerging market banks.

This outcome essentially mirrors, in a summarized way, the differential findings between emerging market banks and developed market banks. Recall, OvMkD is a market discipline construct generated by applying principal component analysis on the first three constructs (dimensions) of market discipline (MkD1, MkD2, and MkD3). Therefore, in most of the estimation results, overall

market discipline construct (OvMkD) retained either the individual or collective effects MkD1, MkD2 and MkD3 had on bank performance and stability.

From the above results, we confirm our previous results, that market disciplines (both internal-and external-originated disciplines) have more effects in developed countries compared to emerging market countries. We also surmise that the essence of such higher effects on developed countries could be attributed to the fact that developed countries have more efficient and effective legal environment that enables the public, government and external stakeholders to effectively discipline banks. In a nutshell, for an effective market discipline, establishment of strong and effective legal institutions by countries, especially emerging market countries, is strongly recommended.

Table 4.11a: GMM Analysis of Effect of market discipline constructs on performance and Stability variables in Emerging Market

	Panel A: Performance Measures						Panel B:Stability Measures									
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
MkD1	0.144	0.147	0.225	0.232	0.001	0.001	0.005*	0.005*	0.020	0.016	0.011	0.011	-0.061	-0.058	-0.071***	-0.069***
	(0.127)	(0.128)	(0.266)	(0.266)	(0.001)	(0.001)	(0.003)	(0.003)	(0.053)	(0.050)	(0.014)	(0.014)	(0.085)	(0.085)	(0.019)	(0.019)
MkD2	1.784	1.880	-1.321*	-1.414*	-0.005*	-0.006**	0.010*	0.010*	-1.213	-1.428	0.706**	0.692**	0.313	0.337	0.597*	0.610*
	(2.153)	(2.168)	(0.746)	(0.746)	(0.002)	(0.002)	(0.006)	(0.006)	(1.324)	(1.315)	(0.328)	(0.336)	(1.209)	(1.209)	(0.313)	(0.312)
MkD3	-0.017	-0.019	-0.094	-0.105	0.004*	0.004**	0.007	0.007	-0.053	-0.035	0.034*	0.033*	-0.039	-0.043	-0.018	-0.022
	(0.157)	(0.157)	(0.395)	(0.393)	(0.002)	(0.002)	(0.005)	(0.006)	(0.070)	(0.076)	(0.018)	(0.018)	(0.081)	(0.081)	(0.027)	(0.027)
MkD4	-0.097	-0.098	0.243	0.244	0.001	0.001*	0.003***	0.003***	-0.108	-0.127	0.013*	0.013**	-0.005	-0.004	-0.005	-0.004
	(0.067)	(0.067)	(0.179)	(0.179)	(0.001)	(0.001)	(0.001)	(0.001)	(0.118)	(0.110)	(0.007)	(0.007)	(0.031)	(0.031)	(0.007)	(0.007)
MkD5	0.170*	0.168*	0.259	0.235	0.001	0.001	0.005*	0.005*	0.007	0.010	-0.011	-0.010	-0.050	-0.052	0.032**	0.031**
	(0.091)	(0.091)	(0.612)	(0.610)	(0.001)	(0.001)	(0.003)	(0.003)	(0.060)	(0.046)	(0.008)	(0.008)	(0.052)	(0.052)	(0.014)	(0.015)
H-Stat	0.023	0.024	-1.349**	-1.324**	0.015	0.025*	0.032**	0.032**	0.036	0.048	0.188**	0.185**	-0.135	-0.134		
	(0.227)	(0.228)	(0.564)	(0.567)	(0.015)	(0.014)	(0.014)	(0.014)	(0.147)	(0.140)	(0.079)	(0.079)	(0.101)	(0.101)		
CAPR	-0.003	-0.003	0.023**	0.023**	0.001	0.001	0.001***	0.001***	-0.000	0.000	0.002***	0.002***	0.003***	0.003***	0.001	0.001
	(0.007)	(0.007)	(0.010)	(0.010)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	0.003	0.003	0.021*	0.021*	-0.000	0.001	-0.001*	-0.001*	0.000	0.000	0.005	0.005	0.002	0.002	-0.001*	-0.002*
	(0.006)	(0.006)	(0.013)	(0.013)	(0.001)	(0.001)	(0.000)	(0.000)	(0.005)	(0.005)	(0.004)	(0.004)	(0.002)	(0.002)	(0.001)	(0.001)
TLTA	1.672**	1.666**	0.097	-0.019	-0.042**	-0.042**	0.023	0.023	0.076	0.164	-1.069***	-1.058***	-0.027	-0.027	0.446***	0.434***
	(0.676)	(0.677)	(1.723)	(1.729)	(0.019)	(0.020)	(0.032)	(0.032)	(0.281)	(0.289)	(0.159)	(0.159)	(0.257)	(0.260)	(0.085)	(0.085)
OPE	0.028**	0.028**	-0.065***	-0.064***	-0.001	-0.001	0.001**	0.001**	0.005	0.005	0.006***	0.006***	-0.007*	-0.007*	0.008***	0.008***
	(0.013)	(0.013)	(0.023)	(0.023)	(0.000)	(0.000)	(0.001)	(0.001)	(0.007)	(0.007)	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)
LogTA	-0.015	-0.016	0.122*	0.118*	0.007***	0.007***	0.013**	0.013**	-0.017	-0.010	0.028	0.028	0.069	0.067	-0.101***	-0.102***
	(0.028)	(0.028)	(0.064)	(0.064)	(0.002)	(0.002)	(0.007)	(0.007)	(0.024)	(0.036)	(0.017)	(0.018)	(0.055)	(0.055)	(0.023)	(0.023)
Lending Rate	0.011	0.010	0.037	0.032	0.001	0.001	-0.001*	-0.001*	-0.012	-0.013	-0.001	-0.000	-0.005	-0.005	0.014***	0.014***
	(0.021)	(0.021)	(0.060)	(0.059)	(0.001)	(0.001)	(0.001)	(0.001)	(0.015)	(0.015)	(0.005)	(0.005)	(0.009)	(0.009)	(0.002)	(0.002)
GDPGrowth	0.027*	0.026*	0.035	0.035	0.002*	0.001	0.001	0.001	-0.004	-0.003	0.001	0.001	-0.001	-0.001	0.012***	0.011***
	(0.015)	(0.015)	(0.036)	(0.036)	(0.001)	(0.001)	(0.001)	(0.001)	(0.006)	(0.005)	(0.002)	(0.002)	(0.006)	(0.006)	(0.002)	(0.002)
CVInflation	-0.002**	-0.002**	0.001**	0.001**	0.001	0.001	-0.001	-0.001	-0.001	0.001	-0.001	-0.001	0.001	0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-0.456		-1.590		-0.009*		0.003		0.459		-0.025		-0.107		-0.022	
	(0.405)		(1.174)		(0.005)		(0.009)		(0.573)		(0.082)		(0.231)		(0.057)	
Legal		-0.416		0.763		0.014**		-0.001		-0.121		-0.003		0.014		0.176*
		(0.515)		(1.296)		(0.006)		(0.013)		(0.310)		(0.074)		(0.336)		(0.096)
Obs.	4,359	4,359	4,716	4,716	4,987	4,987	4,308	4,308	3,952	3,952	4,350	4,350	3,497	3,497	3,590	3,590
No. of BankID	419	419	419	419	419	419	419	419	416	416	419	419	415	415	417	417
AR2	0.59	0.60	0.38	0.39	0.62	0.81	0.42	0.42	0.24	0.24	0.40	0.37	0.66	0.65	0.76	0.78
Sagan Test	8.07	8.02	14.55	14.63	23.75	25.06	28.25	28.11	12.29	9.48	4.33	4.33	27.85	28.03	30.42	30.96
Sagan P. Value	0.52	0.53	0.20	0.20	0.47	0.40	0.11	0.11	0.10	0.21	0.82	0.82	0.26	0.25	0.17	0.15

Table4.11a details the effect of market discipline constructs on performance and stability measures of **emerging market banks only.** The performance measures (panel A)are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA), while stability measures (panel B) include equity ratio (EQR), ratio of non-performing loan to total loan (NPLTL), competition (H-Stat), Z-Index and liquidity ratio. PreTaxP and ROA are at lag of 1, NIM and EQR are at lags of 2, while others are at lags pf 3. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, 10%, respectively.

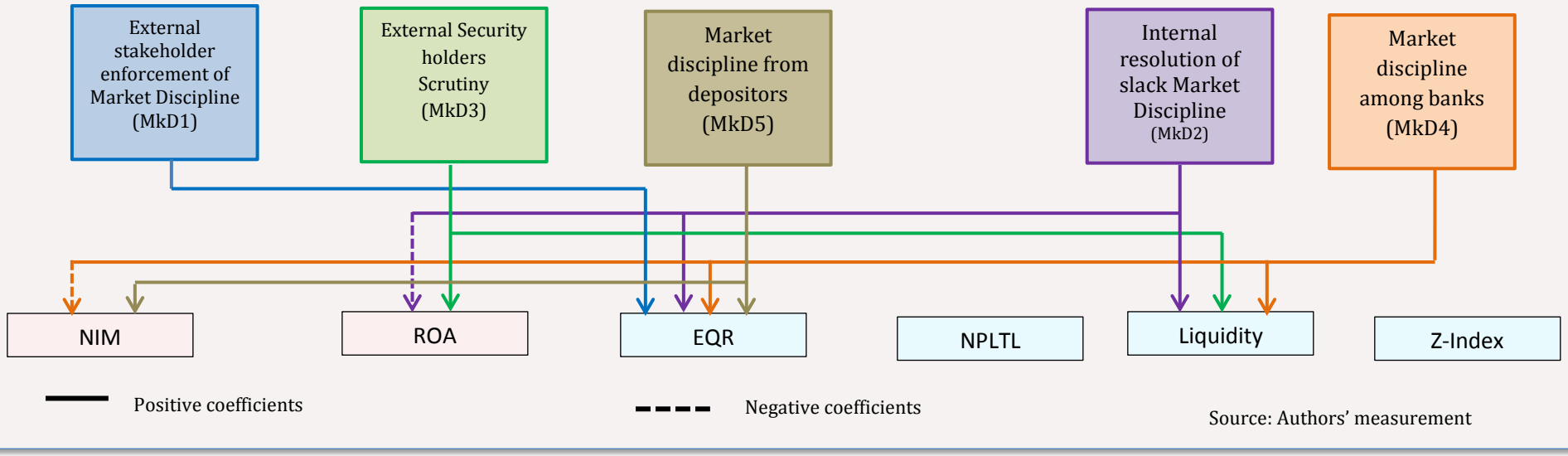
Table 4.11b: GMM Analysis of Effect of market discipline constructs on performance and Stability variables in Developed Market

	Panel A: Performance Measures						Panel B:Stability Measures									
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
MkD1	0.028	0.028	-0.696**	-0.799***	0.005**	0.005***	0.001	0.001	0.001	0.001	0.179***	0.134*	-0.088	-0.076	-0.043***	-0.039**
	(0.026)	(0.028)	(0.315)	(0.272)	(0.002)	(0.002)	(0.001)	(0.001)	(0.006)	(0.006)	(0.063)	(0.072)	(0.083)	(0.088)	(0.015)	(0.016)
MkD2	0.003	0.006	0.059	0.138	-0.002**	-0.004***	0.005***	0.005***	0.005	0.002	-0.054	-0.094***	0.256**	0.223*	-0.015	-0.016
	(0.063)	(0.063)	(0.270)	(0.273)	(0.001)	(0.001)	(0.002)	(0.002)	(0.006)	(0.005)	(0.039)	(0.031)	(0.117)	(0.116)	(0.025)	(0.025)
MkD3	-0.335***	-0.315**	0.660	0.324	0.001	0.002	0.013***	0.011***	-0.012	-0.014	0.162**	0.150	-1.468***	-1.442***	-0.041	-0.032
	(0.124)	(0.123)	(0.984)	(0.984)	(0.004)	(0.004)	(0.003)	(0.003)	(0.024)	(0.025)	(0.081)	(0.111)	(0.314)	(0.305)	(0.037)	(0.038)
MkD4	-0.116***	-0.098***	2.130***	2.194***	-0.004**	-0.005**	-0.001	-0.001	0.000	-0.001	0.060***	0.072***	0.010	0.004	-0.017	-0.018
	(0.036)	(0.035)	(0.558)	(0.534)	(0.002)	(0.002)	(0.001)	(0.001)	(0.010)	(0.010)	(0.021)	(0.026)	(0.081)	(0.082)	(0.015)	(0.014)
MkD5	0.028*	0.027*	0.252	0.202	0.002***	0.002***	0.001	0.001	-0.004	-0.006	0.053	-0.014	0.110***	0.109**	0.035***	0.037***
	(0.015)	(0.015)	(0.274)	(0.262)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.004)	(0.034)	(0.024)	(0.042)	(0.044)	(0.004)	(0.004)
H-Stat	-0.133	-0.041	-6.638***	-6.694***	-0.035***	-0.032***	-0.022***	-0.021***	0.108*	0.126**	-0.095*	-0.035	-0.801***	-0.836***		
	(0.136)	(0.136)	(0.868)	(0.825)	(0.004)	(0.004)	(0.004)	(0.004)	(0.064)	(0.064)	(0.052)	(0.058)	(0.186)	(0.171)		
CAPR	0.006	0.006	0.174***	0.164***	-0.005***	-0.006***	0.001***	0.001***	0.005***	0.005***	0.033***	0.030***	0.017**	0.019***	0.001**	0.001***
	(0.006)	(0.006)	(0.024)	(0.025)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.007)	(0.007)	(0.001)	(0.001)
INTL	0.002***	0.002***	0.002	-0.001	0.001***	0.001***	0.001***	0.001***	-0.001	0.001	0.001	0.001	-0.001***	-0.001***	-0.001***	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-0.187	-0.141	-0.330	-0.146	0.010	0.002	-0.001	-0.001	-0.019	-0.027	-0.614***	-0.980***	-0.647**	-0.647**	-0.066*	-0.071*
	(0.128)	(0.129)	(0.719)	(0.739)	(0.008)	(0.007)	(0.005)	(0.005)	(0.029)	(0.029)	(0.227)	(0.165)	(0.274)	(0.283)	(0.041)	(0.041)
OPE	0.019	0.016	-0.123*	-0.081	0.009***	0.010***	0.002***	0.002***	-0.001	-0.001	-0.022***	-0.015	-0.002	-0.001	-0.004	-0.003
	(0.014)	(0.013)	(0.064)	(0.067)	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.005)	(0.008)	(0.011)	(0.023)	(0.022)	(0.003)	(0.004)
LogTA	-0.292***	-0.273***	-1.209*	-0.994	-0.032***	-0.033***	-0.032***	-0.033***	0.030	0.028	-0.174***	-0.145***	0.179	0.179	-0.146***	-0.150***
	(0.045)	(0.049)	(0.695)	(0.731)	(0.001)	(0.001)	(0.002)	(0.003)	(0.024)	(0.023)	(0.035)	(0.036)	(0.134)	(0.131)	(0.014)	(0.014)
Lending Rate	0.019	0.014	-0.122	-0.192	0.003***	0.004***	0.001	-0.001	-0.003	-0.002	0.079***	0.064***	0.017	0.017	-0.014**	-0.012*
	(0.023)	(0.023)	(0.172)	(0.141)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.014)	(0.018)	(0.038)	(0.038)	(0.007)	(0.007)
GDPGrowth	0.019*	0.017	0.057	0.145**	0.001***	0.001*	-0.001**	-0.001	-0.001	-0.001	0.019***	0.005	-0.032**	-0.031*	0.014***	0.011***
	(0.010)	(0.010)	(0.051)	(0.063)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.004)	(0.015)	(0.018)	(0.002)	(0.002)
CVInflation	0.001***	0.001**	0.007	0.009	-0.001***	-0.001***	-0.001***	-0.001***	0.002	0.001	0.001**	0.001***	-0.001	-0.001	-0.001***	-0.001***
	(0.001)	(0.001)	(0.008)	(0.010)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-0.367*		-3.461***		0.002		0.008*		0.101**		-0.395***		0.312		0.052	
	(0.228)		(1.041)		(0.008)		(0.004)		(0.049)		(0.113)		(0.603)		(0.059)	
Legal		-0.165		-8.875***		0.091***		-0.033***		0.100*		1.750***		0.513		0.425***
		(0.272)		(2.952)		(0.026)		(0.013)		(0.056)		(0.528)		(1.228)		(0.077)
Obs.	600	600	508	508	599	599	507	507	462	462	554	554	405	405	554	554
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.97	0.97	0.95	0.94	0.18	0.17	0.72	0.70	0.64	0.72	0.30	0.30	0.60	0.63	0.19	0.17
Sagan Test	11.91	13.05	26.61	27.66	28.66	29.69	24.58	24.69	7.41	6.74	23.91	22.51	26.41	26.57	31.11	29.87
Sagan P. Value	0.45	0.36	0.14	0.12	0.23	0.19	0.21	0.21	0.38	0.45	0.35	0.42	0.33	0.32	0.10	0.12

Table 4.11b details the effect of market discipline constructs on performance and stability measures of **developed market banks only.** The performance measures (panel A)are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA), while stability measures (panel B) include equity ratio (EQR), ratio of non-performing loan to total loan (NPLTL), competition (H-Stat), Z-Index and liquidity ratio. NIM ROA and H-Stat are at lag of 1, NPLTL and Z-Index are at lags of 3, while others are at lags of2. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, 10%, respectively**.**

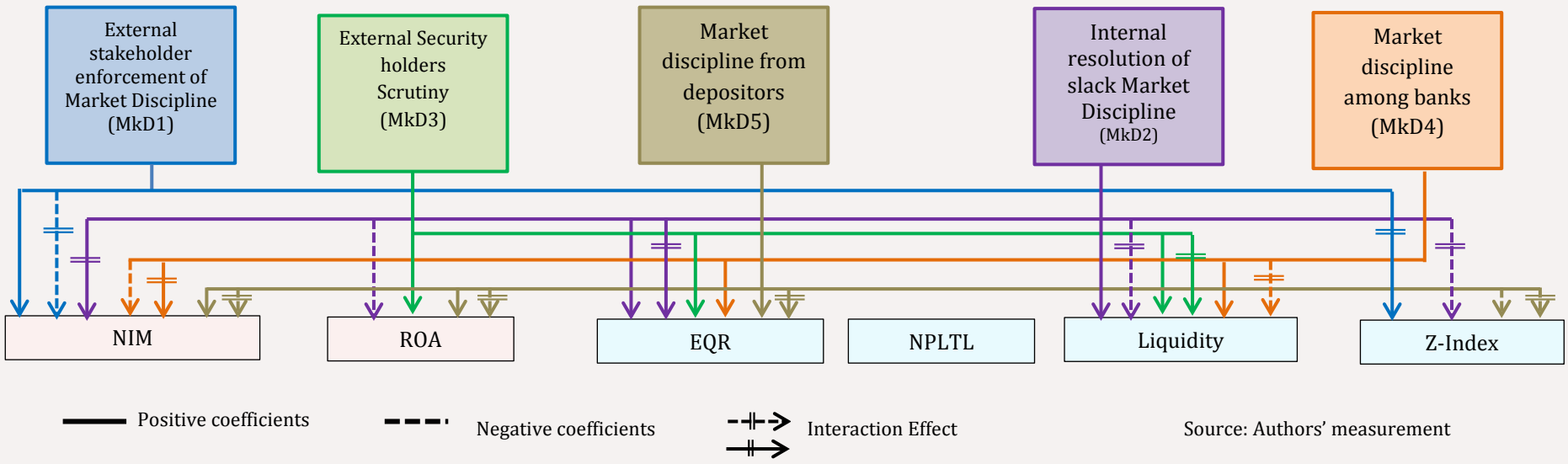
Figures 4.7 and 4.8: Schematic diagram of effects of market discipline on emerging market

Figure 4.7: Emerging Market Sample: Market Discipline Dimensions and Effects on Banks Performance and Stability



Source: Authors' measurement

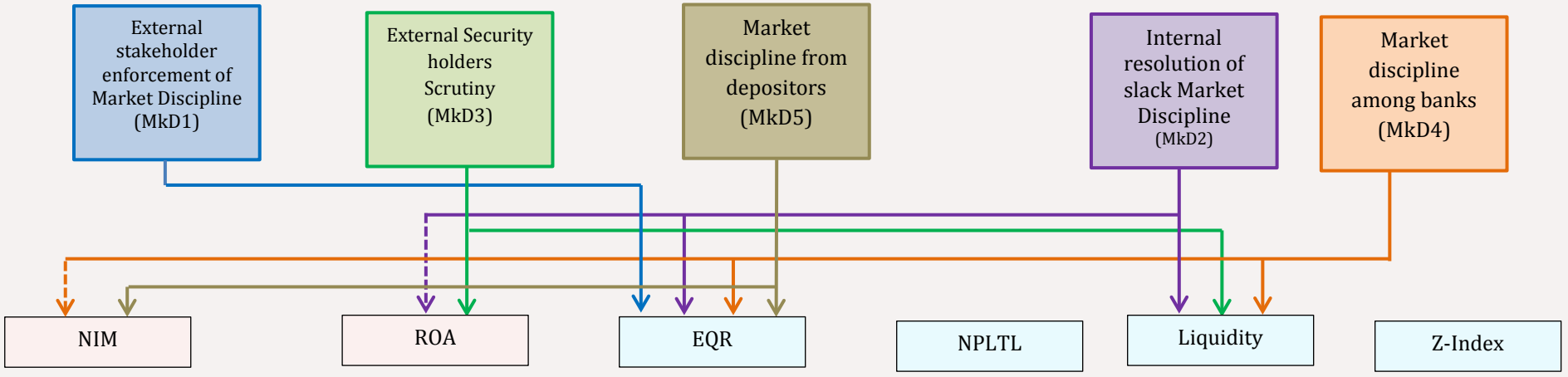
Figure 4.8: Emerging Market Sample: Market Discipline Dimensions; interactions with legal infrastructure and effects on Banks Performance and Stability



Source: Authors' measurement

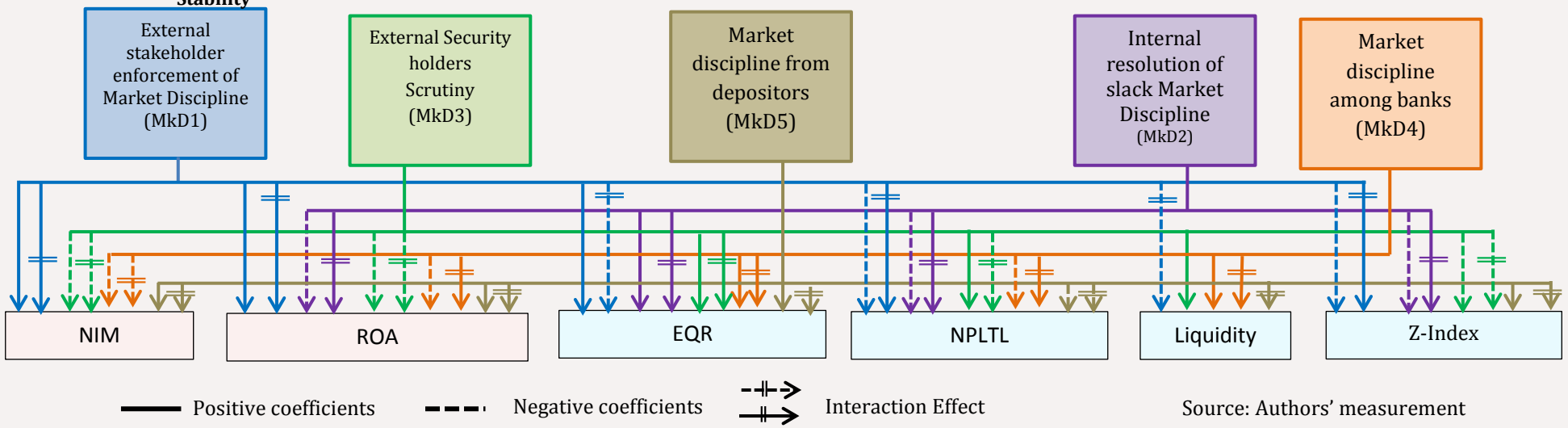
Figures 4.9 and 4.10: Schematic diagram of effects of market discipline on developed market

Figure 4.9: Developed Market: Market Discipline Dimensions and Effects on Banks Performance and Stability



Source: Authors' measurement

Figure 4.10: Developed Market: Market Discipline Dimensions and their interactions with legal infrastructure; Effects on Banks Performance and Stability



Source: Authors' measurement

Table 4.12a: Effects of overall market discipline construct (OvMkD) and its interaction with Legal infrastructures on performance in Emerging market

Variables	NIM				LogPre Tax Profit				ROA			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OvMkD	0.184	0.192	0.205		0.220	0.227	0.322		0.008	0.008	0.006	
	(0.164)	(0.165)	(0.181)		(0.406)	(0.404)	(0.388)		(0.007)	(0.006)	(0.005)	
OvMkD*Legal			0.043	-0.119			0.584	0.445			-0.014	-0.017
			(0.214)	(0.165)			(0.588)	(0.627)			(0.010)	(0.011)
H-Stat	-0.120	-0.107	-0.108	0.099	-1.394**	-1.372**	-1.368**	-1.383**	0.001	0.001	0.001	0.001
	(0.182)	(0.182)	(0.181)	(0.135)	(0.564)	(0.566)	(0.566)	(0.565)	(0.008)	(0.008)	(0.007)	(0.007)
CAPR	0.002	0.002	0.002	0.002	0.023**	0.023**	0.023**	0.023**	0.000	0.000	0.000	0.000
	(0.008)	(0.008)	(0.008)	(0.006)	(0.009)	(0.010)	(0.009)	(0.010)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001	0.001	0.001	-0.001	0.021*	0.021	0.021	0.021	-0.000	-0.000	-0.000	-0.000
	(0.004)	(0.004)	(0.004)	(0.003)	(0.013)	(0.013)	(0.013)	(0.013)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	0.853	0.996	1.012	0.773	-0.038	-0.156	-0.109	-0.080	0.010	0.011	0.009	0.007
	(1.217)	(1.227)	(1.229)	(0.908)	(1.701)	(1.706)	(1.710)	(1.704)	(0.037)	(0.036)	(0.037)	(0.037)
OPE	0.015	0.015	0.015	0.021*	-0.066***	-0.064***	-0.064***	-0.064***	-0.000	-0.000	-0.000	-0.000
	(0.014)	(0.014)	(0.014)	(0.013)	(0.023)	(0.023)	(0.023)	(0.023)	(0.000)	(0.000)	(0.000)	(0.000)
LogTA	0.013	0.013	0.013	-0.007	0.124*	0.120*	0.119*	0.118*	-0.000	-0.000	-0.000	-0.000
	(0.016)	(0.016)	(0.016)	(0.019)	(0.064)	(0.065)	(0.065)	(0.064)	(0.001)	(0.001)	(0.001)	(0.001)
Lending Rate	0.050**	0.049**	0.048**	0.076***	0.032	0.027	0.028	0.029	-0.000	-0.000	-0.000	-0.000
	(0.023)	(0.023)	(0.023)	(0.015)	(0.060)	(0.059)	(0.059)	(0.060)	(0.001)	(0.001)	(0.001)	(0.001)
GDPGrowth	0.042***	0.042***	0.042***	0.045***	0.038	0.038	0.039	0.039	-0.000	-0.000	-0.000	-0.000
	(0.014)	(0.014)	(0.014)	(0.011)	(0.036)	(0.036)	(0.036)	(0.036)	(0.000)	(0.000)	(0.001)	(0.001)
CVInflation	0.000	0.000	0.000	0.000	0.001**	0.001**	0.001**	0.001**	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Political	0.012				-1.817				-0.020			
	(0.344)				(1.175)				(0.015)			
Legal		0.237	0.243			0.571	0.556			-0.030	-0.030	
		(0.468)	(0.467)			(1.288)	(1.284)			(0.024)	(0.023)	
Constant	-0.127	-0.133	-0.129	0.381	-5.795***	-4.823**	-4.775**	-4.960***	0.003	0.002	0.002	0.008
	(0.782)	(0.834)	(0.834)	(0.661)	(1.992)	(1.989)	(1.989)	(1.902)	(0.038)	(0.036)	(0.036)	(0.035)
Obs.	5,062	5,062	5,062	5,062	4,716	4,716	4,716	4,716	3,987	3,987	3,987	3,987
No. of BankID	419	419	419	419	419	419	419	419	418	418	418	418
AR2	0.16	0.17	0.17	0.17	0.37	0.37	0.37	0.38	0.31	0.31	0.31	0.32
Sagan test	18.02	18.23	18.20	46.01	14.75	14.86	14.76	14.89	6.88	6.83	6.82	6.94
P. Value Sagan	0.11	0.10	0.10	0.10	0.19	0.18	0.19	0.18	0.44	0.44	0.44	0.43

Table 4.12a explains effects of the cumulative market discipline construct (OvMkD) on emerging market banks' performance. The cumulative market discipline construct was generated using the first three construct of market discipline (MkD1 to MkD3). All the dependent variables are at lag 1. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, 10%, respectively.

Table 4.12b: Effects of overall market discipline construct (OvMkD) and its interaction with Legal infrastructures on Stability in Emerging market

Variables	EQR				NPLTL				Liquidity				LogZ-Index				H-Stat			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
OvMkD	0.001	0.001	0.002		0.093	0.091	0.077		0.112*	0.111*	0.071		-0.064	-0.061	-0.021		-0.083***	-0.079***	-0.084***	
	(0.003)	(0.003)	(0.003)		(0.086)	(0.086)	(0.084)		(0.058)	(0.058)	(0.055)		(0.090)	(0.089)	(0.101)		(0.024)	(0.024)	(0.024)	
OvMkD*Legal			0.006	0.005			-0.079	-0.112			-0.183*	-0.222*			0.235	0.288*			-0.034	0.001
			(0.006)	(0.006)			(0.112)	(0.113)			(0.105)	(0.124)			(0.199)	(0.176)			(0.041)	(0.040)
H-Stat	0.011	0.011	0.011	0.010	0.036	0.030	0.029	0.028	0.285***	0.281***	0.279***	0.273**	-0.128	-0.127	-0.127	-0.109				
	(0.007)	(0.007)	(0.007)	(0.007)	(0.118)	(0.119)	(0.119)	(0.115)	(0.109)	(0.108)	(0.108)	(0.108)	(0.100)	(0.101)	(0.101)	(0.094)				
CAPR	0.002***	0.002***	0.002***	0.002***	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002*	0.002*	0.002*	0.002	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	-0.001	-0.001*	-0.001*	-0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-0.068	-0.075*	-0.075*	-0.072*	-0.031	-0.019	-0.028	-0.046	-1.231***	-1.228***	-1.254***	-1.267***	-0.032	-0.039	-0.021	0.034	0.468***	0.454***	0.450***	0.459***
	(0.043)	(0.043)	(0.043)	(0.043)	(0.308)	(0.308)	(0.307)	(0.307)	(0.226)	(0.226)	(0.227)	(0.229)	(0.259)	(0.261)	(0.263)	(0.250)	(0.085)	(0.085)	(0.085)	(0.086)
OPE	0.001***	0.001***	0.001***	0.001***	0.002	0.002	0.002	0.002	0.004*	0.004*	0.004	0.004	-0.007*	-0.007*	-0.007*	-0.007*	0.008***	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)
LogTA	-0.009*	-0.009*	-0.009*	-0.009*	0.001	0.002	0.002	-0.003	0.036*	0.036*	0.036*	0.034	0.030	0.029	0.028	0.028	-0.095***	-0.097***	-0.096***	-0.088***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.058)	(0.058)	(0.058)	(0.052)	(0.021)	(0.021)	(0.021)	(0.021)	(0.026)	(0.025)	(0.025)	(0.024)	(0.023)	(0.023)	(0.023)	(0.022)
Lending Rate	-0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.002	-0.001	-0.001	-0.001	-0.000	-0.004	-0.004	-0.004	-0.002	0.014***	0.013***	0.013***	0.014***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.013)	(0.013)	(0.013)	(0.013)	(0.005)	(0.005)	(0.005)	(0.005)	(0.009)	(0.009)	(0.009)	(0.008)	(0.002)	(0.002)	(0.002)	(0.002)
GDPGrowth	0.000**	0.001**	0.001**	0.001**	-0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.001	0.001	0.011***	0.011***	0.011***	0.011***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)	(0.006)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)
CVInflation	-0.001***	-0.001***	-0.001***	-0.001***	-0.001	0.001	0.001	-0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.002								0.055				-0.157				-0.027			
	(0.008)								(0.084)				(0.231)				(0.056)			
Legal		0.015	0.014			-0.129	-0.136			-0.029	-0.022			-0.008	-0.003			0.164*	0.160*	
		(0.010)	(0.010)			(0.241)	(0.241)			(0.084)	(0.094)			(0.320)	(0.323)			(0.095)	(0.094)	
Obs.	5,062	5,062	5,062	5,062	3,952	3,952	3,952	3,952	4,704	4,704	4,704	4,704	3,884	3,884	3,884	3,884	3,590	3,590	3,590	3,590
No. of BankID	419	419	419	419	416	416	416	416	419	419	419	419	416	416	416	416	417	417	417	417
AR2	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.42	0.42	0.42	0.42	0.13	0.13	0.15	0.13	0.76	0.78	0.79	0.73
Sagan test	39.48	39.07	38.84	39.87	10.98	10.65	10.71	11.03	11.56	11.52	11.69	11.98	25.14	25.35	25.09	39.19	30.43	31.11	31.24	30.80
P. Value Sagan	0.27	0.29	0.30	0.26	0.13	0.15	0.15	0.13	0.31	0.31	0.30	0.28	0.12	0.11	0.12	0.06	0.17	0.15	0.14	0.15

Table 4.12b explains effects of the cumulative market discipline construct (OvMkD) on **emerging market** bank stability. The cumulative market discipline construct was generated using the first three construct of market discipline (MkD1 to MkD3). EQR is at lag of 1, liquidity ratio and Z-Index are at lags of 2, others are at lags of 3. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, 10%, respectively.

Table 4.12c: Effects of overall market discipline construct (OvMkD) and its interaction with Legal infrastructures on performance in Developed Market

Variables	NIM				LogPreTax Profit				ROA			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
OvMkD	0.151***	0.151***	-0.703***		-1.649***	-1.493***	3.709		0.008**	0.009***	-0.072*	
	(0.051)	(0.051)	(0.239)		(0.537)	(0.558)	(2.453)		(0.004)	(0.003)	(0.041)	
OvMkD*Legal			0.541***	0.115***			-3.285**	-1.059***			0.060**	0.015**
			(0.159)	(0.035)			(1.542)	(0.301)			(0.030)	(0.007)
H-Stat	-0.183	-0.082	-0.057	-0.131	-6.179***	-5.678***	-5.468***	-5.720***	-0.034***	-0.031***	0.025***	0.020***
	(0.127)	(0.129)	(0.129)	(0.131)	(0.696)	(0.742)	(0.769)	(0.698)	(0.004)	(0.003)	(0.006)	(0.004)
CAPR	0.001	0.002	0.002	-0.001	0.150***	0.133***	0.129***	0.135***	-0.005***	-0.005***	-0.010***	-0.009***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.018)	(0.020)	(0.020)	(0.018)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	0.002***	0.002***	0.002***	0.002***	0.001*	0.001	0.001	0.001	0.001***	0.001***	0.001***	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	-0.178	-0.129	-0.084	-0.146	-0.866*	-0.274	-0.439	-0.541	0.007	-0.006	-0.004	-0.001
	(0.139)	(0.143)	(0.146)	(0.140)	(0.526)	(0.578)	(0.595)	(0.535)	(0.009)	(0.009)	(0.013)	(0.012)
OPE	0.015	0.010	0.010	0.014	0.241***	0.205***	0.195***	0.217**	0.009***	0.010***	0.003**	0.003**
	(0.012)	(0.011)	(0.012)	(0.012)	(0.087)	(0.075)	(0.069)	(0.085)	(0.001)	(0.001)	(0.002)	(0.001)
LogTA	-0.307***	-0.288***	-0.286***	-0.286***	-1.890***	-1.494***	-1.440***	-1.608***	-0.033***	-0.034***	0.052***	0.047***
	(0.055)	(0.059)	(0.058)	(0.056)	(0.341)	(0.371)	(0.364)	(0.332)	(0.001)	(0.002)	(0.006)	(0.006)
Lending Rate	0.037	0.030	0.031	0.034	-0.032	-0.131	-0.122	-0.117	0.002***	0.003***	0.001	0.001
	(0.024)	(0.025)	(0.024)	(0.024)	(0.083)	(0.083)	(0.086)	(0.086)	(0.001)	(0.001)	(0.001)	(0.001)
GDPGrowth	0.014	0.012	0.009	0.013	0.098**	0.132***	0.136***	0.097**	0.001***	0.001	0.001	0.001
	(0.010)	(0.010)	(0.010)	(0.010)	(0.044)	(0.049)	(0.049)	(0.043)	(0.001)	(0.001)	(0.001)	(0.001)
CVInflation	0.001**	0.001*	0.001*	0.001*	-0.001	-0.001	0.001	0.001	-0.001***	-0.001***	-0.001	-0.001*
	(0.000)	(0.001)	(0.001)	(0.001)	(0.007)	(0.007)	(0.006)	(0.006)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-0.357				-5.611***				-0.002			
	(0.220)				(0.743)				(0.009)			
Legal		-0.117	0.302			-5.860**	-7.933***			0.077***	0.072	
		(0.283)	(0.299)			(2.640)	(2.736)			(0.025)	(0.052)	
Constant	6.213***	5.758***	5.118***	5.532***	23.130***	19.275**	22.159***	11.822**	-0.013	-0.118***	-0.772***	-0.591***
	(1.053)	(1.011)	(0.991)	(0.996)	(6.002)	(7.899)	(8.125)	(5.789)	(0.019)	(0.045)	(0.132)	(0.091)
Obs.	600	600	600	600	554	554	554	554	600	600	600	600
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.97	0.95	0.92	0.93	0.27	0.27	0.27	0.27	0.18	0.17	0.24	0.25
Sagan test	11.69	13.12	13.02	11.97	27.61	23.82	23.50	24.06	28.38	25.67	17.79	16.48
P. Value Sagan	0.47	0.35	0.36	0.44	0.18	0.35	0.37	0.34	0.24	0.37	0.12	0.17

Tables 4.12c display effects of the cumulative market discipline construct (OvMkD) on **developed market bank** performance and stability. The cumulative market discipline construct was generated using the first three construct of market discipline (MkD1to MkD3). All the dependent variables are at lag 1. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, 10%, respectively

Table 4.12d: Effects of overall market discipline construct (OvMkD) and its interaction with Legal infrastructures on stability in Developed Market

Variables	EQR				NPLTL				Liquidity				LogZ-Index				H-Stat			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
OvMkD	-0.033**	-0.032**	0.013		0.006	0.003	-0.306***		-0.051	-0.065	1.110*		0.235***	0.194**	-1.560***		-0.057***	-0.061***	-0.380***	
	(0.014)	(0.014)	(0.051)		(0.008)	(0.008)	(0.081)		(0.042)	(0.063)	(0.659)		(0.072)	(0.088)	(0.295)		(0.018)	(0.017)	(0.052)	
OvMkD*Legal			-0.029	-0.021**			0.199***	0.009*			-0.768*	-0.086*			1.114***	0.185***			0.196***	-0.032***
			(0.034)	(0.009)			(0.054)	(0.005)			(0.416)	(0.044)			(0.171)	(0.044)			(0.035)	(0.011)
H-Stat	-0.033	-0.031	-0.029	-0.030	0.159***	0.157***	0.151***	0.159***	0.121***	0.143**	0.057	0.059	-0.403***	-0.413***	-0.461***	-0.405***				
	(0.024)	(0.024)	(0.025)	(0.024)	(0.038)	(0.037)	(0.045)	(0.038)	(0.042)	(0.064)	(0.066)	(0.061)	(0.059)	(0.068)	(0.073)	(0.057)				
CAPR	0.009***	0.009***	0.009***	0.009***	0.002***	0.002***	-0.001	0.002***	0.021***	0.016***	0.017***	0.019***	0.001	0.001	0.002	0.001	0.002***	0.002***	0.003***	0.002***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001	0.001	0.001	0.001	0.001*	0.001*	0.001	0.001*	0.001	0.001***	0.001***	0.001	-0.001	-0.001	-0.001	-0.001	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-0.043	-0.051	-0.052	-0.049	-0.030	-0.026	-0.034	-0.032	-0.704***	-1.008***	-0.888***	-0.681***	-0.921***	-0.915***	-0.844***	-0.880***	-0.053*	-0.050*	-0.045*	-0.049*
	(0.046)	(0.045)	(0.045)	(0.045)	(0.023)	(0.024)	(0.035)	(0.023)	(0.216)	(0.205)	(0.258)	(0.241)	(0.171)	(0.166)	(0.176)	(0.167)	(0.029)	(0.027)	(0.026)	(0.028)
OPE	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	-0.018***	-0.016*	-0.019**	-0.019**	-0.036***	-0.037***	-0.035***	-0.037***	-0.010***	-0.010***	-0.008***	-0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.003)	(0.004)	(0.006)	(0.009)	(0.008)	(0.007)	(0.009)	(0.009)	(0.009)	(0.009)	(0.002)	(0.002)	(0.002)	(0.002)
LogTA	-0.089***	-0.086***	-0.085***	-0.085***	0.037**	0.039***	0.067***	0.040***	-0.104***	-0.122***	-0.163***	-0.149***	0.011	0.018	0.011	0.040	-0.104***	-0.102***	-0.100***	-0.102***
	(0.023)	(0.024)	(0.024)	(0.023)	(0.015)	(0.015)	(0.024)	(0.016)	(0.039)	(0.043)	(0.052)	(0.039)	(0.064)	(0.060)	(0.056)	(0.054)	(0.008)	(0.010)	(0.010)	(0.009)
Lending Rate	0.001	0.001	0.001	0.001	-0.005	-0.005	-0.004	-0.005	-0.012	-0.007	0.003	-0.002	-0.020	-0.024	-0.022	-0.021	-0.014***	-0.014***	-0.014***	-0.015***
	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.011)	(0.011)	(0.006)	(0.006)	(0.021)	(0.021)	(0.022)	(0.021)	(0.004)	(0.004)	(0.004)	(0.004)
GDPGrowth	-0.002**	-0.003**	-0.003**	-0.002**	-0.001	-0.001	-0.001	-0.001	0.005	-0.003	-0.003	0.005	0.031***	0.027**	0.023**	0.031***	0.016***	0.014***	0.014***	0.016***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)	(0.011)	(0.012)	(0.011)	(0.011)	(0.001)	(0.001)	(0.001)	(0.001)
CVInflation	0.001*	0.001*	0.001*	0.001*	0.001***	0.001***	0.001*	0.001***	0.002***	0.001**	0.001*	0.001*	-0.002*	-0.002**	-0.002***	-0.002*	-0.001***	-0.001***	-0.001***	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Political	-0.034								0.465***				-0.222				-0.049			
	(0.023)								(0.143)				(0.316)				(0.035)			
Legal		0.060	0.040			0.060	0.276***			1.292**	0.659			0.040	0.899**			0.345***	0.510***	
		(0.044)	(0.050)			(0.042)	(0.103)			(0.534)	(0.463)			(0.403)	(0.423)			(0.077)	(0.087)	
Obs.	600	600	600	600	508	508	508	508	554	554	554	554	543	543	543	543	554	554	554	554
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.54	0.54	0.54	0.53	0.25	0.27	0.46	0.25	0.30	0.30	0.29	0.30	0.11	0.12	0.10	0.11	0.29	0.26	0.26	0.28
Sagan test	13.72	13.88	13.69	13.33	7.84	8.08	10.24	8.90	15.29	14.14	14.14	14.14	35.58	35.56	35.97	35.78	39.41	39.49	40.38	39.34
P. Value Sagan	0.31	0.30	0.32	0.34	0.44	0.42	0.33	0.35	0.12	0.16	0.16	0.16	0.30	0.30	0.28	0.29	0.17	0.17	0.14	0.17

Tables 4.12c and d display effects of the cumulative market discipline construct (OvMkD) on developed market bank performance and stability. The cumulative market discipline construct was generated using the first three construct of market discipline (MkD1toMkD3). Liquidity ratio is at lags of 2, NPLTL at lag of3, while others are at lags of1.Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, 10%, respectively

4.8. Further robustness checks for implementation of market discipline on bank performance and stability

Thus far we have looked at the effects of different dimensions of market discipline on bank performance and stability, and found that different dimensions of market discipline have different effects. Such effects also vary depending on market segment (emerging or developed market economies). In this section, to test for second hypothesis around identification robustness, we estimate the effect of implementing market discipline principle on bank performance and stability using a method that stress better identification of market discipline effects. The crux of this estimation is to ascertain what happens to bank performance and stability should a country decide to implement market discipline than not.

Though market discipline is a globally required financial regulation, which is the third pillar of Basel II capital accord, not all countries have implemented such globally proffered financial regulation as at the time of this study. Based on that, we are eager to find out whether or not the tendency of implementing market discipline principle of Basel II capital accord has any significant effect on banks' financial and operating activities. We generated dummy variables for countries/banks that have implemented market discipline principle (DummyMkD), whereby countries that implemented are assigned the value of 1, while a value of 0 is assigned to countries that have not. This dummy variable along with control variables are regressed against bank performance and stability measures.

From Table 4.13a (panel A), results of the estimation show that the movement of DummyMkD from 0 to 1 has significant positive effect on banks' net interest margin (NIM) but has negative effect on banks' pretax profit, while there is no significant effect on return on asset (ROA). This means that the tendency of a bank implementing market discipline principle only increases banks' net interest margin as a measure of profit. From the same table (panel B), we see that implementation of market discipline significantly reduces EQR and Z-index which are measures of stability. Level of competition (H-Stat) also increased during this period. Interestingly, liquidity and nonperforming loans (NPLTL) were also marginally increased and reduced, respectively. This is an indication of reduction in banks level of risk exposure as a result of implementation of market discipline. .

Looking at differential effects of market discipline implementation from emerging and developed markets' perspectives (Tables 4.13b and c respectively), similar to the overall sample's result, we find

that market discipline implementation increases NIM of emerging market economies, but reduces pretax profit (Table 4.13b). From stability perspective (panel B), implementation of market discipline does not have favorable effect on emerging market bank stability measures, except that the level of competition increased, while liquidity and nonperforming loans marginally increased and reduced, respectively.

In the developed market (Table 4.13c), implementation of market discipline significantly reduced all measures of performance, unlike in the emerging market where NIM increased. And from stability point of view, developed market recorded more incremental effects on stability due to implementation of market discipline, where equity and liquidity ratios significantly increased at the 1% significance level. Though Z-Index significantly reduced, and no significant effect was recorded on both nonperforming loans and level of competition.

From these results, we surmise that adoption of market discipline principle by countries' banks positively affects performance of emerging market banks, but negatively affect developed market banks' performance. But on the stability aspect, emerging market banks are more unstable due to adoption of market discipline principles, than developed market banks. In terms of level of risk-taking due to market discipline implementation, there is not statistically significant effect on banks both markets, though emerging market economies recorded negative coefficient while developed market recorded positive coefficient on nonperforming loans (NPLTL).

The above results correspond largely to the result of evolutions of bank performance and stability variables in Tables 4.8, 4.9c and 4.9d for overall sample, emerging and developed market economies, respectively. In those results, we found that in the year of market discipline implementation (MDt) net interest margin (NIM) significantly increases in both overall sample and emerging market estimations, while there is a significant decrease in the developed market economies. The sign and significant coefficients of stability measures on MDt also correspond with the effects of the country dummy variable of market discipline implementation (DummyMkD) in the Table 4.13a, b, and c.

Table 4.13a: Overall Sample-GMM analysis of Countries that implemented Market Discipline Principle

	Panel A: Performance Measures								Panel B: Stability Measures							
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
DummyMkD	0.223*	0.211*	-0.966***	-0.966***	-0.001	-0.001	-0.005**	-0.005**	-0.015	-0.009	0.444	0.545	-0.108*	-0.108*	0.037*	0.043**
	(0.119)	(0.121)	(0.294)	(0.292)	(0.001)	(0.001)	(0.002)	(0.002)	(0.029)	(0.029)	(0.954)	(0.938)	(0.065)	(0.065)	(0.019)	(0.021)
H-Stat	-0.330	-0.320	-0.865	-0.834	0.024**	0.022*	0.028**	0.028**	0.048	0.044	-1.410	-1.466	-0.134	-0.132		
	(0.245)	(0.243)	(0.539)	(0.541)	(0.012)	(0.011)	(0.013)	(0.013)	(0.226)	(0.226)	(2.484)	(2.473)	(0.098)	(0.097)		
CAPR	-0.001	-0.001	0.030***	0.030***	0.001	0.001	0.001***	0.001***	0.001	0.001	-1.968***	-1.982***	0.003**	0.003**	-0.000	0.001
	(0.010)	(0.010)	(0.011)	(0.011)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.242)	(0.240)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	0.002**	0.002**	0.004	0.004	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.110	-0.103	0.000	0.000	0.001	0.001
	(0.001)	(0.001)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.300)	(0.300)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	0.915	0.955	0.193	0.101	-0.054	-0.059*	0.045*	0.044*	-0.132	-0.125	-12.18**	-12.35**	0.047	0.045	0.193**	0.195**
	(0.870)	(0.875)	(1.157)	(1.157)	(0.036)	(0.036)	(0.027)	(0.027)	(0.187)	(0.187)	(6.153)	(6.197)	(0.241)	(0.243)	(0.078)	(0.077)
OPE	0.044**	0.044**	-0.055**	-0.054**	-0.001	-0.001	0.001***	0.001***	-0.002	-0.001	0.118	0.119	-0.006*	-0.006*	0.005***	0.005***
	(0.019)	(0.019)	(0.023)	(0.023)	(0.001)	(0.000)	(0.000)	(0.000)	(0.008)	(0.008)	(0.171)	(0.171)	(0.004)	(0.004)	(0.001)	(0.001)
LogTA	0.007	0.007	0.215**	0.209**	-0.002	-0.002	0.005	0.005	-0.007	-0.007	-0.458	-0.451	0.004	0.003	-0.009	-0.009
	(0.021)	(0.021)	(0.089)	(0.090)	(0.005)	(0.005)	(0.010)	(0.010)	(0.032)	(0.032)	(0.435)	(0.438)	(0.068)	(0.067)	(0.015)	(0.015)
Lending Rate	0.012	0.011	0.013	0.009	0.001	0.001	-0.000	-0.001	-0.001	-0.000	-0.126	-0.122	-0.009	-0.009	0.010***	0.010***
	(0.018)	(0.018)	(0.045)	(0.045)	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.007)	(0.212)	(0.211)	(0.008)	(0.008)	(0.002)	(0.002)
GDPGrowth	0.031**	0.030**	0.059*	0.059*	0.001	0.001	-0.001	-0.001	-0.001	-0.001	0.032	0.026	-0.001	-0.001	0.003**	0.003*
	(0.015)	(0.015)	(0.033)	(0.033)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.099)	(0.101)	(0.006)	(0.006)	(0.002)	(0.002)
CVInflation	0.001	0.001	0.003	0.003	0.001	0.001	-0.001	-0.001	0.001	0.001	-0.005	-0.005	0.001	0.001	-0.001***	-0.001***
	(0.000)	(0.000)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)
Political	0.208		-1.655		-0.028**		-0.002		0.335		-2.713		-0.032		-0.095**	
	(0.290)		(1.065)		(0.011)		(0.008)		(0.396)		(3.585)		(0.219)		(0.046)	
Legal		0.443		0.404		0.005		0.002		-0.133		-7.783*		0.073		-0.230*
		(0.471)		(1.161)		(0.012)		(0.013)		(0.144)		(4.248)		(0.346)		(0.120)
Obs.	6,493	6,493	5,508	5,508	6,493	6,493	5,508	5,508	5,965	5,965	5,994	5,994	4,375	4,375	5,499	5,499
No. of BankID	506	506	506	506	506	506	506	506	506	506	506	506	504	504	506	506
AR2	0.22	0.22	0.80	0.82	0.54	0.50	0.18	0.18	0.27	0.27	0.92	0.92	0.30	0.30	0.11	0.11
Sagan Test	17.86	17.63	22.29	22.35	7.74	8.66	35.18	35.12	10.43	10.35	15.76	15.78	20.59	20.75	7.72	7.72
Sagan P. Value	0.12	0.13	0.32	0.32	0.80	0.73	0.23	0.23	0.40	0.40	0.10	0.11	0.15	0.14	0.56	0.56

Table 4.13a shows the estimation of implementation of market discipline principle on banks' performance and stability. Panel A indicates measures of performance, which include net interest margin (NIM), Pretax profit (PreTaxP) and return on asset (ROA), while B specifies measures of stability, including Equity ratio (EQR), Nonperforming loan (NPLTL), Liquidity ratio, Z-Index and measure of competition (H-Stat). NIM and ROA are at lag of 1, while others are in the lags of 2, except Z-Index which is in the lag of 3. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.13b: GMM analysis of Emerging market Countries that implemented Market Discipline Principle

	Panel A: Performance Measures								**Panel B: Stability Measures**							
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
DummyMkD	0.281**	0.269**	-0.862***	-0.890***	-0.000	-0.001	-0.004**	-0.004**	-0.006	-0.005	0.165	0.144	-0.105	-0.103	0.044**	0.048**
	(0.131)	(0.134)	(0.298)	(0.298)	(0.001)	(0.001)	(0.002)	(0.002)	(0.033)	(0.033)	(0.572)	(0.553)	(0.066)	(0.066)	(0.021)	(0.022)
H-Stat	-0.400	-0.388	-1.194**	-1.166**	0.026**	0.023*	0.030**	0.030**	0.442**	0.427**	-5.061*	-4.923*	-0.150*	-0.148*		
	(0.265)	(0.263)	(0.486)	(0.488)	(0.013)	(0.012)	(0.013)	(0.013)	(0.212)	(0.214)	(2.865)	(2.821)	(0.091)	(0.091)		
CAPR	-0.000	-0.001	0.021**	0.021**	0.000	0.000	0.001***	0.001***	0.000	-0.000	0.092	0.097	0.002*	0.002*	0.001	0.001
	(0.010)	(0.010)	(0.009)	(0.009)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.250)	(0.251)	(0.001)	(0.001)	(0.000)	(0.000)
INTL	0.002	0.002	0.019*	0.018*	0.001	0.001	-0.000	-0.000	0.007	0.006	2.128***	2.061***	0.002	0.002	0.005*	0.005*
	(0.005)	(0.005)	(0.011)	(0.011)	(0.001)	(0.001)	(0.000)	(0.000)	(0.008)	(0.008)	(0.721)	(0.722)	(0.002)	(0.002)	(0.003)	(0.003)
TLTA	1.196	1.245	-0.769	-0.891	-0.069*	-0.075*	0.049	0.048	0.017	0.003	-7.817	-7.428	-0.100	-0.106	0.322***	0.333***
	(1.031)	(1.036)	(1.448)	(1.450)	(0.040)	(0.039)	(0.031)	(0.031)	(0.193)	(0.194)	(7.354)	(7.394)	(0.248)	(0.249)	(0.081)	(0.078)
OPE	0.046**	0.045**	-0.049**	-0.048**	-0.001	-0.001	0.001***	0.001***	-0.019**	-0.017**	0.090	0.087	-0.006*	-0.006*	0.005***	0.005***
	(0.020)	(0.020)	(0.023)	(0.023)	(0.001)	(0.001)	(0.001)	(0.001)	(0.008)	(0.008)	(0.178)	(0.177)	(0.003)	(0.003)	(0.001)	(0.001)
LogTA	0.009	0.010	0.125**	0.121**	-0.003	-0.003	0.004	0.003	-0.009	-0.007	-0.151	-0.142	0.024	0.022	-0.007	-0.006
	(0.021)	(0.022)	(0.060)	(0.060)	(0.005)	(0.005)	(0.010)	(0.010)	(0.031)	(0.032)	(1.164)	(1.159)	(0.026)	(0.025)	(0.020)	(0.020)
Lending Rate	0.014	0.012	-0.007	-0.011	0.001	-0.001	-0.001	-0.001	-0.006	-0.006	0.242	0.232	-0.005	-0.005	0.013***	0.013***
	(0.018)	(0.018)	(0.054)	(0.053)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.006)	(0.173)	(0.170)	(0.007)	(0.007)	(0.003)	(0.003)
GDPGrowth	0.031**	0.030**	0.050	0.051	0.001	0.001	-0.001	-0.001	0.001	0.001	0.040	0.041	-0.002	-0.002	0.002	0.001
	(0.015)	(0.015)	(0.033)	(0.033)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.004)	(0.050)	(0.053)	(0.005)	(0.005)	(0.002)	(0.002)
CVInflation	0.001	0.001	0.002***	0.002***	0.001	0.001	-0.001	-0.000	-0.001	-0.001	-0.007	-0.007	0.001	0.001	-0.001***	-0.001***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.010)	(0.010)	(0.001)	(0.001)	(0.001)	(0.001)
Political	0.242		-1.269		-0.027***		-0.002		-0.022		-0.052		-0.116		0.000	
	(0.309)		(1.085)		(0.010)		(0.008)		(0.100)		(2.295)		(0.202)		(0.059)	
Legal		0.502		1.451		0.006		0.004		-0.017		0.713		0.007		-0.183
		(0.498)		(1.242)		(0.012)		(0.014)		(0.153)		(3.201)		(0.295)		(0.124)
Obs.	5,833	5,833	5,391	5,391	5,833	5,833	4,950	4,950	5,356	5,356	4,941	4,941	4,381	4,381	4,493	4,493
No. of BankID	455	455	455	455	455	455	455	455	455	455	455	455	453	453	454	454
AR2	0.22	0.22	0.18	0.19	0.50	0.45	0.19	0.19	0.41	0.41	0.75	0.75	0.56	0.57	0.95	0.96
Sagan Test	18.22	17.92	15.20	15.36	8.47	9.53	35.17	35.07	23.26	22.31	11.06	10.58	11.41	11.54	7.08	7.00
Sagan P. Value	0.11	0.12	0.17	0.16	0.74	0.65	0.23	0.23	0.38	0.44	0.19	0.22	0.17	0.17	0.42	0.42

Table 4.13b shows effects of market discipline implementation in e**merging market economies only**. Panel A indicates measures of performance, which include net interest margin (NIM), Pretax profit (PreTaxP) and return on asset (ROA), while B specifies measures of stability, including Equity ratio (EQR), Nonperforming loan (NPLTL), Liquidity ratio, Z-Index and measure of competition (H-Stat). NIM and ROA are in lags of 1, while others are in the lags of 2, except Z-Index and H-Stat, which are in the lags of 3. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.13c: GMM analysis of Developed market countries that implemented Market Discipline Principle

	Panel A: Performance Measures								Panel B: Stability Measures							
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
DummyMkD	-0.094**	-0.087**	-1.718**	-0.848	-0.004***	-0.004***	0.021***	0.017***	0.008	0.008	0.218***	0.175**	-0.162***	-0.225***	0.011	0.020
	(0.042)	(0.044)	(0.773)	(0.952)	(0.001)	(0.001)	(0.006)	(0.006)	(0.009)	(0.008)	(0.078)	(0.089)	(0.058)	(0.061)	(0.026)	(0.030)
H-Stat	-0.228**	-0.192	-5.212***	-5.064***	-0.004***	-0.005***	-0.017*	-0.021**	0.176***	0.204***	0.535***	0.425***	-0.482***	-0.472***		
	(0.113)	(0.121)	(1.290)	(1.306)	(0.002)	(0.002)	(0.010)	(0.010)	(0.052)	(0.062)	(0.102)	(0.128)	(0.092)	(0.092)		
CAPR	0.006	0.009	0.141***	0.131***	-0.001	-0.001	0.015***	0.014***	0.003***	0.003***	-0.043***	-0.040***	0.002	0.003	0.001	0.002
	(0.006)	(0.006)	(0.053)	(0.049)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.005)	(0.002)	(0.002)
INTL	0.002***	0.002***	-0.001	-0.001	0.001***	0.001***	0.001***	0.001***	0.001	0.001	-0.001	0.001	-0.001	-0.001	-0.000***	-0.000***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
TLTA	-0.260	-0.251	0.225	0.327	0.004	0.005*	-0.184***	-0.183***	-0.065	-0.072*	-0.086	-0.033	-0.636***	-0.494**	-0.045	-0.112
	(0.171)	(0.189)	(1.479)	(1.512)	(0.003)	(0.003)	(0.033)	(0.031)	(0.042)	(0.044)	(0.164)	(0.130)	(0.216)	(0.232)	(0.134)	(0.127)
OPE	0.045***	0.040***	-0.013	-0.002	-0.001	0.001	0.003***	0.003***	-0.001	-0.001	0.016**	0.015***	-0.022*	-0.021*	0.023	0.018
	(0.015)	(0.014)	(0.206)	(0.195)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.004)	(0.007)	(0.005)	(0.013)	(0.013)	(0.018)	(0.018)
LogTA	-0.031*	-0.028*	-2.477**	-2.437**	0.001	0.001	-0.011**	-0.011**	-0.017	-0.022	0.112***	0.069*	-0.040	-0.013	-0.141*	-0.144**
	(0.016)	(0.016)	(0.986)	(0.990)	(0.000)	(0.000)	(0.005)	(0.004)	(0.020)	(0.020)	(0.040)	(0.040)	(0.076)	(0.070)	(0.074)	(0.071)
Lending Rate	0.020	0.017	-0.275	-0.411	-0.001	-0.001	0.005***	0.005***	-0.001	0.000	-0.084***	-0.070**	0.022	0.043	-0.034**	-0.037**
	(0.025)	(0.026)	(0.263)	(0.269)	(0.000)	(0.000)	(0.002)	(0.002)	(0.004)	(0.004)	(0.026)	(0.028)	(0.028)	(0.027)	(0.016)	(0.017)
GDPGrowth	0.018*	0.015	0.219	0.350*	0.001**	0.001**	-0.003***	-0.004***	0.000	-0.000	0.023***	0.023***	0.008	-0.003	0.039***	0.036***
	(0.009)	(0.010)	(0.216)	(0.204)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.008)	(0.011)	(0.012)	(0.006)	(0.006)
CVInflation	0.001**	0.001**	-0.010	-0.007	-0.001	-0.001	0.001***	0.002***	0.001**	0.002***	0.001**	0.001	-0.003**	-0.003**	0.001	0.001
	(0.000)	(0.000)	(0.013)	(0.015)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Political	0.080		-6.778		-0.002		-0.009		0.032		0.345*		-0.464		0.564***	
	(0.252)		(5.954)		(0.004)		(0.016)		(0.034)		(0.184)		(0.380)		(0.203)	
Legal		0.063		-16.31**		-0.001		0.100***		0.031		-0.452**		0.902*		0.141
		(0.350)		(6.357)		(0.004)		(0.028)		(0.048)		(0.181)		(0.506)		(0.336)
Obs.	660	660	558	558	609	609	660	660	507	507	660	660	547	547	558	558
No. of BankID	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
AR2	0.70	0.62	0.99	0.87	0.72	0.71	0.40	0.40	0.37	0.36	0.23	0.23	0.95	0.96	0.19	0.19
Sagan Test	17.19	17.81	7.31	7.15	13.71	14.82	30.15	31.05	11.19	11.82	17.89	13.50	35.98	37.56	14.86	15.03
Sagan P. Value	0.14	0.12	0.60	0.62	0.18	0.13	0.17	0.15	0.13	0.11	0.11	0.33	0.20	0.16	0.13	0.13

Table 4.13c shows effects of market discipline implementation in **developed market economies only**. Panel A indicates measures of performance, which include net interest margin (NIM), Pretax profit (PreTaxP) and return on asset (ROA), while B specifies measures of stability, including Equity ratio (EQR), Nonperforming loan (NPLTL), Liquidity ratio, Z-Index and measure of competition (H-Stat). NIM, equity and liquidity ratios ROA are in lags of 1, while others are in the lags of 2. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

4.9. Factors that determine implementation of market discipline principle

Market discipline principle is the third pillar of Basel II capital accord, whereby banks are required to disclose relevant information to allow market participants assess the soundness and stability of banks. According to Financial Stability Institute Report (FSI), as at July 2014 some emerging market and low income countries were still cautious about implementing Basel II (FSI 2014). Research shows that some countries were not able to implement the Basel II capital accord due to lack of technical and human resources necessary for the policy implementation (Gottschalt and Griffith-Jones 2006, Cornford 2006a, b). However, the Basel II capital accord is the financial regulation housing the market discipline principle which is our focus in this chapter.

In this section, using panel logistic regression model to test hypothesis three, we seek to understand other factors (both country and bank-specific) besides technical and human skills that determine the likelihood of adopting or implementing the market discipline principle in emerging market countries. Logistic regression is applied due to the fact that the dependent variable in this model is a dichotomous variable, with value of 1/0 if a country has adopted/has not adopted market discipline principle, respectively. The estimation is reported in odd ratios, which is the appropriate reporting of coefficients in logistic regression. Odd ratios are used to interpret the likelihood of an event or an outcome occurring; in other words, the likelihood of moving from 0 to 1. In logistic regression, if an odd ratio equals 1, it indicates that independent variable does affect the odd (probability) of the dependent variable occurring. Where odd ratio is >1, it indicates that the independent variable reflects higher/lesser odds of outcome of the dependent variable, respectively.

From Table 4.14, country-specific variables we intuitively considered to affect implementation of market discipline include: a country's real interest rate (RIntR), coefficient of variation of inflation (CVInflation), which measures the variability of inflation in an economy; GDP growth; standard deviation of exchange rate (StdEx), which measures a country's extent of trade with other countries; political; and legal institutions. We find that among these country-specific factors, interest rate, openness to trade (StdEx), political, and legal institutions significantly influence implementation of market discipline. However, openness to trade is associated with highest odds of implementing market discipline compared to other country-specific factors.

From bank-specific factors, size of banks, measured as logarithm of total asset (LogTA), has the highest influence on the likelihood of implementing market discipline, followed by availability of

subordinated debt (DummySubD) in a bank's balance sheet, liquidity status of the bank, and regulatory capital ratio (CAPR). While bank stability, measured as Z-Index, significantly affects the likelihood of implementation of market discipline, performance (NIM) does not affect the likelihood of market discipline implementation. The more stable a bank is, the more likely the bank will decide to implement market discipline principle. Competition in the banking industry (H-Stat) also influences the likelihood of implementation of market discipline, though with lesser odd ratio than the other important bank-specific factors mentioned above.

Table 4.14: Factors that affect implementation of market discipline in emerging market economies

Variables	**Dependent Variable: Dummy of implementation of market discipline**			
	Emerging market		**Overall Sample**	
Models	**(1)**	**(2)**	**(3)**	**(4)**
H-Stat	0.331***(0.107)	0.325***(0.105)	0.355***(0.113)	0.345***(0.109)
NIM	1.022(0.027)	1.026(0.026)	1.023(0.028)	1.027(0.027)
LogZ-Index	1.172**(0.078)	1.163**(0.077)	1.163**(0.07)	1.152**(0.075)
CAPR	1.022***0.004)	1.022***0.004)	1.022***0.004)	1.023***0.004)
Liquidity Ratio	1.002***(0.005)	1.002***(0.004)	1.002***(0.005)	1.002***(0.004)
LogTA	225.63***(50.55)	222.09***(49.67)	226.65***(57.55)	253.55***(56.71)
DummyOutSh	5.967(7.428)	4.434(5.375)	6.324(7.959)	4.517(5.510)
DummySubD	2.506***(0.834)	2.961***(0.982)	2.454***(0.824)	2.934***(0.981)
SINREG	0.000(0.0003)	0.000(0.006)	0.000(0.0003)	0.000(0.001)
Real IntRate	0.955***(0.010)	0.946***(0.010)	0.955***(0.010)	0.946***(0.010)
CVInfla	0.996(0.003)	0.998(0.003)	0.998(0.003)	0.999(0.003)
GDPGrowth	1.005(0.024)	0.988(0.023)	1.004(0.024)	0.984(0.023)
StdvEx	1.009***(0.001)	1.009***(0.001)	1.009***(0.001)	1.009***(0.001)
Political	0.029***(0.014)		0.027***(0.014)	
Legal		0.061***(0.048)		0.089***(0.070)
Obs.	5568	5568	5764	5764
No of groups	412	412	426	426
Chi^2	3678.11***	3638.98***	3867.19***	3823.82***
Log Likelihood	-700.87	-720.44	-720.31	-742.00
Hausman Ch^2 (P. Value	68.74 (0.0000)	66.07 (0.0001)	80.57 (0.0000)	70.49 (0.0001)

Table 4.14 details result of factors that affect implementation of market discipline, using logistic regression model. The dependent variable is a dummy variable of implementing market discipline. The independent variables include banks and country-specific factors that could intuitively affect market discipline implementation. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

4.10. Further Robustness check of effective identification using Difference-in-Differences

To check for robustness of market discipline implementation effects in emerging market economies, we apply difference-in-differences (DID) technique, which was fully described in chapter 3 of this study. DID is a form of event study estimation technique that captures the effect of implementing a policy/ regulation/ treatment, by taking into account a separate group that implemented a policy, while comparing it with a group or sample that did not implement that policy. The group that implemented a policy is regarded as participating or treatment group, while the non-implemented group is the control group. The major essence of DID is to compare the changes in the outcome of the treatment and control groups over time relative to the observed outcomes for the period before the policy implementation.

4.10.1. Propensity score matching (PSM)

For an effective DID estimation, the treatment and control groups should exhibit similar features; to ensure such similarity, propensity score method is usually applied. In this study, we apply propensity score matching (PSM) method. PSM compares the treatment and control groups by modelling the probability of implementing or not implementing the policy based on features not affected by the policy under review. PSM is used to reduce the impact of treatment-selection bias in the DID estimations because matched groups using PSM are on average, more similar than groups selected randomly (d'Agostino 1998, Austin 2008, 2011). In PSM the treated and control groups could be in the form of one-to-one, one-to-many, or many-to-many. In this study we employed one-to-many and many-to-many approaches. More importantly, in PSM, the null is a test of the hypothesis of no difference between the treated and control groups. With a significant P-Value, it indicates that the two groups are not similar, therefore cannot be compared based on policy implementation effect.

Table 4.15 details the result of the PSM. We compared the treatment and control groups using features of financial development, which includes market capitalization, domestic credit to private sectors and coefficient variation of inflation (CVInflation) of each country. Market capitalization (MKTCAP) and domestic credit to private sector (DCrP) are standardized as percentage of GDP. Theoretically, these three variables are not in any way affected by implementing or not implementing market discipline principle of Basel II, which is the policy under review in this study.

To ensure effective robustness checks, we had two treatment groups that implemented market discipline principle in different years. The first treatment group in this estimation is Brazil, which implemented market discipline principle in 2006; therefore 2006 is the treatment dependent variable with values of 1 for Brazil and 0 for the control group. The second treatment group includes China, Morocco and Philippine; these three countries implemented market discipline principle in 2007, therefore 2007 is the treatment dependent variable with values of 1 for China, Morocco, and Philippine and 0 for the control group. The control group is made of 8 countries that did not implement market discipline in 2006 and did not implement in five subsequent years. They include Chile, Colombia, Egypt, Indonesia, Nigeria, Peru, Russia, and Zambia.

Table 4.15: Propensity-Score matching (PSM)

Treatment groups	**Brazil**		**China, Morocco, and Philippines**
Models	**(1)**	**(2)**	**(3)**
Dependent variable	MKTCAP	CVInflation	CVInflation
Treatment independent variables	CVInflation and average of MKTCAP and DCrP	DCrP	DCrP
Treatment dependent variable	Policy implementation (1 vs 0)	Policy implementation (1 vs 0)	Policy implementation (1 vs 0)
Coefficients	0.129	-0.325	5.284
Robust Standard Errors	0.991	1.071	11.478
Z-Statistics	0.13	-0.30	0.46
P. Values	0.897	0.762	0.645
Number of Observations	4305	4305	4350

Table 4.15 explains the result of PSM using treatment logit model on two treatment groups separately used in the study. Models 1 and 2 are PSM results for Brazilian banks as a treatment group, while model 3 is the result for Chinese, Moroccan, and Philippine banks collectively used as treatment group. The insignificant P-Values of the treatment dependent variables indicate that treatment and control groups are similar and could be used to estimate the actual effects of implementing market discipline principle in the emerging market countries used in the sample.

4.10.2. Estimation of difference-in-differences (DID) in emerging market economies

From Table 4.16a (DID estimation, using Brazil as participating group, with implementation date of 2006), the positive coefficients of the dummy variable of treatment implies that bank performance (NIM) improved in Brazil in the year of implementation of market discipline principle. This confirms the result in Table 4.13b (panel A, models 1 and 2), where the dummy variable of market discipline implementation significantly improved emerging market performance (NIM). Another confirmation is recorded in Table 4.9c (model 1), where NIM significantly increased in year of market discipline implementation (MDt) in emerging market countries.

Another noteworthy result is the negative coefficients of interaction effects (Treatment*Post Policy period), which indicate that performance of emerging market banks reduced in the subsequent years following the year of implementation of market discipline principle. This reduction effect remains, even after introducing bank and country-specific variables that could also affect bank performance. This result confirms the result of evolution of performance variables over the period of market discipline implementation in Table 4.9c (model 1), where NIM recorded negative coefficients in all the subsequent years (MDtplus1 through MDtplus5) following year of implementation.

A similar trend is noted for return on assets (ROA) as a measure of performance (Table 4.16b); dummy variable of treatment significantly reduces ROA, especially when bank and country-specific factors are included in the models. This result is also consistent with results in Table 4.13b (panel A, models 5 and 6) where dummy variable of market discipline implementation reduced emerging market banks' ROA, though not significant. The interaction effect (Treatment*Post Policy period) also follows the trend of the evolution of ROA in Table 4.9c (model 3), where ROA recorded positive coefficients in periods 1 and 2 (Mdtplus1 and MDtplus2), became negative in period 3, later turned to positive in periods 4 and 5. In the DID estimation, ROA follows exactly the same trend wherein interaction effect (Treatment*Post Policy period) significantly increased in post policy period 1 and 2, reduced in period 3 and eventually increased in periods 4 and 5.

According to the principles of DID, the actual impact of a policy/intervention is the incremental effect of coefficients of the interaction term between post policy participating variables and time; i.e., Treatment*Post Policy period (Puhani 2012). From the above results (evolution and robustness estimation results), we posit that, effects of market discipline especially on emerging market economies' bank performance, takes a gradual process but reaches its peak between two and three years after market discipline principle implementation. We assume that such gradual changes, either positive or negative reflect any underlining measures banks put in place to regularize the effect of the policy implementation. Such measures could be positive or negative; positive being whereby banks abide by and accept discipline from different perspectives of market discipline (or stakeholders) and reduce level of exposure to instability risk. The measure could as well be negative in the sense that with the opaque nature of banks, they could engage in regulatory arbitrage by disclosing only information that could impact positively on performance and stability.

Looking at stability measures in Table 4.16c, focusing on equity ratio (EQR), the dummy variable of treatment significantly reduces EQR, which is a confirmation of the results in Tables 4.13b (Panel B), where EQR is significantly reduced by the dummy variable of market discipline implementation. The interaction effects effect (Treatment*Post Policy period) recoded fluctuating coefficients from period 1 to period 5, but significantly increased EQR in period 5, all of which is consistent with evolution of EQR of emerging market economies in Table 4.9c (model 4).

From the Z-Index perspective, as a measure of stability (Table 4.16d), the dummy variable of treatment has no significant effect on Z-Index (though with positive coefficients). This particular result is inconsistent with the effect of the dummy variable on market discipline implementation in Table 4.13b (models 13 and 14), which decreased Z-index, though not significantly. Interestingly, the interaction effect followed exactly the same trend as the evolution of Z-Index in Table 4.9c, whereby Z-Index is significantly reduced in periods 1 and 3, whereas every other period recorded insignificant incremental effect.

For further check, we carried out another DID estimation, whereby China, Morocco and Philippines, are used as participating group, with 2007 as market discipline implementation date (see Tables 4.17a, b, c and d). The results are quite similar to those of Brazil, and together they confirm the effects of market discipline implementation in emerging market banks. An interesting finding from the second DID estimation lies in the dummy variable of treatment variable. While the dummy variable of treatment has no significant effect on Z-Index when Brazil is used as participating group, it significantly reduces Z-Index when China, Morocco, and Philippines are the treated group. The later result is consistent with the effect of the dummy variable of market discipline implementation on Z-Index in Table 4.13b (models 13 and 14), where Z-Index is reduced by market discipline implementation, though marginally significantly.

These results from this further robustness check, also confirm our previous results from GMM analysis, which suggest that market discipline has differential effects on different measures of performance, of which we found that the actual effect of market discipline implementation (Treatment*Post Policy period) is more favorable to ROA compared to NIM, while the dummy variable of treatment (which represent effects of market discipline on the exact year of implementation), is more favorable to NIM than to ROA.

Table 4.16a: DID estimation of emerging market bank performance (NIM), due to implementation of market discipline, using Brazil as treatment group

Variables	**NIM**														
Models	**Post policy Period 1**			**Post policy Period 2**			**Post policy Period 3**			**Post policy Period 4**			**Post policy Period 5**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Treatment	5.779***	2.363***	2.319***	6.313***	4.242***	4.078***	4.831***	3.533***	3.705***	6.864***	5.385***	5.060***	6.541***	3.697***	3.277***
	(0.269)	(0.643)	(0.678)	(1.177)	(1.246)	(1.316)	(0.577)	(1.062)	(1.099)	(1.233)	(1.483)	(1.514)	(1.110)	(1.131)	(1.161)
Post Policy Periods	0.100	0.035	0.025	0.483***	0.319***	0.307***	0.083	0.025	0.034	-0.007	-0.002	0.014	0.083	0.019	0.028
	(0.066)	(0.124)	(0.125)	(0.112)	(0.111)	(0.108)	(0.082)	(0.109)	(0.107)	(0.089)	(0.098)	(0.098)	(0.085)	(0.082)	(0.081)
Treatment*Post	-0.245***	-0.794**	-0.856***	-1.679***	-1.903***	-1.965***	-0.579***	-0.856***	-0.980***	-0.830***	-1.320***	-1.343***	-0.509**	-1.013***	-1.073***
Policy Periods	(0.067)	(0.341)	(0.328)	(0.373)	(0.429)	(0.418)	(0.199)	(0.329)	(0.322)	(0.228)	(0.281)	(0.283)	(0.228)	(0.256)	(0.249)
H-Stat		-0.086	-0.110		-0.222	-0.201		-0.178	-0.135		-0.354	-0.303		-0.196	-0.158
		(0.238)	(0.240)		(0.345)	(0.349)		(0.332)	(0.339)		(0.352)	(0.356)		(0.334)	(0.338)
CAPR		-0.000	0.002		-0.005	-0.005		-0.003	-0.005		-0.002	-0.003		-0.003	-0.005
		(0.009)	(0.009)		(0.011)	(0.011)		(0.011)	(0.011)		(0.011)	(0.011)		(0.011)	(0.011)
INTL		-0.003	-0.003		-0.001	-0.001		-0.002	-0.002		-0.002	-0.003		0.001	0.001
		(0.006)	(0.006)		(0.005)	(0.005)		(0.005)	(0.005)		(0.006)	(0.006)		(0.005)	(0.005)
TLTA		0.152	0.272		1.034	0.816		0.920	0.827		1.135	0.842		1.132	0.775
		(0.860)	(0.920)		(1.169)	(1.178)		(1.138)	(1.163)		(1.158)	(1.171)		(1.118)	(1.141)
OPE		0.026**	0.027**		0.031**	0.032**		0.031**	0.030**		0.033**	0.031**		0.030**	0.028**
		(0.013)	(0.013)		(0.014)	(0.014)		(0.014)	(0.014)		(0.014)	(0.014)		(0.014)	(0.014)
Log2TA		0.054*	0.050		0.062	0.061		0.068*	0.069*		0.063	0.061		0.068*	0.065
		(0.032)	(0.032)		(0.039)	(0.040)		(0.038)	(0.039)		(0.040)	(0.040)		(0.040)	(0.041)
Lending Rate		0.047***	0.048***		0.040***	0.042***		0.047***	0.047***		0.029**	0.031**		0.056***	0.057***
		(0.012)	(0.012)		(0.013)	(0.013)		(0.013)	(0.013)		(0.014)	(0.014)		(0.013)	(0.013)
GDPGrowth		0.031**	0.032**		0.027*	0.027*		0.022	0.020		0.024	0.026		0.031*	0.033*
		(0.015)	(0.015)		(0.017)	(0.017)		(0.015)	(0.015)		(0.018)	(0.018)		(0.018)	(0.018)
CVInflation		0.002	0.002		0.002	0.002		0.002	0.003		0.003	0.002		0.002	0.002
		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)
Political		0.249			0.035			0.533			0.629			0.576	
		(0.426)			(0.498)			(0.451)			(0.449)			(0.451)	
Legal			0.052			-0.403			-0.330			0.012			0.268
			(0.444)			(0.548)			(0.566)			(0.524)			(0.537)
Observations	4,018	3,320	3,320	4,018	3,320	3,320	4,018	3,320	3,320	4,018	3,320	3,320	4,018	3,320	3,320
No. of BankID	287	244	244	287	244	244	287	244	244	287	244	244	287	244	244
AR2	0.53	0.38	0.38	0.56	0.42	0.42	0.56	0.40	0.40	0.54	0.41	0.41	0.52	0.39	0.39
Sagan Test	113.99	33.69	35.09	18.85	24.77	25.94	32.61	24.94	26.37	18.75	23.07	24.79	18.78	24.27	25.74
Sagan P. Value	0.19	0.57	0.51	0.75	0.41	0.35	0.63	0.40	0.33	0.76	0.51	0.41	0.76	0.44	0.36

Table 4.16a details the result of DID estimation of the effect of market discipline implementation of banks performance, measured as net interest margin (NIM) which is at lag of 1. The treatment group in this estimation is **Brazil** that implemented market discipline in **2006**. Treatment represents the dummy of the implementing market discipline principle, while Treatment*Post Policy Periods represents the impact of implementing market discipline on the dependent variable. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.16b: DID estimation of emerging market bank performance (ROA), due to implementation of market discipline, using Brazil as treatment group

Variables	**ROA**														
Models	**Post policy Period 1**			**Post policy Period 2**			**Post policy Period 3**			**Post policy Period 4**			**Post policy Period 5**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Treatment	0.030	-0.011*	-0.016**	0.022***	-0.020	-0.042**	0.033***	-0.016	-0.039**	0.016*	-0.031*	-0.027	0.031***	-0.027*	-0.024
	(0.019)	(0.007)	(0.007)	(0.007)	(0.019)	(0.019)	(0.006)	(0.019)	(0.019)	(0.010)	(0.017)	(0.018)	(0.005)	(0.017)	(0.017)
Post Policy Periods	0.003**	0.002*	0.002*	-0.001	-0.005***	-0.006***	0.000	0.001	0.002	0.000	-0.002	-0.002	-0.001*	-0.002*	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Treatment*Post	-0.001	0.005	0.006*	0.003*	0.009***	0.010***	-0.002***	-0.004	-0.003	0.001	0.003	0.003	0.002	0.005*	0.005*
Policy Periods	(0.003)	(0.004)	(0.004)	(0.002)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)
H-Stat		-0.011***	-0.012***		0.001	-0.001		0.000	-0.001		-0.009**	-0.009**		-0.009**	-0.009**
		(0.004)	(0.004)		(0.005)	(0.005)		(0.005)	(0.005)		(0.004)	(0.004)		(0.004)	(0.004)
CAPR		-0.001	-0.001		-0.001	-0.001		-0.001	-0.001*		-0.001	-0.001		-0.001	-0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
INTL		0.001	0.001*		0.001	0.001		0.001	0.001		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
TLTA		-0.008	-0.010		-0.058***	-0.048***		-0.068***	-0.057***		0.007	0.009		0.010	0.013
		(0.008)	(0.008)		(0.016)	(0.016)		(0.015)	(0.015)		(0.014)	(0.014)		(0.015)	(0.015)
OPE		-0.001	-0.001		-0.002***	-0.002***		-0.001***	-0.001***		-0.001	-0.001		-0.001	-0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
LogTA		-0.001	-0.001		-0.008***	-0.010***		-0.006**	-0.008***		-0.002	-0.003		-0.003	-0.003
		(0.002)	(0.002)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)
Lending Rate		0.001***	0.001***		0.001	0.001		0.001	0.001		0.001**	0.001**		0.001**	0.001*
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
GDPGrowth		0.001	0.001		-0.001	-0.001		-0.001	-0.001		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
CVInflation		0.001	-0.001		0.001	0.001*		0.001	0.001		0.001	0.001		-0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Political		-0.010**			-0.003			-0.006			-0.003			-0.004	
		(0.004)			(0.005)			(0.005)			(0.006)			(0.006)	
Legal			-0.005			0.030***			0.026***			-0.008			-0.009
			(0.006)			(0.009)			(0.008)			(0.009)			(0.009)
Observations	3,731	2,856	2,856	3,731	3,320	3,320	3,731	3,320	3,320	3,731	2,856	2,856	3,444	2,856	2,856
Number of BankID	287	243	243	287	244	244	287	244	244	287	243	243	287	243	243
AR2	0.18	0.65	0.64	0.35	0.83	0.82	0.22	0.83	0.81	0.21	0.24	0.24	0.80	0.24	0.25
Sagan Test	29.27	37.64	39.24	39.77	32.14	29.14	55.36	33.09	30.52	26.29	24.07	24.02	50.58	24.01	24.33
Sagan P. Value	0.13	0.15	0.12	0.22	0.12	0.21	0.13	0.11	0.16	0.23	0.19	0.19	0.14	0.19	0.18

Table 4.16b details the result of DID estimation of the effect of market discipline implementation of banks performance, measured as Return on Assets margin (ROA), which is at lag of 1in post policy periods 2 and 3, but at lags of 3 in others. The treatment group in this estimation is **Brazil** that implemented market discipline in **2006**. Treatment represents the dummy of the implementing market discipline principle, while Treatment*Post Policy Periods represents the impact of implementing market discipline on the dependent variable. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.16c: DID estimation of emerging market bank stability (EQR), due to implementation of market discipline, using Brazil as treatment group

VARIABLES	EQR														
Models	**Post policy Period 1**			**Post policy Period 2**			**Post policy Period 3**			**Post policy Period 4**			**Post policy Period 5**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Treatment	-0.194***	-0.080***	-0.096***	-0.191***	-0.075***	-0.091***	-0.295***	-0.034***	-0.058***	-0.350***	-0.075***	-0.057	-0.104**	-0.066***	-0.081***
	(0.055)	(0.016)	(0.015)	(0.054)	(0.015)	(0.015)	(0.030)	(0.012)	(0.013)	(0.037)	(0.015)	(0.038)	(0.044)	(0.016)	(0.016)
Post Policy Periods	0.006*	0.006*	0.004	-0.007**	-0.005**	-0.006***	0.005***	-0.002	-0.002	0.002	0.002	0.002	-0.004	-0.000	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Treatment*Post	-0.006	0.005	0.006	0.000	0.003	0.003	0.000	0.001	0.004	-0.001	-0.001	-0.000	0.016**	0.019***	0.018***
Policy Periods	(0.006)	(0.005)	(0.005)	(0.005)	(0.003)	(0.004)	(0.001)	(0.003)	(0.003)	(0.001)	(0.003)	(0.007)	(0.008)	(0.004)	(0.004)
H-Stat		0.032***	0.034***		0.031***	0.033***		0.033***	0.035***		0.030***	0.054***		0.031***	0.032***
		(0.006)	(0.005)		(0.006)	(0.005)		(0.005)	(0.005)		(0.005)	(0.012)		(0.006)	(0.005)
CAPR		0.001***	0.001***		0.001***	0.001***		0.002***	0.002***		0.001***	0.001***		0.001***	0.001***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
INTL		-0.001***	-0.001***		-0.001***	-0.001***		-0.001	-0.001		-0.001***	-0.001**		-0.001***	-0.001***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
TLTA		0.059***	0.062***		0.060***	0.062***		0.065***	0.062***		0.058***	0.052*		0.059***	0.060***
		(0.014)	(0.013)		(0.014)	(0.014)		(0.011)	(0.012)		(0.014)	(0.031)		(0.014)	(0.013)
OPE		0.001	0.001		0.001	0.001		0.001***	0.001***		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
LogTA		-0.004*	-0.003		-0.003	-0.003		-0.003	-0.004*		-0.004*	-0.008		-0.004*	-0.004*
		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.008)		(0.002)	(0.002)
Lending Rate		0.001	0.001		0.001	-0.001		-0.001	-0.001		0.001	-0.001		-0.001	-0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
GDPGrowth		0.001	0.001		0.001*	0.001*		-0.000	-0.000		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
CVInflation		0.001	0.001		0.001	-0.001		-0.001	-0.001		0.001	-0.001		0.001	-0.000
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Political		-0.012			-0.010			-0.003			-0.012			-0.013*	
		(0.008)			(0.007)			(0.006)			(0.007)			(0.007)	
Legal			0.021**			0.021**			0.025***			0.007			0.013
			(0.009)			(0.009)			(0.007)			(0.016)			(0.009)
Observations	3,157	2,856	2,856	3,157	2,856	2,856	3,157	2,856	2,856	3,444	2,856	2,856	2,870	2,856	2,856
Number of BankID	287	243	243	287	243	243	287	243	243	287	243	243	287	243	243
AR2	0.24	0.84	0.84	0.87	0.88	0.88	0.20	0.74	0.75	0.73	0.87	0.84	0.82	0.84	0.84
Sagan Test	17.23	62.48	62.38	16.78	64.20	64.16	64.52	70.21	74.45	67.28	63.74	20.63	11.79	61.85	62.13
Sagan P. Value	0.37	0.31	0.32	0.39	0.26	0.26	0.15	0.17	0.09	0.18	0.28	0.41	0.54	0.34	0.33

Table 4.16c details the result of DID estimation of the effect of market discipline implementation of banks stability, measured as Equity ratio (EQR), which is at lag of 3 in post policy period 3, while at lags of 2 in others. The treatment group in this estimation is **Brazil** that implemented market discipline in **2006**. Treatment represents the dummy of the implementing market discipline principle, while Treatment*Post Policy Periods represents the impact of implementing market discipline on the dependent variable. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.16d: DID estimation of emerging market bank stability (LogZ-Index), due to implementation of market discipline, using Brazil as treatment group

Variables	**LogZ-Index**														
Models	**Post policy Period 1**			**Post policy Period 2**			**Post policy Period 3**			**Post policy Period 4**			**Post policy Period 5**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Treatment	0.216	0.580	0.434	0.234	0.764	0.580	0.195	0.563	0.535	0.230	0.265	0.157	0.212	0.156	0.032
	(0.310)	(0.391)	(0.390)	(0.311)	(0.492)	(0.551)	(0.312)	(0.383)	(0.387)	(0.310)	(0.391)	(0.388)	(0.308)	(0.401)	(0.397)
Post Policy Periods	0.073	0.008	0.000	-0.040	-0.061	-0.086*	0.013	-0.034	-0.041	-0.053	-0.126***	-0.127***	-0.017	-0.087***	-0.091***
	(0.051)	(0.046)	(0.044)	(0.041)	(0.055)	(0.053)	(0.040)	(0.033)	(0.033)	(0.042)	(0.027)	(0.026)	(0.040)	(0.028)	(0.027)
Treatment*Post	-0.118	-0.223**	-0.153**	0.016	-0.007	0.054	-0.225***	-0.209***	-0.191***	0.044	0.060	0.058	0.048	0.024	0.020
Policy Periods	(0.097)	(0.097)	(0.075)	(0.072)	(0.108)	(0.103)	(0.081)	(0.064)	(0.061)	(0.073)	(0.058)	(0.053)	(0.086)	(0.078)	(0.068)
H-Stat		-0.212**	-0.215**		-0.267**	-0.275**		-0.184**	-0.186**		-0.217***	-0.218***		-0.215**	-0.212**
		(0.084)	(0.084)		(0.118)	(0.118)		(0.085)	(0.084)		(0.084)	(0.083)		(0.084)	(0.083)
CAPR		0.002**	0.002**		0.004**	0.004**		0.002*	0.002*		0.002**	0.002**		0.003**	0.002**
		(0.001)	(0.001)		(0.002)	(0.002)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
INTL		0.001	0.001		0.002	0.002		0.001	0.001		0.001	0.001		0.001	0.001
		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)
TLTA		0.265	0.237		0.109	0.093		0.153	0.139		0.239	0.193		0.308*	0.270
		(0.191)	(0.192)		(0.231)	(0.236)		(0.191)	(0.191)		(0.184)	(0.184)		(0.186)	(0.186)
OPE		-0.007**	-0.007**		-0.004	-0.005		-0.006**	-0.006**		-0.005*	-0.005*		-0.006**	-0.006**
		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)
Log2TA		0.088***	0.065**		0.010	-0.006		0.088***	0.085**		0.116***	0.100***		0.133***	0.108***
		(0.033)	(0.032)		(0.058)	(0.058)		(0.034)	(0.034)		(0.034)	(0.033)		(0.037)	(0.035)
Lending Rate		-0.001	-0.001		0.007	0.007		0.004	0.004		0.008*	0.007		0.008	0.007
		(0.005)	(0.005)		(0.007)	(0.007)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)
GDPGrowth		-0.003	-0.003		0.007	0.006		-0.007*	-0.007*		-0.001	-0.001		-0.001	0.001
		(0.004)	(0.004)		(0.008)	(0.008)		(0.004)	(0.004)		(0.004)	(0.004)		(0.004)	(0.004)
CVInflation		-0.001	-0.001		-0.001	-0.001		-0.001	-0.001		-0.001	-0.001		-0.001	-0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Political		-0.247			-0.386			-0.132			0.060			0.014	
		(0.187)			(0.255)			(0.171)			(0.168)			(0.171)	
Legal			0.015			0.013			-0.107			0.207			0.239
			(0.205)			(0.311)			(0.211)			(0.189)			(0.191)
Observations	2,782	2,573	2,573	2,782	2,336	2,336	2,782	2,573	2,573	2,782	2,573	2,573	2,782	2,573	2,573
Number of BankID	287	242	242	287	242	242	287	242	242	287	242	242	287	242	242
AR2	0.16	0.28	0.30	0.13	0.38	0.33	0.15	0.26	0.26	0.17	0.33	0.42	0.14	0.17	0.19
Sagan Test	59.3	63.49	63.72	58.94	36.57	38.07	58.88	65.50	66.37	60.32	55.12	54.04	60.12	59.35	57.68
Sagan P. Value	0.12	0.17	0.17	0.13	0.30	0.24	0.13	0.13	0.12	0.11	0.43	0.47	0.11	0.28	0.34

Table 4.16d details the result of DID estimation of the effect of market discipline implementation of banks stability, measured as Log of Z-Index, which is at lag of 3. The treatment group in this estimation is **Brazil** that implemented market discipline in **2006**. Treatment represents the dummy of the implementing market discipline principle, while Treatment*Post Policy Periods represents the impact of implementing market discipline on the dependent variable. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.17a: DID estimation of emerging market bank performance (NIM), due to implementation of market discipline, using China, Morocco, and Philippines as treatment group

Variables	**NIM**														
Models	**Post policy Period 1**			**Post policy Period 2**			**Post policy Period 3**			**Post policy Period 4**			**Post policy Period 5**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Treatment	0.031	1.115	1.114	0.645	2.899**	2.863**	2.449***	2.555*	2.239*	0.017	2.240**	2.470**	0.100	1.987	1.554
	(0.299)	(0.951)	(0.973)	(0.762)	(1.322)	(1.327)	(0.705)	(1.331)	(1.337)	(1.347)	(0.999)	(1.062)	(1.548)	(2.115)	(2.051)
Post Policy Periods	0.403***	0.530***	0.498***	0.169**	0.291***	0.282***	-0.086*	0.190***	0.200***	0.126*	0.043	0.066	0.111	0.128*	0.156**
	(0.057)	(0.081)	(0.081)	(0.084)	(0.080)	(0.083)	(0.047)	(0.066)	(0.073)	(0.069)	(0.044)	(0.044)	(0.074)	(0.076)	(0.078)
Treatment*Post	-0.224***	-0.321***	-0.286**	-0.378***	-0.367***	-0.399***	-0.055*	-0.309***	-0.334***	-0.108	-0.011	-0.037	-0.209**	-0.135	-0.192*
Policy Periods	(0.075)	(0.109)	(0.111)	(0.099)	(0.098)	(0.102)	(0.033)	(0.089)	(0.097)	(0.075)	(0.061)	(0.063)	(0.085)	(0.100)	(0.101)
H-Stat		-0.138	-0.158		-0.245	-0.249*		-0.147	-0.148		-0.115	-0.134		-0.156	-0.129
		(0.115)	(0.120)		(0.155)	(0.153)		(0.156)	(0.154)		(0.117)	(0.121)		(0.163)	(0.164)
CAPR		0.005*	0.006**		0.004	0.005*		0.003	0.004		0.005*	0.007**		0.005*	0.007**
		(0.002)	(0.002)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)
INTL		-0.004	-0.005		-0.002	-0.002		-0.003	-0.004		-0.005	-0.004		-0.004	-0.006
		(0.008)	(0.007)		(0.007)	(0.008)		(0.007)	(0.008)		(0.007)	(0.007)		(0.011)	(0.011)
TLTA		1.398**	1.498***		1.361**	1.577**		1.608**	1.675**		1.754***	1.825***		0.530	0.688
		(0.567)	(0.553)		(0.684)	(0.716)		(0.679)	(0.718)		(0.577)	(0.576)		(0.604)	(0.594)
OPE		0.008*	0.008*		0.013**	0.015**		0.015**	0.015**		0.012**	0.014***		0.006	0.007
		(0.005)	(0.005)		(0.006)	(0.006)		(0.006)	(0.007)		(0.005)	(0.005)		(0.006)	(0.006)
LogTA		-0.002	-0.006		-0.004	-0.008		-0.001	-0.005		-0.001	-0.006		-0.002	0.004
		(0.007)	(0.008)		(0.008)	(0.008)		(0.008)	(0.008)		(0.007)	(0.007)		(0.018)	(0.018)
Lending Rate		0.001	-0.003		-0.003	-0.007		-0.007	-0.013		0.021	0.014		-0.032	-0.030
		(0.015)	(0.016)		(0.018)	(0.019)		(0.019)	(0.019)		(0.014)	(0.016)		(0.023)	(0.022)
GDPGrowth		0.033***	0.034***		0.043***	0.039***		0.034***	0.034***		0.041***	0.041***		0.036**	0.034**
		(0.009)	(0.009)		(0.013)	(0.014)		(0.012)	(0.013)		(0.010)	(0.010)		(0.014)	(0.014)
CVInflation		0.001	0.001		0.001	0.001		0.001	0.001		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Political		-0.024			0.036			-0.047			0.114			-0.011	
		(0.238)			(0.309)			(0.315)			(0.238)			(0.318)	
Legal			0.074			-0.019			0.130			0.199			-0.700
			(0.320)			(0.454)			(0.457)			(0.321)			(0.441)
Obs.	4,060	3,423	3,423	4,060	3,423	3,423	3,770	3,423	3,423	3,770	3,423	3,423	3,666	3,116	3,116
No. of Bank ID	290	249	249	290	249	249	290	249	249	290	249	249	282	243	243
AR2	0.20	0.14	0.13	0.21	0.13	0.13	0.43	0.14	0.13	0.43	0.15	0.14	0.42	0.18	0.15
Sagan Test	102.27	32.22	29.60	35.78	26.47	26.47	91.55	32.50	31.30	17.79	48.94	45.35	16.46	22.75	17.30
Sagan P. Value	0.47	0.64	0.76	0.05	0.32	0.32	0.37	0.11	0.14	0.71	0.07	0.14	0.79	0.41	0.74

Table 4.17a details the result of DID estimation of the effect of market discipline implementation of banks performance, measured as net interest margin (NIM), which is at lag of 1. The treatment group in this estimation includes **China, Morocco, and Philippines** that implemented market discipline in **2007**. Treatment represents the dummy of the implementing market discipline principle, while Treatment*Post Policy Periods represents the impact of implementing market discipline on the dependent variable. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.17b: DID estimation of emerging market bank performance (ROA), due to implementation of market discipline, using China, Morocco, and Philippines as treatment group

Variables	**ROA**														
Models	**Post policy Period 1**			**Post policy Period 2**			**Post policy Period 3**			**Post policy Period 4**			**Post policy Period 5**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Treatment	-0.332***	-0.015	-0.016	-0.334***	-0.010	-0.021*	-0.332***	-0.004	-0.019	-0.331***	-0.018	-0.025	-0.357***	-0.007	-0.009
	(0.039)	(0.012)	(0.013)	(0.039)	(0.012)	(0.012)	(0.039)	(0.014)	(0.013)	(0.040)	(0.018)	(0.016)	(0.038)	(0.012)	(0.013)
Post Policy Periods	-0.004**	-0.006*	-0.009**	-0.001	-0.001	-0.002	-0.001	-0.002	-0.004**	0.000	-0.002	-0.003	0.001	0.002	0.002
	(0.001)	(0.004)	(0.003)	(0.001)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Treatment*Post	0.004***	0.002	0.003	0.001	-0.002	-0.001	0.001	0.001	0.004*	0.001	0.004	0.005**	0.001	-0.004	-0.003
Policy Periods	(0.002)	(0.004)	(0.004)	(0.001)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	(0.002)
H-Stat		0.052***	0.056***		0.057***	0.046***		0.052***	0.039***		0.031***	0.027***		0.038***	0.039***
		(0.011)	(0.011)		(0.010)	(0.010)		(0.009)	(0.010)		(0.009)	(0.009)		(0.010)	(0.010)
CAPR		0.001	0.001*		0.001***	0.001**		0.001**	0.001**		0.001	0.001		0.001	0.001*
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
INTL		0.007**	0.006*		0.008**	0.008**		0.008**	0.008**		0.018***	0.016***		0.008**	0.008**
		(0.003)	(0.003)		(0.004)	(0.003)		(0.004)	(0.003)		(0.004)	(0.004)		(0.003)	(0.003)
TLTA		-0.104***	-0.111***		-0.100***	-0.112***		-0.095***	-0.106***		-0.113***	-0.116***		-0.103***	-0.109***
		(0.012)	(0.012)		(0.012)	(0.013)		(0.011)	(0.012)		(0.013)	(0.013)		(0.012)	(0.012)
OPE		-0.001***	-0.002***		-0.001***	-0.001***		-0.001***	-0.001***		-0.000*	-0.000**		-0.001***	-0.001***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
LogTA		0.001	0.001		0.004	0.001		0.003	-0.001		-0.002	-0.003		0.001	0.001
		(0.003)	(0.002)		(0.003)	(0.002)		(0.003)	(0.002)		(0.002)	(0.002)		(0.003)	(0.003)
Lending Rate		-0.002***	-0.002***		-0.003***	-0.002***		-0.003***	-0.002***		-0.002***	-0.002***		-0.002***	-0.002***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
GDPGrowth		0.001	0.001		-0.001	0.001		-0.001	0.001		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
CVInflation		0.001	0.001		-0.001	0.001		-0.001	0.001		-0.000***	-0.001***		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Political		-0.001			-0.026***			-0.026***			-0.012*			-0.004	
		(0.007)			(0.008)			(0.008)			(0.008)			(0.006)	
Legal			0.011			0.009			0.009			-0.001			0.019*
			(0.012)			(0.011)			(0.011)			(0.009)			(0.011)
Obs.	3,480	3,423	3,423	3,480	3,423	3,423	3,480	3,423	3,423	3,480	3,181	3,181	3,384	3,353	3,353
No. of Bank ID	290	249	249	290	249	249	290	249	249	290	248	248	282	244	244
AR2	0.73	0.20	0.20	0.71	0.37	0.16	0.70	0.35	0.16	0.70	0.20	0.25	0.62	0.13	0.12
Sagan Test	27.69	18.04	17.58	28.24	19.7	13.93	27.70	19.15	13.60	27.76	23.72	24.35	27.15	15.80	18.50
Sagan P. Value	0.12	0.80	0.82	0.11	0.71	0.94	0.12	0.74	0.95	0.12	0.36	0.32	0.13	0.89	0.77

Table 4.17b details the result of DID estimation of the effect of market discipline implementation of banks performance, measured as Return on Assets margin (ROA) which is at lags of 2 in post policy period 4, while at lag of 1 in others. The treatment group in this estimation includes **China, Morocco, and Philippines** that implemented market discipline in **2007**. Treatment represents the dummy of the implementing market discipline principle, while Treatment*Post Policy Periods represents the impact of implementing market discipline on the dependent variable. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.17c: DID estimation of emerging market bank stability (EQR), due to implementation of market discipline, using China, Morocco, and Philippines as treatment group

Variables	**EQR**														
Models	**Post policy Period 1**			**Post policy Period 2**			**Post policy Period 3**			**Post policy Period 4**			**Post policy Period 5**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Treatment	0.024***	-0.007	-0.006	-0.046**	-0.006	0.006	-0.063***	-0.008	-0.012	0.013**	-0.014*	-0.014*	-0.056***	-0.011	-0.011
	(0.008)	(0.008)	(0.008)	(0.020)	(0.015)	(0.017)	(0.014)	(0.008)	(0.008)	(0.006)	(0.008)	(0.008)	(0.020)	(0.008)	(0.008)
Post Policy Periods	-0.008***	-0.010***	-0.011***	0.002	0.004	0.006*	-0.001	-0.007***	-0.007***	-0.002	-0.006***	-0.007***	-0.001	-0.004***	-0.004***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Treatment*Post	0.006	0.010**	0.011***	-0.001	-0.008**	-0.010***	0.001	0.005**	0.005**	0.003	0.004*	0.006**	0.006***	0.005**	0.005**
Policy Periods	(0.005)	(0.004)	(0.004)	(0.002)	(0.004)	(0.004)	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
H-Stat		-0.005	-0.007		-0.016*	-0.011		-0.004	-0.006		-0.004	-0.007		-0.004	-0.006
		(0.005)	(0.005)		(0.008)	(0.008)		(0.004)	(0.004)		(0.004)	(0.004)		(0.004)	(0.004)
CAPR		0.001***	0.001***		0.001***	0.001***		0.002***	0.001***		0.002***	0.002***		0.002***	0.001***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
INTL		0.002**	0.001*		0.001	-0.001		0.001*	0.001		0.001	0.001		0.001*	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
TLTA		0.046***	0.052***		0.057***	0.068***		0.033***	0.044***		0.032***	0.041***		0.034***	0.044***
		(0.011)	(0.011)		(0.017)	(0.018)		(0.012)	(0.011)		(0.011)	(0.011)		(0.012)	(0.011)
OPE		0.001***	0.001***		-0.001	-0.001		0.001***	0.001***		0.001***	0.001***		0.000**	0.001***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
LogTA		0.005***	0.004**		0.004	0.005		0.006***	0.006***		0.007***	0.007***		0.006***	0.005***
		(0.002)	(0.002)		(0.004)	(0.004)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)
Lending Rate		0.001	0.001**		0.001	0.001		0.001	0.001*		0.001	0.001*		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
GDPGrowth		0.001	0.001*		0.001	0.001		0.001	0.001		0.001	0.001		0.001	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
CVInflation		-0.001***	-0.001**		-0.001**	-0.001**		-0.001	-0.001**		-0.001	-0.001		-0.001**	-0.001***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Political		-0.014***			-0.013*			-0.022***			-0.023***			-0.023***	
		(0.005)			(0.007)			(0.005)			(0.005)			(0.005)	
Legal			0.014**			0.018*			0.009			0.012*			0.008
			(0.007)			(0.009)			(0.007)			(0.007)			(0.007)
Obs.	3,480	2,940	2,940	3,190	2,940	2,940	3,190	2,940	2,940	3,480	2,940	2,940	3,102	2,880	2,880
No. of Bank ID	290	248	248	290	248	248	290	248	248	290	248	248	282	243	243
AR2	0.12	0.97	0.99	0.21	0.78	0.79	0.19	0.94	0.96	0.11	0.94	0.97	0.21	0.95	0.97
Sagan Test	43.07	65.86	68.89	38.92	52.79	49.85	59.52	62.93	65.19	59.69	67.30	67.90	38.11	68.39	69.19
Sagan P. Value	0.38	0.28	0.20	0.38	0.10	0.16	0.28	0.37	0.30	0.41	0.24	0.22	0.41	0.21	0.19

Table 4.17c details the result of DID estimation of the effect of market discipline implementation of banks stability, measured as Equity ratio (EQR), which is at lag of 2 in post policy period 2, while at lag of 3 in others. The treatment group in this estimation includes **China, Morocco, and Philippines** that implemented market discipline in **2007**. Treatment represents the dummy of the implementing market discipline principle, while Treatment*Post Policy Periods represents the impact of implementing market discipline on the dependent variable. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

Table 4.17d: DID estimation of emerging market bank stability (LogZ-Index), due to implementation of market discipline, using China, Morocco, and Philippines as treatment group

Variables	**LogZ-Index**														
Models	**Post policy Period 1**			**Post policy Period 2**			**Post policy Period 3**			**Post policy Period 4**			**Post policy Period 5**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Treatment	-0.369*	-0.550***	-0.548***	-0.544**	-0.480**	-0.554*	-0.398*	-0.672***	-0.683***	-0.649**	-0.675***	-0.694***	-0.281	-0.580***	-0.630***
	(0.228)	(0.212)	(0.212)	(0.269)	(0.241)	(0.296)	(0.236)	(0.223)	(0.249)	(0.257)	(0.215)	(0.231)	(0.192)	(0.202)	(0.236)
Post Policy Periods	-0.084	-0.117*	-0.116*	-0.120**	-0.076	-0.064	-0.117**	-0.152***	-0.168***	-0.052	-0.073*	-0.083*	-0.087**	-0.078*	-0.075
	(0.056)	(0.065)	(0.062)	(0.047)	(0.061)	(0.062)	(0.046)	(0.052)	(0.052)	(0.039)	(0.042)	(0.043)	(0.044)	(0.048)	(0.050)
Treatment*Post	-0.020	-0.032	-0.045	0.166**	0.061	0.058	-0.023	-0.055	-0.012	0.062	0.002	0.031	0.083	0.040	0.055
Policy Periods	(0.103)	(0.113)	(0.108)	(0.078)	(0.091)	(0.095)	(0.076)	(0.086)	(0.082)	(0.061)	(0.082)	(0.081)	(0.087)	(0.089)	(0.088)
H-Stat		-0.120	-0.121		-0.092	-0.131		-0.131	-0.158*		-0.122	-0.153*		-0.117	-0.143
		(0.092)	(0.091)		(0.093)	(0.096)		(0.090)	(0.091)		(0.089)	(0.091)		(0.090)	(0.091)
CAPR		0.002	0.002		0.002	0.002		0.002	0.002		0.002	0.002		0.001	0.002
		(0.001)	(0.001)		(0.001)	(0.002)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
INTL		0.020*	0.021*		0.021*	0.020*		0.019	0.018		0.020*	0.020*		0.019*	0.018
		(0.012)	(0.012)		(0.012)	(0.012)		(0.012)	(0.012)		(0.012)	(0.012)		(0.012)	(0.012)
TLTA		-0.159	-0.178		-0.129	-0.085		-0.198	-0.198		-0.151	-0.149		-0.117	-0.104
		(0.232)	(0.235)		(0.241)	(0.248)		(0.233)	(0.234)		(0.238)	(0.237)		(0.232)	(0.232)
OPE		-0.009***	-0.009***		-0.008**	-0.008**		-0.008***	-0.009***		-0.009***	-0.009***		-0.009***	-0.010***
		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)
LogTA		-0.021	-0.020		-0.010	0.001		0.011	0.018		0.001	0.014		0.006	0.017
		(0.043)	(0.043)		(0.044)	(0.047)		(0.043)	(0.044)		(0.043)	(0.043)		(0.043)	(0.043)
Lending Rate		-0.029**	-0.029**		-0.022*	-0.017		-0.030***	-0.019*		-0.029**	-0.020*		-0.032***	-0.022**
		(0.012)	(0.012)		(0.012)	(0.013)		(0.012)	(0.012)		(0.011)	(0.012)		(0.011)	(0.011)
GDPGrowth		-0.007	-0.005		-0.011*	-0.010		-0.010*	-0.009*		-0.010*	-0.009		-0.012**	-0.012**
		(0.006)	(0.006)		(0.006)	(0.007)		(0.006)	(0.006)		(0.006)	(0.006)		(0.006)	(0.006)
CVInflation		0.001	0.001		0.001*	0.001		0.002**	0.002**		0.001*	0.001		0.001*	0.001
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Political		0.013			0.045			-0.162			-0.083			-0.061	
		(0.190)			(0.191)			(0.188)			(0.186)			(0.187)	
Legal			0.445			0.102			0.179			0.262			0.097
			(0.277)			(0.259)			(0.242)			(0.238)			(0.247)
Obs.	3,070	2,612	2,612	2,775	2,612	2,612	3,070	2,612	2,612	2,775	2,612	2,612	2,982	2,557	2,557
No. of Bank ID	290	248	248	290	248	248	290	248	248	290	248	248	282	243	243
AR2	0.22	0.26	0.35	0.99	0.25	0.35	0.22	0.33	0.33	0.76	0.21	0.21	0.31	0.23	0.20
Sagan Test	51.86	62.37	64.22	55.34	53.03	46.40	52.75	63.15	60.68	64.29	62.79	60.68	49.06	65.57	63.00
Sagan P. Value	0.05	0.15	0.11	0.06	0.19	0.13	0.04	0.13	0.19	0.05	0.14	0.19	0.08	0.09	0.14

Table 4.17d details the result of DID estimation of the effect of market discipline implementation of banks stability, measured as Log of Z-Index, which is at lag of 3. The treatment group in this estimation includes **China, Morocco, and Philippines** that implemented market discipline in **2007**. Treatment represents the dummy of the implementing market discipline principle, while Treatment*Post Policy Periods represents the impact of implementing market discipline on the dependent variable. Standard errors are in parentheses. ***, **, * represent significant levels at 1%, 5%, and 10%, respectively.

4.11. Chapter Summary

In this chapter, we focused on the first concept of this research study; market discipline principle of Basel II capital accord. The section tested hypothesis one to three, as well answered research questions one to three. We developed market discipline constructs/dimensions using principal component analysis. Next, we estimated the evolution of these different dimensions of market discipline from the year of implementation and five subsequent years of implementation. We found that market discipline exists more in developed market compared to emerging market economies. From our results, these different dimensions of market discipline affect banks' performance and stability differently, as well affect different market regions (emerging and developed) differently.

Looking at interaction effect of market discipline dimensions with legal institution, both internal and external of market discipline significantly favor both performance and stability of developed market banking industry. We also found that the interaction effects have more unified effect in developed compared to emerging markets' banks' performance and stability. We then infer that the essence of such higher effects on developed countries could be attributed to the fact that developed countries have more efficient and effective legal environment that could enable the public, government and external stakeholders to effectively discipline banks.

We found that both emerging and developed market banking industries experienced waning performance and stability during the periods of market discipline implementation. The negative effect on emerging market banks were confirmed with results from our robustness check, using difference-in-differences. In the next chapter, we present detailed estimation results of twin-peaks regulatory model, which is the second concept of this research study.

Chapter Five

5. TWIN-PEAKS FINANCIAL REGULATORY MODEL

5.1. Introduction

The twin-peaks regulatory model is defined by the G30 (2008) as a regulatory model, by objective, with two independent regulators. These regulators, independently will be responsible for macro-prudential and market conduct regulatory objectives, while regulating the functions and activities of financial services firms rather than the form (i.e., the different sectors) (Pan 2010, Botha and Makina 2011). The twin-peaks model is designed to incorporate the benefits and efficiencies from single regulatory model, namely, reducing costs and regulatory redundancy, and introducing clearer lines of regulatory responsibilities, but does not consider the benefit of all regulatory authorities be being viewed under one umbrella. Post the recent global financial crisis, many countries, including emerging market countries have been increasingly considering moving towards twin-peaks regulatory structure. In this section, we examine the effect of adopting the twin-peaks regulatory model on bank performance and stability.

We start by first estimating the evolution of performance and stability measures over the relative periods of twin-peaks implementation or adopted features of twin-peaks. Next, we estimate the effects of implementation or adoption of features of twin-peaks on bank performance and stability, by developing dummy variables for countries that implemented or adopted twin-peaks features. Third, factors that are likely to lead to implementation or adoption of features of twin-peaks are also estimated and explained using logistic regression. Fourth, being a regulatory model, by structure, we also estimate the choice of twin-peaks structure on bank performance and stability, where we developed dummy variables for countries that deploy central banks as one of the peaks, as well as another dummy variable for countries that use two regulatory bodies, independent of the central banks, to oversee the macro-prudential and market conduct regulatory objectives of the country. In other words, what effects does separating regulation of financial sector and monetary policy have on banks (i.e., the conduit though which monetary policy is delivered).

Fifth, before we could focus on positive effects of twin-peaks regulatory model, we estimate effects of a single regulatory model on bank performance and stability. Sixth, having found individual effects of both market discipline and twin-peaks on bank performance and stability, we went further

to estimate possible outcome of scenario where market discipline and twin-peaks complements each other instead of substitutes, whereby we interacted market discipline and twin peaks, and regressed them against bank performance and stability. Finally, to emphasize the paramountcy of financial regulation in the banking industry, we estimated the effect of regulatory quality, measured as Basel core principle (BCP), on bank performance and stability measures.

5.2. Post effect of twin-peaks regulatory model on bank performance and stability

Unlike the market discipline principle, there are no proxies to measure twin-peaks regulatory model, to test for the effect of this regulatory model, using event study methodology, we carry out similar estimations as conducted in market discipline section. This section tests for hypothesis 4, which postulates that adoption of features, or full implementation of twin-peaks regulatory reforms, could affect bank performance and stability. Based on that, we estimate the evolution of bank performance and stability, over the periods that countries/banks implemented or adopted features of this model based on equation 14 in chapter 3.

Due to the fact that very few countries, mostly developed countries implemented the twin-peaks regulatory model during the period under review, we form a sample of countries that adopted features of twin-peaks regulatory model between the year 2000 and 2014, and estimate the evolution of performance and stability measures, respectively, around the period of adopting these features. The essence of this particular sample is to incorporate emerging market countries that have not fully implemented twin-peaks, but have adopted some of its features in their banking regulations. From Table 5.1a, one can see that there are significant changes in both performance and stability measures over the relative period that our sample countries adopted features of twin-peaks regulatory model. Net interest margin (NIM) and pretax profit (PretaxP) exhibited positive and significant coefficients from the year of adoption (TWPt) up to the fifth year (TWPtplus5) after adoption, which implies positive performance by banks during this period. ROA, recorded insignificant negative coefficients, but became positive and significant at the 1% level in year-5 (TWPtplus5) after adoption.

Looking at stability measures, equity ratio (EQR) recorded positive coefficients all through the period, which were marginally significant at the beginning of the period and statistically significant toward the end of the period. Ratio of non-performing loan to total loan (NPLTL), an inverse measure of stability displayed negative and significant coefficients, indicating less risk exposure by

banks during this period. Though liquidity ratio recorded negative coefficients, but they were not significant all through the period. Conversely, Z-Index recorded negative coefficients over the period of adoption of twin-peaks. We infer from these results that implementation and/or adoption of twin-peaks features encourages shareholders to increase their ownership stakes in banks, which resulted in the incremental effect of EQR in Table 5.1a.

Also banks are exposed to lesser risks in their loan portfolio, where nonperforming loan is found to significantly reduced, especially in the first three years after implementation and/or adoption feature of twin-peaks regulatory model. LogZ-Index, which measures (inverse) probability of banks failure, is found to significantly decrease during the period, especially from the third year after implantation of twin-peaks. This implies that stability of banks during the period of implementation decreased, which is contrary to the increase in equity ratio as a measure of stability. To clearly understand this contradictory outcome, we further look at the evolution of these stability measures on the different markets (emerging and developed).

Table 5.1a: Overall sample-GMM analysis of evolution of performance and stability (proxied by date/year a country adopted features of Twin-peaks)

	Panel A: Performance Measures			**Panel B: Stability Measures**				
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variables	**NIM**	**LogPreTaxP**	**ROA**	**EQR**	**NPLTL**	**Liquidity**	**LogZ-Index**	**H-Stat**
TWPt	0.400**	1.568***	-0.003	0.013	-0.015	-0.011	-0.231	-0.087
	(0.166)	(0.559)	(0.006)	(0.008)	(0.036)	(0.124)	(0.221)	(0.100)
TWPtplus1	0.241*	1.090**	-0.003	0.007	-0.164**	-0.076	-0.142	0.025
	(0.125)	(0.507)	(0.006)	(0.012)	(0.082)	(0.124)	(0.103)	(0.075)
TWPtplus2	0.271**	0.828**	-0.001	0.011	-0.035**	-0.251	-0.027	0.136**
	(0.122)	(0.416)	(0.004)	(0.007)	(0.018)	(0.165)	(0.099)	(0.055)
TWPtplus3	0.188*	0.349	-0.004	0.011***	-0.036**	-0.005	-0.278***	0.082*
	(0.111)	(0.300)	(0.003)	(0.004)	(0.015)	(0.051)	(0.092)	(0.051)
TWPtplus4	0.273***	0.443**	-0.002	0.002	-0.009	-0.023	-0.295***	0.119***
	(0.103)	(0.212)	(0.003)	(0.005)	(0.009)	(0.043)	(0.069)	(0.037)
TWPtplus5	0.159**	-0.141	0.003***	0.009**	-0.002	-0.020	-0.206***	0.140***
	(0.077)	(0.199)	(0.001)	(0.004)	(0.005)	(0.042)	(0.064)	(0.035)
Obs.	1,660	1,826	1,660	1,826	1,810	2,158	1,583	1,660
No. of BankID	166	166	166	166	166	166	166	166
AR2	0.43	0.90	0.31	0.26	0.30	0.32	0.26	0.83
Sagan Test	22.87	57.71	20.70	23.69	12.78	15.36	48.74	8.30
Sagan P.Value	0.15	0.13	0.23	0.25	0.17	0.22	0.22	0.40

*Table 5.1a: details the evolution of performance and stability measures from the year of adopting twin-peaks features or the year twin-peaks regulatory model was implemented (TWPt) through 5 subsequent years after implementation (TWPtplus1 to TWPtplus5). The dependent variables are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA) for measures of performance; equity ratio (EQR), Ratio of non-performing loan to total loan (NPLTL), H-Stat, LogZ-Index, and liquidity ratio for measures of stability. Panel A and B contain performance and stability measures, respectively. For correction of autocorrelation and over-identification of the models liquidity ratio is at lag of 1, NIM and ROA are at lags of 3, while others are at lags of 2. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.*

From emerging market perspective (Table 5.1b), there is evidence of positive and significant performance in emerging market countries that adopted features of twin-peaks regulatory model. The net interest margin (NIM) and pretax profit recorded positive coefficients from the year of adoption to the fifth year after adoption. Ratio of non-performing loan to total loan (NPLTL) as a measure of instability reduced during this period, which implies less risk exposure by banks during this period as a result of features of twin-peaks regulatory model. Equity ratio (EQR), another measure of stability, significantly increased over this period, while liquidity ratio and Z-Index had negative coefficients. Competition (H-Stat) recorded a decline for the first four years after the event and then became positive only on the fifth year after adoption of twin-peaks regulatory model.

Table 5.1b: GMM analysis of evolution of performance and stability (proxied by date/year a country adopted features of Twin-peaks) for Emerging Markets

	Panel A: Performance Measures			**Panel B: Stability Measures**				
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variables	**NIM**	**LogPreTaxP**	**ROA**	**EQR**	**NPLTL**	**Liquidity**	**LogZ-Index**	**H-Stat**
TWPt	0.052	0.294	0.051	0.015	-0.129	-0.861	0.379*	-0.229***
	(0.068)	(0.365)	(0.048)	(0.020)	(0.112)	(0.991)	(0.199)	(0.043)
TWPtplus1	0.344***	0.469	0.003	0.000	-0.350**	-1.072	0.013	-0.306***
	(0.095)	(0.520)	(0.016)	(0.016)	(0.156)	(0.905)	(0.186)	(0.050)
TWPtplus2	0.278***	0.063	-0.012**	0.015***	-0.055***	-0.836	0.167	-0.005
	(0.087)	(0.389)	(0.005)	(0.005)	(0.014)	(0.928)	(0.176)	(0.021)
TWPtplus3	0.062	0.323	-0.008	0.015***	-0.050***	-0.918	-0.226**	-0.039
	(0.152)	(0.308)	(0.009)	(0.004)	(0.014)	(0.957)	(0.111)	(0.026)
TWPtplus4	0.569***	0.766***	-0.000	0.001	-0.014***	-1.147	-0.213**	-0.005
	(0.121)	(0.263)	(0.002)	(0.005)	(0.004)	(1.160)	(0.097)	(0.016)
TWPtplus5	0.628***	0.481**	0.004***	0.011**	-0.007**	-1.928*	-0.162	0.103***
	(0.154)	(0.190)	(0.001)	(0.005)	(0.003)	(1.057)	(0.110)	(0.012)
Obs.	1,428	1,309	1,309	1,309	1,293	1,309	1,241	1,309
No. of BankID	119	119	119	119	119	119	119	119
AR2	0.41	0.64	0.76	0.24	0.12	0.31	0.91	0.77
Sagan Test	15.23	29.71	9.92	23.81	8.13	16.70	10.88	59.63
Sagan P.Value	0.17	0.10	0.27	0.25	0.52	0.10	0.37	0.11

*Table 5.1b: details the evolution of performance and stability measures (for emerging markets only) from the year of adopting twin-peaks features or the year twin-peaks regulatory model was implemented (TWPt) through 5 subsequent years after implementation (TWPtplus1 to TWPtplus5). The dependent variables are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA) for measures of performance; equity ratio (EQR), Ratio of non-performing loan to total loan (NPLTL), H-Stat, LogZ-Index, and liquidity ratio for measures of stability. Panel A and B contain performance and stability measures, respectively. For correction of autocorrelation and over-identification of the models liquidity ratio is at lag of 1, NIM and ROA are at lags of 3, while others are at lags of 2. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.*

To view the post effect of twin-peaks regulatory model in developed market economies, we estimate the evolution of performance and stability variables during the years and subsequent years after implementation of twin-peaks regulatory model by sampled developed market economies as well

(Table5.1c). We use three developed countries (Belgium, France and Netherlands) that implemented twin-peaks regulatory model between 2000 and 2014. There are positive and significant coefficients in performance measures, though net interest margin (NIM) exhibits both negative and positive signs during this period. From stability perspective, non-performing loan (NPLTL) significantly reduced, which indicates improved stability. Equity ratio (EQR) and Z-Index also significantly increased during this period. Surprisingly, liquidity ratio experienced negative coefficients during this period.

Table 5.1c: GMM analysis of evolution of some performance and stability variables (proxied by date/year a country implemented Twin-peaks) for Developed market

	Panel A: Performance Measures			**Panel B: Stability Measures**				
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variables	**NIM**	**LogPreTaxP**	**ROA**	**EQR**	**NPLTL**	**Liquidity**	**LogZ-Index**	**H-Stat**
TWPt	0.034	1.843	-0.001***	-0.001***	-0.003***	-0.146***	-0.026	0.084***
	(0.022)	(1.462)	(0.000)	(0.000)	(0.001)	(0.028)	(0.036)	(0.028)
TWPtplus1	-0.067***	3.621**	0.000	0.002***	-0.004***	-0.148***	0.296***	0.270***
	(0.014)	(1.749)	(0.000)	(0.000)	(0.001)	(0.030)	(0.049)	(0.038)
TWPtplus2	0.037***	3.263**	0.002***	0.003***	-0.003***	-0.160***	0.251***	0.183***
	(0.010)	(1.319)	(0.000)	(0.000)	(0.001)	(0.032)	(0.044)	(0.031)
TWPtplus3	0.046***	2.378**	0.004***	0.017***	-0.003*	-0.181***	0.220***	0.154***
	(0.015)	(1.123)	(0.000)	(0.001)	(0.001)	(0.036)	(0.055)	(0.032)
TWPtplus4	-0.084***	0.755	0.003***	0.007***	-0.004**	-0.167***	0.319***	0.151***
	(0.010)	(1.201)	(0.000)	(0.000)	(0.001)	(0.034)	(0.055)	(0.027)
TWPtplus5	-0.055**	-0.710	0.003***	0.001***	-0.004**	-0.177***	0.166*	0.182***
	(0.023)	(0.726)	(0.000)	(0.001)	(0.002)	(0.036)	(0.090)	(0.045)
Obs.	780	715	845	845	845	845	769	650
No. of BankID	65	65	65	65	65	65	65	65
AR2	0.78	0.52	0.77	0.22	0.85	0.31	0.27	0.10
Sagan Test	55.01	9.15	59.14	58.28	13.20	27.21	55.83	9.75
Sagan P.Value	0.97	0.42	0.29	0.32	0.35	0.29	0.23	0.28

*Table 5.1c: details the evolution of performance and stability measures (for developed markets only) from the year of adopting twin-peaks features or the year twin-peaks regulatory model was implemented (TWPt) through 5 subsequent years after implementation (TWPtplus1 to TWPtplus5). The dependent variables are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA) for measures of performance; equity ratio (EQR), Ratio of non-performing loan to total loan (NPLTL), H-Stat, LogZ-Index, and liquidity ratio for measures of stability. Panel A and B contain performance and stability measures, respectively. For correction of autocorrelation and over-identification of the models liquidity ratio is at lag of 1, NIM and ROA are at lags of 3, while others are at lags of 2. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.*

From the above results, we could notice incremental evolution of performance and stability measures during the period of adopting features of twin-peaks regulatory model. Despite mere adoption of features of twin-peaks by emerging market economies, bank performance and stability significantly improved over the period. From developed market perspective, both bank performance and stability significantly increased during the period of implementation, especially Z-Index, which has been recording negative coefficients in our previous evolution estimations.

However, the results empirically confirm already existing differences in the financial markets of blocks of countries (emerging and developed markets) reviewed in our analysis (Ladekarl and Zervos 2004, Karacadag 2001). These results also confirm our argument that regulatory policies might affect the two markets differently, due to the fact that financial markets of developed economies are more developed, relatively perfect, relatively stable, and with less information asymmetry, than emerging market economies. Comparing Tables 5.1b (emerging market) and 5.1c (developed market) results, we could see the differential effects on both different measures of performance and stability during the periods of implementation and/or adoption of twin-peaks features. Net interest margin (NIM) of emerging markets significantly increased over the period, while there is decline in that of developed market economies in the fourth and fifth year after implementation. Meanwhile, looking at time effects on return on asset (ROA), banks' assets of developed market economies contributed more to banks' profit compared to their impact on emerging markets' banks' profit during the period of implementation and/or adoption of features of twin-peaks. From stability perspective, developed market banks exhibit more stable features compared to emerging market banks, but only from Z-Index and H-stats point of view, but looking at equity ratio (EQR), both emerging and develop markets' banks were significantly stable during the period under review. Based on our results above, we infer that implementation of twin-peaks could improve both performance and stability of the banking industry both in emerging and developed economies.

Our findings are in line with that of Lui (2013), who compared performance of four big United Kingdom (UK) and four big Australian banks, while analyzing Macro and micro prudential regulatory failures between banks in the UK and Australia between 2004 and 2009. He found that Australian banks never required government bailout during the financial crisis, unlike UK banks. Being that Australia had implemented twin-peak regulatory model (with prudential regulatory oversight separated from market conduct regulators) before the global financial crises, twin-peaks has attracted the attention of many other countries including US and UK, and other emerging market countries like South Africa.

5.3. Effect of twin-peaks regulatory model on bank performance and stability

Having looked at the evolution of banks' performance and stability measures over the period of twin-peaks implementation, we go further to estimate the effect of implementing or adopting features of twin-peaks on banks' performance and stability. This estimation complements hypothesis 4, which postulates that adoption of features, or full implementation of twin-peaks regulatory

reforms, could affect bank performance and stability. The essence of this estimation is to find out what happens to bank performance and stability should a country decide to implement or adopt features of twin-peaks regulatory model.

Twin-peaks is not a globally required regulatory model but a national decision at country levels; therefore, we want to find out if the tendency of implementing or adopting features of twin-peaks has any significant effect on banks' financial activities. Using a sample of 24 countries (both emerging and developed countries), we generate a dummy variable of implementation/adoption of twin-peaks features (DummyTwin) and regress it against measures of bank performance and stability, along with banks and country-specific variables. We also look at differential effects of implementation/ adoption of twin-peaks features across different market types (emerging and developed markets economies).

From Table 5.2a, you can see that the implementation of twin-peaks regulatory model has positive significant effect on return on asset (ROA), as a measure of performance, though net interest margin (NIM) also increases but not significantly. From the stability perspective, Z-Index and H-Stat significantly increased, while there is no significant effect on other stability measures. From emerging market perspective (Table 5.2b), adoption of features of twin-peaks also increases ROA, but it has no significant effect on other measures of performance. An interesting discovery is the effect of twin-peaks on nonperforming loan (NPLTL), which significantly falls as a result of adopting twin-peaks regulatory features. This suggests that there is reduction in the level of risk exposure in emerging market banking industry due to twin-peaks regulatory model.

In the case of developed market (Table5.2c), twin-peaks implementation elicited positive and significant effects on both performance and stability measures. It significantly increases NIM and ROA, and no significant effect on pretax profit. From the stability perspective, all stability measures are positively and significantly affected, nonperforming loan has negative statistically significant effect, indicating less risk exposure as a result of twin-peaks implementation. We deduce from these results that twin-peaks regulatory model improves bank performance and stability, with the most interesting finding being that a mere adoption of features of twin-peaks model, even in emerging market countries does positively contribute to performance and stability of financial institutions.

Table5.2a: Overall sample -Estimation of Twin peaks (dummy) on performance and stability

	Panel A: Performance Measures						Panel B: Stability Measures									
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
Dummy Twin	0.133	0.103	-2.920	-3.068	0.047*	0.045*	0.000	0.000	0.536	0.520	1.138	1.268	0.650**	0.619**	0.083*	0.083*
	(0.137)	(0.137)	(2.176)	(2.175)	(0.024)	(0.024)	(0.005)	(0.005)	(0.386)	(0.388)	(4.410)	(4.261)	(0.315)	(0.304)	(0.050)	(0.050)
H-Stat	-0.385	-0.378	-0.865	-0.842	0.025*	0.023*	0.037***	0.037***	0.475**	0.466**	-3.534	-3.595	-0.094	-0.092		
	(0.298)	(0.295)	(0.541)	(0.544)	(0.015)	(0.014)	(0.011)	(0.011)	(0.193)	(0.195)	(2.450)	(2.446)	(0.090)	(0.088)		
CAPR	0.001	0.001	0.031***	0.031***	0.001	0.001	0.001***	0.001***	0.001	0.001	-2.151***	-2.156***	0.002	0.002	-0.001	-0.001
	(0.012)	(0.012)	(0.011)	(0.011)	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)	(0.002)	(0.182)	(0.181)	(0.002)	(0.002)	(0.001)	(0.001)
INTL	0.002	0.002	0.006	0.006	0.001	0.001	0.001	0.001	0.002	0.002	-0.029	-0.023	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.327)	(0.328)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	1.938***	1.922***	0.147	0.077	-0.052	-0.057	0.061***	0.062***	0.019	0.009	-15.98***	-15.92***	-0.098	-0.066	0.291***	0.282***
	(0.570)	(0.568)	(1.162)	(1.163)	(0.036)	(0.036)	(0.023)	(0.023)	(0.168)	(0.169)	(5.406)	(5.429)	(0.288)	(0.291)	(0.085)	(0.084)
OPE	0.052**	0.052**	-0.057**	-0.056**	-0.001	-0.001	0.002***	0.002***	-0.021***	-0.020***	-0.087	-0.089	-0.004	-0.004	0.006***	0.006***
	(0.022)	(0.023)	(0.023)	(0.023)	(0.000)	(0.001)	(0.001)	(0.000)	(0.007)	(0.007)	(0.185)	(0.185)	(0.005)	(0.005)	(0.002)	(0.002)
LogTA	-0.005	-0.006	0.210**	0.205**	-0.002	-0.002	0.009	0.009	-0.005	-0.003	-0.339	-0.335	0.072	0.081	-0.020	-0.021
	(0.034)	(0.035)	(0.089)	(0.089)	(0.005)	(0.005)	(0.010)	(0.010)	(0.033)	(0.033)	(0.625)	(0.630)	(0.108)	(0.110)	(0.025)	(0.025)
Lending Rate	0.014	0.013	0.015	0.012	0.001	0.001	-0.001	-0.001	-0.012**	-0.011**	-0.230	-0.220	-0.003	-0.002	0.017***	0.017***
	(0.021)	(0.021)	(0.045)	(0.045)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)	(0.005)	(0.197)	(0.198)	(0.009)	(0.009)	(0.002)	(0.002)
GDPGrowth	0.036**	0.036**	0.050	0.049	0.001	0.001	-0.001	-0.001	0.001	0.001	-0.054	-0.058	0.007	0.007	0.009***	0.009***
	(0.015)	(0.015)	(0.033)	(0.033)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.004)	(0.101)	(0.104)	(0.008)	(0.008)	(0.002)	(0.002)
CVInflation	-0.001	-0.001	0.003	0.003	0.001	0.001	-0.001	-0.001	0.001	0.001	-0.001	-0.001	-0.002	-0.002	-0.001	-0.001
	(0.001)	(0.001)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.006)	(0.002)	(0.002)	(0.000)	(0.000)
Political	-0.351		-1.573		-0.027**		-0.002		-0.056		0.639		-0.337		0.017	
	(0.337)		(1.064)		(0.011)		(0.007)		(0.095)		(3.340)		(0.335)		(0.065)	
Legal		0.071		-0.132		0.005		-0.003		-0.084		-6.413		-0.581		0.263***
		(0.515)		(1.184)		(0.012)		(0.013)		(0.146)		(4.493)		(0.456)		(0.095)
Constant	-2.398***	-2.284***	-4.907**	-4.416**	0.101	0.109*	-0.125	-0.126	1.079**	1.044*	39.596***	39.035***	-1.246	-1.351	-0.135	-0.117
	(0.844)	(0.821)	(1.951)	(1.925)	(0.063)	(0.064)	(0.144)	(0.143)	(0.550)	(0.554)	(12.340)	(12.314)	(1.725)	(1.779)	(0.395)	(0.399)
Obs.	5,508	5,508	5,508	5,508	6,493	6,493	5,508	5,508	5,965	5,965	5,994	5,994	3,874	3,874	5,000	5,000
No. of BankID	506	506	506	506	506	506	506	506	506	506	506	506	503	503	505	505
AR2	0.37	0.38	0.85	0.86	0.55	0.52	0.19	0.20	0.42	0.42	0.92	0.92	0.20	0.2	0.54	0.56
Sagan Test	9.23	9.21	21.62	21.67	7.85	8.75	47.13	47.03	22.33	22.02	12.53	12.48	3.99	4.44	24.28	23.65
Sagan P. Value	0.41	0.41	0.36	0.35	0.79	0.72	0.17	0.17	0.44	0.45	0.25	0.25	0.40	0.34	0.14	0.16

Table5.2a reports the regression result of the dummy variable of implementation or adoption of features of twin peaks regulatory model on bank performance and stability measures, using the **entire sample size.** The dependent variables are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA), equity ratio (EQR), ratio of non-performing loan to total loan (NPLTL), H-Stat, LogZ-Index, and liquidity ratio. Panel A and B contain performance and stability measures, respectively. For correction of autocorrelation and over-identification of the models all the variables are at lags of 2, except LogZ-Index at lag of 4. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table5.2b: Estimation of Twin peaks dummy on performance and stability for Emerging markets

	Panel A: Performance Measures						Panel B: Stability Measures									
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
Dummy Twin	-0.168	-0.185	2.321	2.178	0.079*	0.074*	0.012	0.012	-1.234*	-1.262*	0.294	0.813	0.228	0.266	-0.875***	-0.889***
	(0.117)	(0.118)	(2.078)	(2.093)	(0.042)	(0.041)	(0.032)	(0.032)	(0.730)	(0.743)	(8.717)	(8.669)	(0.464)	(0.465)	(0.291)	(0.291)
H-Stat	-0.391	-0.380	-1.166**	-1.141**	0.026	0.023	0.029***	0.029***	0.300	0.312	3.574	3.141	-0.144**	-0.150**		
	(0.268)	(0.267)	(0.485)	(0.488)	(0.017)	(0.016)	(0.006)	(0.006)	(0.196)	(0.197)	(2.716)	(2.703)	(0.060)	(0.060)		
CAPR	-0.001	-0.002	0.021**	0.021**	0.001	0.001	0.002***	0.002***	0.002	0.002	-2.597***	-2.608***	0.001	0.001	-0.001	-0.001
	(0.009)	(0.009)	(0.009)	(0.009)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.033)	(0.033)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	0.002	0.002	0.019*	0.018*	0.001	0.001	-0.001	-0.001	0.001	0.001	0.292	0.286	0.001	0.001	0.008*	0.008*
	(0.005)	(0.005)	(0.011)	(0.011)	(0.001)	(0.001)	(0.000)	(0.000)	(0.007)	(0.007)	(0.242)	(0.239)	(0.002)	(0.002)	(0.004)	(0.004)
TLTA	1.052	1.096	-0.727	-0.837	-0.067*	-0.071*	-0.023**	-0.022**	-0.226	-0.226	-7.220	-7.592	0.003	0.020	0.371***	0.366***
	(1.014)	(1.022)	(1.457)	(1.460)	(0.040)	(0.040)	(0.009)	(0.009)	(0.205)	(0.206)	(8.173)	(8.120)	(0.183)	(0.183)	(0.088)	(0.088)
OPE	0.043**	0.042**	-0.050**	-0.049**	-0.001	-0.001	0.001***	0.001***	0.007	0.007	0.001	-0.001	-0.005**	-0.005**	0.007***	0.007***
	(0.020)	(0.020)	(0.023)	(0.023)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.008)	(0.127)	(0.129)	(0.002)	(0.002)	(0.002)	(0.002)
LogTA	0.018	0.019	0.125**	0.121**	-0.004	-0.004	0.009***	0.009***	0.040*	0.041*	-0.429	-0.453	-0.010	-0.013	-0.033***	-0.033***
	(0.022)	(0.022)	(0.060)	(0.060)	(0.005)	(0.005)	(0.002)	(0.002)	(0.025)	(0.025)	(0.472)	(0.474)	(0.015)	(0.015)	(0.011)	(0.011)
Lending Rate	0.039*	0.038*	-0.005	-0.009	-0.001	-0.001	0.001**	0.001**	0.010	0.010	-0.468	-0.452	-0.001	-0.001	0.011***	0.011***
	(0.022)	(0.022)	(0.054)	(0.053)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.007)	(0.292)	(0.292)	(0.004)	(0.004)	(0.002)	(0.002)
GDPGrowth	0.035**	0.035**	0.042	0.043	0.000	0.000	0.000***	0.000***	-0.004	-0.004	0.002	-0.007	0.001	0.001	0.005***	0.005***
	(0.015)	(0.015)	(0.033)	(0.033)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.164)	(0.153)	(0.004)	(0.004)	(0.002)	(0.002)
CVInflation	0.001	0.001	0.005*	0.004*	0.001	0.001	-0.001	-0.001	-0.001**	-0.001**	-0.005	-0.004	-0.001	0.001	-0.001***	-0.001***
	(0.000)	(0.000)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.010)	(0.010)	(0.001)	(0.001)	(0.000)	(0.000)
Political	0.234		-1.322		-0.022***		-0.002		-0.048		0.137		0.036		-0.103**	
	(0.304)		(1.079)		(0.009)		(0.007)		(0.108)		(4.318)		(0.154)		(0.045)	
Legal		0.581		1.017		0.004		0.008		0.028		-3.192		-0.057		0.007
		(0.492)		(1.248)		(0.012)		(0.008)		(0.143)		(4.165)		(0.217)		(0.082)
Constant	-0.646	-0.601	-4.997**	-4.100**	0.124*	0.137**	0.097***	0.098***	0.235	0.268	71.68***	71.07***	2.063***	2.070***	0.410**	0.456**
	(0.756)	(0.780)	(1.973)	(1.986)	(0.067)	(0.068)	(0.017)	(0.017)	(0.491)	(0.496)	(9.817)	(9.768)	(0.471)	(0.451)	(0.206)	(0.212)
Obs.	5,833	5,833	5,391	5,391	5,833	5,833	5,391	5,391	5,805	5,805	5,385	5,385	5,281	5,281	5,385	5,385
No. of BankID	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455
AR2	0.20	0.20	0.19	0.20	0.49	0.45	0.30	0.28	0.15	0.15	0.65	0.65	0.000	0.000	0.11	0.12
Sagan Test	17.52	17.33	14.92	15.06	8.66	9.52	70.27	69.60	31.07	30.64	19.74	18.76	47.14	45.79	16.74	16.83
Sagan P. Value	0.13	0.13	0.18	0.17	0.73	0.65	0.05	0.06	0.31	0.33	0.10	0.10	0.000	0.000	0.12	0.12

Table5.2b displays the regression result of dummy of implementation or adoption of features of twin peaks regulatory model on Bank's performance and stability measures, using **only emerging market sample size.** The dependent variables are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA), equity ratio (EQR), Ratio of non-performing loan to total loan (NPLTL), H-Stat, LogZ-Index, and liquidity ratio. Panel A and B contain performance and stability measures, respectively. For correction of autocorrelation and over-identification of the models all the variables are at lags of 1, except EQR at lag of 2.Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table5.2c: Estimation of Twin peaks dummy on performance and stability for Developed markets

	Panel A Performance Measures						Panel B: Stability Measures									
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**Liquidity**		**LogZ-Index**		**H-Stat**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
Dummy Twin	0.122*	0.118*	-2.824	-3.729	0.010*	0.010*	0.013***	0.018***	-0.020**	-0.031**	0.074**	0.073**	0.109	0.146*	0.046**	0.053**
	(0.067)	(0.068)	(2.156)	(2.115)	(0.006)	(0.006)	(0.005)	(0.003)	(0.010)	(0.014)	(0.035)	(0.031)	(0.067)	(0.076)	(0.022)	(0.021)
H-Stat	-0.147	-0.162	-4.907***	-4.939***	0.003	0.004	-0.048***	-0.047***	-0.014*	0.224***	0.362***	0.400***	-0.401	-0.078		
	(0.137)	(0.124)	(1.191)	(1.190)	(0.002)	(0.003)	(0.002)	(0.003)	(0.008)	(0.019)	(0.090)	(0.088)	(0.248)	(0.154)		
CAPR	0.008	0.009*	0.098	0.079	-0.008***	-0.008***	0.013***	0.013***	-0.004***	-0.001*	-0.041***	-0.042***	0.004	0.009***	0.001**	0.001***
	(0.006)	(0.006)	(0.063)	(0.063)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)	(0.003)	(0.005)	(0.003)	(0.001)	(0.001)
INTL	0.002***	0.002***	0.005**	0.004**	0.001***	0.001***	0.001***	0.001***	0.001	0.001**	-0.001	-0.001	-0.001	-0.001	0.001	0.001
	(0.000)	(0.000)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
TLTA	-0.238	-0.218	-1.201	-0.686	0.028**	0.029**	-0.193***	-0.209***	0.007	-0.015	-0.029	0.018	-0.841***	-1.026***	-0.098**	-0.101**
	(0.166)	(0.188)	(1.533)	(1.576)	(0.011)	(0.012)	(0.011)	(0.010)	(0.032)	(0.051)	(0.160)	(0.150)	(0.173)	(0.124)	(0.045)	(0.045)
OPE	0.044***	0.043***	0.408**	0.383**	0.001	0.001	0.003***	0.003***	0.010**	0.011*	0.015**	0.016***	-0.023**	0.056***	0.008**	0.008**
	(0.016)	(0.016)	(0.179)	(0.167)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)	(0.006)	(0.007)	(0.005)	(0.010)	(0.011)	(0.003)	(0.004)
LogTA	-0.026	-0.026	-1.010***	-0.976***	0.001	0.001	-0.018***	-0.017***	-0.035*	-0.033	0.077**	0.086**	-0.115*	0.312***	-0.119***	-0.119***
	(0.018)	(0.017)	(0.137)	(0.130)	(0.003)	(0.003)	(0.002)	(0.002)	(0.019)	(0.026)	(0.039)	(0.040)	(0.063)	(0.057)	(0.001)	(0.001)
Lending Rate	0.019	0.015	-0.114	-0.077	-0.001	-0.001	0.006***	0.007***	0.003*	0.007*	-0.035*	-0.040**	0.034	-0.001	-0.007	-0.005
	(0.029)	(0.028)	(0.146)	(0.149)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)	(0.018)	(0.017)	(0.024)	(0.022)	(0.005)	(0.006)
GDPGrowth	0.022*	0.022*	-0.142	-0.078	0.001	0.001	-0.005***	-0.006***	-0.002**	-0.005***	0.019**	0.014**	-0.004	-0.026***	0.015***	0.013***
	(0.011)	(0.012)	(0.159)	(0.182)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.006)	(0.007)	(0.007)	(0.003)	(0.003)
CVInflation	0.001**	0.001**	-0.011	-0.008	-0.001**	-0.001*	0.001***	0.001***	0.001***	0.001***	-0.000	-0.001	-0.004***	0.002**	-0.001***	-0.001***
	(0.001)	(0.001)	(0.017)	(0.018)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Political	0.078		-11.24**		-0.017		-0.015		0.027		0.210		-0.569*		0.063	
	(0.252)		(4.908)		(0.013)		(0.010)		(0.019)		(0.201)		(0.326)		(0.066)	
Legal		-0.043		-12.00***		-0.001		0.188***		0.013		1.032***		-0.708		0.256***
		(0.276)		(4.306)		(0.017)		(0.018)		(0.063)		(0.318)		(0.655)		(0.094)
Constant	0.344	0.457	24.277***	26.006***	0.121**	0.094*	0.158***	-0.164***	0.546	0.504	0.186	-1.137*	4.990***	-3.960***	-0.148	-0.461***
	(0.568)	(0.423)	(8.217)	(7.362)	(0.049)	(0.054)	(0.033)	(0.036)	(0.340)	(0.458)	(0.608)	(0.614)	(1.190)	(1.328)	(0.110)	(0.153)
Obs.	660	660	609	609	660	660	660	660	558	558	660	660	547	547	608	608
No. of BankID	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
AR2	0.60	0.59	0.26	0.26	0.30	0.31	0.41	0.42	0.55	0.50	0.22	0.22	0.48	0.35	0.71	0.67
Sagan Test	14.66	14.77	9.77	11.04	14.24	14.09	39.95	43.33	15.10	14.52	15.25	18.05	46.39	46.56	30.62	30.17
Sagan P. Value	0.26	0.25	0.55	0.43	0.28	0.29	0.25	0.15	0.12	0.15	0.22	0.11	0.49	0.36	0.11	0.11

Table5.2b displays the regression result of dummy of implementation or adoption of features of twin peaks regulatory model on Bank's performance and stability measures, using **developed market** sample size. The dependent variables are net interest margin (NIM), pre-tax profit (PreTaxP), return on assets (ROA), equity ratio (EQR), Ratio of non-performing loan to total loan (NPLTL), H-Stat, LogZ-Index, and liquidity ratio. Panel A and B contain performance and stability measures, respectively. For correction of autocorrelation and over-identification of the models all the variables are at lags of 1. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

5.4. Factors that affect implementation of the twin-peaks model

This section addresses hypothesis 5, which proposes that economic and environmental factors contribute to the adoption of twin-peaks regulatory reforms or model in the emerging market country's banking industry. Using panel logistic regression, we ascertain factors (bank-and country-specific) that are likely to foster implementation and/or adoption of features of the twin-peaks regulatory model. Generating dummy variable of implementation and/or adoption of twin-peaks, we assign value of 1 to a country that implemented or adopted features of twin-peaks, while value of 0 to those that did not implement and/or adopt features of twin-peaks model.

The results are presented in **Table 5.3,** with coefficients presented in odd ratios. Country-specific variables we considered to affect implementation of twin-peaks include: real interest rate (RIntR), coefficient of variation of inflation rates (CVInflation), which measures the variability of inflation in an economy; GDP growth, standard deviation of exchange rate (StdEx), which measures a country's openness to trade with other countries, and institutional factors (political and legal environments).

We find that all the country-specific factors included in our model significantly affect a country's decision to implement and/or adopt of twin-peaks regulatory model. Specifically, GDP growth, political and legal institutions are associated with higher odds (probability) of implementing twin-peaks compared to other country-specific factors. In respect of bank-specific factors, availability of subordinated debt has the highest influence on implementing twin-peaks, followed by bank size (measured as logarithm of total asset (LogTA)), net interest margin (NIM), and regulatory capital ratio (CAPR). Competition in the banking industry (H-Stat) also significantly increases the likelihood of implementation of twin-peaks, but with a lesser magnitude compared to factors mentioned above. Z-Index, as stability measure only has marginal significant effect on implementation of twin-peaks, while liquidity has no significant effect, though with higher odd ratio.

From the above results, we conclude that implementation and/or adoption for twin-peaks features largely depends on both country-and bank-specific factors. Counties considering implementation of twin-peaks regulatory model should specifically establish strong political and legal institutions, as well maintain positive economic growth. The performance of banks in a country is also a strong indicator of to attract twin-peaks regulatory model in a country. Therefore, for countries to attract benefits from twin-peaks regulatory model, strong macroeconomic environment, institutional environment as well as strong financial institutions should be established and maintained.

Table 5.3: Factors that affect implementation and/or adoption of features of twin-peaks regulatory model

Variables	Dummy of implementation of twin-peaks or adoption of twin-peaks features			
	Emerging market		Overall sample	
	(1)	(2)	(3)	(4)
H-Stat	0.052***(0.024)	1.004(0.650)	0.056*** (0.025)	2.684(2.025)
NIM	1.162*(0.925)	0.774**(0.043)	1.176**(0.089)	0.15***(0.051)
LogZ-Index	1.280(0.210)	1.115(0.267)	1.250(0.197)	0.924(0.239)
CAPR	1.032**(0.014)	1.006(0.013)	1.033***(0.011)	1.002(0.016)
Liquidity Ratio	1.000(0.001)	1.000(0.008)	1.000(0.001)	1.000(0.007)
LogTA	1.981***(0.180)	1.106(0.104)	2.230***(0.250)	1.193(0.152)
DummyOutSh	1.357(0.890)	0.001***(0.001)	0.967(0.564)	0.014***(0.013)
DummySubD	16.496***(10.561)	1.394(0.900)	14.482***(8.923)	0.658(0.498)
Real IntRate	0.649***(0.029)	0.739***(0.023)	0.679***(0.026)	0.851***(0.030)
CVInflation	1.000(0.001	0.978***(0.002)	1.000(0.001)	0.974***(0.002)
GDPGrowth	1.657***(0.175)	1.522***(0.143)	1.693***(0.168)	1.173(0.152
StdvOffEx	0.944***(0.008)	0.929***(0.007)	0.956***(0.008)	0.959***(0.008)
L1.Political	3.251***(3.338)		9.927***(3.529)	
L2.Legal		1.064***(0.696)		7.047***(0.512)
Obs.	6281	5850	6477	6032
No of groups	463	462	477	476
Chi^2	372.84***	238.17***	399.88***	489.89***
Log Likelihood	-456.26	-297.35	-456.03	-313.69
Hausman Ch^2	0.00	0.00	0.00	0.00
(P. Value)	(1.00)	(1.00)	(1.00)	(1.00)

*Table 5.3 displays logistic regression result **(using random effects)** of factors affecting implementation of twin-peaks for both **overall sample** and **emerging market economy sample.** The dependent variable is the dummy variable of implementing twin-peaks, while the independent variables are bank-specific factors, along with macroeconomic and institutional variables. The estimation is reported in odd ratios, which is the appropriate reporting of coefficients in logistic regression. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, and 10%, respectively.*

5.5. Choice of twin-peaks structure, banks' performance and stability

We found, from previous sections, that implementation of twin-peaks regulatory model is beneficial to banks, both in terms of performance and stability (though with more positive impact in developed compared to emerging market economies). In this section, we ascertain the extent to which different twin-peaks regulatory structure affect bank performance and stability differently. This analysis is test of hypothesis 6 from chapter 3, section 3.9. Recall from literature that twin-peaks is a regulatory model, by objective, whereby two regulators are independently responsible for the prudential and market conduct regulatory objectives. Some countries, such as Netherlands and

Belgium, assigned the prudential regulatory authority of the country to the central bank, while countries such as, Australia and France prefer two independent bodies to oversee the two peaks of this financial regulatory model. Emerging market countries that have adopted features of twin-peaks still have the central bank participating as one of the two peaks, mostly occupying the prudential space of the regulatory model.

From the literature, there is little empirical evidence about the effect of regulatory structure on financial industries' performance, with conflicting results on the importance of central bank as part of the main regulatory organs of countries. One would expect bank performance to improve due to central bank's (CB) involvement because the central bank could easily attract supervisory experts than non-central bank regulators. On the other hand, conflict of interest in CB's role of monetary policy and bank supervision could exist, thereby affecting CB's regulation of banks in unwelcome ways. Barth et al. (2003) did not find any effect on bank performance that is due to CB's involvement in financial supervision, while Dincer and Eichengreen (2012) find that CB involvement reduces the magnitude of non-performing loans. Based on the foregoing, the above model is also an alternative way of measuring the effect of CB involvement in financial regulation on bank performance and stability. On that note, expected effects of these variables are an open empirical question

In this section, we sample four developed countries (Australia, Belgium, France and Netherlands) that have fully implemented twin-peaks regulatory model. We form a dummy variable whereby a country included central bank as one of the peaks (TwinCB) as well as a dummy where two independent bodies take the responsibilities of prudential and market conduct regulatory objectives, respectively (TwinInBody). From Table 5.4a, we find that, countries with central banks (TwinCB) as one of the peaks have significant increase in net interest margin (NIM) compared to return on asset (ROA) as measures of performance. On the other hand, TwinInBody recorded significant increase in ROA with insignificant effect in NIM.

Looking at stability measures (Table 5.4b); TwinCB significantly increases equity (EQR) and liquidity ratios, while TwinInbody had no significant (though incremental) effects on both. Interestingly, our results stipulate that choice of either central bank as one of the regulators, or choice of two independent bodies, being in charge of regulatory oversight of banks, significantly reduce the magnitude of nonperforming loan (NPLTL). The result indicates that whether a country chooses

central bank as one of its peaks or not, banks are likely to be exposed to lesser risk due to implementation of twin-peaks regulatory model.

Despite that results in Tables 5.4 a and 5.4b show favorable effects of Central banks' involvement in twin peaks regulatory structure, some countries such as Australia and France still use two regulatory bodies independent of the central bank. In fact, France had central bank as one of its regulators while adopting features of twin-peaks in 2003, but when full implementation took off in 2010, the responsibilities of Banque de France as prudential regulator was assigned to an independent body, Autorité de Contrôle Prudentiel (APC). And though governor of Banque de France is the chairman of APC, the daily management is under the control of secretary general. The reason for persistent use of independent bodies instead of central bank as a part of the peak could be due to the kind of evidence found of TwinInbody on Z-Index in Table 5.4b (models 15 and 16). We find that while TwinCB reduces Z-Index (though not significantly), TwinInBody significantly increases it. Recall Z-Index is an inverse measure of bank risks; a higher Z-Index implies a lesser probability of bank failure, as well as higher capitalization, hence reflecting more stable banks.

Another interesting result is on the effects of TwinInbody on return on assets (ROA) in Table 5.4a and that of TwinCB on equity ratio (EQR) in Table 5.4b. We find that, while TwinInbody increases ROA, TwinCB increases EQR. This result posits that central bank's involvement in regulatory oversight of banks increases shareholder confidence to invest more in banks, thereby increasing equity base of bank balance sheet. On the other hand, the use of regulatory bodies independent of the central bank increases assets base of banks, which implies that banks were able to increase their loan portfolio if regulatory bodies are independent of the monetary circuit of the economy.

Based on the above results, there is still no conclusive beneficial evidence on involvement of central bank on a country's financial regulatory structure. It should be left to the country's discretion at to its preference for either increase in owners' equity (more capitalization by banks) or increase in banks' loan portfolio, which will in turn increase ease of access to loan by firms, especially SMEs.

Table 5.4a: Estimations of Twin peaks structures on bank performance for Developed Markets

Variables	NIM				LogPreTaxP				ROA			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TwinwithCB	0.275***	0.257***			-0.482	-0.919			0.001	-0.004		
	(0.082)	(0.089)			(0.990)	(0.875)			(0.004)	(0.003)		
TwinInBody			-0.017	-0.041			-0.580**	-0.487			0.014*	0.015*
			(0.093)	(0.088)			(0.288)	(0.315)			(0.008)	(0.008)
H-Stat	-0.095	-0.088	-0.204*	-0.222*	-5.442***	-5.263***	-1.943***	-2.410***	0.002	0.008***	0.003	0.003
	(0.145)	(0.147)	(0.127)	(0.131)	(0.554)	(0.554)	(0.697)	(0.696)	(0.002)	(0.002)	(0.002)	(0.003)
CAPR	0.008	0.009*	0.007	0.008	0.134***	0.115***	0.008	0.020**	-0.008***	-0.008***	-0.008***	-0.008***
	(0.006)	(0.005)	(0.006)	(0.006)	(0.014)	(0.016)	(0.008)	(0.009)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.002***	0.002***	0.002***	0.002***	0.001	0.001	-0.000	0.000	0.000***	0.000***	0.000**	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	-0.242	-0.238	-0.295*	-0.284	0.245	0.254	-0.812**	-1.708***	0.026**	0.018**	0.029**	0.029**
	(0.165)	(0.188)	(0.164)	(0.186)	(0.336)	(0.325)	(0.390)	(0.562)	(0.011)	(0.009)	(0.012)	(0.012)
OPE	0.043***	0.041***	0.045***	0.042***	0.264***	0.219***	-0.162***	-0.172***	0.001	0.001***	0.001	0.001
	(0.016)	(0.015)	(0.015)	(0.014)	(0.089)	(0.072)	(0.010)	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)
LogTA	-0.021	-0.019	-0.029*	-0.029*	-1.045***	-0.982***	-0.329***	-0.296***	0.001	0.002	0.000	0.000
	(0.019)	(0.017)	(0.018)	(0.016)	(0.122)	(0.119)	(0.073)	(0.061)	(0.003)	(0.002)	(0.003)	(0.003)
GDPGrowth	0.025**	0.024**	0.019*	0.019	0.077	0.107*	0.158***	0.191***	0.000	0.001***	0.000	0.000
	(0.011)	(0.012)	(0.011)	(0.011)	(0.060)	(0.062)	(0.041)	(0.048)	(0.000)	(0.000)	(0.000)	(0.000)
Lending Rate	0.015	0.012	0.014	0.011	-0.132**	-0.213***	-0.222***	-0.166**	-0.001*	-0.002***	-0.001	-0.001
	(0.030)	(0.029)	(0.027)	(0.027)	(0.060)	(0.078)	(0.070)	(0.077)	(0.001)	(0.001)	(0.001)	(0.001)
CVInflation	0.001***	0.001***	0.001**	0.001**	0.001	0.000	-0.005	-0.004	-0.000**	-0.000***	-0.000**	-0.000*
	(0.001)	(0.001)	(0.000)	(0.000)	(0.006)	(0.007)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.060		0.082		-4.193***		-1.136**		-0.018		-0.012	
	(0.241)		(0.264)		(1.016)		(0.455)		(0.013)		(0.011)	
Legal		-0.132		-0.214		-6.734***		-5.767***		0.052***		0.003
		(0.366)		(0.364)		(2.506)		(1.887)		(0.012)		(0.017)
Constant	0.573	0.680	0.587	0.981	9.949***	14.489***	11.775***	18.119***	0.124**	0.018	0.108**	0.086
	(0.587)	(0.691)	(0.540)	(0.671)	(2.619)	(4.319)	(0.779)	(2.994)	(0.049)	(0.037)	(0.048)	(0.053)
Obs.	660	660	660	660	609	609	660	660	660	660	660	660
No. of BankID	51	51	51	51	51	51	51	51	51	51	51	51
AR2	0.58	0.57	0.62	0.60	0.21	0.21	0.38	0.32	0.31	0.34	0.31	0.32
Sagan Test	13.51	13.76	15.76	16.39	24.19	23.77	24.10	26.56	13.46	32.49	14.17	14.24
Sagan P. Value	0.33	0.31	0.20	0.17	0.33	0.35	0.45	0.32	0.33	0.12	0.29	0.28

Table 5.4a displays the effects of choice of twin-peaks regulatory structure on bank performance for the **developed market sample only.** Performance is measured as net interest margin (NIM), pretax profit and return on asset (ROA), which are the dependent variables. All the dependent variables are at lag of 1. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively

Table 5.4b: Estimation of Twin peaks structures on bank stability for Developed Markets

Variables	EQR				NPLTL				Liquidity				LogZ-Index				H-Stat			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
TwinwithCB	0.033***	0.034***			-0.017*	-0.008			0.201*	0.122			-0.183	-0.141			-0.019	0.040		
	(0.011)	(0.009)			(0.010)	(0.012)			(0.111)	(0.124)			(0.259)	(0.255)			(0.068)	(0.061)		
TwinInBody			-0.005	0.003			-0.011	-0.058**			0.076	0.047			0.422***	0.451***			0.013	0.048
			(0.012)	(0.010)			(0.029)	(0.025)			(0.059)	(0.059)			(0.157)	(0.150)			(0.049)	(0.050)
H-Stat	-0.018*	-0.018*	-0.023**	-0.017	-0.011	-0.009	0.065	0.134***	0.081**	0.090*	0.374***	0.263**	-0.465**	-0.450**	-0.440**	-0.428*				
	(0.010)	(0.011)	(0.010)	(0.011)	(0.008)	(0.012)	(0.040)	(0.033)	(0.039)	(0.053)	(0.088)	(0.109)	(0.217)	(0.227)	(0.216)	(0.225)				
CAPR	0.014***	0.014***	0.014***	0.014***	-0.004***	-0.004***	0.000	-0.002***	0.017***	0.013***	-0.042***	-0.040***	0.003	0.003	0.004	0.003	-0.000	0.000	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.007)	(0.007)	(0.007)	(0.007)	(0.002)	(0.002)	(0.002)	(0.002)
INTL	0.001***	0.001***	0.001***	0.001***	0.001	0.001***	-0.001	0.001**	0.001	0.001***	-0.001	0.001	-0.001	0.001	-0.001	-0.001	-0.001***	-0.001***	-0.001***	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.0001)	(0.001)	(0.001)	(0.001)
TLTA	-0.179***	-0.191***	-0.170***	-0.183***	0.009	-0.142***	0.023	-0.167***	-0.680***	-0.952***	-0.038	0.051	-1.157***	-1.185***	-1.145***	-1.169***	0.023	-0.030	0.007	-0.044
	(0.026)	(0.024)	(0.025)	(0.024)	(0.033)	(0.031)	(0.037)	(0.038)	(0.195)	(0.186)	(0.148)	(0.124)	(0.384)	(0.391)	(0.389)	(0.396)	(0.123)	(0.119)	(0.125)	(0.120)
OPE	0.003***	0.003***	0.003***	0.003***	0.009**	0.009***	0.003	-0.003	-0.013*	-0.015	0.014**	0.013***	0.038	0.039	0.037	0.037	0.033**	0.029*	0.033**	0.029*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.003)	(0.004)	(0.003)	(0.006)	(0.010)	(0.007)	(0.005)	(0.029)	(0.029)	(0.029)	(0.029)	(0.017)	(0.017)	(0.016)	(0.017)
LogTA	-0.013***	-0.011***	-0.014***	-0.011***	-0.034*	-0.026	0.003	-0.050**	0.014***	0.015*	0.087**	0.043	0.270	0.276	0.261	0.266	-0.096	-0.098	-0.109	-0.106
	(0.005)	(0.004)	(0.004)	(0.004)	(0.019)	(0.026)	(0.017)	(0.026)	(0.004)	(0.008)	(0.041)	(0.044)	(0.169)	(0.169)	(0.170)	(0.170)	(0.071)	(0.067)	(0.070)	(0.065)
GDPGrowth	-0.003***	-0.005***	-0.003***	-0.005***	-0.002***	-0.002***	-0.000	-0.002**	0.004	-0.003	0.018**	0.019**	-0.036*	-0.034	-0.041*	-0.041*	0.036***	0.034***	0.036***	0.032***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.003)	(0.004)	(0.007)	(0.008)	(0.021)	(0.023)	(0.023)	(0.025)	(0.007)	(0.007)	(0.008)	(0.007)
Lending Rate	0.003**	0.004**	0.004***	0.005***	0.003	0.004	-0.001	0.002**	-0.009	-0.002	-0.041**	-0.036	0.037	0.041	0.041	0.046	-0.005	-0.005	-0.006	-0.006
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.011)	(0.012)	(0.020)	(0.022)	(0.053)	(0.055)	(0.053)	(0.055)	(0.014)	(0.014)	(0.014)	(0.015)
CVInflation	0.001***	0.001***	0.001***	0.001***	0.001***	0.001	0.001	0.001*	0.001***	0.001**	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-0.027		-0.003		0.020		0.030		0.413***		0.243		0.504		0.348		0.597***		0.609***	
	(0.019)		(0.017)		(0.020)		(0.050)		(0.145)		(0.157)		(0.648)		(0.645)		(0.211)		(0.188)	
Legal		0.153***		0.167***		0.074**		0.129*		1.012**		-0.374***		-0.166		-0.141		0.134		0.190
		(0.029)		(0.029)		(0.035)		(0.067)		(0.456)		(0.139)		(0.900)		(0.918)		(0.318)		(0.306)
Constant	0.173**	-0.12***	0.133**	-0.17***	0.535	0.313	0.038	0.992**	-0.078	-0.844	0.021	0.774	-5.845*	-4.936*	-5.747*	-5.118*	0.551	1.293	0.739	1.312
	(0.068)	(0.048)	(0.058)	(0.047)	(0.345)	(0.443)	(0.324)	(0.461)	(0.257)	(0.760)	(0.588)	(0.516)	(3.165)	(2.948)	(3.148)	(2.937)	(1.271)	(1.078)	(1.273)	(1.068)
Observations	660	660	660	660	558	558	507	507	609	609	660	660	547	547	547	547	558	558	558	558
No. of BankID	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
AR2	0.40	0.40	0.39	0.38	0.55	0.56	0.33	0.38	0.29	0.29	0.22	0.22	0.54	0.54	0.58	0.57	0.15	0.16	0.16	0.16
Sagan Test	28.87	32.26	29.27	33.51	15.52	10.64	7.17	13.89	15.60	15.11	15.66	12.99	10.66	10.88	10.58	10.83	15.33	15.85	14.16	15.12
Sagan P. Value	0.22	0.12	0.20	0.09	0.11	0.38	0.51	0.08	0.11	0.12	0.20	0.36	0.38	0.36	0.39	0.37	0.12	0.10	0.16	0.12

Table 5.4b displays the effects of choice of twin-peaks regulatory structure on bank stability for the **developed market sample only.** Stability measures as equity ratio (EQR), non-performing loans (NPLTL), liquidity ratio, Z-Index and competition measure (H-Stat), which are the dependent variables. EQR, Z-Index and H-Stat are at lag of 1, NPLTL has lag of 1 for models 5 and 6, with lag of 2 in models 7 and 8. Liquidity has lag of 2 in models 9 and 10, with lag of 1 in models 11 and 12. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

5.6. Effect of regulatory structure on performance and stability.

Before we can draw a relatively robust conclusion about effects of twin-peaks on bank performance and stability, we additionally estimated a model of effects of single-body regulatory model on banks as robustness check. This model assumes that one regulatory agency can simultaneously and efficiently handle all the regulatory objectives (Di Giorgio, Di Noia, and Piatti 2000, Pan 2010, Briault 2002). This model estimation takes us to hypothesis 7, in chapter 3 (section 3.9), which addressed the possible effect of financial regulatory structure on bank performance and stability.

Using our sample of 24 countries, we formed a dummy variable of countries that used a single regulator (SINREG) as their financial regulatory architecture. This variable is regressed against bank performance and stability, alongside other bank- and country-specific factors for period 2000-2014. Taking market discipline into account, we went further to estimate interaction effect between single regulatory model and market discipline on performance and stability of banks. The motivation for this interaction effect is to find out what happens to bank performance and stability should a country operate under a single regulatory body and also implemented market discipline principles.

From Table 5.5a, we see that single regulatory body has no significant effects on banks' net interest margin (NIM), even after interacting with the market discipline principle variable. But looking at other measures of performance, the interaction effect significantly reduces pretax profit, while its reduction effect on return on asset (ROA) is not significant, though without interaction single regulatory body significantly reduces ROA. From the stability perspective (Tables 5.5b and 5.5c), a single regulatory body based structure also reduces bank stability measures, whereby SINREG's interaction effect with market discipline significantly reduces equity ratio (EQR) and Z-Index.

This same estimation analysis is extended to a sub-sample of only emerging market countries, and similar as observed for the overall were recorded for both the single regulatory body variable and its interaction with the market discipline principle variable (see Tables 5.5 d, 5.5 e, and 5.5f). From these results, we can reasonably conclude that single regulator based regulator structure does not favorably enable positive banks performance and stability. Despite implementation of market discipline principle, adopting a single regulator type regulatory structure is not advantageous for bank performance and stability, even in emerging market economies. Based on these results, as well as positive results from twin-peaks estimations in previous sections (5.2 and 5.3) above, twin-peaks regulatory model ought to sensibly embrace as an appropriate structure for banking regulation.

Table 5.5a: Overall Sample-Effect of Regulatory structure (Single regulatory body) on performance measures

VARIABLES	NIM						PreTax Profit						ROA					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
SINREG	0.055	0.066	0.102	0.063			-0.511	-0.560	-1.196	-1.309			-0.051*	-0.050*	-0.050*	-0.049*		
	(0.091)	(0.091)	(0.091)	(0.091)			(0.461)	(0.462)	(1.298)	(1.301)			(0.026)	(0.026)	(0.026)	(0.026)		
DummyMkD			0.234*	0.191					-0.328	-0.340					0.001	0.001		
			(0.130)	(0.129)					(0.305)	(0.302)					(0.002)	(0.002)		
SINREG*MkD			-0.070	0.005	0.205	0.195			0.353	0.361	-0.908**	-0.931**			-0.002	-0.003	-0.001	-0.002
			(0.234)	(0.229)	(0.175)	(0.178)			(0.436)	(0.436)	(0.402)	(0.404)			(0.002)	(0.002)	(0.001)	(0.001)
H-Stat	-0.340	-0.329	-0.341	-0.330	-0.339	-0.328	-0.954***	-0.996***	-1.141***	-1.181***	-0.993	-0.964	0.025*	0.024*	0.025*	0.023	0.024**	0.023**
	(0.250)	(0.249)	(0.249)	(0.249)	(0.248)	(0.247)	(0.333)	(0.336)	(0.351)	(0.354)	(0.620)	(0.617)	(0.015)	(0.015)	(0.015)	(0.015)	(0.012)	(0.011)
CAPR	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	0.021***	0.021***	0.018**	0.018**	0.031**	0.031**	0.001	0.001	0.001	0.001	0.001	0.001
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.012)	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.002**	0.002**	0.002*	0.002**	0.002**	0.002*	0.003	0.003	0.003	0.003	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	0.835	0.875	0.928	0.940	0.900	0.942	-0.942	-0.922	-0.588	-0.583	0.022	-0.064	-0.053	-0.057	-0.052	-0.056	-0.054	-0.060*
	(0.868)	(0.876)	(0.868)	(0.875)	(0.867)	(0.875)	(0.977)	(0.984)	(0.929)	(0.934)	(1.283)	(1.290)	(0.036)	(0.036)	(0.037)	(0.036)	(0.036)	(0.036)
OPE	0.042**	0.041**	0.045**	0.043**	0.044**	0.044**	-0.048***	-0.047***	-0.034*	-0.034*	-0.053**	-0.052**	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.017)	(0.017)	(0.018)	(0.018)	(0.024)	(0.024)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Log2TA	0.014	0.014	0.011	0.012	0.011	0.011	0.161***	0.162***	0.127**	0.127**	0.223**	0.216**	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.042)	(0.043)	(0.058)	(0.057)	(0.100)	(0.100)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Lending Rate	0.037*	0.036*	0.036*	0.037*	0.039*	0.037*	-0.007	-0.009	-0.018	-0.018	-0.013	-0.018	0.001	0.001	0.001	-0.000	0.001	0.001
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.028)	(0.028)	(0.032)	(0.032)	(0.055)	(0.055)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDPGrowth	0.034**	0.035**	0.036**	0.035**	0.036**	0.036**	0.028	0.030	0.033	0.035*	0.046	0.046	0.001	0.001	0.001	0.001	0.001	0.001
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.021)	(0.021)	(0.022)	(0.021)	(0.036)	(0.036)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CVInflation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.004	0.004	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	0.225		0.513*		0.222		-0.732		-0.620		-1.575		-0.024**		-0.023**		-0.029**	
	(0.296)		(0.286)		(0.296)		(0.732)		(0.712)		(1.220)		(0.010)		(0.010)		(0.012)	
Legal		0.532		0.517		0.562		-0.938		-0.345		0.486		0.003		0.003		0.003
		(0.500)		(0.502)		(0.503)		(0.916)		(0.869)		(1.667)		(0.013)		(0.014)		(0.013)
Constant	-0.495	-0.525	-0.766	-0.730	-0.624	-0.637	3.133**	3.151**	3.517**	3.581**	-5.68***	-5.13**	0.145**	0.152**	0.139*	0.144*	0.102	0.110*
	(0.671)	(0.676)	(0.674)	(0.682)	(0.662)	(0.672)	(1.354)	(1.369)	(1.535)	(1.519)	(2.124)	(2.070)	(0.074)	(0.075)	(0.075)	(0.076)	(0.066)	(0.066)
Obs.	6,406	6,406	6,406	6,406	6,406	6,406	6,406	6,406	5,928	5,928	5,451	5,451	6,406	6,406	6,406	6,406	6,406	6,406
No. of BankID	505	505	505	505	505	505	505	505	505	505	505	505	505	505	505	505	505	505
AR2	0.20	0.20	0.21	0.21	0.20	0.21	0.92	0.92	0.29	0.32	0.65	0.66	0.54	0.51	0.54	0.52	0.53	0.50
Sagan Test	17.41	0.14	18.03	18.48	18.42	18.24	49.37	49.03	46.62	46.55	12.02	12.06	7.67	8.49	7.55	8.30	7.42	8.33
Sagan P. Value	0.13	17.26	0.12	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.21	0.20	0.80	0.74	0.81	0.76	0.82	0.75

Table 5.5a displays the effect of single regulatory structure (SINREG) of banks' performance for the **overall sample.** Performance is measured using as net interest margin (NIM), pretax profit and return on asset (ROA), which are the dependent variables. All the dependent variables are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table 5.5b: Overall Sample-Effect of Regulatory structure (Single regulatory body) on stability measures

VARIABLES	EQR						NPLTL						Liquidity					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
SINREG	-0.012	-0.012	-0.012	-0.012			-0.247	-0.233	-0.255	-0.241			-0.771	-0.943	-0.926	-1.051		
	(0.016)	(0.016)	(0.016)	(0.016)			(0.407)	(0.413)	(0.412)	(0.417)			(5.759)	(5.078)	(5.875)	(5.195)		
DummyMkD			0.002	0.002					-0.020	-0.018					0.934	1.248		
			(0.003)	(0.003)					(0.054)	(0.053)					(1.254)	(1.258)		
SINREG*MkD			-0.011***	-0.011***	-0.009***	-0.009***			0.006	0.013	-0.013	-0.004			-0.790	-1.119	0.065	0.057
			(0.004)	(0.004)	(0.003)	(0.003)			(0.063)	(0.062)	(0.032)	(0.032)			(2.285)	(2.289)	(1.575)	(1.556)
H-Stat	0.028**	0.028**	0.028**	0.028**	0.028**	0.028**	0.044	0.039	0.046	0.042	0.048	0.044	-1.362	-1.401	-1.411	-1.441	-1.443	-1.485
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.231)	(0.231)	(0.230)	(0.230)	(0.229)	(0.229)	(2.486)	(2.474)	(2.477)	(2.466)	(2.491)	(2.476)
CAPR	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001	0.001	0.001	0.001	0.001	0.001	-1.98***	-1.99***	-1.97***	-1.98***	-1.97***	-1.98***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.242)	(0.241)	(0.242)	(0.241)	(0.242)	(0.241)
INTL	0.001	0.001	0.001	0.001	0.001	0.001	-0.000	-0.000	-0.001	-0.000	-0.001	-0.000	-0.090	-0.086	-0.097	-0.095	-0.107	-0.100
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.299)	(0.299)	(0.299)	(0.300)	(0.299)	(0.299)
TLTA	0.044*	0.044*	0.045*	0.045*	0.044*	0.044*	-0.143	-0.135	-0.136	-0.128	-0.135	-0.128	-11.41*	-11.75*	-12.26**	-12.51**	-12.44**	-12.69**
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.189)	(0.188)	(0.189)	(0.188)	(0.190)	(0.189)	(6.294)	(6.321)	(6.229)	(6.272)	(6.209)	(6.248)
OPE	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	-0.001	-0.001	-0.002	-0.002	-0.001	-0.001	0.100	0.102	0.117	0.118	0.116	0.117
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.172)	(0.172)	(0.171)	(0.171)	(0.170)	(0.170)
Log2TA	0.005	0.005	0.005	0.005	0.005	0.005	-0.008	-0.007	-0.007	-0.007	-0.008	-0.007	-0.471	-0.459	-0.456	-0.445	-0.452	-0.441
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.032)	(0.033)	(0.032)	(0.033)	(0.032)	(0.032)	(0.445)	(0.449)	(0.436)	(0.440)	(0.442)	(0.446)
Lending Rate	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.147	-0.142	-0.132	-0.129	-0.135	-0.130
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.217)	(0.217)	(0.214)	(0.212)	(0.214)	(0.214)
GDPGrowth	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.000	-0.001	-0.000	-0.001	-0.000	0.027	0.022	0.032	0.024	0.032	0.026
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.098)	(0.101)	(0.099)	(0.101)	(0.098)	(0.101)
CVInflation	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.000	0.000	0.000	0.000	0.000	0.000	-0.004	-0.005	-0.004	-0.004	-0.005	-0.005
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.007)	(0.008)	(0.007)	(0.004)	(0.004)
Political	-0.003		-0.002		-0.002		0.335		0.318		0.341		-3.153		-3.257		-3.159	
	(0.008)		(0.008)		(0.008)		(0.407)		(0.408)		(0.409)		(3.676)		(3.679)		(3.658)	
Legal		-0.004		-0.002		-0.001		-0.147		-0.153		-0.150		-8.248*		-8.933*		-8.813**
		(0.014)		(0.014)		(0.014)		(0.152)		(0.150)		(0.152)		(4.572)		(4.559)		(4.440)
Constant	-0.065	-0.067	-0.069	-0.071	-0.073	-0.073	0.611	0.511	0.622	0.526	0.489	0.391	49.36***	49.81***	48.94***	49.42***	48.73***	49.11***
	(0.150)	(0.150)	(0.150)	(0.149)	(0.150)	(0.149)	(0.670)	(0.652)	(0.667)	(0.648)	(0.615)	(0.594)	(10.468)	(10.111)	(10.358)	(9.997)	(9.746)	(9.645)
Obs.	5,451	5,451	5,451	5,451	5,451	5,451	5,893	5,893	5,893	5,893	5,893	5,893	5,922	5,922	5,922	5,922	5,922	5,922
No. of BankID	505	505	505	505	505	505	505	505	505	505	505	505	505	505	505	505	505	505
AR2	0.19	0.19	0.19	0.19	0.19	0.19	0.27	0.27	0.27	0.27	0.27	0.27	0.92	0.92	0.92	0.92	0.92	0.92
Sagan Test	35.66	35.56	35.73	35.65	35.30	35.22	10.74	10.35	10.48	10.15	10.45	10.19	15.35	15.31	15.6	15.64	15.60	15.54
Sagan P. Value	0.21	0.22	0.21	0.21	0.23	0.23	0.37	0.40	0.39	0.42	0.40	0.42	0.11	0.12	0.12	0.12	0.12	0.12

Table 5.5b displays the effect of single regulatory structure (SINREG) of banks' stability for the **overall sample.** The dependent variables are Equity ratio (EQR), non-performing loans (NPLTL), liquidity ratio, Z-Index and competition measure (H-Stat), which are stability measures. All the dependent variables are at lag of 2. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table 5.5c: Overall Sample-Effect of Regulatory structure (Single regulatory body) on stability measures.. Cont.

VARIABLES	LogZ-Index						H-Stat					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SINREG	0.462	0.447	0.661	0.446			0.070	0.063	0.067	0.059		
	(0.480)	(0.479)	(0.470)	(0.478)			(0.076)	(0.077)	(0.075)	(0.076)		
DummyMkD			0.059	0.059					0.068**	0.074**		
			(0.103)	(0.107)					(0.032)	(0.033)		
SINREG*MkD			-0.253**	-0.195	-0.209**	-0.212**			-0.042	-0.046	0.027	0.030
			(0.129)	(0.135)	(0.104)	(0.105)			(0.032)	(0.032)	(0.019)	(0.020)
H-Stat	-0.098	-0.095	-0.102	-0.095	-0.157	-0.157						
	(0.087)	(0.088)	(0.082)	(0.087)	(0.117)	(0.117)						
CAPR	0.003**	0.003**	0.003**	0.003**	0.003*	0.003*	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	-0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-0.352	-0.351	-0.199	-0.348	-0.216	-0.220	0.197**	0.199**	0.197**	0.200**	0.195**	0.198**
	(0.224)	(0.225)	(0.208)	(0.225)	(0.287)	(0.288)	(0.082)	(0.080)	(0.081)	(0.080)	(0.082)	(0.081)
OPE	-0.003	-0.003	-0.005	-0.003	-0.009**	-0.009**	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log2TA	0.040**	0.040**	0.047***	0.040**	-0.086	-0.086	-0.041***	-0.040***	-0.041***	-0.041***	-0.041***	-0.040***
	(0.016)	(0.016)	(0.015)	(0.016)	(0.077)	(0.076)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
GDPGrowth	-0.003	-0.003	-0.001	-0.002	-0.003	-0.004	0.003**	0.003**	0.003**	0.003*	0.003**	0.003*
	(0.005)	(0.005)	(0.005)	(0.005)	(0.008)	(0.008)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Lending Rate	-0.003	-0.003	-0.004	-0.005	-0.012	-0.012	0.009***	0.009***	0.009***	0.009***	0.009***	0.009***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.010)	(0.010)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CVInflation	0.001**	0.001**	0.001**	0.001**	0.002*	0.002*	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.134		-0.174		-0.007		-0.055		-0.054		-0.055	
	(0.201)		(0.188)		(0.278)		(0.047)		(0.047)		(0.047)	
Legal		-0.209		-0.188		0.069		-0.137		-0.159		-0.149
		(0.292)		(0.289)		(0.406)		(0.120)		(0.125)		(0.125)
Constant	-0.881*	-0.843*	-1.156***	-0.811*	1.279	1.294	0.261	0.268	0.252	0.257	0.297	0.298
	(0.476)	(0.469)	(0.444)	(0.469)	(1.334)	(1.312)	(0.225)	(0.227)	(0.226)	(0.228)	(0.219)	(0.221)
Obs.	5,321	5,321	5,321	5,321	4,347	4,347	5,442	5,442	5,442	5,442	5,442	5,442
No. of BankID	505	505	505	505	504	504	505	505	505	505	505	505
AR2	0.33	0.31	0.72	0.33	0.19	0.19	0.23	0.23	0.19	0.18	0.23	0.23
Sagan Test	27.45	27.74	43.85	28.01	8.07	8.07	7.46	7.26	8.52	8.42	7.47	7.26
Sagan P. Value	0.00	0.00	0.00	0.00	0.32	0.32	0.58	0.60	0.48	0.49	0.58	0.61

Table 5.5c is continuation of regulatory structure effects on banks' stability measures. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively

Table 5.5d: Emerging Market- Effect of Regulatory structure (Single regulatory body) on performance measures

VARIABLES	NIM						PreTax Profit						ROA					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
SINREG	0.170	0.188	0.704	0.674			-2.376	-2.247	-2.653	-2.532			-0.080*	-0.075*	-0.079*	-0.074*		
	(0.117)	(0.118)	(0.749)	(0.750)			(2.084)	(2.100)	(2.094)	(2.109)			(0.041)	(0.041)	(0.042)	(0.041)		
DummyMkD			0.282**	0.273*					-0.816*	-0.844**					0.003	0.003		
			(0.140)	(0.143)					(0.418)	(0.416)					(0.002)	(0.002)		
SINREG*MkD			-0.152	-0.148	0.208	0.198			-0.090	-0.103	-0.890**	-0.927**			-0.004	-0.005*	-0.001	-0.002
			(0.207)	(0.207)	(0.174)	(0.178)			(0.551)	(0.560)	(0.379)	(0.383)			(0.002)	(0.003)	(0.001)	(0.001)
HHI2b	-0.393	-0.383	-0.278	-0.271	-0.389	-0.378	-1.172**	-1.148**	-1.188**	-1.161**	-1.186**	-1.161**	0.027	0.024	0.027	0.024	0.026**	0.024**
	(0.269)	(0.268)	(0.217)	(0.213)	(0.267)	(0.266)	(0.488)	(0.490)	(0.488)	(0.490)	(0.488)	(0.491)	(0.017)	(0.016)	(0.017)	(0.016)	(0.013)	(0.012)
CAPR	-0.001	-0.002	0.002	0.002	-0.000	-0.001	0.022**	0.021**	0.021**	0.021**	0.021**	0.021**	0.001	0.001	0.001	0.001	0.001	0.001
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.002	0.002	-0.001	-0.001	0.002	0.002	0.019*	0.018*	0.019*	0.018	0.019*	0.018	0.001*	0.001	0.001	0.001	0.001	0.001
	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	1.088	1.136	1.382**	1.400**	1.163	1.215	-0.627	-0.746	-0.643	-0.777	-0.660	-0.782	-0.068*	-0.072*	-0.068*	-0.072*	-0.068*	-0.075*
	(1.033)	(1.042)	(0.696)	(0.699)	(1.032)	(1.040)	(1.472)	(1.474)	(1.469)	(1.469)	(1.463)	(1.465)	(0.040)	(0.041)	(0.040)	(0.041)	(0.040)	(0.040)
OPE	0.043**	0.042**	0.042**	0.041**	0.046**	0.045**	-0.050**	-0.049**	-0.049**	-0.047**	-0.049**	-0.048**	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.020)	(0.020)	(0.018)	(0.018)	(0.019)	(0.020)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log2TA	0.018	0.019	0.041	0.040	0.015	0.015	0.125**	0.120**	0.127**	0.122**	0.122**	0.117*	-0.003	-0.004	-0.003	-0.003	-0.002	-0.003
	(0.022)	(0.022)	(0.026)	(0.026)	(0.022)	(0.022)	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Lending Rate	0.039*	0.038*	0.058***	0.058***	0.041*	0.040*	-0.006	-0.011	-0.009	-0.014	-0.011	-0.016	-0.001	-0.001	-0.001	-0.001	0.001	-0.001
	(0.022)	(0.022)	(0.017)	(0.017)	(0.022)	(0.023)	(0.054)	(0.053)	(0.054)	(0.054)	(0.054)	(0.054)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GDPGrowth	0.035**	0.035**	0.037***	0.036***	0.036**	0.036**	0.041	0.042	0.050	0.052	0.046	0.047	0.000	0.001	0.001	0.001	0.001	0.001
	(0.015)	(0.015)	(0.013)	(0.013)	(0.015)	(0.015)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CVInflation	0.000	0.000	-0.001	-0.001	0.001	0.001	0.005*	0.005*	0.005*	0.005*	0.002***	0.002***	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	0.264		0.160		0.258		-1.275		-1.258		-1.157		-0.023***		-0.022**		-0.027***	
	(0.314)		(0.262)		(0.315)		(1.111)		(1.103)		(1.107)		(0.009)		(0.009)		(0.010)	
Legal		0.606		0.224		0.624		1.454		1.904		1.737		0.003		0.003		0.005
		(0.535)		(0.430)		(0.537)		(1.302)		(1.295)		(1.295)		(0.013)		(0.014)		(0.012)
Constant	-0.809	-0.786	-1.757**	-1.720**	-0.850	-0.799	-2.824	-1.946	-2.365	-1.359	-3.958**	-2.967*	0.195**	0.205**	0.187**	0.194**	0.121*	0.138*
	(0.808)	(0.828)	(0.792)	(0.781)	(0.768)	(0.805)	(1.944)	(1.878)	(1.958)	(1.904)	(1.747)	(1.742)	(0.086)	(0.088)	(0.087)	(0.088)	(0.070)	(0.071)
Obs.	5,746	5,746	5,319	5,319	5,746	5,746	5,319	5,319	5,319	5,319	5,319	5,319	5,746	5,746	5,746	5,746	5,746	5,746
No. of BankID	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454
AR2	0.20	0.20	0.18	0.19	0.21	0.21	0.19	0.20	0.18	0.18	0.18	0.19	0.48	0.45	0.49	0.46	0.50	0.45
Sagan Test	17.47	17.25	31.44	30.97	18.54	18.27	14.88	15.02	15.16	15.32	15.09	15.24	8.42	9.32	8.13	8.91	7.91	8.91
Sagan P. Value	0.13	0.14	0.10	0.10	0.10	0.10	0.18	0.18	0.17	0.16	0.17	0.17	0.75	0.67	0.77	0.71	0.79	0.71

Table 5.5d displays the effect of single regulatory structure (SINREG) of banks' performance for the **emerging market sample.** Performance is measured using as net interest margin (NIM), pretax profit and return on asset (ROA), which are the dependent variables. All the dependent variables are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table 5.5e: Emerging Market-Effect of Regulatory structure (Single regulatory body) on stability measures

VARIABLES	EQR						NPLTL						Liquidity					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
SINREG	-0.030	-0.032	-0.038	-0.040			-0.532	-0.486	-0.565	-0.518			-0.316	-0.728	0.741	0.707		
	(0.029)	(0.030)	(0.030)	(0.030)			(0.903)	(0.913)	(0.905)	(0.914)			(8.776)	(8.680)	(11.13)	(10.75)		
DummyMkD			-0.003	-0.004					-0.025	-0.028					1.908	2.136		
			(0.003)	(0.003)					(0.078)	(0.076)					(1.617)	(1.597)		
SINREG*MkD			-0.003	-0.003	-0.006**	-0.006**			0.008	0.019	-0.014	-0.003			-1.739	-1.922	0.113	0.157
			(0.004)	(0.004)	(0.003)	(0.003)			(0.087)	(0.084)	(0.034)	(0.034)			(2.516)	(2.497)	(1.599)	(1.584)
HHI2b	0.012	0.014	0.011	0.012	0.010	0.007	0.045	0.036	0.047	0.040	0.041	0.033	3.579	3.119	-3.027	-2.969	-3.144	-3.085
	(0.009)	(0.010)	(0.009)	(0.010)	(0.009)	(0.010)	(0.250)	(0.250)	(0.250)	(0.250)	(0.243)	(0.243)	(2.740)	(2.725)	(3.615)	(3.601)	(3.650)	(3.629)
CAPR	0.003***	0.003***	0.003***	0.003***	0.003***	0.002***	0.001	0.001	0.001	0.001	0.001	0.001	-2.601***	-2.612***	-1.902***	-1.922***	-1.903***	-1.918***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.033)	(0.033)	(0.258)	(0.257)	(0.259)	(0.257)
INTL	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	0.292	0.287	1.516***	1.509***	1.438***	1.443***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.0001	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)	(0.243)	(0.239)	(0.460)	(0.464)	(0.463)	(0.466)
TLTA	0.024	0.021	0.028	0.024	0.030	0.087***	-0.244	-0.223	-0.233	-0.213	-0.221	-0.195	-7.295	-7.682	-16.86**	-16.93**	-17.09**	-17.25**
	(0.020)	(0.021)	(0.021)	(0.022)	(0.021)	(0.021)	(0.205)	(0.202)	(0.205)	(0.202)	(0.209)	(0.207)	(8.298)	(8.234)	(7.381)	(7.423)	(7.335)	(7.375)
OPE	0.001	0.001	0.001	0.001	0.001	-0.001	-0.003	-0.003	-0.004	-0.003	-0.001	-0.000	0.000	-0.002	0.115	0.113	0.108	0.107
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.127)	(0.129)	(0.178)	(0.178)	(0.177)	(0.177)
D.Log2TA	0.001	0.001	0.001	0.001	0.001	-0.004	-0.014	-0.012	-0.013	-0.011	-0.012	-0.009	-0.421	-0.446	-0.787	-0.768	-0.794	-0.776
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.034)	(0.034)	(0.034)	(0.034)	(0.031)	(0.031)	(0.477)	(0.477)	(0.528)	(0.530)	(0.529)	(0.532)
Lending Rate	0.001	0.001	0.0001	0.001	0.001	0.001**	-0.001	0.000	-0.001	-0.000	-0.001	0.001	-0.467	-0.450	-0.135	-0.132	-0.142	-0.139
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)	(0.292)	(0.292)	(0.285)	(0.283)	(0.286)	(0.285)
GDPGrowth	0.001*	0.001**	0.001*	0.001*	0.001*	0.000	-0.001	-0.001	-0.000	-0.001	-0.001	-0.001	0.000	-0.009	0.039	0.030	0.041	0.033
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.164)	(0.153)	(0.107)	(0.110)	(0.106)	(0.110)
CVInflation	0.001	0.001	0.000*	0.001*	0.000	-0.000	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.005	-0.004	-0.007	-0.008	-0.006	-0.006
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.010)	(0.010)	(0.013)	(0.013)	(0.005)	(0.005)
Political	0.006		0.007		0.006		0.386		0.361		0.499		-0.483		-1.458		-1.577	
	(0.013)		(0.013)		(0.013)		(0.479)		(0.481)		(0.481)		(4.447)		(3.993)		(3.968)	
Legal		0.031*		0.040**		0.023		-0.048		-0.054		-0.088		-4.334		-9.053*		-9.039*
		(0.017)		(0.017)		(0.018)		(0.156)		(0.153)		(0.155)		(4.478)		(4.987)		(4.927)
Constant	0.082**	0.092**	0.086**	0.098***	0.057***	0.088	1.059	0.822	1.067	0.844	0.702	0.409	71.87***	71.61***	49.54***	48.66***	50.65***	49.73***
	(0.036)	(0.037)	(0.036)	(0.037)	(0.021)	(0.088)	(1.008)	(0.991)	(1.006)	(0.988)	(0.701)	(0.627)	(10.70)	(10.19)	(15.44)	(14.72)	(13.08)	(12.69)
Obs.	5,746	5,746	5,746	5,746	5,746	5,746	5,284	5,284	5,284	5,284	5,284	5,284	5,313	5,313	5,313	5,313	5,313	5,313
No. of BankID	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454	454
AR2	0.47	0.46	0.48	0.47	0.46	0.49	0.27	0.27	0.27	0.27	0.27	0.27	0.65	0.65	0.92	0.92	0.92	0.92
Sagan Test	44.99	44.72	46.85	45.83	45.87	45.86	11.92	10.99	11.51	10.61	11.20	10.68	19.71	18.68	16.52	16.50	16.09	16.10
Sagan P. Value	0.11	0.12	0.10	0.11	0.11	0.11	0.29	0.35	0.31	0.38	0.34	0.38	0.10	0.10	0.10	0.10	0.10	0.10

Table 5.5e displays the effect of single regulatory structure (SINREG) of banks' stability for the **emerging market sample.** The dependent variables are Equity ratio (EQR), non-performing loans (NPLTL), liquidity ratio, Z-Index and competition measure (H-Stat), which are stability measures. EQR is at lag of 1, while others are at lags of 2. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table 5.5f: Emerging Market-Effect of Regulatory structure (Single regulatory body) on stability measures.. Cont.

VARIABLES	LogZ-Index						H-Stat					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SINREG	-0.201	-0.248	-0.346	-0.180			0.846***	0.858***	0.850***	0.861***		
	(0.465)	(0.466)	(0.455)	(0.469)			(0.292)	(0.292)	(0.292)	(0.292)		
DummyMkD			0.115	0.007					0.051	0.052		
			(0.072)	(0.076)					(0.044)	(0.043)		
SINREG*MkD			-0.152	-0.061	-0.156**	-0.150**			-0.089*	-0.092*	-0.041***	-0.043***
			(0.098)	(0.104)	(0.075)	(0.075)			(0.047)	(0.047)	(0.015)	(0.015)
HHI2b	-0.136**	-0.145**	-0.136**	-0.150**	-0.122	-0.122						
	(0.060)	(0.060)	(0.057)	(0.059)	(0.086)	(0.087)						
CAPR	0.001	0.001	0.001*	0.001	0.002	0.002	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	0.001	0.001	0.001	0.001	0.002	0.002	0.008*	0.008*	0.008*	0.008*	0.008*	0.008*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
TLTA	0.001	0.024	-0.005	0.036	-0.094	-0.088	0.374***	0.368***	0.376***	0.370***	0.389***	0.382***
	(0.183)	(0.183)	(0.173)	(0.182)	(0.241)	(0.242)	(0.089)	(0.089)	(0.089)	(0.089)	(0.090)	(0.090)
OPE	-0.005**	-0.005**	-0.006**	-0.005**	-0.006*	-0.006*	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Log2TA	-0.009	-0.012	-0.006	-0.012	0.025	0.025	-0.033***	-0.033***	-0.032***	-0.033***	-0.031***	-0.031***
	(0.015)	(0.015)	(0.014)	(0.015)	(0.026)	(0.025)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Lending Rate	-0.000	-0.001	-0.007*	-0.002	-0.006	-0.006	0.011***	0.010***	0.010***	0.010***	0.010***	0.010***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)	(0.007)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
GDPGrowth	0.002	0.001	-0.002	0.001	-0.002	-0.002	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CVInflation	-0.000	0.000	0.000	-0.000	0.000	0.000	-0.001***	-0.001***	-0.001***	-0.001***	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	0.042		0.163		-0.135		-0.093**		-0.086*		-0.104**	
	(0.160)		(0.144)		(0.200)		(0.046)		(0.046)		(0.046)	
Legal		-0.144		-0.130		-0.286		0.066		0.063		0.074
		(0.220)		(0.213)		(0.285)		(0.085)		(0.083)		(0.086)
Constant	2.216***	2.253***	2.301***	2.293***	-0.414	-0.423	-0.380	-0.334	-0.383	-0.339	0.124	0.184
	(0.448)	(0.421)	(0.406)	(0.414)	(0.528)	(0.512)	(0.236)	(0.236)	(0.236)	(0.235)	(0.167)	(0.172)
Obs.	5,209	5,209	5,209	5,209	4,339	4,339	5,313	5,313	5,313	5,313	5,313	5,313
No. of BankID	454	454	454	454	453	453	454	454	454	454	454	454
AR2	0.00	0.00	0.00	0.00	0.31	0.32	0.11	0.13	0.12	0.13	0.15	0.17
Sagan Test	45.93	43.97	119.42	44.15	12.76	12.72	16.89	16.91	17.37	17.39	18.31	18.34
Sagan P. Value	0.00	0.00	0.00	0.00	0.12	0.12	0.11	0.11	0.10	0.10	0.10	0.10

Table 5.5f is continuation of regulatory structure effects on banks' stability measures. The variables are at lag of 1, except in models 5 and 6, where Z-Index is at lags of 2. Note that models 1 to 4 have autocorrelation and are over identified, therefore, they are not included in the interpretations. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively

5.7. Market discipline and twin-peaks effects on bank performance/stability

This section has the detailed result of hypothesis 8, which postulates that market discipline framework and twin-peaks regulatory models would substitute, or complement each other as regulatory frameworks in emerging market economies. This section is motivated by the argument and concerns that exclusive reliance on market discipline could render the financial sector ineffective due to the opaque nature of banks and the release of incomplete or flawed information to the market, which can lead to false market reaction (Prowse 1997, Dhumale 2000, 2001, Linnell 2001, Morgan 2002). In fact, in a market with information asymmetry and externalities like emerging markets, market discipline enforcement could trigger bank runs, which in turn can destabilize the financial system (Diamond and Dybvig 1983, Goodhart et al. 2013). Some researchers have gone further to argue that the market discipline principle should be a complementary regulatory tool but not a substitute to rule-based regulation (Hamalainen 2006, Bruni and Paternò 1995).

Based on the above arguments, we estimate market discipline and twin-peaks effects on performance and stability of banks, in order to determine whether market discipline and twin-peaks regulatory models could complement each other. We estimate the effects by looking at the interaction effects of market discipline and twin peaks on bank performance and stability, and only so for the emerging market banking industry. From Table 5.6a you can see that there is no significant effect (though with a positive sign) on net interest margin (NIM). However, looking at pretax profit and return on asset (ROA) equations, the interaction of market discipline and twin-peaks significantly increases the coefficients of these two measures of performance, notwithstanding that market discipline (OvMkD) significantly reduced ROA in model 9 (Table 5.6a).

From banking stability perspective Table 5.6b reports more significant joint effects of interacting market discipline and twin-peaks (Twin*OvMkD). In model 1 of Table 5.6b, while individual effects of twin-peaks and market disciple on EQR are negative, the joint effect of their interaction on EQR is positive. In models 5 to 8, while market discipline principle increases non-performing loan (NPLTL), twin-peaks as well as its interaction with market discipline reduces non-performing loan incidence, albeit the interaction effect is not significant. One can surmise that the negative effect of market discipline principle aspect of bank performance is neutralized by implementation or adoption of twin-peaks features in emerging market context. Liquidity ratio also shows an interesting result, where incremental effect of twin-peaks on liquidity is not significant, but market discipline

Table5.6a: Effects of Twin peaks interaction with Market discipline on banks' performance in Emerging market

	NIM				LogPreTaxP				ROA			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Dummy Twin	0.078	-0.185			1.634	2.178			0.044***	0.074*		
	(0.215)	(0.118)			(2.152)	(2.093)			(0.015)	(0.041)		
OvMkD	0.221		0.192		0.158		0.227		-0.006**		0.008	
	(0.187)		(0.165)		(0.472)		(0.404)		(0.002)		(0.006)	
Twin*OvMkD	0.128			0.059	0.294			0.483**	0.021***			0.005
	(0.180)			(0.122)	(0.391)			(0.245)	(0.007)			(0.013)
H-Stat	-0.107	-0.380	-0.107	-0.058	-1.365**	-1.141**	-1.372**	-1.380**	0.042***	0.023	0.001	0.011
	(0.183)	(0.267)	(0.182)	(0.172)	(0.566)	(0.488)	(0.566)	(0.566)	(0.005)	(0.016)	(0.008)	(0.007)
CAPR	0.002	-0.002	0.002	0.001	0.022**	0.021**	0.023**	0.023**	-0.000	0.001	0.000	0.002***
	(0.008)	(0.009)	(0.008)	(0.007)	(0.009)	(0.009)	(0.010)	(0.010)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001	0.002	0.001	-0.002	0.020	0.018*	0.021	0.020	0.002***	0.001	-0.000	0.001
	(0.004)	(0.005)	(0.004)	(0.003)	(0.013)	(0.011)	(0.013)	(0.013)	(0.000)	(0.001)	(0.000)	(0.000)
TLTA	0.983	1.096	0.996	1.021	-0.136	-0.837	-0.156	-0.140	-0.038***	-0.071*	0.011	-0.073*
	(1.227)	(1.022)	(1.227)	(0.762)	(1.711)	(1.460)	(1.706)	(1.703)	(0.008)	(0.040)	(0.036)	(0.044)
OPE	0.015	0.042**	0.015	0.021	-0.064***	-0.049**	-0.064***	-0.064***	-0.001***	-0.001	-0.000	0.001***
	(0.014)	(0.020)	(0.014)	(0.014)	(0.023)	(0.023)	(0.023)	(0.023)	(0.000)	(0.000)	(0.000)	(0.000)
LogTA	0.014	0.019	0.013	-0.001	0.121*	0.121**	0.120*	0.115*	0.007***	-0.004	-0.000	-0.009*
	(0.017)	(0.022)	(0.016)	(0.028)	(0.066)	(0.060)	(0.065)	(0.064)	(0.001)	(0.005)	(0.001)	(0.005)
Lending Rate	0.048**	0.038*	0.049**	0.057***	0.027	-0.009	0.027	0.028	-0.000	-0.001	-0.000	-0.000
	(0.023)	(0.022)	(0.023)	(0.019)	(0.059)	(0.053)	(0.059)	(0.059)	(0.000)	(0.000)	(0.001)	(0.000)
GDPGrowth	0.042***	0.035**	0.042***	0.040***	0.038	0.043	0.038	0.038	0.000	0.000	-0.000	0.001**
	(0.014)	(0.015)	(0.014)	(0.013)	(0.036)	(0.033)	(0.036)	(0.036)	(0.000)	(0.000)	(0.000)	(0.000)
CVInflation	0.000	0.001	0.000	0.001	0.004	0.004*	0.001**	0.002***	0.000	0.001	-0.000	-0.001***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Legal	0.239	0.581	0.237	0.237	0.548	1.017	0.571	0.548	-0.003	0.004	-0.030	0.015
	(0.470)	(0.492)	(0.468)	(0.381)	(1.290)	(1.248)	(1.288)	(1.292)	(0.004)	(0.012)	(0.024)	(0.010)
Constant	-0.152	-0.601	-0.133	-0.237	-5.362**	-4.100**	-4.823**	-3.425**	0.103***	0.137**	0.002	0.023
	(0.838)	(0.780)	(0.834)	(0.746)	(2.288)	(1.986)	(1.989)	(1.127)	(0.010)	(0.068)	(0.036)	(0.102)
Obs.	5,062	5,833	5,062	4,716	4,716	5,391	4,716	4,716	5,055	5,833	3,987	5,062
No. of BankID	419	455	419	419	419	455	419	419	419	455	418	419
AR2	0.17	0.20	0.17	0.14	0.37	0.20	0.37	0.38	0.81	0.45	0.31	0.25
Sagan Test	18.20	17.33	18.23	29.26	14.87	15.06	14.86	14.93	60.89	9.52	6.83	40.69
Sagan P. Value	0.11	0.13	0.10	0.13	0.18	0.17	0.18	0.18	0.24	0.65	0.44	0.23

Table 5.6a detailed the effects of implementation of twin-peaks (DummyTwin) on banks performance. Interaction effect of DummyTwin and market discipline (Twin*OvMkD) is also included. The dependent variable are Net interest margin (NIM), Pretax Profit (PreTaxP) and Return on assets (ROA). NIM and PreTaxP are at lag of 1, while ROA is at lag of 2. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table 5.6b: Effects of Twin peaks interaction with Market discipline on bank stability in Emerging markets

Variables	EQR				NPLTL				Liquidity				LogZ-Index				H-Stat			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
DummyTwin	-0.039	0.012			0.020	-1.262*			0.384	0.813			0.540	0.266			-0.99***	-0.89***		
	(0.025)	(0.032)			(0.062)	(0.743)			(0.478)	(8.669)			(0.542)	(0.465)			(0.361)	(0.291)		
OvMkD	-0.002		0.001		0.039**		0.091		0.050		0.111*		-0.155**		-0.061		-0.08***		-0.08***	
	(0.005)		(0.003)		(0.019)		(0.086)		(0.086)		(0.058)		(0.062)		(0.089)		(0.027)		(0.024)	
Twin*OvMkD	0.015			0.005	-0.023			-0.011	0.103			0.045*	0.221*			0.069	0.026			-0.16***
	(0.012)			(0.013)	(0.040)			(0.064)	(0.112)			(0.029)	(0.151)			(0.311)	(0.057)			(0.054)
H-Stat	0.010	0.029***	0.011	0.011	0.468***	0.312	0.030	0.022	0.316***	3.141	0.281***	0.188**	-0.093	-0.150**	-0.127	-0.179				
	(0.008)	(0.006)	(0.007)	(0.007)	(0.020)	(0.197)	(0.119)	(0.116)	(0.113)	(2.703)	(0.108)	(0.079)	(0.069)	(0.060)	(0.101)	(0.137)				
CAPR	0.002***	0.002***	0.002***	0.002***	0.005***	0.002	0.001	0.001	0.002**	-2.608***	0.001	0.002***	0.001	0.001	0.002*	0.003*	0.001	-0.001	0.001	0.001**
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)	(0.002)	(0.001)	(0.033)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)	(0.000)	(0.000)
INTL	0.000	-0.001	0.001	0.001	-0.003**	0.001	0.001	-0.000	0.004	0.286	0.003	0.004	0.001	0.001	0.001	0.004	0.005	0.008*	-0.001*	0.006*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.007)	(0.005)	(0.004)	(0.004)	(0.239)	(0.005)	(0.004)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.001)	(0.003)
TLTA	-0.073*	-0.022**	-0.075*	-0.073*	-1.50***	-0.226	-0.019	-0.013	-1.64***	-7.592	-1.23***	-1.07***	0.039	0.020	-0.039	-0.235	0.281***	0.366***	0.454***	0.240***
	(0.044)	(0.009)	(0.043)	(0.044)	(0.030)	(0.206)	(0.308)	(0.310)	(0.227)	(8.120)	(0.226)	(0.157)	(0.187)	(0.183)	(0.261)	(0.368)	(0.077)	(0.088)	(0.085)	(0.079)
OPE	0.001***	0.001***	0.001***	0.001***	0.002***	0.007	0.002	0.002	0.007*	-0.001	0.004*	0.006***	-0.004	-0.005**	-0.007*	-0.011**	0.007***	0.007***	0.008***	0.006***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.008)	(0.003)	(0.003)	(0.004)	(0.129)	(0.002)	(0.002)	(0.003)	(0.002)	(0.004)	(0.005)	(0.001)	(0.002)	(0.002)	(0.001)
LogTA	-0.008	0.009***	-0.009*	-0.009*	-0.007	0.041*	0.002	-0.004	0.052	-0.453	0.036*	0.028	0.035*	-0.013	0.029	-0.023	-0.019	-0.033***	-0.09***	-0.034**
	(0.005)	(0.002)	(0.005)	(0.005)	(0.009)	(0.025)	(0.058)	(0.050)	(0.036)	(0.474)	(0.021)	(0.017)	(0.021)	(0.015)	(0.025)	(0.087)	(0.013)	(0.011)	(0.023)	(0.017)
Lending Rate	-0.000	0.001**	-0.001	-0.000	0.056***	0.010	0.001	0.002	0.003	-0.452	-0.001	-0.001	-0.010**	-0.001	-0.004	-0.007	0.010***	0.011***	0.013***	0.010***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.007)	(0.013)	(0.013)	(0.006)	(0.292)	(0.005)	(0.005)	(0.005)	(0.004)	(0.009)	(0.011)	(0.002)	(0.002)	(0.002)	(0.001)
GDPGrowth	0.001**	0.000***	0.001**	0.001**	0.024***	-0.004	-0.001	-0.000	0.001	-0.007	0.001	0.000	0.002	0.001	-0.001	-0.005	0.005***	0.005***	0.011***	0.003**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.003)	(0.003)	(0.003)	(0.002)	(0.153)	(0.002)	(0.002)	(0.004)	(0.004)	(0.006)	(0.008)	(0.001)	(0.002)	(0.002)	(0.001)
CVInflation	-0.001***	-0.001	-0.001***	-0.001***	0.000**	-0.001**	0.001	-0.001	0.000	-0.004	0.001	-0.001	0.001	0.001	0.001	0.002*	-0.000**	-0.001***	-0.001	-0.001***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.002)	(0.002)	(0.000)	(0.010)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Legal	0.016*	0.008	0.015	0.015	0.917***	0.028	-0.129	-0.156	0.018	-3.192	-0.029	0.018	0.128	-0.057	-0.008	0.332	0.133*	0.007	0.164*	-0.216**
	(0.010)	(0.008)	(0.010)	(0.010)	(0.057)	(0.143)	(0.241)	(0.238)	(0.114)	(4.165)	(0.084)	(0.075)	(0.229)	(0.217)	(0.320)	(0.467)	(0.082)	(0.082)	(0.095)	(0.085)
Constant	0.260***	0.279*	0.258*	0.138*	1.188***	0.241**	0.386**	0.157*	0.514	0.567	0.432	0.210	0.911*	0.826*	0.821*	0.221*	0.043	0.068	0.054	0.079
	(0.092)	(0.063)	(0.057)	(0.069)	(0.169)	(0.124)	(0.287)	(0.215)	(0.578)	(0.549)	(0.573)	(0.327)	(0.509)	(0.346)	(0.327)	(0.129)	(0.098)	(0.079)	(0.032)	(0.026)
Obs.	5,062	5,391	5,062	5,062	5,039	5,805	3,952	3,952	4,710	5,385	4,704	4,350	4,631	5,281	3,884	3,497	4,710	5,385	3,590	4,350
No. of BankID	419	455	419	419	419	455	416	416	419	455	419	419	418	455	416	415	419	455	417	419
AR2	0.23	0.28	0.24	0.25	0.31	0.15	0.23	0.23	0.30	0.65	0.42	0.34	0.00	0.00	0.13	0.11	0.12	0.12	0.78	0.28
Sagan Test	40.91	69.60	39.07	40.69	236.79	30.64	10.65	10.52	15.72	18.76	11.52	4.22	117.82	45.79	25.35	9.79	18.58	16.83	31.11	12.65
Sagan P. Value	0.22	0.06	0.29	0.23	0.00	0.33	0.15	0.16	0.15	0.10	0.31	0.83	0.00	0.00	0.11	0.20	0.10	0.12	0.15	0.17

Table 5.6b detailed the effects of implementation of twin-peaks (DummyTwin) on banks stability. Interaction effect of DummyTwin and market dripline (Twin*OvMkD) is also displayed. The dependent variable re Equity ratio (EQR), non-performing loans (NPLTL), liquidity ratio, Z-Index and competition measure (H-Stat). Models 7, 8, 12 and 19 are at lag of 3. Models 1, 11, 15, 16 and 20 are at lag of 2. Other models are at lag of 1Note that models 5, 13 and 14 have autocorrelation and are over identified, therefore, they are not included in the interpretations Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

significantly increases it, as is similarly the case when market discipline interacted with twin-peaks (see models 9 to 12). Z-Index in models 13-16, also show an interesting outcome of market discipline and twin-peaks interaction effect: whereas twin peaks increases Z-index, market discipline significantly reduces it, and the interaction term significantly increases it. From these results, we conclude that twin-peaks financial regulatory model is more likely a complement to market discipline principle of Basel II, than a substitute.

5.8. Quality of financial regulation on bank performance and stability

Banks are among the most regulated financial institutions due to the high level of risk they are exposed to, particularly during transformation of loanable funds. Based on that, many financial regulatory policies have been put in place by regulatory bodies to ensure efficient banking operations, as well as to reduce risks that banks face. In this section, we test hypothesis 9, which postulates that quality of regulation affects bank performance and stability. The essence of this section is to explore further on the importance of financial regulation in the banking industry of emerging market economies mainly because of their institutional environment. Therefore, we estimate regulatory quality of a country on bank performance and stability. Regulatory quality is measured by using Basel core principles (BCP), whereby countries are rated based on the ability to comply with core requirements of Basel regulatory policies. The core principles (CPs) are designed to reflect global regulatory issues and requirements across all countries.

We find that compliance with regulation has significant effect on both bank performance and stability. Both in the overall sample and sub-sample of only emerging market economies (Tables 5.7a and 5.7b), regulatory quality significantly increases net interest margin (NIM) and return on asset (ROA), while pretax profit also increased, though not statistically significant. From stability point of view, equity ratio (EQR) and Z-Index are significantly increased by regulatory quality. Liquidity ratio and level of competition in the banking industry also increased but not significantly. In the emerging market context, nonperforming loans (NPLTL) are insignificantly reduced. From these result we infer that compliance with regulatory policies enhances bank performance and stability. This result supports Podpiera and Cihak (2006), who found that higher regulatory compliance is correlated with lower ratio of nonperforming loan to total loan. We therefore recommend that for banks' profit maximization as well as improved stability, countries, both emerging and developed markets should endeavor to comply with required financial regulatory policies that are already in place.

Table 5.7a: Effect of Regulatory quality[38] on performance and stability for the Overall Sample

	Panel A						Panel B									
Variables	**NIM**		**LogPreTaxP**		**ROA**		**EQR**		**NPLTL**		**H-Stat**		**LogZ-Index**		**Liquidity**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
BCP	0.162*	0.160*	0.032	0.016	0.003**	0.003**	0.006**	0.006**	0.002	0.053	0.004	0.002	0.166***	0.165***	0.431	0.681
	(0.094)	(0.094)	(0.234)	(0.235)	(0.001)	(0.001)	(0.003)	(0.003)	(0.133)	(0.113)	(0.019)	(0.019)	(0.051)	(0.051)	(1.580)	(1.480)
H-Stat	-0.137	-0.135	-1.034***	-1.101***	0.019*	0.018*	0.015**	0.013*	-0.117	-0.059			-0.123*	-0.126*	6.398	8.062
	(0.186)	(0.185)	(0.366)	(0.370)	(0.010)	(0.010)	(0.007)	(0.007)	(0.318)	(0.307)			(0.073)	(0.073)	(5.333)	(5.291)
CAPR	0.015*	0.015*	0.021**	0.022**	0.001	0.001	0.002***	0.002***	-0.001	-0.001	-0.001	-0.001	0.001	0.001	0.266	0.323*
	(0.008)	(0.008)	(0.009)	(0.009)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.201)	(0.197)
INTL	0.002*	0.002*	0.004	0.004	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.132	-0.159
	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.299)	(0.301)
TLTA	1.242***	1.252***	-1.088	-1.136	0.013	0.012	-0.076***	-0.075***	0.132	0.266	0.082	0.101	0.014	0.022	-3.906	-4.832
	(0.459)	(0.460)	(1.053)	(1.067)	(0.011)	(0.011)	(0.026)	(0.025)	(0.337)	(0.314)	(0.094)	(0.089)	(0.171)	(0.171)	(11.150)	(10.869)
OPE	0.036**	0.036**	-0.045***	-0.044***	-0.001	-0.001	-0.001	-0.001	0.006	0.005	0.005***	0.005***	-0.007**	-0.007**	0.033	0.064
	(0.016)	(0.016)	(0.017)	(0.017)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.005)	(0.001)	(0.001)	(0.003)	(0.003)	(0.305)	(0.305)
LogTA	0.010	0.011	0.104***	0.104***	-0.011***	-0.010***	-0.005	-0.005	-0.018	0.006	-0.040**	-0.040**	0.046*	0.047*	2.899	3.301
	(0.032)	(0.032)	(0.034)	(0.033)	(0.002)	(0.002)	(0.005)	(0.005)	(0.092)	(0.118)	(0.016)	(0.016)	(0.025)	(0.025)	(5.092)	(4.967)
GDPGrowth	0.025*	0.025*	0.040*	0.043*	0.001	0.001	0.001	0.001	0.008	0.009	0.002	0.003	-0.003	-0.003	0.201	0.247
	(0.014)	(0.014)	(0.023)	(0.022)	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.008)	(0.002)	(0.002)	(0.004)	(0.004)	(0.336)	(0.333)
Lending Rate	0.052***	0.052***	-0.010	-0.016	0.001	0.001	0.001	0.001	-0.001	-0.001	0.008***	0.008***	-0.003	-0.003	0.320	0.369
	(0.017)	(0.017)	(0.029)	(0.029)	(0.001)	(0.001)	(0.001)	(0.001)	(0.012)	(0.011)	(0.002)	(0.002)	(0.006)	(0.006)	(0.296)	(0.289)
CVInflation	0.001	0.001	0.001	-0.001	0.001	0.001	-0.001	-0.001	-0.003	0.001	-0.001***	-0.001***	-0.001**	-0.001**	0.005	0.007
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.007)	(0.001)	(0.001)	(0.001)	(0.001)	(0.024)	(0.022)
Political	0.358		-1.580*		-0.005**		0.009		-0.116		-0.056		0.029		-4.077	
	(0.307)		(0.819)		(0.003)		(0.010)		(0.966)		(0.056)		(0.171)		(7.388)	
Legal		0.182		-1.899*		-0.004		0.014		-0.396		-0.202		-0.005		
		(0.416)		(0.980)		(0.003)		(0.018)		(1.287)		(0.165)		(0.222)		
Constant	-2.895***	-2.944***	3.866**	4.069***	0.191***	0.188***	0.181**	0.177**	-0.003	-0.667	0.381	0.384	0.776	0.760	-41.933	-46.781
	(1..532)	(1.012	(1.548)	(1.543)	(0.033)	(0.033)	(0.076)	(0.076)	(1.597)	(1.911)	(0.252)	(0.251)	(0.499)	(0.493)	(79.164)	(77.009)
Obs.	4,682	4,682	5,289	5,289	4,682	4,682	5,289	5,289	4,257	4,257	4,673	4,673	4,195	4,195	3,878	3,878
No. of BankID	444	444	444	444	444	444	444	444	442	442	444	444	443	443	444	444
AR2	0.35	0.34	0.96	0.94	0.12	0.12	0.43	0.43	0.15	0.15	0.16	0.94	0.76	0.77	0.23	0.23
Sagan Test	39.23	39.11	43.99	43.18	40.05	40.10	41.20	40.38	8.04	7.60	6.36	7.36	53.67	53.59	9.49	12.38
Sagan P. Value	0.12	0.12	0.14	0.16	0.11	0.11	0.21	0.24	0.32	0.36	0.70	0.59	0.15	0.15	0.14	0.10

Table 5.7a detailed result of quality of financial regulation on bank's performance and stability for the **overall sample**. .Variables in panel A are performance measures. NIM is at lag pf 2, PreTaxP, at lag of 3, while ROA is at lag of 1. Stability measures are reported in Panel B, EQR is at lag 1, NPLTL is at lag 3 while others are at lag 1. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

[38] Regulatory quality is measured as Basel Core Principle (BCP) of effective financial regulation, which is the internationally accepted regulatory standard for banking sector regulation.

Table 5.7b: Effect of Regulatory quality on performance and stability of the sub-sample (Emerging Market)

Variables	NIM		LogPreTaxP		ROA		EQR		NPLTL		Liquidity		LogZ-Index		H-Stat	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
BCP	0.184*	0.183*	0.071	0.073	0.003**	0.003**	0.005*	0.005*	-0.038	-0.002	0.124	0.438	0.179***	0.178***	0.009	0.008
	(0.100)	(0.100)	(0.396)	(0.393)	(0.001)	(0.001)	(0.003)	(0.003)	(0.138)	(0.122)	(1.716)	(1.594)	(0.051)	(0.051)	(0.018)	(0.017)
HHI2b	0.158	0.166	-0.061	-0.053	0.017*	0.016*	0.007	0.006	-0.323	-0.298	4.899	7.469	-0.085	-0.092		
	(0.272)	(0.272)	(0.816)	(0.818)	(0.010)	(0.010)	(0.008)	(0.008)	(0.328)	(0.332)	(6.128)	(6.036)	(0.077)	(0.077)		
CAPR	-0.000	-0.001	0.016	0.016	0.001	0.001	0.002***	0.002***	0.001	-0.001	0.138	0.212	0.001	0.001	-0.001	-0.001
	(0.006)	(0.006)	(0.012)	(0.012)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.210)	(0.203)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	0.001	0.001	0.025*	0.024*	0.001	0.001	-0.001	-0.001	0.004	0.004	-0.128	-0.330	0.001	0.001	0.006**	0.006**
	(0.004)	(0.004)	(0.014)	(0.014)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.004)	(1.040)	(1.072)	(0.002)	(0.002)	(0.003)	(0.003)
INTL2	1.278**	1.297**	-0.138	-0.149	0.008	0.007	-0.034**	-0.023	0.233	0.281	0.389	-0.534	0.179	0.178	0.133	0.136
	(0.542)	(0.545)	(1.765)	(1.771)	(0.011)	(0.010)	(0.017)	(0.016)	(0.384)	(0.382)	(11.947)	(11.673)	(0.189)	(0.190)	(0.099)	(0.098)
OPE	0.022	0.022	-0.032	-0.032	-0.001	-0.001	-0.001	0.001	0.008*	0.009*	0.042	0.060	-0.005**	-0.005**	0.005***	0.005***
	(0.017)	(0.017)	(0.023)	(0.023)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.005)	(0.323)	(0.321)	(0.003)	(0.003)	(0.001)	(0.001)
LogTA	0.003	0.006	0.244	0.238	-0.011***	-0.011***	-0.004	-0.005	-0.007	0.004	2.786	3.193	0.056**	0.056**	-0.040***	-0.040**
	(0.041)	(0.041)	(0.217)	(0.211)	(0.002)	(0.002)	(0.005)	(0.005)	(0.118)	(0.123)	(5.678)	(5.511)	(0.026)	(0.026)	(0.016)	(0.016)
Lending Rate	0.058***	0.058***	-0.049	-0.050	0.001	0.000	0.001**	0.001**	-0.006	-0.005	0.283	0.325	-0.002	-0.003	0.008***	0.008***
	(0.012)	(0.012)	(0.071)	(0.070)	(0.001)	(0.000)	(0.000)	(0.000)	(0.013)	(0.011)	(0.340)	(0.333)	(0.006)	(0.006)	(0.002)	(0.002)
GDPGrowth	0.024*	0.025*	0.049	0.048	0.001	0.001	0.001	0.001*	0.004	0.005	0.249	0.296	-0.002	-0.002	0.003*	0.002
	(0.014)	(0.014)	(0.041)	(0.041)	(0.001)	(0.001)	(0.001)	(0.001)	(0.008)	(0.009)	(0.379)	(0.373)	(0.004)	(0.004)	(0.002)	(0.002)
CVInflation	0.001	0.001	-0.001	-0.001	0.000	0.000	-0.000	-0.000	-0.006	-0.004	-0.001	0.001	-0.001*	-0.001*	-0.001***	-0.001***
	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.007)	(0.031)	(0.028)	(0.001)	(0.001)	(0.001)	(0.001)
Political	0.284		-1.548		-0.006*		-0.015*		-0.230		-3.658		-0.036		-0.050	
	(0.384)		(1.483)		(0.003)		(0.008)		(0.414)		(8.729)		(0.180)		(0.056)	
Legal		0.099		-2.332		-0.003		-0.000		0.771		1.667		-0.079		-0.175**
		(0.496)		(2.380)		(0.004)		(0.018)		(1.155)		(6.290)		(0.227)		(0.087)
Constant	-2.045**	-2.143**	-3.346	-3.131	0.194***	0.193***	0.129*	0.127	-0.332	-0.487	-43.466	-45.845	0.346	0.401	0.293	0.317
	(1.041)	(1.034)	(4.433)	(4.151)	(0.036)	(0.036)	(0.078)	(0.079)	(1.957)	(2.103)	(87.305)	(83.799)	(0.546)	(0.530)	(0.245)	(0.243)
Obs.	3,792	3,792	3,792	3,792	4,124	4,124	4,629	4,629	3,750	3,750	3,422	3,422	3,699	3,699	4,115	4,115
No. of BankID	393	393	393	393	393	393	393	393	391	391	393	393	392	392	393	393
AR2	0.25	0.25	0.50	0.50	0.12	0.12	0.57	0.60	0.13	0.12	0.23	0.23	0.34	0.40	0.24	0.19
Sagan Test	32.95	32.81	14.01	14.24	36.50	36.49	39.55	40.81	10.65	9.99	5.55	7.72	54.01	53.60	12.56	12.69
Sagan P. Value	0.19	0.20	0.05	0.04	0.19	0.19	0.27	0.22	0.15	0.18	0.47	0.25	0.14	0.15	0.18	0.17

Table 5.7a detailed result of quality of financial regulation on bank's performance and stability for **emerging market sample**. Variables in panel A are performance measures, which are at lags of 3. Stability measures are reported in Panel B, EQR is at lag 1, H-Stat is at lag 2 while others are at lag 3. Standard errors are in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

5.9. Chapter Summary

This chapter focused on the second key preoccupation of this research (Twin-peaks financial regulatory model), and to a lesser extent on the effect of regulatory quality on bank performance and stability, especially in emerging market economies. The chapter also explored interaction effects of the two regulatory policies, which are the two major thrusts of this study: market discipline principle of Basel II and the twin-peaks regulatory model. We tested hypotheses 4 to 9 and answered research questions 4 and 5.

We started by estimating evolution of bank performance and stability over the period of implementation or adoption of features of twin-peaks financial regulatory model. We also focused on differential effects of this model on emerging and developed market economies. We found that bank performance and stability improved during twin-peaks implementation/adoption. Interestingly, we found that mere adoption of twin-peaks features is highly likely to improve bank performance and stability in emerging market economies. Secondly, twin-peaks, being a regulatory policy by structure, we estimated the effect of twin-peaks in terms of its structural forms on bank performance and stability. We found that involving central banks as one of the peaks, as well as using two regulatory bodies independent of the central bank, have differentiated positive effect on both bank performance and stability.

Thirdly, to firmly establish the positive effect of twin-peaks regulatory model on banking activities; we estimated the effect of single regulator based regulatory structure on bank performance and stability. We found that single regulator based structure of financial regulation has negative effects on both bank performance and stability, even when interacted with market discipline implementation by a country. Fourthly, we estimated joint effect of market discipline principle and twin-peaks, and found that twin-peaks and market discipline work more jointly as complements, than substitutes.

Finally, to justify why implementation of financial regulatory policies is fundamentally essential in the banking industry, we estimated effect of the quality of in-place financial regulation on bank performance and stability. Regulatory quality was measured using Basel core principle (BCP), which measures the extent of a country's compliance with the internationally accepted best practice Basel regulatory policies. We found that for profit maximization and improved stability, countries/banks should comply with financial regulatory policies that are already vetted as quality and in place.

Chapter Six

6. CONCLUSION, POLICY IMPLICATIONS AND RECOMMENDATION

6.1. Introduction

Due to the dynamic nature of financial regulation, it has attracted the attention of both academic researchers and policy makers. Different financial regulatory policies and laws have come into place, pre and post the recent global financial crisis of 2007/2008. While some regulations are complements to, others are substitutes to existing financial regulations. In as much as countries are not mandated, with immediate effects, to implement them but instead follow a phased-in approach, a major concern is that compliance with the Basel Capital Accords (I, II, and II) have been perceived literally as a global norm, and thus needing to be quickly adopted by all serious nation states.

Ratings and investability measures of international rating agencies and consulting firms are often based on banking industries' capacity to incorporate and implement global regulation policies (Claessens, Underhill, and Zhang 2008, Gottschalt and Griffith-Jones 2006). Additionally, globally distributed financial institutions are now largely globally integrated; which, in turn, makes contagious spread of bank failures across the globe easier than without globalization. Based on that, both developed and emerging economies' national regulators need to abide by some minimum international standards, as well as embrace greater coordination of these rules across countries.

Along the lines of international standards, Basel II's objectives were based on three important pillars, with the third pillar, mandatory information disclosure (market discipline), being the first salient regulatory matter engaged by this PhD work. The rationale behind market discipline is that banks perceived to be stable will be preferred by creditors, investors and depositors, to banks that are perceived to experience little scrutiny and are thus riskier (Tarbert 2000). The pace of Basel II implementation (especially incorporation of a more risk-sensitive capital requirement) has not been as good as that of Basel I (Basel 2014). The seemingly niggling concern is that most emerging market countries are still contemplating how to effectively implement Basel II, including the best approach to deploy, as well as needing a better understanding of its implications post-adoption (FSI 2014).

Another increasingly globally popular financial regulatory model besides the Basel capital accords, is the twin-peaks regulatory model, which is the second salient bank regulatory matter engaged by this

study. It posits that regulatory objectives ought to be focused on financial institutions' functions and activities, instead of focusing on identifiable grouping of financial institutions (industries or forms) (Pan 2010, Botha and Makina 2011).

The primary motivation of this study derives from the fact that the "one size fits all" approach to global financial regulation seems unsuitable for emerging market countries. For instance, the major negative unintended consequences of the current globally popular financial regulatory policies (i.e., Basel accords) are said to affect emerging countries very negatively. The consequent credit rationing of Basel II affects emerging economies drastically, as banks channel credits toward low-risk borrowers, and indirectly neglect high-risk borrowers, which are relatively more prevalent in emerging economies. Such risky borrowers are thus left to depend on smaller and less sophisticated banks; this in turn increases these banks' level of risk-taking. Further, the market discipline principle through mandatory disclosure works better in well-developed banking markets, with less information asymmetry and market imperfections (Scott 2004), and such banking markets are rare in emerging economies. For example, the volume of subordinated debt required for effective market discipline may not be available in emerging economies (Karacadag 2001).

On that note, a sound financial regulatory framework suitable for emerging market countries is required, especially to effectively regulate financial service firms and markets in order to avoid regulatory arbitrage and its likes, which increases financial fragility. Thus, effective regulation approaches most amenable to emerging economy environments are the focus of this study.

This study is therefore designed to compare and contrast the two recent central ideas in international banking regulation, namely the market discipline framework and the twin-peaks regulatory model. This aim is achieved by investigating the extent to which banks in the emerging market countries adopted market discipline principle and how that adoption has contributed to bank performance and stability, as well as ascertain the factors that contribute to the adoption of the market discipline framework. This study also measured how the twin-peaks regulatory model maintains and/or strengthens the safety and performance of banks. In the following sections, we present systematically the specific engagements with objectives of the study, alongside corresponding documented findings.

6.2. Market discipline principle

To begin, we sampled 20 emerging market countries (Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Kuwait, Malaysia, Mexico, Morocco, Namibia, Nigeria, Peru, Philippines, Russia, South Africa, Thailand, Turkey, and Zambia) and 4 developed countries (Australia, Belgium, France and Netherlands) over 15 years period, 2000-2014. We extracted bank-specific data from the Bankscope database, country-specific data from World Development Indicators (WDI), and institutional factors from World Governance Indicators (WGI). First, we deployed principal component analysis (PCA) on variables believed to be reflective of market discipline principle, which included: interest spread, interbank rate, long term credit ratings, viability ratings, number of outstanding shares, availability of subordinated debts, availability of government implicit guarantee, and availability of deposit insurance scheme.

Using the PCA, we generated constructs that are better reflective of market discipline than any single variable that is popularly in use in developed country based studies. From the constructs, we found two broad distinct dimensions of market discipline; namely internal and external dimensions. Internal dimension include market discipline from government resolution/policy **(MkD2)** and internal industry discipline **(MkD4),** while external dimension includes market discipline from external stakeholders **(MkD1),** market discipline from security holders **(MkD3),** and market discipline from market activities **(MkD5).** To validate the resultant constructs generated using PCA, we checked the convergence of the first three component loadings (MkD1, MkD2, and MkD3). These three constructs loaded clearly in component 1, into what we termed the overall market discipline construct *(OvMkD)*. From these results, we inferred that there are two explicit dimensions of market discipline: internal- and external-originated market discipline, which may exhibit different effects on bank performance and stability.

Second, to investigate the existence of market discipline, we deployed event study models applied by other researchers (Henry 2000a, b, Ojah and Pillay 2009). Using GMM estimation techniques, we estimated the evolution of market discipline constructs over the year of market discipline implementation and five years thereafter. We found that market discipline exists in these banking industries and the effect of market discipline takes a gradual process to take hold after implementation, and it registers its peak effects between second and third years after the implementation year. We also found that bank performance and stability exhibited significant changes during this period. Most importantly, non-performing loans significantly declined during the

post-implementation periods of market discipline, which implies that banks recorded low levels of non-performing (less risk exposure) over the years after implementation. H-Stat, a measure of competition among banks, also increased during this period, which suggests a declining market power of banks during post-implementation of market discipline principle.

Third, due to differences between emerging and developed market economies, we estimated the evolution of market discipline constructs for these different market regions, to find out if different market discipline dimensions have similar or different effects or timing of effects in these two distinct market regions. From developed markets' perspective, there is a higher level of market discipline from both internal and external dimensions of market discipline, compared to emerging market economies. Most importantly, developed market economies recorded higher levels of market discipline attributable to external security holders (MkD3).

This last result confirms two views in favor of subordinated debt as a market discipline tool. First, subordinated debtholders are likely to discipline banks more, due to holders' high likelihood of loss than other class of creditors in the event of bank failure (Calomiris 1999, Evanoff and Wall 2001a). Second, it confirms the argument that market discipline, through subordinated debtholder, is not feasible in emerging market economies due to the nature and size of emerging market economies' financial markets. Based on that argument, it is believed that most emerging market banks do not maintain the level of subordinated debts presence required for an effective market discipline.

We also explored trends of bank performance and stability during and five subsequent years following market discipline implementation in emerging and developed market economies, respectively. Analytically, we found that during these years, both emerging and developed market banking industries experienced waning performance and stability trends. But, interestingly, there was reduction in the level of risk-taking in emerging market economies, an outcome that is the major aim of market discipline principle of Basel II. Also the magnitude of the decline in performance and stability was larger in developed market economies than in emerging market economies. These results confirm the evolution of market discipline principle in both economies, where all the different dimensions of market discipline, as well as the overall market discipline, were found to be more substantially present in developed markets than in emerging market economies.

Fourth, we carried out further exploration of market discipline effects on bank performance and stability, where we regressed the different dimensions of market discipline on the different bank

performance and stability measures. We found that different dimensions of market discipline have different effects on the different measures of bank performance and stability. We expectedly found that internal dimensions of market discipline (MkD2 & MkD4) have related effects on performance and stability, and external dimensions (MkD1, MkD3 & MkD5) exhibit similar effects.

6.2.1. Interaction effects of legal institution and market discipline on bank performance and stability

For further checks, we estimated effects of these individual dimensions of market discipline alongside their interactions with legal infrastructure (institution) on performance and stability. The rationale behind this estimation is to ascertain whether effective legal infrastructure in a country could strengthen or weaken the effects of market discipline. We found that different dimensions of market discipline have different individual effects on both bank performance and stability, but these effects become stronger or even favorable when those different dimensions are interacted with a country's quality legal institution. We specifically notice that internal market discipline proxies reduce performance, but when quality legal institutions are considered jointly with them, performance is improved.

From the different market perspectives (emerging and developed market economies), we found that more dimensions of market discipline recorded statistically significant favorable effects on banks performance and stability for developed economies than was the case for emerging economies. For instance, both internal- and external-originated market disciplines increase stability of the banking industry of developed markets. The effects of interaction between dimensions of market discipline and legal institutions have more expected and robust effects in developed than in emerging markets' bank performance and stability. In most cases in developed markets, the effects of individual market discipline constructs are improved or retained when interacted with legal institution, though there are few exceptions. For instance, in developed market, MkD1 on its own significantly increases NIM at the 5% significance level, but when interacted with legal institutions, the incremental effect increased statistically to the 1% level.

For further robustness checks of the above results, we also estimated the effects of the overall market discipline construct and its interaction with legal institution in both emerging and developed economies. The overall market discipline (OvMkD) significantly and positively affect both developed markets' bank performance and stability, and retains its effects upon being interacted with

the legal institution variable. However, there are minimal significant effects on emerging market banks. This outcome essentially confirms our differential findings on market discipline between emerging market banks and developed market banks, and the wisdom of using markets discipline constructs that are sensibly reflective of realities in emerging economies.

6.2.2. Further robustness checks for implementation of market discipline on bank performance and stability

For more robustness checks on market discipline implementation, we also estimated the effect of implementing market discipline principle on bank performance and stability. This estimation enabled us to ascertain what happens to bank performance and stability should a country decide to implement market discipline than not. We regressed dummy variable of implementation of market discipline against bank performance and stability measures, we found that the tendency of a bank implementing market discipline principle only increases banks' net interest margin as a measure of profit. We also found that implementation of market discipline significantly reduces equity ratio and Z-Index which are measures of stability. Interestingly, liquidity and nonperforming loans were also marginally increased and reduced, respectively. This is an indication of reduction in banks level of risk exposure as a result of implementation of market discipline. .

Following our routine estimations on effects of market discipline in different market segments (emerging and developed markets), we found that implementation of market discipline significantly reduced all measures of performance in developed markets, unlike in the emerging market where only net interest margin increased. But from stability point of view, developed market recorded more incremental effects on stability due to implementation of market discipline, where equity and liquidity ratios significantly increased at the 1% significance level, than emerging market recorded.

From these results, we drew the inference that adoption of market discipline principle by countries' banks positively affects performance of emerging market banks, but negatively affect developed market banks' performance. But on the stability front, emerging market banks are more unstable due to adoption of market discipline principles, than developed market banks. In terms of level of risk-taking due to market discipline implementation, there is no statistically significant effect on banks of both markets, though emerging market economies recorded negative coefficient while developed market recorded positive coefficient on nonperforming loans. These results correspond largely with

the result of evolutions of bank performance and stability variables for the overall sample, emerging and developed market economies.

For further and more generalization of our findings, we extended our robustness check to a more comprehensive check and adopted difference-in-differences (DID) technique, which effectively captures the effect of implementing a policy/regulation/treatment. DID takes into account a separate group that implemented a policy, while comparing it with a group or sample that did not implement that policy. Using propensity score matching, we first identified countries that did not implement market discipline principle (control group) but have similar features as the group of countries which implemented (treatment group).

Using Brazil as treatment group, with 2006 as year of implementation of market discipline, we confirm previous results (evolution and robustness estimation results). We confirm that, effects of market discipline especially on emerging market economies' bank performance, takes a gradual process and reaches its peak between two and three years after market discipline principle implementation. We assume that such gradual changes reflect any underlining measures banks put in place to regularize the effect of the policy implementation. Such measures could be positive or negative: positive being whereby banks abide by and accept discipline from different perspectives of the market and reduce level of exposure to instability/risk. The measure could also be negative in the sense that with the opaque nature of banks, they could engage in regulatory arbitrage by disclosing only information that could impact positively on performance and stability.

For further check, we carried out another DID estimation, using China, Morocco and Philippines, as the treatment group, with 2007 as year of implementation of market discipline. The results are quite similar to those of Brazil as the control country, and together they confirm the effects of market discipline implementation in emerging market banks, as well as confirm our previous findings that market discipline has differential effects on different measures of bank performance and stability.

6.2.3. Determinants of market discipline implementation

Research shows that some countries, especially emerging markets and low income countries were not able to implement the Basel II capital accord due to lack of technical and human resources necessary for the policy implementation (Gottschalt and Griffith-Jones 2006, Cornford 2006a, b, FSI 2014). However, the Basel II capital accord is the financial regulation housing the market discipline principle which is a focus in this study.

Due to the fact that most countries have not implemented market discipline principle, as at the time of this study, we went further to find out what factors apart from lack of technical and human resources determine the likelihood of a country adopting or implementing the market discipline principle, especially in emerging markets. Using panel logistic regression, we found that interest rate, openness to trade, political, and legal institutions of a country significantly influence implementation of market discipline. However, openness to trade has the highest influence on the likelihood of implementing market discipline compared to other country-specific factors.

In terms of bank-specific factors, bank size, measured as logarithm of total asset, has the highest influence on the likelihood of implementing market discipline, followed by availability of subordinated debt in a bank's balance sheet, liquidity level of the bank, and regulatory capital ratio. While the level of bank stability measured as Z-Index significantly affects the likelihood of implementation of market discipline, performance (measured as net interest margin) is not a significant factor in affecting the likelihood of market discipline implementation. This implies that the more stable a bank is, the more likely the bank will decide to implement market discipline principle. Competition in the banking industry also statistically influences the likelihood of implementation of market discipline, though with lesser odd ratio compared to the other important bank-specific factors included in the model.

6.3. Twin-peaks financial regulatory model

As at the time of this study, very few countries, even among the developed countries, had fully implemented the twin-peaks financial regulatory model. In fact, no emerging market country had fully implemented this regulatory model, but some of them have adopted twin-peaks features in their financial regulatory regimes. To include emerging market countries that have not fully implemented twin-peaks, but have adopted some of its features in their banking regulations in our estimation, we formed a sample of countries that adopted features of twin-peaks regulatory model between the year 2000 and 2014. In order to explore the benefits of twin-peaks regulatory model in the financial system, first, we estimated the evolution of associated banks' performance and stability measures, respectively, around the period countries adopted features of twin-peaks. We found that during this period, bank performance and stability significantly increased. Moreover, nonperforming loans decreased over the period, indicating less credit risk exposure by banks during this period.

Extending our estimation separately to different groupings of markets (emerging and developed), we found that with mere adoption of features of twin-peaks by emerging market economies; there is evidence of positive and significant performance in emerging market countries. From developed market countries' perspective, we sampled countries that fully implemented twin-peaks regulatory models, and found that both bank performance and stability significantly increased during the period of implementation, especially Z-Index, which has been recording negative coefficients in our previous evolution estimations. We specifically found that performance and stability of developed country banks are more significantly pronounced than those of emerging market country banks.

However, the results empirically confirm already existing differences in the financial markets of blocks of countries (emerging and developed markets) reviewed in our analysis (Ladekarl and Zervos 2004, Karacadag 2001). These results also confirm our argument that regulatory policies might affect the two groups of markets differently, due to the fact that financial markets of developed economies are more developed, relatively perfect, relatively stable, and with less information asymmetry than those of emerging market economies.

Second, to find out what happens to bank performance and stability should a country decide to implement or adopt features of twin-peaks regulatory model, we estimated the effect of implementing or adopting features of twin-peaks on bank performance and stability. From the emerging market perspective, adoption of features of twin-peaks increases return on asset as a measure of performance. We also found that the level of risk exposure for emerging market banks reduced during this period, which is reflected in the significant reduction of nonperforming loans in the estimation results.

In the case of developed markets, twin-peaks implementation elicited positive and significant effects on both performance and stability measures. The level of risk exposure for developed market banks also reduced during this period. These findings confirm our results from estimation of evolution of performance and stability measures, where we found that mere adoption of features of twin-peaks model, even in emerging market countries does positively contribute to performance and stability of financial institutions (particularly banks).

Third, using panel logistic regression, we ascertain factors (bank-and country-specific) that are likely to foster implementation and/or adoption of features of the twin-peaks regulatory model. We found that GDP growth, political and legal institutions are associated with higher odds (probability) of

implementing twin-peaks compared to other country-specific factors included in our model. In respect of bank-specific factors, availability of subordinated debt has the highest influence on implementing twin-peaks, followed by bank size, net interest margin, and regulatory capital ratio. Competition in the banking industry also increases the likelihood of implementation of twin-peaks, but with a lesser magnitude compared to the other statistically important bank-specific factors.

Fourth, as we found that implementation and/or adoption of features of twin-peaks improves bank performance and stability, we went further to examine whether or not central bank's involvement in twin-peaks structure could have differential effects on performance and stability of banks. We found that both central bank's involvement in twin-peaks regulatory structure or use of regulatory bodies independent of the central bank have different effects on different measures of banks' performance and stability. Central bank's involvement in regulatory oversight of banks increases shareholder confidence to invest more in banks, thereby increasing equity base of bank balance sheet. Whereas the use of regulatory bodies independent of the central bank increases assets base of banks, which implies that banks are able to increase their loan portfolio if regulatory bodies are independent of the monetary policy circuit of the economy.

Based on these results, there is still no conclusive beneficial evidence on involvement of central bank in a country's financial regulatory structure. It should be left to the country's discretion as to its preference for either increase in owners' equity (more capitalization by banks) or increase in banks' loan portfolio, which will in turn increase ease of access to loan by borrowers, especially SMEs.

Fifth, before we can draw a relatively strong conclusion on effects of twin-peaks on bank performance and stability, we estimated a model of effects of single regulatory model on bank performance as a further robustness check. The single regulatory model stipulates that one regulatory agency can simultaneously and efficiently handle all the national financial regulatory objectives (Di Giorgio, Di Noia, and Piatti 2000, Pan 2010, Briault 2002). Taking market discipline into considerations, we also estimated interaction effect between single regulatory model and market discipline on performance and stability of banks. The motivation for this interaction (joint) effect analysis is to find out what happens to bank performance and stability should a country operate under a single regulatory body and also implemented market discipline principle. In other words, given our construct of markets discipline that is reflective of both internally and externally originated scrutiny of bank, could the constraints or shortcomings of single regulatory model be mitigated?

We found that single regulatory body reduces return on assets, and has no significant effects on banks' net interest margin even after interacting with the market discipline principle variable. From the stability perspective we also found that a single regulatory body based structure reduces bank stability measures, whereby its interaction effect with market discipline significantly reduces equity ratio and Z-Index. Similar results were found when we extended the estimations to a sub-sample of only emerging market countries. Therefore, we concluded that a single authority based regulatory structure does not favorably enable positive bank performance and stability, despite implementation of market discipline principle.

6.3.1. Are market discipline and twin-peaks complements or substitute?

It has been argued that due to the opaque nature of banks, exclusive reliance on market discipline principle could render the financial sector restrictively ineffective and could trigger bank runs (Prowse 1997, Dhumale 2000, 2001, Linnell 2001, Morgan 2002). Could the twin-peaks model mitigate this restrictiveness effect or could the additional cost of both used jointly outweigh their join positives? Based on this question, we estimated interaction effect of market discipline and twin-peaks on performance and stability of emerging market banks, so as to determine whether market discipline and twin-peaks regulatory models could complement each other.

We found that where the overall market discipline reduced return on assets, the interaction term of overall market discipline and twin-peaks increases return on assets and profit before tax of emerging market banks. The interaction term also increases stability of emerging market banks, where equity ratio and Z-Index were significantly increased, while individual effects of market discipline and twin-peaks have no favorable effects on equity ratio. To the best of our knowledge, as at the time of this research, there was no existing empirical research on the interaction effect of market discipline principle and twin-peaks regulatory models. Thus, we conclude that twin-peaks financial regulatory model is more likely a complement to market discipline principle of Basel II, than a substitute.

6.3.2. Regulatory quality and bank performance/stability

Finally, to further justify our research focus on financial regulation, and to explore further the importance of financial regulation in the banking industry of emerging market economies, mainly on account of their relatively weak institutional environment, we examined the effects of regulatory quality of a country on bank performance and stability. Regulatory quality is measured using Basel core principles, which assess a country's ability to comply with Basel regulatory requirements. We

found that compliance with regulation has significant positive effect on both bank performance and stability; increasing net interest margin, return on assets, equity ratio and Z-Index. Therefore, we conclude that compliance with regulatory policies enhances bank performance and stability, which supports Podpiera and Cihak (2006) findings, that regulatory compliance lowers ratio of nonperforming loans in banks' balance sheet.

6.4. Policy implications of the research

A number of policy inferences can be drawn from the findings of this study. From the market discipline perspective, first, the use of subordinated debt as a market discipline tool has been widely accepted by financial researchers. The reason being that unsecured debt holders, like subordinated debt holders, are more likely to discipline banks due to holders' higher likelihood of loss than other class of creditors in the event of bank failure. But our estimation results from principal component analysis (PCA) revealed that there are other effective proxies to be used as market discipline principle instrument in banking research. Financial regulatory authorities should consider these other possible instruments of market discipline and encourage their use in the same manner mandatory issuance of subordinated debt has been proposed and circulated.

The more compelling reason why regulators should promote other possible instruments of market discipline is that our results confirmed that the use of subordinated debt as an instrument of market discipline is not feasible and thus unsuitable in emerging market economies. Our analysis revealed that market discipline through subordinated debt is of lesser importance in emerging market than in developed market economies. Therefore, to ensure that emerging markets' banks are appropriately disciplined by the market, as one of the major objectives of Basel II, regulatory authorities should ensure that other instruments of market discipline such as (long-term credit ratings, viability ratings, interbank rates, government implicit guarantee, deposit insurance corporations) are considered when proposing regulatory policies regarding market discipline.

Second, banks and financial regulatory authorities should be aware of existence of various dimensions of market discipline, which affect differently different measures of bank performance and stability. Also regulatory authorities should be aware that these various dimensions of market discipline affect the two distinct markets (emerging and developed) differently; therefore, such differential effects should be considered during subsequent market discipline policy formulation.

Third, our results revealed that higher effects of market discipline exist in developed market economies than in emerging market economies. The essence of such higher effects was shown to be due to the existence of efficient and effective legal environment in developed countries, which enables the public, government and external stakeholders to effectively discipline banks. Therefore, we recommend that to ensure effective market discipline in emerging market economies, strong and effective legal institutions should be established and maintained in emerging market economies as a useful prerequisite for the efficiency of regulatory policies.

Fourth, research shows that some countries, especially emerging market ones, were not able to implement the Basel II capital accord (which is the financial regulation housing the market discipline principle) due to lack of technical and human resources necessary for the policy implementation (Gottschalt and Griffith-Jones 2006, Cornford 2006a, b). Based on these findings, financial regulatory authorities have considered a phased-in approach in order to allow some countries comply with regulatory policies at intervals while regularizing whatever technical and human resources impediments to hindering smooth implementation.

We recommend that regulatory authorities should also consider other impediments we found hindering implementation of market discipline principle, which include: unfavorable openness to trade, interest rate, political, and legal institutions of a country. From bank-level perspective, banks that are aspiring to implement market discipline principle should endeavor to increase their asset base, maintain relatively high levels of liquidity and capital ratios, as well as the level of subordinated debt in their balance sheet.

Looking at twin-peaks financial regulatory model, we recommend that countries, both emerging and developed, should endeavor to implement the twin-peaks model because we found that implementation of twin-peaks could improve both performance and stability of the banking industry both in emerging and developed economies. Most importantly, adoption of mere features of twin-peaks, by some emerging market countries, elicited significant improvement in bank performance and stability.

Secondly, the choice of twin-peaks structure should largely depend on country's discretion and largely guided by what major goal the financial system of a country aspires to achieve. Incorporating central banks as one of the peaks in twin-peaks regulatory model increases shareholder confidence to invest more in banks, thereby increasing equity base of bank balance sheet (and strengthening

stability). Whereas the use of regulatory bodies independent of the central bank increases banks' assets base, which implies that banks will be likely to increase their loan portfolio if regulatory bodies are independent of the monetary policy circuit of the economy. Based on that, it should be left to a country's discretion for its preference for either increase in owners' equity (more stability of banks) or increase in banks' loan portfolio, which will in turn increase ease of access to loan by firms, especially SMEs.

Thirdly, through our analysis and various robustness checks, we found that interaction term of market discipline principle and twin-peaks financial regulatory model improves bank performance and stability relative to their independent individual effects. We concluded that twin-peaks regulatory model is more likely a complement to market discipline principle of Basel II, than a substitute. Therefore, we recommend that countries that have already implemented Basel II's market discipline principle should endeavor to implement twin-peaks financial regulatory model as well, for enhanced benefits.

Finally, we recommend that for banks' profit maximization as well as improved stability, both emerging and developed market countries should endeavor to comply with required financial regulatory policies that are already in place. They are value-enhancing for national financial markets.

6.5. Recommendation for further research

Reviewing financial regulatory policies has been viewed to be a dynamic process due the dynamic nature of the economy as well as the dynamic nature of banks' products and services (i.e., the rate of innovation in the banking space). Financial regulatory authorities have been striving to move along with these changes in order to develop and maintain financial regulatory models suitable for the economy at a various points in time.

Based on this dynamic nature of financial regulatory policies, we recommend that research on financial regulations should follow the same dynamic trends, focusing on the differential effects of financial regulations on distinct economies based on levels of economic development.

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APPENDIX

Table A1: Overall Sample_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance variables

Variables	NIM																			
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**
MkD1	0.133*	0.076	0.156*																	
	(0.081)	(0.101)	(0.090)																	
MkD1*Legal			-0.099	-0.045																
			(0.069)	(0.052)																
MkD2					0.100	0.171	0.035													
					(0.277)	(0.295)	(0.194)													
MkD2*Legal							0.238*	0.263**												
							(0.144)	(0.128)												
MkD3									-0.254*	-0.258*	-0.316*									
									(0.144)	(0.144)	(0.165)									
MkD3*Legal											-0.266	-0.087								
											(0.194)	(0.161)								
MkD4													-0.129**	-0.126*	-0.125*					
													(0.065)	(0.065)	(0.069)					
MkD4*Legal															0.012	0.062				
															(0.061)	(0.055)				
MkD5																	0.206***	0.205***	0.209***	
																	(0.070)	(0.069)	(0.075)	
MkD5*Legal																			-0.053	-0.039*
																			(0.044)	(0.022)
Legal		0.179	0.364			0.257	-0.032			0.329	0.350			0.168	0.159			0.197	0.192	
		(0.438)	(0.344)			(0.440)	(0.251)			(0.356)	(0.359)			(0.442)	(0.439)			(0.359)	(0.360)	
H-Stat	0.095	-0.080	0.095	-0.089	-0.098	-0.103	0.262***	0.219**	-0.014	0.010	0.022	0.001	-0.103	-0.091	-0.092	-0.090	-0.065	-0.044	-0.044	-0.006
	(0.130)	(0.171)	(0.130)	(0.172)	(0.174)	(0.177)	(0.101)	(0.105)	(0.170)	(0.169)	(0.169)	(0.170)	(0.173)	(0.172)	(0.172)	(0.172)	(0.164)	(0.163)	(0.163)	(0.170)
CAPR	0.001	0.002	0.001	0.003	0.002	-0.001	0.004	0.005	-0.001	-0.001	-0.001	-0.001	0.002	0.002	0.002	0.003	-0.000	-0.000	-0.000	-0.001
	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)	(0.008)	(0.005)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
INTL	0.002	0.002**	0.002	0.002**	0.002**	0.002**	0.001	0.001	0.001**	0.001**	0.001**	0.001**	0.002**	0.002**	0.002**	0.002**	0.001	0.001	0.001	0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	0.447	0.728	0.403	0.699	0.618	0.890	0.408	0.289	0.786	0.842	0.871	0.858	0.541	0.665	0.672	0.698	0.765	0.829	0.834	0.846
	(0.758)	(1.020)	(0.764)	(1.017)	(1.013)	(1.049)	(0.361)	(0.409)	(0.655)	(0.655)	(0.660)	(0.661)	(1.015)	(1.023)	(1.024)	(1.021)	(0.644)	(0.643)	(0.643)	(0.659)
OPE	0.021*	0.015	0.020*	0.015	0.015	0.017	0.038***	0.040***	0.023	0.023	0.023	0.023	0.016	0.015	0.015	0.015	0.021	0.021	0.021	0.022
	(0.012)	(0.013)	(0.012)	(0.013)	(0.013)	(0.014)	(0.011)	(0.012)	(0.015)	(0.015)	(0.015)	(0.015)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.015)
LogTA	-0.009	0.010	-0.010	0.010	0.011	0.005	-0.055*	-0.061**	-0.009	-0.010	-0.009	-0.010	0.009	0.009	0.009	0.010	-0.006	-0.007	-0.007	-0.010
	(0.018)	(0.016)	(0.018)	(0.017)	(0.017)	(0.018)	(0.029)	(0.031)	(0.036)	(0.037)	(0.037)	(0.037)	(0.017)	(0.017)	(0.017)	(0.017)	(0.029)	(0.029)	(0.029)	(0.037)
Lending Rate	0.070***	0.047**	0.069***	0.048**	0.047**	-0.009	0.037***	0.033***	0.012	0.013	0.014	0.012	0.049**	0.048**	0.048**	0.049**	0.054***	0.055***	0.055***	0.012
	(0.014)	(0.022)	(0.014)	(0.022)	(0.022)	(0.017)	(0.006)	(0.006)	(0.012)	(0.012)	(0.012)	(0.012)	(0.022)	(0.022)	(0.022)	(0.022)	(0.018)	(0.018)	(0.018)	(0.012)
GDPGrowth	0.042***	0.041***	0.040***	0.040***	0.042***	0.032**	0.047***	0.044***	0.028**	0.026**	0.026**	0.027**	0.042***	0.041***	0.041***	0.040***	0.040***	0.039***	0.039***	0.028**
	(0.010)	(0.013)	(0.010)	(0.014)	(0.013)	(0.014)	(0.009)	(0.009)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.012)	(0.012)	(0.012)	(0.013)
CVInflation	0.001	0.000	0.001	0.001	0.001	0.001	0.002	0.001	-0.002	-0.001	-0.002	-0.001	0.001	0.001	0.001	0.002	-0.001	-0.001	0.002	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.103				0.011				0.050				-0.001				-0.101			
	(0.260)				(0.316)				(0.285)				(0.327)				(0.275)			
Obs.	5,662	5,662	5,662	5,662	5,662	5,662	5,662	5,662	5,270	5,270	5,270	5,270	5,662	5,662	5,662	5,662	5,270	5,270	5,270	5,270
No. of BankID	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466
AR2	0.16	0.17	0.16	0.17	0.17	0.17	0.18	0.18	0.13	0.14	0.14	0.13	0.17	0.17	0.17	0.17	0.14	0.14	0.14	0.13
Sagan test	45.81	18.50	45.91	18.30	17.99	15.20	79.16	69.39	26.27	26.14	26.25	26.25	18.08	18.32	18.35	18.36	29.08	28.93	29.05	26.25
P. Value Sagan	0.10	0.10	0.10	0.11	0.12	0.23	0.18	0.24	0.24	0.24	0.24	0.24	0.11	0.11	0.11	0.11	0.14	0.14	0.14	0.24

Table A1 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on net interest margin (NIM), using GMM analysis. Models 9 to 12 and 17 to 20 are at lag of 2, other models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A2: Overall Sample -Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance variables Cont.

Variables	Pre Tax Profit																			
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**
MkD1	0.091	0.087	0.176																	
	(0.362)	(0.362)	(0.301)																	
MkD1*Legal			-0.428	-0.373																
			(0.547)	(0.578)																
MkD2					-0.866**	-0.851**	-0.857**													
					(0.431)	(0.433)	(0.431)													
MkD2*Legal							0.892**	0.859**												
							(0.402)	(0.409)												
MkD3									-0.276	-0.279	-0.316									
									(0.380)	(0.378)	(0.375)									
MkD3*Legal											-0.170	0.013								
											(0.559)	(0.566)								
MkD4													0.271*	0.266*	0.280*					
													(0.159)	(0.159)	(0.169)					
MkD4*Legal															0.127	0.025				
															(0.256)	(0.246)				
MkD5																	0.073	0.062	0.080	
																	(0.429)	(0.427)	(0.439)	
MkD5*Legal																			-0.158	-0.149
																			(0.207)	(0.202)
Legal		-0.380	-0.327			-0.207	-0.322			-0.332	-0.315			-0.361	-0.387			-0.390	-0.408	
		(1.299)	(1.309)			(1.334)	(1.340)			(1.301)	(1.311)			(1.210)	(1.210)			(1.302)	(1.302)	
H-Stat	-1.51***	-1.49***	-1.49***	-1.50***	-1.49***	-1.47***	-1.48***	-1.50***	-1.51***	-1.49***	-1.49***	-1.50***	-1.24**	-1.21**	-1.22**	-1.22**	-1.52***	-1.50***	-1.49***	-1.50***
	(0.561)	(0.564)	(0.563)	(0.560)	(0.568)	(0.571)	(0.571)	(0.560)	(0.559)	(0.561)	(0.562)	(0.561)	(0.598)	(0.599)	(0.600)	(0.600)	(0.559)	(0.561)	(0.561)	(0.560)
CAPR	0.025**	0.025**	0.025**	0.025**	0.026***	0.026***	0.026***	0.025**	0.025**	0.025**	0.025**	0.025**	0.031***	0.031***	0.031***	0.031***	0.025**	0.025**	0.025**	0.025**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
INTL	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
TLTA	-0.288	-0.358	-0.373	-0.383	-0.240	-0.313	-0.291	-0.358	-0.307	-0.379	-0.364	-0.372	0.682	0.599	0.590	0.375	-0.297	-0.366	-0.358	-0.364
	(1.465)	(1.470)	(1.470)	(1.466)	(1.550)	(1.554)	(1.556)	(1.469)	(1.470)	(1.474)	(1.479)	(1.474)	(1.304)	(1.305)	(1.310)	(1.289)	(1.468)	(1.472)	(1.475)	(1.470)
OPE	-0.07***	-0.06***	-0.06***	-0.06***	-0.07***	-0.07***	-0.07***	-0.06***	-0.07***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.07***	-0.06***	-0.06***	-0.06***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)	(0.024)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)
LogTA	0.124*	0.121*	0.123*	0.121*	0.173*	0.168*	0.168*	0.119*	0.124*	0.121*	0.121*	0.120*	0.147*	0.143*	0.142*	0.143*	0.122*	0.120*	0.120*	0.120*
	(0.065)	(0.065)	(0.065)	(0.065)	(0.092)	(0.092)	(0.093)	(0.065)	(0.065)	(0.065)	(0.065)	(0.065)	(0.081)	(0.081)	(0.081)	(0.080)	(0.065)	(0.065)	(0.065)	(0.065)
Lending Rate	0.029	0.022	0.021	0.021	0.033	0.025	0.031	0.027	0.028	0.021	0.022	0.021	0.051	0.047	0.047	0.048	0.029	0.022	0.021	0.021
	(0.060)	(0.060)	(0.060)	(0.060)	(0.061)	(0.061)	(0.061)	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)	(0.049)	(0.049)	(0.049)	(0.049)	(0.060)	(0.060)	(0.060)	(0.060)
GDPGrowth	0.044	0.044	0.043	0.043	0.040	0.039	0.040	0.044	0.044	0.044	0.044	0.044	0.053	0.052	0.052	0.052	0.045	0.044	0.044	0.044
	(0.038)	(0.038)	(0.038)	(0.038)	(0.039)	(0.038)	(0.039)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.036)	(0.036)	(0.036)	(0.036)	(0.038)	(0.038)	(0.038)	(0.038)
CVInflation	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001	0.001	0.001	0.001	0.001**	0.001**	0.001**	0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-2.433**				-2.534**				-2.428**				-2.022*				-2.434**			
	(1.196)				(1.216)				(1.196)				(1.155)				(1.196)			
Obs.	5,270	5,270	5,270	5,270	5,206	5,206	5,206	5,270	5,270	5,270	5,270	5,270	4,867	4,867	4,867	4,867	5,270	5,270	5,270	5,270
No. of BankID	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466
AR2	0.13	0.13	0.12	0.13	0.18	0.18	0.18	0.13	0.12	0.12	0.12	0.12	0.90	0.89	0.89	0.90	0.12	0.12	0.12	0.12
Sagan test	12.92	12.94	12.96	12.95	12.97	13.02	12.85	12.74	12.88	12.89	12.88	12.92	19.92	19.99	19.92	19.91	12.91	12.93	12.92	12.92
P. Value Sagan	0.29	0.29	0.29	0.29	0.29	0.29	0.30	0.31	0.30	0.30	0.30	0.29	0.46	0.45	0.46	0.46	0.29	0.29	0.29	0.29

Table A2 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on Pretax profit, using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A3: Overall Sample -Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance variables Cont.

Variables	ROA																			
Models	**(1) Lag1**	**(2) Lag1**	**(3) Lag1**	**(4) Lag1**	**(5) Lag1**	**(6) Lag1**	**(7) Lag1**	**(8) Lag1**	**(9) Lag1**	**(10) Lag1**	**(11) Lag1**	**(12) Lag1**	**(13) Lag1**	**(14) Lag1**	**(15) Lag1**	**(16) Lag1**	**(17) Lag1**	**(18) Lag1**	**(19) Lag1**	**(20) Lag1**
MkD1	0.000	0.000	0.001																	
	(0.001)	(0.001)	(0.001)																	
MkD1*Legal			-0.001	-0.001																
			(0.001)	(0.001)																
MkD2					-0.003*	-0.004**	-0.007**													
					(0.002)	(0.002)	(0.003)													
MkD2*Legal							0.003**	0.003*												
							(0.001)	(0.002)												
MkD3									0.003	0.003	0.003									
									(0.002)	(0.002)	(0.002)									
MkD3*Legal											0.003	0.001								
											(0.003)	(0.002)								
MkD4													0.001*	0.001**	0.001**					
													(0.001)	(0.001)	(0.001)					
MkD4*Legal															-0.002*	-0.002*				
															(0.001)	(0.001)				
MkD5																	0.000	0.000	0.000	
																	(0.001)	(0.001)	(0.001)	
MkD5*Legal																			-0.001**	-0.001**
																			(0.000)	(0.000)
Legal		0.009	0.009			0.010	0.009			0.008	0.008			0.009	0.009			0.009	0.009	
		(0.006)	(0.006)			(0.006)	(0.006)			(0.006)	(0.006)			(0.006)	(0.006)			(0.006)	(0.006)	
H-Stat	0.017	0.025**	0.025**	0.018*	0.018	0.025**	0.028**	0.021*	0.016	0.024**	0.024**	0.017	0.018	0.025**	0.025**	0.017	0.017	0.025**	0.030***	0.022**
	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)	(0.010)	(0.010)
CAPR	0.001	0.002	0.002	0.001	0.003	0.001	0.001	0.002	0.001	0.001	0.002	0.002	0.001	0.001	0.002	0.001	0.001	0.003	0.002	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	-0.033*	-0.034*	-0.035*	-0.032*	-0.028	-0.028	-0.030*	-0.028*	-0.032*	-0.033*	-0.033*	-0.031*	-0.026	-0.025	-0.022	-0.027	-0.033*	-0.035*	-0.038**	-0.035**
	(0.017)	(0.018)	(0.018)	(0.018)	(0.019)	(0.019)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)	(0.017)	(0.017)	(0.018)	(0.018)	(0.017)
OPE	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LogTA	0.005***	0.005***	0.005***	0.005***	0.006***	0.006***	0.007***	0.007***	0.005***	0.005***	0.005***	0.005***	0.006***	0.007***	0.007***	0.005***	0.005***	0.005***	0.006***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lending Rate	0.001	-0.001	-0.001	-0.001	-0.002	-0.001	-0.003	-0.001	0.001	-0.003	-0.002	-0.001	0.003	-0.001	-0.001	-0.002	0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDPGrowth	0.001	0.003	0.001	0.002	0.003	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CVInflation	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.012**				-0.012*				-0.012**				-0.011*				-0.012**			
	(0.006)				(0.006)				(0.006)				(0.006)				(0.006)			
Obs.	5,662	5,662	5,662	5,662	5,586	5,586	5,586	5,586	5,662	5,662	5,662	5,662	5,586	5,586	5,586	5,662	5,662	5,662	5,662	5,662
No. of BankID	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466
AR2	0.78	0.93	0.94	0.77	0.81	0.98	0.99	0.90	0.76	0.92	0.89	0.76	0.77	0.93	0.92	0.78	0.79	0.94	0.90	0.92
Sagan test	29.72	30.86	30.85	29.62	29.03	29.93	30.93	29.92	29.96	31.07	30.94	29.53	29.69	30.49	29.92	28.96	29.80	30.90	31.95	30.84
P. Value Sagan	0.19	0.15	0.15	0.19	0.21	0.18	0.15	0.18	0.18	0.15	0.15	0.20	0.19	0.16	0.18	0.22	0.19	0.15	0.12	0.15

Table A3 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on return on asset (ROA), using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A4: Overall Sample -Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability variables

Variables	EQR																			
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**
MkD1	0.003	0.003	0.003																	
	(0.003)	(0.003)	(0.003)																	
MkD1*Legal			-0.001	-0.000																
			(0.003)	(0.002)																
MkD2					0.010**	0.010**	-0.05***													
					(0.005)	(0.005)	(0.017)													
MkD2*Legal							0.035***	0.012**												
							(0.010)	(0.005)												
MkD3									0.010**	0.010**	0.010**									
									(0.005)	(0.005)	(0.004)									
MkD3*Legal											0.001	-0.004								
											(0.007)	(0.007)								
MkD4													0.002*	0.002*	0.004***					
													(0.001)	(0.001)	(0.001)					
MkD4*Legal															0.001	0.001				
															(0.002)	(0.002)				
MkD5																	0.003**	0.003**	0.003**	
																	(0.002)	(0.002)	(0.002)	
MkD5*Legal																			-0.002*	-0.002**
																			(0.001)	(0.001)
Legal		0.003	0.003			0.003	-0.002			0.002	0.001			0.003	0.005			0.004	0.003	
		(0.013)	(0.013)			(0.013)	(0.013)			(0.011)	(0.012)			(0.013)	(0.013)			(0.011)	(0.011)	
H-Stat	0.028**	0.028**	0.028**	0.028**	0.031**	0.031**	0.028**	0.028**	0.029***	0.029***	0.030***	0.030***	0.028**	0.028**	0.031**	0.031**	0.029***	0.030***	0.030***	0.029***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.009)	(0.009)	(0.009)	(0.009)	(0.014)	(0.014)	(0.014)	(0.014)	(0.009)	(0.009)	(0.009)	(0.009)
CAPR	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	0.038	0.038	0.038	0.037	0.021	0.022	0.037	0.038	0.047**	0.046**	0.045**	0.047**	0.040	0.039	0.023	0.021	0.047**	0.046**	0.046**	0.047**
	(0.029)	(0.030)	(0.030)	(0.030)	(0.027)	(0.027)	(0.030)	(0.030)	(0.020)	(0.020)	(0.020)	(0.020)	(0.030)	(0.030)	(0.027)	(0.027)	(0.020)	(0.020)	(0.020)	(0.020)
OPE	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001***	0.001***	0.001***	0.001***	0.001**	0.001**	0.001**	0.001**	0.001***	0.001***	0.001***	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
LogTA	0.013*	0.013*	0.013*	0.013*	0.013**	0.013*	0.013*	0.013*	0.016***	0.016***	0.016***	0.016***	0.014*	0.013*	0.013**	0.013**	0.016***	0.016***	0.016***	0.016***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)
Lending Rate	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001*	-0.001*	-0.001*	-0.001*	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDPGrowth	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CVInflation	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	0.004				0.004				0.001				0.004				0.001			
	(0.009)				(0.009)				(0.007)				(0.009)				(0.007)			
Obs.	4,867	4,867	4,867	4,867	4,815	4,815	4,867	4,867	4,867	4,867	4,867	4,867	4,867	4,867	4,815	4,815	4,867	4,867	4,867	4,867
No. of BankID	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466
AR2	0.32	0.32	0.32	0.32	0.35	0.35	0.32	0.32	0.31	0.31	0.31	0.31	0.32	0.32	0.35	0.35	0.31	0.31	0.31	0.31
Sagan test	26.60	26.67	26.65	26.73	27.01	27.01	26.65	26.65	48.85	48.91	48.98	49.56	26.66	26.73	27.03	26.86	49.19	49.28	49.37	49.57
P. Value Sagan	0.14	0.14	0.14	0.14	0.13	0.13	0.14	0.14	0.39	0.39	0.39	0.37	0.14	0.14	0.13	0.13	0.38	0.38	0.37	0.37

Table A4 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on equity ratio (EQR), using GMM analysis. All models are at lag of 2. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A5: Overall Sample -Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability variables Cont.

Variables	NPLTL																			
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**
MkD1	0.031	0.031	0.034																	
	(0.038)	(0.038)	(0.043)																	
MkD1*Legal			-0.015	-0.005																
			(0.043)	(0.039)																
MkD2					-0.038	-0.037	-0.201													
					(0.152)	(0.152)	(0.310)													
MkD2*Legal							0.101	0.005												
							(0.166)	(0.041)												
MkD3									-0.094	-0.092	-0.084									
									(0.085)	(0.085)	(0.085)									
MkD3*Legal											0.032	0.082								
											(0.110)	(0.096)								
MkD4													-0.114	-0.115	-0.112					
													(0.106)	(0.106)	(0.104)					
MkD4*Legal															0.078	0.023				
															(0.103)	(0.140)				
MkD5																	0.020	0.021	0.022	
																	(0.053)	(0.054)	(0.071)	
MkD5*Legal																			-0.015	-0.012
																			(0.051)	(0.027)
Legal		-0.146	-0.147			-0.152	-0.155			-0.134	-0.138			-0.129	-0.136			-0.156	-0.159	
		(0.228)	(0.227)			(0.228)	(0.231)			(0.231)	(0.234)			(0.292)	(0.300)			(0.228)	(0.228)	
H-Stat	0.036	0.030	0.031	0.031	0.031	0.025	0.026	0.031	0.034	0.028	0.028	0.030	0.048	0.044	0.042	0.007	0.028	0.022	0.022	0.031
	(0.110)	(0.110)	(0.111)	(0.108)	(0.109)	(0.109)	(0.108)	(0.108)	(0.110)	(0.111)	(0.111)	(0.108)	(0.125)	(0.126)	(0.129)	(0.118)	(0.108)	(0.109)	(0.109)	(0.109)
CAPR	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
INTL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-0.009	0.001	0.003	-0.004	-0.006	0.004	0.033	-0.006	-0.008	0.002	-0.001	-0.012	0.131	0.135	0.131	0.022	-0.003	0.007	0.008	-0.002
	(0.273)	(0.272)	(0.272)	(0.272)	(0.271)	(0.271)	(0.273)	(0.273)	(0.270)	(0.270)	(0.270)	(0.271)	(0.238)	(0.238)	(0.251)	(0.295)	(0.272)	(0.272)	(0.271)	(0.272)
OPE	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.002	0.002	0.002	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)	(0.007)	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)
LogTA	-0.004	-0.004	-0.003	-0.007	-0.008	-0.007	-0.005	-0.007	-0.004	-0.004	-0.004	-0.007	-0.014	-0.013	-0.015	-0.014	-0.008	-0.008	-0.008	-0.007
	(0.049)	(0.049)	(0.050)	(0.045)	(0.044)	(0.044)	(0.048)	(0.045)	(0.049)	(0.050)	(0.050)	(0.046)	(0.030)	(0.030)	(0.027)	(0.037)	(0.043)	(0.043)	(0.043)	(0.045)
Lending Rate	0.001	0.001	0.001	0.001	0.001	0.001	-0.000	0.001	0.001	0.001	0.001	0.001	-0.013	-0.013	-0.013	-0.001	0.001	0.001	0.001	0.001
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.015)	(0.015)	(0.015)	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)
GDPGrowth	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.003	-0.003	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)
CVInflation	-0.000	0.001	0.001	-0.000	-0.000	0.001	0.001	-0.000	-0.000	0.001	0.001	-0.000	0.001	0.001	0.001	0.001	-0.001	0.001	0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Obs.	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414	4,414
No. of BankID	463	463	463	463	463	463	463	463	463	463	463	463	463	463	465	463	463	463	465	463
AR2	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.25	0.25	0.24	0.23	0.23	0.23	0.23	0.23
Sagan test	11.94	11.61	11.75	11.80	11.74	11.41	11.12	11.75	11.79	11.39	11.40	11.78	9.98	9.88	9.65	10.23	11.62	11.31	11.21	11.66
P. Value Sagan	0.10	0.11	0.10	0.10	0.10	0.12	0.13	0.10	0.10	0.12	0.12	0.10	0.18	0.19	0.20	0.17	0.11	0.12	0.12	0.11

Table A5 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on nonperforming loans (NPLTL), using GMM analysis. All models are at lag of 3. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A6: Overall Sample -Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability variables Cont.

Variables	Liquidity																			
Models	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**
MkD1	-0.000	-0.002	0.009																	
	(0.014)	(0.014)	(0.016)																	
MkD1*Legal			-0.05***	-0.05***																
			(0.017)	(0.017)																
MkD2					0.009	0.012	0.087													
					(0.044)	(0.043)	(0.112)													
MkD2*Legal							-0.049	-0.012												
							(0.059)	(0.024)												
MkD3									0.017	0.021	0.035									
									(0.027)	(0.027)	(0.026)									
MkD3*Legal											0.056*	0.124*								
											(0.032)	(0.069)								
MkD4													0.025***	0.025***	0.026***					
													(0.008)	(0.008)	(0.009)					
MkD4*Legal															-0.001	-0.013				
															(0.017)	(0.012)				
MkD5																	-0.006	-0.005	-0.006	
																	(0.011)	(0.011)	(0.012)	
MkD5*Legal																			0.010	0.010
																			(0.011)	(0.009)
Legal		-0.077	-0.076			-0.024	-0.015			-0.028	-0.033			-0.022	-0.022			-0.083	-0.082	
		(0.116)	(0.115)			(0.082)	(0.087)			(0.081)	(0.082)			(0.082)	(0.083)			(0.115)	(0.115)	
H-Stat	0.120	0.116	0.117	0.118	0.240**	0.240**	0.241***	0.241**	0.240**	0.240**	0.239**	0.120	0.243***	0.243***	0.244***	0.242***	0.118	0.114	0.114	0.117
	(0.083)	(0.083)	(0.083)	(0.083)	(0.093)	(0.094)	(0.094)	(0.094)	(0.093)	(0.094)	(0.094)	(0.083)	(0.093)	(0.094)	(0.094)	(0.094)	(0.083)	(0.083)	(0.083)	(0.083)
CAPR	0.001**	0.001**	0.001**	0.001**	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.001**	0.003***	0.003***	0.003***	0.003***	0.001**	0.001**	0.001**	0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	0.001	0.001	0.001	0.001	0.001*	0.001*	0.001*	0.001*	0.001*	0.001*	0.001*	0.001	0.001*	0.001*	0.001*	0.001*	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-1.34***	-1.34***	-1.35***	-1.36***	-1.02***	-1.03***	-1.03***	-1.03***	-1.02***	-1.02***	-1.03***	-1.35***	-1.00***	-1.01***	-1.01***	-1.02***	-1.35***	-1.35***	-1.35***	-1.36***
	(0.209)	(0.208)	(0.208)	(0.208)	(0.159)	(0.160)	(0.160)	(0.159)	(0.159)	(0.160)	(0.161)	(0.211)	(0.160)	(0.161)	(0.160)	(0.160)	(0.208)	(0.207)	(0.207)	(0.208)
OPE	0.004**	0.004**	0.004*	0.004*	0.006**	0.006**	0.006**	0.006**	0.006**	0.006**	0.006**	0.004*	0.006**	0.006**	0.006**	0.006**	0.004**	0.004**	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
LogTA	0.033*	0.033*	0.033*	0.032*	0.038**	0.038**	0.038**	0.037**	0.037**	0.038**	0.038**	0.033*	0.038**	0.038**	0.038**	0.038**	0.032*	0.032*	0.032*	0.032*
	(0.018)	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)
Lending Rate	0.004	0.004	0.003	0.003	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	0.004	-0.002	-0.002	-0.002	-0.002	0.003	0.003	0.003	0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
GDPGrowth	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.001	-0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CVInflation	0.001**	0.001**	0.001**	0.001**	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.001**	-0.001	-0.001	-0.001	-0.001	0.001**	0.001**	0.001**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Political	0.002				-0.038				-0.040				-0.037				-0.000			
	(0.093)				(0.079)				(0.079)				(0.078)				(0.093)			
Obs.	5,264	5,264	5,264	5,264	4,858	4,858	4,858	4,858	4,858	4,858	4,858	5,264	4,858	4,858	4,858	4,858	5,264	5,264	5,264	5,264
No. of BankID	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466	466
AR2	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Sagan test	14.07	13.92	13.87	14.23	14.02	13.83	14.08	14.27	13.78	13.66	13.49	13.67	13.96	13.78	13.82	14.12	13.96	13.78	13.71	13.97
P. Value Sagan	0.16	0.17	0.17	0.16	0.17	0.18	0.16	0.16	0.18	0.18	0.19	0.18	0.17	0.18	0.18	0.16	0.17	0.18	0.18	0.17

Table A6 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on liquidity ratio, using GMM analysis. All models are at lag of 2. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A7: Overall Sample -Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability variables Cont.

Variables	LogZ-Index																			
Models	(1) Lag3 1st Diff	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	-0.055	-0.054	-0.092																	
	(0.074)	(0.074)	(0.071)																	
MkD1*Legal			0.171*	0.140																
			(0.098)	(0.098)																
MkD2					0.188	0.187	0.993**													
					(0.135)	(0.135)	(0.400)													
MkD2*Legal							-0.510**	-0.023												
							(0.234)	(0.094)												
MkD3									-0.004	-0.007	-0.008									
									(0.075)	(0.075)	(0.088)									
MkD3*Legal											-0.001	0.007								
											(0.140)	(0.118)								
MkD4													-0.003	-0.002	-0.004					
													(0.030)	(0.030)	(0.030)					
MkD4*Legal															-0.011	-0.009				
															(0.041)	(0.042)				
MkD5																	-0.033	-0.034	-0.035	
																	(0.042)	(0.042)	(0.042)	
MkD5*Legal																			-0.013	-0.015
																			(0.045)	(0.033)
Legal		0.049	0.019			0.047	0.082			0.058	0.056			0.056	0.057			0.058	0.054	
		(0.330)	(0.333)			(0.331)	(0.323)			(0.332)	(0.332)			(0.331)	(0.330)			(0.330)	(0.331)	
H-Stat	-0.172*	-0.171*	-0.178*	-0.168*	-0.168*	-0.167*	-0.166*	-0.165*	-0.167*	-0.166*	-0.165*	-0.165*	-0.167*	-0.166*	-0.166*	-0.165*	-0.167*	-0.166*	-0.166*	-0.164*
	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)	(0.098)	(0.097)	(0.097)	(0.097)	(0.098)	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)
CAPR	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-0.075	-0.078	-0.076	-0.071	-0.073	-0.075	-0.094	-0.073	-0.073	-0.075	-0.076	-0.074	-0.075	-0.077	-0.077	-0.073	-0.071	-0.074	-0.070	-0.070
	(0.229)	(0.232)	(0.232)	(0.230)	(0.229)	(0.231)	(0.231)	(0.229)	(0.229)	(0.232)	(0.232)	(0.230)	(0.228)	(0.230)	(0.230)	(0.228)	(0.229)	(0.231)	(0.232)	(0.230)
OPE	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.007*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
LogTA	0.057	0.055	0.046	0.059	0.067	0.065	0.047	0.060	0.064	0.063	0.062	0.062	0.064	0.062	0.062	0.062	0.067	0.065	0.065	0.062
	(0.053)	(0.053)	(0.052)	(0.051)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.051)
Lending Rate	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.007	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)
GDPGrowth	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000	-0.002	-0.001	-0.000	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001	-0.001
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
CVInflation	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-0.092				-0.084				-0.087				-0.089				-0.086			
	(0.225)				(0.224)				(0.225)				(0.225)				(0.224)			
Obs.	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902	3,902
No. of BankID	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462	462
AR2	0.80	0.78	0.78	0.84	0.86	0.84	0.72	0.80	0.83	0.81	0.81	0.81	0.83	0.81	0.81	0.81	0.84	0.82	0.81	0.81
Sagan test	31.84	32.05	31.58	31.60	31.91	32.10	31.39	31.97	31.85	32.05	32.04	31.95	31.80	32.01	31.93	31.86	32.00	32.21	32.16	31.90
P. Value Sagan	0.13	0.12	0.13	0.13	0.13	0.12	0.14	0.12	0.13	0.12	0.12	0.12	0.13	0.12	0.12	0.13	0.12	0.12	0.12	0.12

Table A7 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on logZ-Index, using GMM analysis. All models are at lag of 3. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A8: Overall Sample -Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability variables Cont.

Variables	H-Stat																			
Models	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	-0.068***	-0.066***	-0.076***																	
	(0.018)	(0.017)	(0.020)																	
MkD1*Legal			0.041**	0.016																
			(0.020)	(0.016)																
MkD2					0.031	0.028	0.075													
					(0.049)	(0.049)	(0.103)													
MkD2*Legal							-0.030	0.012												
							(0.059)	(0.029)												
MkD3									0.019	0.017	0.048**									
									(0.023)	(0.023)	(0.023)									
MkD3*Legal											0.112**	0.075*								
											(0.044)	(0.039)								
MkD4													-0.003	-0.003	-0.002					
													(0.007)	(0.007)	(0.008)					
MkD4*Legal															0.004	0.006				
															(0.018)	(0.016)				
MkD5																	0.028**	0.026**	0.026**	
																	(0.012)	(0.012)	(0.012)	
MkD5*Legal																			-0.005	-0.007
																			(0.009)	(0.012)
Legal		0.182*	0.177*			0.184**	0.193**			0.182**	0.166*			0.186**	0.186**			0.185**	0.184**	
		(0.093)	(0.092)			(0.092)	(0.087)			(0.092)	(0.094)			(0.092)	(0.092)			(0.092)	(0.092)	
CAPR	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
TLTA	0.416***	0.405***	0.406***	0.416***	0.417***	0.406***	0.405***	0.416***	0.418***	0.407***	0.399***	0.407***	0.413***	0.403***	0.403***	0.415***	0.413***	0.402***	0.403***	0.417***
	(0.075)	(0.076)	(0.076)	(0.075)	(0.075)	(0.076)	(0.076)	(0.075)	(0.075)	(0.075)	(0.075)	(0.076)	(0.075)	(0.075)	(0.076)	(0.076)	(0.075)	(0.076)	(0.076)	(0.076)
OPE	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
LogTA	-0.095***	-0.096***	-0.097***	-0.086***	-0.085***	-0.086***	-0.087***	-0.085***	-0.086***	-0.087***	-0.085***	-0.083***	-0.086***	-0.087***	-0.087***	-0.086***	-0.087***	-0.088***	-0.089***	-0.086***
	(0.022)	(0.021)	(0.022)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Lending Rate	0.014***	0.014***	0.014***	0.014***	0.014***	0.013***	0.013***	0.014***	0.014***	0.013***	0.014***	0.014***	0.014***	0.013***	0.013***	0.014***	0.014***	0.013***	0.013***	0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
GDPGrowth	0.012***	0.011***	0.012***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CVInflation	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Political	-0.013				-0.008				-0.010				-0.008				-0.009			
	(0.055)				(0.054)				(0.055)				(0.054)				(0.055)			
Obs.	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006	4,006
No. of BankID	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464
AR2	0.65	0.67	0.65	0.63	0.65	0.67	0.68	0.63	0.64	0.66	0.69	0.65	0.64	0.66	0.66	0.64	0.63	0.65	0.65	0.63
Sagan test	32.06	32.18	32.36	32.83	32.62	32.82	32.91	32.61	32.76	32.94	33.07	32.77	32.66	32.85	32.87	32.67	33.10	33.24	33.25	32.72
P. Value Sagan	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.11

Table A8 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on H-Statistics (H-Stat), using GMM analysis. All models are at lag of 3. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A9: Emerging market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance (GMM analysis)

Variables	NIM																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.173*	0.166*	0.159*																	
	(0.097)	(0.098)	(0.096)																	
MkD1*Legal			-0.121	-0.147																
			(0.122)	(0.104)																
MkD2					0.049	0.041	0.483													
					(0.280)	(0.281)	(0.325)													
MkD2*Legal							0.742***	0.403*												
							(0.236)	(0.249)												
MkD3									-0.149	-0.155	-0.199									
									(0.151)	(0.152)	(0.198)									
MkD3*Legal											-0.123	0.037								
											(0.275)	(0.191)								
MkD4													-0.128*	-0.124*	-0.125					
													(0.068)	(0.069)	(0.085)					
MkD4*Legal															0.007	0.116*				
															(0.110)	(0.070)				
MkD5																	0.263**	0.265**	0.420**	
																	(0.122)	(0.119)	(0.175)	
MkD5*Legal																			0.300	-0.164**
																			(0.226)	(0.067)
Legal		0.382	0.403			0.392	0.225			0.254	0.291			0.203	0.191			0.206	0.225	
		(0.362)	(0.361)			(0.355)	(0.372)			(0.472)	(0.485)			(0.472)	(0.466)			(0.471)	(0.471)	
H-Stat	0.092	0.096	0.096	0.101	0.095	0.099	0.082	0.100	-0.121	-0.108	-0.104	-0.111	-0.126	-0.113	-0.113	-0.017	-0.114	-0.101	-0.096	-0.112
	(0.136)	(0.135)	(0.135)	(0.135)	(0.135)	(0.135)	(0.134)	(0.135)	(0.183)	(0.182)	(0.182)	(0.182)	(0.183)	(0.182)	(0.182)	(0.151)	(0.184)	(0.183)	(0.183)	(0.182)
CAPR	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	-0.000	0.002	0.003	0.002	0.003
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
INTL	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	-0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.000	-0.001	0.001	0.000	0.000	0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
TLTA	0.841	0.779	0.776	0.787	0.817	0.774	0.698	0.728	0.850	0.992	1.025	0.994	0.792	0.940	0.951	0.815	0.898	1.044	1.052	0.989
	(0.911)	(0.920)	(0.921)	(0.909)	(0.879)	(0.887)	(0.900)	(0.899)	(1.219)	(1.228)	(1.231)	(1.227)	(1.226)	(1.234)	(1.235)	(1.068)	(1.222)	(1.231)	(1.231)	(1.226)
OPE	0.021*	0.020*	0.021*	0.021*	0.022*	0.022*	0.020*	0.021*	0.016	0.015	0.015	0.015	0.016	0.015	0.015	0.019	0.016	0.015	0.015	0.015
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)
LogTA	-0.006	-0.007	-0.006	-0.007	-0.007	-0.008	-0.008	-0.009	0.013	0.012	0.012	0.012	0.011	0.011	0.011	0.008	0.012	0.011	0.011	0.012
	(0.018)	(0.018)	(0.018)	(0.019)	(0.019)	(0.019)	(0.018)	(0.019)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)
Lending Rate	0.074***	0.074***	0.073***	0.076***	0.076***	0.076***	0.077***	0.078***	0.050**	0.049**	0.049**	0.051**	0.052**	0.051**	0.051**	0.057***	0.052**	0.051**	0.051**	0.051**
	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.016)	(0.023)	(0.023)	(0.023)	(0.023)
GDPGrowth	0.044***	0.043***	0.042***	0.045***	0.045***	0.044***	0.045***	0.044***	0.042***	0.042***	0.042***	0.042***	0.043***	0.042***	0.042***	0.039***	0.043***	0.043***	0.043***	0.042***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.012)	(0.014)	(0.014)	(0.014)	(0.014)
CVInflation	0.001	0.001	0.001	0.001	0.001	0.001	0.002**	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Political	-0.090				-0.112				0.023				0.011				0.006			
	(0.277)				(0.269)				(0.348)				(0.348)				(0.348)			
Obs.	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062	5,062
No. of BankID	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419
AR2	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Sagan test	44.99	45.22	45.14	45.83	44.92	45.17	43.03	44.69	17.92	18.10	18.03	18.29	18.17	18.34	18.36	31.16	18.10	18.29	18.27	18.24
P. Value Sagan	0.12	0.12	0.12	0.11	0.12	0.12	0.16	0.12	0.12	0.11	0.12	0.11	0.11	0.11	0.11	0.15	0.11	0.11	0.10	0.11

Table A9 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on net interest margin (NIM), on **emerging market sampled banks only,** using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A10: Emerging market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	Pre Tax Profit																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.231	0.240	0.243																	
	(0.269)	(0.269)	(0.268)																	
MkD1*Legal			0.070	0.062																
			(0.328)	(0.343)																
MkD2					-0.995*	-1.002*	-0.935*													
					(0.517)	(0.518)	(0.504)													
MkD2*Legal							0.312	1.127												
							(0.750)	(0.824)												
MkD3									-0.254	-0.267	-0.438									
									(0.382)	(0.380)	(0.390)									
MkD3*Legal											-0.622	-0.259								
											(0.655)	(0.640)								
MkD4													0.176	0.173	0.082					
													(0.149)	(0.149)	(0.164)					
MkD4*Legal															-0.357	-0.415*				
															(0.274)	(0.249)				
MkD5																	0.270	0.248	0.907	
																	(0.603)	(0.601)	(1.273)	
MkD5*Legal																			1.236	0.197
																			(1.531)	(0.367)
Legal		0.558	0.545			0.725	0.666			0.597	0.694			0.837	0.893			0.519	0.596	
		(1.289)	(1.289)			(1.324)	(1.336)			(1.290)	(1.308)			(1.131)	(1.136)			(1.292)	(1.290)	
H-Stat	-1.390**	-1.368**	-1.369**	-1.385**	-1.346**	-1.323**	-1.325**	-1.386**	-1.397**	-1.374**	-1.360**	-1.379**	-0.917	-0.880	-0.878	-0.892	-1.394**	-1.373**	-1.364**	-1.384**
	(0.564)	(0.566)	(0.566)	(0.565)	(0.573)	(0.575)	(0.575)	(0.565)	(0.564)	(0.566)	(0.568)	(0.566)	(0.597)	(0.599)	(0.599)	(0.598)	(0.564)	(0.567)	(0.567)	(0.565)
CAPR	0.023**	0.023**	0.023**	0.023**	0.023**	0.023**	0.023**	0.023**	0.023**	0.023**	0.023**	0.023**	0.030***	0.030***	0.030***	0.030***	0.022**	0.022**	0.023**	0.023**
	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.010)	(0.009)	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.009)	(0.010)	(0.010)	(0.010)
INTL	0.021*	0.021	0.021	0.021	0.022*	0.021*	0.021*	0.021*	0.021*	0.021	0.021	0.021	0.022*	0.022*	0.022*	0.022*	0.021*	0.021	0.021	0.021
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
TLTA	-0.030	-0.147	-0.142	-0.113	0.076	-0.051	-0.055	-0.138	-0.042	-0.162	-0.096	-0.086	0.704	0.576	0.596	0.581	-0.038	-0.154	-0.140	-0.114
	(1.698)	(1.703)	(1.703)	(1.699)	(1.809)	(1.814)	(1.813)	(1.700)	(1.702)	(1.707)	(1.714)	(1.708)	(1.483)	(1.481)	(1.481)	(1.458)	(1.699)	(1.703)	(1.700)	(1.698)
OPE	-0.07***	-0.06***	-0.06***	-0.06***	-0.07***	-0.07***	-0.07***	-0.06***	-0.07***	-0.06***	-0.06***	-0.06***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.06***	-0.07***	-0.06***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)	(0.024)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
LogTA	0.124*	0.120*	0.120*	0.119*	0.169*	0.163*	0.163*	0.116*	0.123*	0.119*	0.119*	0.119*	0.152**	0.149*	0.148*	0.149**	0.121*	0.117*	0.119*	0.120*
	(0.064)	(0.065)	(0.065)	(0.064)	(0.092)	(0.092)	(0.092)	(0.064)	(0.064)	(0.064)	(0.065)	(0.064)	(0.076)	(0.076)	(0.076)	(0.076)	(0.064)	(0.064)	(0.064)	(0.064)
Lending Rate	0.032	0.026	0.027	0.028	0.038	0.031	0.033	0.034	0.033	0.027	0.028	0.029	0.038	0.036	0.035	0.037	0.033	0.027	0.030	0.029
	(0.060)	(0.059)	(0.059)	(0.059)	(0.061)	(0.061)	(0.061)	(0.060)	(0.060)	(0.059)	(0.059)	(0.059)	(0.048)	(0.047)	(0.047)	(0.048)	(0.060)	(0.059)	(0.059)	(0.059)
GDPGrowth	0.038	0.038	0.038	0.038	0.033	0.033	0.034	0.039	0.038	0.038	0.039	0.038	0.022	0.022	0.022	0.021	0.038	0.038	0.038	0.038
	(0.036)	(0.036)	(0.036)	(0.036)	(0.037)	(0.037)	(0.037)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.034)	(0.034)	(0.034)	(0.034)	(0.036)	(0.036)	(0.036)	(0.036)
CVInflation	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.002**	0.001**	0.001**	0.001**	0.001**	0.002	0.002	0.002	0.002	0.001**	0.001**	0.001**	0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-1.807				-1.914				-1.810				-1.141				-1.834			
	(1.176)				(1.199)				(1.176)				(1.116)				(1.173)			
Obs.	4,716	4,716	4,716	4,716	4,653	4,653	4,653	4,716	4,716	4,716	4,716	4,716	4,359	4,359	4,359	4,359	4,716	4,716	4,716	4,716
No. of BankID	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419
AR2	0.36	0.37	0.37	0.38	0.49	0.50	0.50	0.37	0.37	0.37	0.37	0.38	0.86	0.86	0.85	0.85	0.37	0.37	0.38	0.38
Sagan test	14.76	14.87	14.89	14.97	14.44	14.57	14.52	14.72	14.74	14.85	14.77	14.93	24.23	24.18	24.26	24.33	14.78	14.89	14.92	14.96
P. Value Sagan	0.19	0.18	0.18	0.18	0.20	0.20	0.20	0.19	0.19	0.18	0.19	0.18	0.23	0.23	0.23	0.22	0.19	0.18	0.18	0.18

Table A10 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on Pretax profit, on **emerging market sampled banks only,** using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A11: Emerging market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	ROA																			
	(1) Lag1	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) Lag3	(10) Lag3	(11) Lag3	(12) Lag3	(13)	(14)	(15)	(16)	(17)	(18)	(19) Lag3	(20) Lag3
MkD1	0.000	0.001	0.001																	
	(0.001)	(0.001)	(0.001)																	
MkD1*Legal			-0.002	-0.001																
			(0.002)	(0.002)																
MkD2					-0.004	-0.005**	-0.007													
					(0.002)	(0.002)	(0.004)													
MkD2*Legal							0.004	0.005												
							(0.003)	(0.003)												
MkD3									0.002*	0.002*	0.002*									
									(0.001)	(0.001)	(0.001)									
MkD3*Legal											0.000	-0.002								
											(0.002)	(0.002)								
MkD4													0.001	0.001	0.001					
													(0.001)	(0.001)	(0.001)					
MkD4*Legal															-0.001	-0.002				
															(0.001)	(0.001)				
MkD5																	0.001	0.001	0.002*	
																	(0.001)	(0.001)	(0.001)	
MkD5*Legal																			0.001	-0.002**
																			(0.002)	(0.001)
Legal		0.012*	0.012*			0.014**	0.013*			-0.003	-0.003			0.012*	0.012*			0.012*	-0.002	
		(0.006)	(0.006)			(0.007)	(0.007)			(0.005)	(0.005)			(0.006)	(0.007)			(0.006)	(0.005)	
H-Stat	0.009	0.020	0.021*	0.015	0.012	0.022	0.023	0.014	0.005	0.005	0.005	0.005	0.009	0.020	0.019	0.013	0.009	0.020	0.005	0.005
	(0.015)	(0.013)	(0.013)	(0.013)	(0.016)	(0.015)	(0.015)	(0.015)	(0.010)	(0.010)	(0.010)	(0.010)	(0.015)	(0.013)	(0.013)	(0.013)	(0.015)	(0.013)	(0.010)	(0.010)
CAPR	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002*	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	-0.001	0.001	0.001	0.000	-0.001	0.001	0.001	-0.000	0.001	0.001	0.001	0.001	-0.001	0.001	0.001	0.001	-0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-0.039*	-0.039*	-0.040*	-0.038*	-0.037*	-0.037*	-0.038*	-0.039**	-0.004	-0.004	-0.004	-0.004	-0.043**	-0.041*	-0.038*	-0.036*	-0.039*	-0.040*	-0.004	-0.004
	(0.021)	(0.022)	(0.022)	(0.021)	(0.021)	(0.022)	(0.021)	(0.020)	(0.009)	(0.008)	(0.008)	(0.009)	(0.021)	(0.023)	(0.023)	(0.022)	(0.021)	(0.022)	(0.008)	(0.009)
OPE	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LogTA	0.005***	0.006***	0.006***	0.006***	0.007***	0.007***	0.008***	0.007***	-0.01***	-0.01***	-0.01***	-0.01***	0.005***	0.006***	0.006***	0.005***	0.005***	0.006***	-0.01***	-0.01***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Lending Rate	0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001	0.002	0.001	0.001	0.002	0.002	-0.001	-0.001	-0.001	0.001	-0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDPGrowth	0.001*	0.002	0.001	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001*	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CVInflation	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.007				-0.008				-0.002				-0.007				-0.007			
	(0.005)				(0.005)				(0.003)				(0.005)				(0.005)			
Obs.	5,062	5,062	5,062	5,062	4,987	4,987	4,987	4,987	4,359	4,359	4,359	4,359	5,062	5,062	5,062	5,062	5,062	5,062	4,359	4,359
No. of BankID	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419
AR2	0.51	0.65	0.66	0.56	0.57	0.73	0.70	0.62	0.55	0.58	0.58	0.56	0.51	0.52	0.54	0.51	0.63	0.64	0.58	0.55
Sagan test	26.62	28.35	28.34	26.86	24.58	26.02	27.34	26.21	37.44	36.53	36.54	36.28	26.30	26.42	26.31	26.82	28.55	28.56	36.15	35.93
P. Value Sagan	0.32	0.24	0.24	0.31	.42	0.35	0.28	0.34	0.16	0.19	0.19	0.19	0.32	0.30	0.33	0.31	0.24	0.23	0.20	0.21

Table A11 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on return on assets (ROA), on **emerging market sampled banks only,** using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A12: Emerging market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability

Variables	EQR																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.004	0.004	0.003																	
	(0.003)	(0.003)	(0.003)																	
MkD1*Legal			-0.004	-0.004																
			(0.004)	(0.004)																
MkD2					0.012**	0.011*	-0.089*													
					(0.006)	(0.006)	(0.050)													
MkD2*Legal							0.031***	0.032***												
							(0.012)	(0.011)												
MkD3									0.011**	0.011**	0.012**									
									(0.005)	(0.005)	(0.005)									
MkD3*Legal											0.002	-0.006								
											(0.008)	(0.008)								
MkD4													0.003**	0.003**	0.004***					
													(0.001)	(0.001)	(0.001)					
MkD4*Legal															0.001	-0.000				
															(0.002)	(0.002)				
MkD5																	0.005**	0.005**	0.010**	
																	(0.002)	(0.002)	(0.005)	
MkD5*Legal																			0.011*	-0.001
																			(0.006)	(0.002)
Legal		0.004	0.004			0.007	-0.002			0.005	0.003			0.008	0.008			0.007	0.007	
		(0.012)	(0.012)			(0.012)	(0.013)			(0.012)	(0.012)			(0.012)	(0.012)			(0.012)	(0.012)	
H-Stat	0.033***	0.033***	0.033***	0.033***	0.042***	0.042***	0.030**	0.029**	0.038***	0.038***	0.038***	0.038***	0.038***	0.038***	0.041***	0.041***	0.038***	0.038***	0.038***	0.038***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.009)	(0.009)	(0.014)	(0.014)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
CAPR	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	-0.001**	-0.001**	-0.001**	-0.001**	-0.001*	-0.001*	-0.001**	-0.001**	-0.001*	-0.000*	-0.000*	-0.000*	-0.001*	-0.001*	-0.001*	-0.001*	-0.000*	-0.000*	-0.000*	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	0.035	0.036	0.035	0.034	0.040*	0.039*	0.040	0.040	0.047**	0.046**	0.045**	0.049**	0.052**	0.051**	0.043**	0.041*	0.049**	0.048**	0.049**	0.048**
	(0.028)	(0.028)	(0.028)	(0.028)	(0.021)	(0.020)	(0.035)	(0.035)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.021)	(0.021)	(0.022)	(0.022)	(0.022)	(0.022)
OPE	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001**	0.001**	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LogTA	0.017**	0.017**	0.017**	0.017**	0.017***	0.017***	0.014*	0.014*	0.016***	0.016***	0.016***	0.016***	0.017***	0.017***	0.017***	0.017***	0.016***	0.016***	0.016***	0.016***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.004)	(0.004)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Lending Rate	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDPGrowth	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CVInflation	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	0.003				0.003				0.000				0.001				-0.000			
	(0.009)				(0.007)				(0.007)				(0.007)				(0.007)			
Obs.	4,359	4,359	4,359	4,359	4,308	4,308	4,359	4,359	4,359	4,359	4,359	4,359	4,359	4,359	4,308	4,308	4,359	4,359	4,359	4,359
No. of BankID	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419
AR2	0.38	0.38	0.38	0.39	0.37	0.37	0.38	0.39	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Sagan test	35.11	35.03	35.17	35.31	54.43	54.51	27.84	27.79	0.26	52.74	52.86	53.39	53.13	53.14	53.74	54.16	53.22	53.27	53.59	53.40
P. Value Sagan	0.23	0.24	0.23	0.23	0.21	0.21	0.11	0.11	52.74	0.26	0.25	0.24	0.24	0.24	0.23	0.21	0.24	0.24	0.23	0.24

Table A12 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on equity ratio (EQR), on **emerging market sampled banks only,** using GMM analysis. All models are at lag of 2. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A13: Emerging market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability Cont.

Variables	NPLTL																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.026	0.026	0.025																	
	(0.045)	(0.045)	(0.043)																	
MkD1*Legal			-0.050	-0.054																
			(0.049)	(0.063)																
MkD2					-1.160	-1.160	-1.135													
					(1.416)	(1.419)	(1.423)													
MkD2*Legal							-0.005	0.020												
							(0.157)	(0.160)												
MkD3									-0.096	-0.094	-0.087									
									(0.088)	(0.088)	(0.097)									
MkD3*Legal											0.022	0.094								
											(0.145)	(0.118)								
MkD4													-0.130	-0.131	-0.117					
													(0.111)	(0.110)	(0.109)					
MkD4*Legal															0.056	0.038				
															(0.162)	(0.189)				
MkD5																	0.028	0.028	0.026	
																	(0.092)	(0.092)	(0.106)	
MkD5*Legal																			-0.003	-0.032
																			(0.150)	(0.101)
Legal		-0.146	-0.144			-0.142	-0.148			-0.132	-0.133			-0.145	-0.148			-0.160	-0.160	
		(0.239)	(0.237)			(0.248)	(0.238)			(0.241)	(0.249)			(0.309)	(0.314)			(0.239)	(0.239)	
H-Stat	0.033	0.027	0.026	0.029	0.036	0.030	0.030	0.027	0.032	0.026	0.026	0.027	0.041	0.036	0.033	0.001	0.025	0.019	0.020	0.026
	(0.117)	(0.118)	(0.118)	(0.115)	(0.122)	(0.123)	(0.123)	(0.115)	(0.117)	(0.118)	(0.118)	(0.115)	(0.136)	(0.136)	(0.139)	(0.129)	(0.115)	(0.116)	(0.116)	(0.115)
CAPR	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
INTL	-0.001	-0.001	0.001	-0.001	0.001	0.001	0.001	-0.001	0.001	0.001	0.001	-0.001	-0.001	0.001	0.001	0.001	-0.001	0.001	0.001	-0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
TLTA	-0.027	-0.016	-0.016	-0.029	-0.007	0.006	-0.004	-0.025	-0.032	-0.019	-0.022	-0.035	0.147	0.154	0.142	0.001	-0.023	-0.012	-0.013	-0.022
	(0.311)	(0.310)	(0.310)	(0.309)	(0.318)	(0.317)	(0.317)	(0.311)	(0.308)	(0.307)	(0.309)	(0.308)	(0.283)	(0.283)	(0.294)	(0.338)	(0.310)	(0.309)	(0.309)	(0.310)
OPE	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.003	0.002	0.002	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)	(0.007)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)
LogTA	-0.002	-0.001	0.000	-0.003	-0.002	-0.001	-0.002	-0.004	-0.002	-0.001	-0.001	-0.004	-0.015	-0.014	-0.015	-0.014	-0.006	-0.005	-0.005	-0.006
	(0.054)	(0.054)	(0.055)	(0.051)	(0.056)	(0.056)	(0.056)	(0.050)	(0.055)	(0.055)	(0.055)	(0.051)	(0.030)	(0.030)	(0.029)	(0.040)	(0.048)	(0.048)	(0.048)	(0.048)
Lending Rate	0.002	0.001	0.001	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	-0.013	-0.013	-0.013	-0.001	0.002	0.001	0.001	0.001
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.015)	(0.015)	(0.015)	(0.015)	(0.013)	(0.013)	(0.013)	(0.013)
GDPGrowth	-0.001	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.003	-0.003	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
CVInflation	-0.001	0.001	0.001	-0.001	-0.001	0.001	0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001	-0.001	0.001	0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Obs.	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952	3,952
No. of BankID	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416
AR2	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23
Sagan test	10.96	10.69	10.73	10.90	10.93	10.62	10.72	10.76	10.84	10.50	10.51	10.81	9.44	9.37	9.28	9.36	10.63	10.40	10.45	10.60
P. Value Sagan	0.14	0.15	0.15	0.14	0.14	0.15	0.15	0.14	0.14	0.16	0.16	0.14	0.22	0.22	0.23	0.22	0.15	0.16	0.16	0.15

Table A13 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on nonperforming loans (NPLTL), on **emerging market sampled banks only,** using GMM analysis. All models are at lag of 3. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A14: Emerging market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability Cont.

Variables	Liquidity																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	-0.012	-0.014	-0.014																	
	(0.018)	(0.019)	(0.019)																	
MkD1*Legal			-0.010	-0.011																
			(0.021)	(0.022)																
MkD2					0.849*	0.906*	0.895*													
					(0.475)	(0.490)	(0.492)													
MkD2*Legal							-0.079	-0.084												
							(0.059)	(0.058)												
MkD3									0.062*	0.066*	0.086**									
									(0.037)	(0.038)	(0.039)									
MkD3*Legal											0.070*	0.066								
											(0.038)	(0.286)								
MkD4													0.019***	0.019**	0.014**					
													(0.007)	(0.007)	(0.007)					
MkD4*Legal															-0.017	-0.030*				
															(0.016)	(0.015)				
MkD5																	-0.023	-0.025	-0.045	
																	(0.023)	(0.022)	(0.033)	
MkD5*Legal																			-0.039	0.012
																			(0.041)	(0.016)
Legal		0.049	0.052			0.039	0.055			0.034	0.024			0.052	0.054			0.052	0.050	
		(0.074)	(0.074)			(0.073)	(0.075)			(0.073)	(0.073)			(0.074)	(0.073)			(0.074)	(0.073)	
H-Stat	0.189**	0.185**	0.185**	0.188**	0.187**	0.184**	0.185**	0.190**	0.190**	0.187**	0.185**	0.303***	0.192**	0.189**	0.190**	0.191**	0.191**	0.188**	0.188**	0.189**
	(0.085)	(0.085)	(0.086)	(0.085)	(0.084)	(0.085)	(0.085)	(0.085)	(0.084)	(0.085)	(0.085)	(0.113)	(0.084)	(0.085)	(0.085)	(0.085)	(0.084)	(0.085)	(0.085)	(0.085)
CAPR	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.002**	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
TLTA	-1.06***	-1.06***	-1.06***	-1.06***	-1.07***	-1.06***	-1.06***	-1.06***	-1.06***	-1.05***	-1.06***	-1.61***	-1.05***	-1.04***	-1.04***	-1.05***	-1.07***	-1.06***	-1.06***	-1.06***
	(0.188)	(0.187)	(0.187)	(0.188)	(0.187)	(0.186)	(0.186)	(0.187)	(0.188)	(0.187)	(0.188)	(0.238)	(0.190)	(0.189)	(0.189)	(0.188)	(0.188)	(0.187)	(0.187)	(0.187)
OPE	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**	0.007*	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**	0.007**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
LogTA	0.033*	0.033*	0.033*	0.033*	0.033*	0.033*	0.033*	0.034*	0.033*	0.033*	0.033*	0.051	0.034*	0.033*	0.033*	0.033*	0.034*	0.033*	0.033*	0.033*
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.035)	(0.017)	(0.018)	(0.018)	(0.017)	(0.017)	(0.018)	(0.018)	(0.017)
Lending Rate	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	0.003	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
GDPGrowth	-0.001	-0.000	-0.000	-0.001	-0.000	-0.000	-0.000	-0.001	-0.000	-0.000	-0.000	-0.000	-0.001	-0.000	-0.001	-0.001	-0.001	-0.000	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CVInflation	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-0.004				-0.001				-0.010				-0.003				-0.002			
	(0.080)				(0.080)				(0.080)				(0.079)				(0.080)			
Obs.	4,350	4,350	4,350	4,350	4,350	4,350	4,350	4,350	4,350	4,350	4,350	4,710	4,350	4,350	4,350	4,350	4,350	4,350	4,350	4,350
No. of BankID	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419
AR2	0.48	0.51	0.51	0.49	0.48	0.51	0.51	0.49	0.48	0.51	0.51	0.30	0.47	0.50	0.50	0.49	0.48	0.50	0.50	0.49
Sagan Test	10.43	10.44	10.43	10.43	10.53	10.56	10.59	10.46	10.51	10.53	10.56	15.07	10.56	10.59	10.68	10.57	10.56	10.60	10.56	10.48
Sagan P. Value	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.31	0.31	0.30	0.30	0.17	0.30	0.30	0.29	0.30	0.30	0.30	0.30	0.31

Table A14 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on liquidity ratio, on **emerging market sampled banks only,** using GMM analysis. All models are at lag of 2. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A15: Emerging market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability Cont.

Variables	LogZ-Index																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	-0.063	-0.061	-0.059																	
	(0.081)	(0.081)	(0.075)																	
MkD1*Legal			0.334**	0.328**																
			(0.142)	(0.141)																
MkD2					0.370	0.369	0.201													
					(0.992)	(0.993)	(0.997)													
MkD2*Legal							-0.605**	-0.597**												
							(0.260)	(0.263)												
MkD3									-0.004	-0.007	-0.003									
									(0.074)	(0.074)	(0.091)									
MkD3*Legal											0.016	0.020								
											(0.150)	(0.121)								
MkD4													-0.002	-0.001	-0.006					
													(0.031)	(0.031)	(0.033)					
MkD4*Legal															-0.020	-0.015				
															(0.056)	(0.053)				
MkD5																	-0.052	-0.054	-0.24***	
																	(0.053)	(0.054)	(0.083)	
MkD5*Legal																			-0.36***	-0.082*
																			(0.116)	(0.050)
Legal		0.005	-0.040			0.011	0.072			0.018	0.013			0.017	0.019			0.019	-0.001	
		(0.336)	(0.342)			(0.337)	(0.326)			(0.337)	(0.338)			(0.336)	(0.335)			(0.336)	(0.336)	
H-Stat	-0.133	-0.131	-0.139	-0.133	-0.131	-0.129	-0.118	-0.116	-0.128	-0.126	-0.126	-0.125	-0.128	-0.126	-0.126	-0.126	-0.129	-0.128	-0.129	-0.125
	(0.101)	(0.101)	(0.101)	(0.101)	(0.102)	(0.102)	(0.102)	(0.101)	(0.101)	(0.101)	(0.102)	(0.101)	(0.101)	(0.101)	(0.101)	(0.101)	(0.101)	(0.101)	(0.102)	(0.101)
CAPR	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INTL	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
TLTA	-0.018	-0.018	-0.013	-0.015	-0.020	-0.020	-0.036	-0.030	-0.017	-0.018	-0.019	-0.019	-0.020	-0.020	-0.018	-0.014	-0.016	-0.016	-0.012	-0.017
	(0.258)	(0.261)	(0.261)	(0.258)	(0.257)	(0.261)	(0.261)	(0.258)	(0.257)	(0.261)	(0.261)	(0.259)	(0.256)	(0.260)	(0.259)	(0.256)	(0.257)	(0.260)	(0.260)	(0.258)
OPE	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007**	-0.007**	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
LogTA	0.066	0.063	0.049	0.057	0.072	0.070	0.052	0.054	0.074	0.072	0.071	0.071	0.073	0.071	0.070	0.071	0.077	0.074	0.069	0.066
	(0.054)	(0.054)	(0.054)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.054)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)
Lending Rate	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.007	-0.007	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.006	-0.006
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
GDPGrowth	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.003	-0.003	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
CVInflation	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-0.112				-0.102				-0.103				-0.105				-0.102			
	(0.230)				(0.229)				(0.229)				(0.229)				(0.229)			
Obs.	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497	3,497
No. of BankID	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415	415
AR2	0.68	0.67	0.67	0.71	0.71	0.69	0.57	0.57	0.71	0.69	0.69	0.69	0.71	0.69	0.70	0.70	0.70	0.69	0.70	0.71
Sagan Test	27.82	28.00	27.07	27.02	27.73	27.89	27.18	27.17	27.79	27.96	27.96	27.92	27.72	27.90	27.79	27.76	27.96	28.14	27.40	27.61
Sagan P. Value	0.26	0.25	0.30	0.30	0.27	0.26	0.29	0.29	0.26	0.26	0.26	0.26	0.27	0.26	0.26	0.27	0.26	0.25	0.28	0.27

Table A15 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on LogZ-Index, on **emerging market sampled banks only,** using GMM analysis. All models are at lag of 3. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A16: Emerging market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on stability Cont.

Variables	H-Stat																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	-0.078***	-0.075***	-0.075***																	
	(0.020)	(0.019)	(0.020)																	
MkD1*Legal			0.041	0.039																
			(0.028)	(0.031)																
MkD2					0.569**	0.556**	0.559**													
					(0.242)	(0.242)	(0.249)													
MkD2*Legal							-0.000	0.017												
							(0.073)	(0.074)												
MkD3									0.019	0.016	0.046**									
									(0.022)	(0.022)	(0.023)									
MkD3*Legal											0.103**	0.065*								
											(0.046)	(0.040)								
MkD4													-0.004	-0.003	-0.005					
													(0.007)	(0.007)	(0.008)					
MkD4*Legal															-0.008	-0.002				
															(0.019)	(0.017)				
MkD5																	0.028**	0.026*	-0.008	
																	(0.014)	(0.014)	(0.019)	
MkD5*Legal																			-0.064**	-0.056**
																			(0.030)	(0.023)
Legal		0.172*	0.166*			0.177*	0.180**			0.174*	0.159*			0.178*	0.178*			0.176*	0.174*	
		(0.095)	(0.094)			(0.095)	(0.086)			(0.095)	(0.096)			(0.095)	(0.095)			(0.095)	(0.095)	
CAPR	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	-0.001	-0.001	-0.001*	-0.001	-0.001	-0.001*	-0.001*	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001*	-0.002*	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	0.462***	0.448***	0.448***	0.460***	0.457***	0.444***	0.443***	0.460***	0.465***	0.451***	0.441***	0.452***	0.458***	0.445***	0.445***	0.462***	0.462***	0.448***	0.449***	0.460***
	(0.086)	(0.086)	(0.086)	(0.085)	(0.085)	(0.085)	(0.085)	(0.085)	(0.085)	(0.085)	(0.085)	(0.086)	(0.086)	(0.086)	(0.085)	(0.085)	(0.086)	(0.086)	(0.085)	(0.085)
OPE	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
LogTA	-0.098***	-0.099***	-0.100***	-0.089***	-0.090***	-0.091***	-0.091***	-0.088***	-0.088***	-0.090***	-0.088***	-0.086***	-0.088***	-0.089***	-0.089***	-0.088***	-0.089***	-0.091***	-0.091***	-0.091***
	(0.023)	(0.023)	(0.023)	(0.022)	(0.023)	(0.022)	(0.022)	(0.022)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.023)	(0.022)	(0.022)	(0.022)
Lending Rate	0.014***	0.014***	0.014***	0.014***	0.014***	0.013***	0.013***	0.014***	0.014***	0.013***	0.013***	0.014***	0.014***	0.013***	0.013***	0.014***	0.014***	0.013***	0.013***	0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
GDPGrowth	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***	0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CVInflation	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.023				-0.015				-0.020				-0.018				-0.020			
	(0.057)				(0.056)				(0.056)				(0.056)				(0.056)			
Ob.	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590	3,590
No. of BankID	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417	417
AR2	0.75	30.78	0.76	0.73	0.78	0.80	0.80	0.73	0.75	0.77	0.80	0.75	0.75	0.77	0.76	0.74	0.73	0.75	0.75	.72
Sagan Test	30.18	0.16	30.92	30.82	30.72	31.34	31.28	30.55	30.65	31.31	31.48	30.75	30.54	31.21	31.27	30.70	30.73	31.38	31.72	31.16
Sagan P. Value	0.17	30.78	0.15	0.15	0.16	0.14	0.14	0.16	0.16	0.14	0.14	0.16	0.16	0.14	0.14	0.16	0.16	0.14	0.13	0.14

Table A16 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on H-Statistics (H-Stat), on **emerging market sampled banks only,** using GMM analysis. All models are at lag of 3. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A17: Developed market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance

Variables	NIM																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.048**	0.047*	-0.392***																	
	(0.024)	(0.024)	(0.126)																	
MkD1*Legal			0.280***	0.041***																
			(0.080)	(0.015)																
MkD2					-0.045	-0.035	0.408													
					(0.060)	(0.059)	(0.346)													
MkD2*Legal							-0.267	-0.027												
							(0.214)	(0.035)												
MkD3									-0.352**	-0.325**	0.618*									
									(0.144)	(0.143)	(0.346)									
MkD3*Legal											-0.630**	-0.244**								
											(0.255)	(0.098)								
MkD4													-0.126***	-0.111***	-0.281					
													(0.040)	(0.039)	(0.401)					
MkD4*Legal															0.106	-0.071***				
															(0.241)	(0.023)				
MkD5																	0.031**	0.029**	0.256	
																	(0.014)	(0.015)	(0.197)	
MkD5*Legal																			-0.141	0.017*
																			(0.124)	(0.009)
Legal		-0.112	0.302			-0.112	-0.159			-0.196	-0.183			-0.083	-0.050			-0.079	-0.080	
		(0.285)	(0.305)			(0.290)	(0.287)			(0.271)	(0.275)			(0.278)	(0.284)			(0.285)	(0.285)	
H-Stat	-0.185	-0.082	-0.056	-0.124	-0.178	-0.086	-0.107	-0.106	-0.139	-0.044	-0.055	-0.070	-0.179	-0.063	-0.057	-0.100	-0.219*	-0.114	-0.122	-0.151
	(0.126)	(0.129)	(0.128)	(0.130)	(0.124)	(0.130)	(0.124)	(0.127)	(0.133)	(0.133)	(0.135)	(0.136)	(0.128)	(0.129)	(0.129)	(0.130)	(0.127)	(0.133)	(0.135)	(0.131)
CAPR	0.001	0.001	0.001	-0.001	0.002	0.002	0.001	0.001	0.002	0.003	0.002	0.001	0.003	0.003	0.003	0.002	0.002	0.002	0.003	0.000
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
INTL	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	-0.157	-0.111	-0.078	-0.123	-0.160	-0.121	-0.124	-0.124	-0.184	-0.136	-0.107	-0.142	-0.152	-0.109	-0.105	-0.120	-0.160	-0.120	-0.125	-0.129
	(0.138)	(0.142)	(0.145)	(0.140)	(0.134)	(0.138)	(0.138)	(0.135)	(0.137)	(0.140)	(0.139)	(0.137)	(0.130)	(0.132)	(0.129)	(0.130)	(0.138)	(0.142)	(0.145)	(0.139)
OPE	0.017	0.012	0.012	0.016	0.018	0.013	0.016	0.016	0.013	0.010	0.012	0.014	0.025**	0.020*	0.020*	0.022**	0.019	0.014	0.014	0.018
	(0.012)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.010)	(0.011)	(0.015)	(0.015)	(0.015)	(0.016)	(0.011)	(0.010)	(0.010)	(0.011)	(0.012)	(0.011)	(0.012)	(0.012)
LogTA	-0.310***	-0.291***	-0.289***	-0.288***	-0.311***	-0.290***	-0.291***	-0.289***	-0.301***	-0.279***	-0.281***	-0.277***	-0.291***	-0.275***	-0.277***	-0.270***	-0.321***	-0.303***	-0.307***	-0.301***
	(0.055)	(0.058)	(0.058)	(0.055)	(0.052)	(0.056)	(0.055)	(0.052)	(0.053)	(0.057)	(0.057)	(0.054)	(0.047)	(0.050)	(0.050)	(0.047)	(0.057)	(0.060)	(0.060)	(0.057)
Lending Rate	0.037	0.030	0.030	0.033	0.033	0.027	0.029	0.028	0.030	0.022	0.025	0.024	0.022	0.017	0.018	0.020	0.036	0.030	0.029	0.032
	(0.025)	(0.025)	(0.025)	(0.024)	(0.025)	(0.026)	(0.026)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.022)	(0.023)	(0.022)	(0.022)	(0.025)	(0.025)	(0.025)	(0.024)
GDPGrowth	0.016	0.014	0.012	0.015	0.018*	0.016	0.014	0.017*	0.017*	0.015	0.013	0.015	0.022**	0.019*	0.018*	0.020**	0.017*	0.014	0.013	0.016
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
CVInflation	0.001**	0.001*	0.001*	0.001*	0.001**	0.001**	0.001*	0.001**	0.001***	0.001**	0.001**	0.001**	0.001***	0.001**	0.001**	0.001**	0.001**	0.001*	0.001*	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.383*				-0.390*				-0.408*				-0.398*				-0.355			
	(0.221)				(0.225)				(0.228)				(0.222)				(0.222)			
Obs.	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.99	0.95	0.92	0.95	0.93	0.90	0.95	0.95	0.95	0.92	0.97	0.99	0.88	0.93	0.96	0.86	0.97	0.92	0.91	0.99
Sagan Test	11.88	13.11	12.94	12.33	11.82	12.73	12.36	12.33	11.79	13.27	12.68	12.35	12.39	13.05	13.15	12.66	12.52	13.45	13.56	12.83
Sagan P Value	0.45	0.36	0.37	0.41	0.46	0.38	0.41	0.41	0.46	0.34	0.39	0.41	0.41	0.36	0.35	0.39	0.40	0.33	0.32	0.38

Table A17 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on net interest margin (NIM), on **developed market sampled banks only**, using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

A18: Developed market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	Pre Tax Profit																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	-0.953	-0.364	2.447																	
	(0.669)	(0.954)	(2.277)																	
MkD1*Legal			-2.145	-0.933**																
			(1.661)	(0.459)																
MkD2					0.228	0.365	5.654**													
					(0.300)	(0.314)	(2.769)													
MkD2*Legal							-3.202*	0.229												
							(1.640)	(0.206)												
MkD3									0.178	0.484	0.578									
									(0.823)	(0.834)	(4.411)									
MkD3*Legal											-0.021	0.376								
											(2.555)	(0.466)								
MkD4													1.264***	1.230***	12.33**					
													(0.194)	(0.169)	(5.488)					
MkD4*Legal															-6.742**	0.731***				
															(3.297)	(0.123)				
MkD5																	0.104	0.326	-1.104	
																	(0.335)	(0.250)	(4.366)	
MkD5*Legal																			0.779	0.176
																			(2.631)	(0.141)
Legal		-9.182**	-7.228**			-4.010	-4.252			-4.118	-4.148			-8.016***	-11.13***			-4.732	-4.658	
		(4.240)	(2.926)			(3.148)	(3.027)			(3.194)	(3.180)			(2.142)	(2.764)			(3.203)	(3.332)	
H-Stat	-3.708***	-5.557***	-3.066**	-3.137**	-3.641***	-2.845**	-2.793**	-3.061**	-3.658***	-2.853**	-2.896**	-3.040**	-4.745***	-5.002***	-5.447***	-4.930***	-3.692***	-3.232***	-3.445***	-3.306***
	(1.261)	(1.406)	(1.193)	(1.258)	(1.221)	(1.221)	(1.198)	(1.231)	(1.218)	(1.226)	(1.229)	(1.224)	(0.930)	(0.915)	(0.856)	(0.967)	(1.231)	(1.237)	(1.236)	(1.234)
CAPR	0.018	0.128*	0.022	0.012	0.008	0.004	0.003	-0.001	0.012	0.006	0.005	0.002	0.017	0.025	0.018	0.022	0.013	0.011	0.016	0.004
	(0.028)	(0.068)	(0.029)	(0.028)	(0.027)	(0.028)	(0.028)	(0.027)	(0.028)	(0.028)	(0.029)	(0.027)	(0.019)	(0.017)	(0.016)	(0.019)	(0.029)	(0.029)	(0.029)	(0.028)
INTL	0.000	0.002*	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
TLTA	-1.057	-0.126	-1.021	-0.959	-1.024	-0.609	-0.666	-0.700	-1.002	-0.606	-0.622	-0.691	-3.048***	-2.292***	-2.805***	-2.249***	-1.140	-0.654	-0.724	-0.714
	(0.903)	(1.604)	(0.751)	(0.752)	(0.871)	(0.727)	(0.718)	(0.716)	(0.866)	(0.725)	(0.720)	(0.713)	(0.885)	(0.695)	(0.596)	(0.808)	(0.856)	(0.723)	(0.774)	(0.712)
OPE	-0.156***	0.247	-0.161***	-0.164***	-0.152***	-0.159***	-0.156***	-0.162***	-0.155***	-0.163***	-0.163***	-0.164***	-0.011	-0.007	-0.006	0.005	-0.150***	-0.162***	-0.162***	-0.163***
	(0.027)	(0.168)	(0.023)	(0.024)	(0.027)	(0.022)	(0.023)	(0.023)	(0.026)	(0.022)	(0.022)	(0.023)	(0.073)	(0.060)	(0.058)	(0.064)	(0.025)	(0.022)	(0.022)	(0.022)
LogTA	-1.374**	-2.268**	-0.878*	-0.933**	-1.251**	-0.512	-0.453	-0.630	-1.323**	-0.609	-0.626	-0.700*	-0.695	-1.238***	-1.244***	-0.876**	-1.266**	-0.805*	-0.789	-0.876*
	(0.557)	(0.895)	(0.464)	(0.440)	(0.544)	(0.424)	(0.422)	(0.419)	(0.550)	(0.438)	(0.432)	(0.430)	(0.450)	(0.458)	(0.467)	(0.427)	(0.563)	(0.470)	(0.497)	(0.467)
Lending Rate	0.153	-0.080	-0.024	0.126	0.228	0.085	0.062	0.219	0.236	0.085	0.094	0.207	-0.028	-0.135	-0.128	-0.035	0.214	0.075	0.029	0.222
	(0.204)	(0.176)	(0.258)	(0.207)	(0.223)	(0.275)	(0.272)	(0.224)	(0.220)	(0.269)	(0.266)	(0.216)	(0.112)	(0.133)	(0.141)	(0.118)	(0.225)	(0.271)	(0.272)	(0.218)
GDPGrowth	0.153	-0.125	0.143	0.038	0.120	0.082	0.071	-0.005	0.112	0.084	0.078	-0.002	0.145***	0.179***	0.196***	0.111*	0.127	0.077	0.064	-0.015
	(0.115)	(0.171)	(0.146)	(0.124)	(0.119)	(0.154)	(0.152)	(0.127)	(0.120)	(0.155)	(0.155)	(0.128)	(0.055)	(0.067)	(0.068)	(0.062)	(0.119)	(0.155)	(0.155)	(0.128)
CVInflation	-0.014	-0.006	-0.013	-0.020**	-0.016*	-0.018*	-0.018*	-0.023**	-0.016*	-0.018*	-0.019*	-0.022**	-0.015***	-0.011*	-0.016***	-0.014**	-0.015*	-0.016	-0.016*	-0.021**
	(0.009)	(0.020)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.009)	(0.006)	(0.006)	(0.005)	(0.006)	(0.009)	(0.010)	(0.010)	(0.009)
Political	-5.999**				-6.577***				-6.639***				-2.283**				-6.675***			
	(2.557)				(2.551)				(2.473)				(1.011)				(2.406)			
Obs.	600	554	600	600	600	600	600	600	600	600	600	600	554	554	554	554	600	600	600	600
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.56	0.28	0.46	0.46	0.55	0.42	0.43	0.42	0.55	0.43	0.42	0.42	0.79	0.94	0.98	0.84	0.56	0.45	0.46	0.44
Sagan Test	14.57	11.25	14.20	14.85	13.93	13.19	13.00	13.95	14.10	13.55	13.70	14.12	29.90	25.91	27.24	27.54	14.14	12.25	12.05	13.38
Sagan P Value	0.26	0.42	0.28	0.24	0.30	0.35	0.36	0.30	0.29	0.32	0.31	0.29	0.12	0.25	0.20	0.19	0.29	0.42	0.44	0.34

Table A18 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on pretax profit, on **developed market sampled banks only,** using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A19: Developed market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	ROA																			
	(1) Lag1	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.004**	0.004**	-0.039**																	
	(0.002)	(0.002)	(0.017)																	
MkD1*Legal			0.029***	0.003***																
			(0.011)	(0.001)																
MkD2					0.007***	0.023***	-0.103***													
					(0.002)	(0.004)	(0.036)													
MkD2*Legal							0.078***	0.015***												
							(0.024)	(0.003)												
MkD3									-0.017***	-0.012**	0.024									
									(0.003)	(0.005)	(0.039)									
MkD3*Legal											-0.014	-0.013*								
											(0.030)	(0.007)								
MkD4													-0.005*	-0.004	-0.066*					
													(0.002)	(0.002)	(0.036)					
MkD4*Legal															0.039*	-0.002*				
															(0.021)	(0.001)				
MkD5																	0.003***	0.002**	-0.018	
																	(0.001)	(0.001)	(0.012)	
MkD5*Legal																			0.012*	0.002***
																			(0.007)	(0.000)
Legal		0.076***	0.130***			0.087***	0.092***			0.122***	0.023			0.078***	0.111***			0.072***	0.073***	
		(0.026)	(0.035)			(0.019)	(0.023)			(0.010)	(0.027)			(0.026)	(0.028)			(0.026)	(0.026)	
H-Stat	-0.033***	-0.031***	-0.029***	-0.034***	-0.035***	0.017***	0.018***	0.016***	0.027***	0.026***	0.020***	0.018***	-0.033***	-0.029***	-0.027***	-0.033***	-0.035***	-0.031***	-0.031***	-0.036***
	(0.004)	(0.003)	(0.005)	(0.004)	(0.004)	(0.002)	(0.004)	(0.002)	(0.001)	(0.001)	(0.005)	(0.002)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
CAPR	-0.005***	-0.005***	-0.006***	-0.005***	-0.005***	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.010***	-0.009***	-0.006***	-0.006***	-0.006***	-0.005***	-0.005***	-0.006***	-0.006***	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	0.008	-0.005	-0.008	0.008	0.007	-0.038***	-0.038***	-0.034***	-0.048***	-0.053***	-0.004	-0.028***	0.009	-0.005	-0.008	0.009	0.010	-0.002	-0.002	0.010
	(0.008)	(0.008)	(0.008)	(0.009)	(0.010)	(0.008)	(0.009)	(0.007)	(0.004)	(0.004)	(0.012)	(0.008)	(0.009)	(0.008)	(0.011)	(0.009)	(0.009)	(0.008)	(0.008)	(0.009)
OPE	0.009***	0.010***	0.010***	0.009***	0.009***	0.004***	0.005***	0.004***	0.004***	0.004***	0.003**	0.003***	0.009***	0.010***	0.010***	0.009***	0.009***	0.010***	0.010***	0.009***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LogTA	-0.032***	-0.034***	-0.033***	-0.033***	-0.033***	0.060***	0.060***	0.059***	0.066***	0.058***	0.047***	0.054***	-0.032***	-0.032***	-0.033***	-0.032***	-0.033***	-0.034***	-0.034***	-0.033***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.006)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Lending Rate	0.002***	0.003***	0.003***	0.002***	0.002***	0.002**	0.003***	0.002**	0.001	0.002***	0.000	0.001	0.002***	0.002***	0.002***	0.002***	0.002***	0.003***	0.003***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GDPGrowth	0.001***	0.000	0.001*	0.001***	0.002***	0.001**	0.001***	0.002***	0.002***	0.001***	0.000	0.002***	0.002***	0.001*	0.001	0.002***	0.002***	0.001*	0.001**	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CVInflation	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.002				0.002				0.079***				-0.003				0.005			
	(0.009)				(0.008)				(0.006)				(0.008)				(0.009)			
Obs.	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.18	0.17	0.18	0.18	0.17	0.27	0.24	0.26	0.23	0.25	0.27	0.26	0.17	0.16	0.16	0.17	0.17	0.16	0.16	0.17
Sagan Test	28.73	25.51	26.56	28.56	28.33	32.85	32.17	32.77	45.43	46.04	17.47	32.93	28.78	26.90	27.38	28.77	29.6	25.47	26.24	29.26
Sagan P Value	0.23	0.37	0.32	0.23	0.24	0.11	0.12	0.10	0.11	0.11	0.13	0.11	0.22	0.30	0.28	0.22	0.19	0.38	0.34	0.21

Table A19 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on return on assets (ROA), on **developed market sampled banks only,** using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A20: Developed market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	EQR																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.001	0.001	0.013**																	
	(0.001)	(0.001)	(0.007)																	
MkD1*Legal			-0.008*	-0.001																
			(0.005)	(0.002)																
MkD2					0.009***	0.009***	-0.013													
					(0.003)	(0.003)	(0.010)													
MkD2*Legal							0.013**	0.005***												
							(0.006)	(0.002)												
MkD3									0.057***	0.062***	0.151**									
									(0.016)	(0.017)	(0.077)									
MkD3*Legal											-0.052	0.032***								
											(0.049)	(0.011)								
MkD4													0.015**	0.013**	-0.005					
													(0.007)	(0.006)	(0.019)					
MkD4*Legal															0.003	0.004***				
															(0.011)	(0.001)				
MkD5																	0.002***	0.002***	-0.006	
																	(0.001)	(0.001)	(0.010)	
MkD5*Legal																			0.004	0.001***
																			(0.006)	(0.000)
Legal		-0.033***	-0.043***			-0.026**	-0.022*			0.019	0.010			0.093**	-0.028*			-0.015*	-0.045*	
		(0.013)	(0.014)			(0.013)	(0.013)			(0.049)	(0.051)			(0.046)	(0.015)			(0.009)	(0.026)	
H-Stat	-0.027***	-0.026***	-0.026***	-0.024***	-0.025***	-0.025***	-0.025***	-0.025***	-0.104***	-0.099***	-0.101***	-0.101***	0.083***	0.085***	-0.024***	-0.022***	-0.030***	-0.029***	-0.022***	-0.029***
	(0.004)	(0.004)	(0.004)	(0.007)	(0.004)	(0.005)	(0.004)	(0.004)	(0.011)	(0.012)	(0.013)	(0.012)	(0.011)	(0.012)	(0.005)	(0.003)	(0.002)	(0.002)	(0.007)	(0.002)
CAPR	0.001***	0.001***	0.001***	0.000	0.001***	0.001***	0.001***	0.001***	-0.011***	-0.011***	-0.011***	-0.011***	0.003***	0.003***	0.001***	0.001***	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	-0.006	-0.005	-0.006	0.005	-0.003	-0.003	-0.002	-0.003	-0.131***	-0.119***	-0.115***	-0.127***	-0.074	-0.097	-0.005	0.001	0.006*	0.007*	0.006	0.007*
	(0.006)	(0.006)	(0.006)	(0.011)	(0.006)	(0.006)	(0.006)	(0.006)	(0.046)	(0.039)	(0.041)	(0.043)	(0.091)	(0.079)	(0.006)	(0.004)	(0.004)	(0.004)	(0.011)	(0.004)
OPE	0.001*	0.001	0.001	0.001	0.001*	0.001*	0.001*	0.001*	0.010**	0.008	0.007	0.009**	-0.007	-0.005	0.001	0.002***	0.001***	0.001***	0.001	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.005)	(0.005)	(0.004)	(0.006)	(0.005)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
LogTA	-0.033***	-0.033***	-0.033***	-0.031***	-0.034***	-0.033***	-0.033***	-0.033***	-0.126***	-0.114***	-0.115***	-0.120***	0.047***	0.044***	-0.032***	-0.034***	-0.038***	-0.038***	-0.032***	-0.038***
	(0.002)	(0.002)	(0.002)	(0.006)	(0.002)	(0.002)	(0.002)	(0.002)	(0.018)	(0.016)	(0.017)	(0.016)	(0.016)	(0.015)	(0.003)	(0.002)	(0.001)	(0.002)	(0.007)	(0.001)
Lending Rate	-0.002***	-0.002***	-0.002***	-0.002	-0.000	-0.000	-0.000	-0.000	0.002	0.001	0.002	0.002	-0.000	0.000	-0.002***	-0.002***	-0.003***	-0.003***	-0.002*	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
GDPGrowth	-0.000	-0.000	-0.000	-0.001*	-0.001**	-0.001	-0.001	-0.001**	-0.002**	-0.002*	-0.002**	-0.002*	-0.002**	-0.003**	-0.000	-0.000	-0.001	0.001	-0.01	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CVInflation	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	0.004				0.007*				0.051				0.017				-0.001			
	(0.004)				(0.004)				(0.033)				(0.026)				(0.003)			
Obs.	508	508	508	508	508	508	508	508	554	554	554	554	600	600	508	507	508	508	508	508
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.69	0.67	0.67	0.68	0.71	0.69	0.70	0.71	0.32	0.34	0.35	0.33	0.65	0.30	0.66	0.64	0.72	0.72	0.66	0.72
Sagan Test	26.62	26.13	25.38	12.09	24.05	23.34	24.31	24.48	16.26	15.50	14.90	16.10	12.02	11.19	26.09	25.15	35.30	35.02	11.72	35.23
Sagan P Value	0.14	0.16	0.18	0.20	0.23	0.27	0.22	0.22	0.13	0.16	0.18	0.13	0.44	0.51	0.16	0.19	0.23	0.24	0.22	0.23

Table A20 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on equity ratio (EQR), on **developed market sampled banks only,** using GMM analysis. All models are at lag of 2. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A21: Developed market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	NPLTL																			
	(1) Lag3	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.003	0.003	-0.095***																	
	(0.004)	(0.004)	(0.023)																	
MkD1*Legal			0.058***	0.003																
			(0.015)	(0.003)																
MkD2					0.001	-0.000	-0.477*													
					(0.006)	(0.006)	(0.243)													
MkD2*Legal							0.289**	0.005*												
							(0.145)	(0.003)												
MkD3									-0.008	-0.004	0.160*									
									(0.013)	(0.012)	(0.097)									
MkD3*Legal											-0.099	-0.011								
											(0.064)	(0.010)								
MkD4													0.005	0.005	-0.221**					
													(0.011)	(0.011)	(0.102)					
MkD4*Legal															0.137**	0.004				
															(0.061)	(0.007)				
MkD5																	-0.008**	-0.008**	-0.028	
																	(0.003)	(0.003)	(0.038)	
MkD5*Legal																			0.012	-0.005**
																			(0.022)	(0.002)
Legal		0.063	0.131**			0.067*	0.086			0.071*	0.074			0.066	0.147**			0.062	0.050	
		(0.041)	(0.066)			(0.040)	(0.135)			(0.039)	(0.052)			(0.042)	(0.062)			(0.041)	(0.041)	
H-Stat	0.161***	0.159***	0.177***	0.162***	0.160***	0.158***	0.193***	0.159***	0.158***	0.155***	0.146***	0.160***	0.161***	0.159***	0.182***	0.162***	0.162***	0.161***	0.155***	0.163***
	(0.038)	(0.037)	(0.036)	(0.038)	(0.038)	(0.037)	(0.035)	(0.038)	(0.038)	(0.037)	(0.037)	(0.038)	(0.038)	(0.037)	(0.036)	(0.038)	(0.039)	(0.038)	(0.038)	(0.039)
CAPR	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	0.001*	0.001**	0.001	0.001*	0.001*	0.001*	0.001***	0.001*	0.001*	0.001*	0.001*	0.001*	0.001*	0.001*	0.001**	0.001*	0.001	0.001*	0.001*	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	-0.029	-0.027	-0.017	-0.030	-0.033	-0.032	-0.036*	-0.035	-0.034	-0.034	-0.040*	-0.035	-0.031	-0.032	-0.036	-0.030	-0.031	-0.031	-0.028	-0.031
	(0.023)	(0.024)	(0.025)	(0.023)	(0.023)	(0.023)	(0.022)	(0.022)	(0.023)	(0.023)	(0.023)	(0.024)	(0.023)	(0.023)	(0.025)	(0.023)	(0.024)	(0.023)	(0.024)	(0.024)
OPE	0.001	0.001	0.002	0.001	0.001	0.002	0.000	0.001	0.001	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
LogTA	0.039**	0.040***	0.044***	0.041***	0.040***	0.040***	0.041***	0.041***	0.040***	0.041***	0.034**	0.039**	0.040***	0.040***	0.035**	0.040***	0.044***	0.045***	0.048***	0.044***
	(0.016)	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.014)	(0.014)	(0.016)	(0.014)	(0.015)	(0.015)	(0.014)	(0.015)
Lending Rate	-0.006	-0.005	-0.008**	-0.006	-0.005	-0.005	-0.006	-0.005	-0.006	-0.005	-0.004	-0.006	-0.006	-0.005	-0.005	-0.006	-0.006	-0.006	-0.006	-0.006
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
GDPGrowth	-0.000	-0.001	-0.001	-0.00	-0.001	-0.001	0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CVInflation	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs.	508	508	508	508	508	508	508	508	508	508	508	508	508	508	508	508	508	508	508	508
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.25	0.27	0.26	0.25	0.25	0.27	0.24	0.25	0.25	0.27	0.27	0.25	0.25	0.27	0.28	0.26	0.25	0.27	0.27	0.25
Sagan Test	8.28	8.69	12.92	9.05	8.59	9.03	8.86	8.70	8.75	9.36	8.07	8.60	8.64	9.17	12.08	8.62	8.30	8.89	7.99	8.41
Sagan P Value	0.40	0.36	0.11	0.33	0.37	0.33	0.35	0.36	0.36	0.31	0.42	0.37	0.37	0.32	0.14	0.37	0.40	0.35	0.43	0.39

Table A21 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on nonperforming loans (NPLTL), on **developed market sampled banks only,** using GMM analysis. All models are at lag of 3. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A22: Developed market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	Liquidity																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	-0.018	-0.024	0.612																	
	(0.030)	(0.039)	(0.452)																	
MkD1*Legal			-0.397	-0.031*																
			(0.273)	(0.018)																
MkD2					-0.042	-0.048	0.549													
					(0.043)	(0.044)	(0.457)													
MkD2*Legal							-0.362	-0.040												
							(0.271)	(0.033)												
MkD3									0.149*	0.226**	1.026									
									(0.083)	(0.092)	(0.836)									
MkD3*Legal											-0.642	0.009								
											(0.491)	(0.035)								
MkD4													0.058***	0.064**	0.223					
													(0.021)	(0.029)	(0.294)					
MkD4*Legal															-0.094	0.031**				
															(0.187)	(0.013)				
MkD5																	0.021	0.019	-0.043	
																	(0.015)	(0.017)	(0.334)	
MkD5*Legal																			0.040	0.012
																			(0.209)	(0.008)
Legal		1.149**	0.389			1.096**	0.934*			2.078***	1.333**			2.036***	2.028***			1.110**	1.141**	
		(0.549)	(0.420)			(0.509)	(0.496)			(0.457)	(0.543)			(0.431)	(0.442)			(0.549)	(0.556)	
H-Stat	0.120***	0.141**	-0.539**	0.092**	0.125***	0.148**	0.135**	0.091**	0.121***	-0.022	0.152**	0.100**	-0.173***	-0.059	-0.055	-0.154***	0.113**	0.143**	0.153**	0.085**
	(0.041)	(0.062)	(0.237)	(0.043)	(0.046)	(0.068)	(0.067)	(0.043)	(0.042)	(0.071)	(0.068)	(0.041)	(0.048)	(0.063)	(0.065)	(0.048)	(0.044)	(0.067)	(0.066)	(0.043)
CAPR	0.021***	0.017***	-0.010*	0.023***	0.022***	0.018***	0.019***	0.024***	0.022***	0.031***	0.017***	0.024***	0.037***	0.032***	0.031***	0.035***	0.022***	0.017***	0.016***	0.024***
	(0.003)	(0.004)	(0.006)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.004)	(0.004)	(0.003)
INTL	0.001	0.001**	-0.001	0.001	0.001	0.002**	0.001*	0.002	0.001	0.003***	0.001**	0.001	0.002***	0.001***	0.001***	0.002**	0.001	0.002*	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	-0.654***	-0.925***	-0.218	-0.709***	-0.640***	-0.891***	-0.792***	-0.580**	-0.698***	-1.059***	-0.947***	-0.609***	-1.018***	-1.125***	-1.112***	-0.967***	-0.681***	-0.935***	-0.978***	-0.619***
	(0.221)	(0.215)	(0.267)	(0.229)	(0.214)	(0.208)	(0.232)	(0.230)	(0.216)	(0.185)	(0.199)	(0.233)	(0.188)	(0.173)	(0.180)	(0.183)	(0.214)	(0.204)	(0.204)	(0.229)
OPE	-0.017***	-0.015*	0.017	-0.019***	-0.017***	-0.014*	-0.017***	-0.018***	-0.016***	-0.021*	-0.016	-0.018**	-0.031***	-0.022*	-0.023**	-0.033***	-0.018***	-0.015*	-0.015*	-0.018***
	(0.005)	(0.008)	(0.019)	(0.007)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)	(0.012)	(0.012)	(0.007)	(0.009)	(0.012)	(0.012)	(0.010)	(0.005)	(0.008)	(0.008)	(0.007)
LogTA	-0.105***	-0.122***	-0.133	-0.154***	-0.127***	-0.156***	-0.170***	-0.177***	-0.102***	-0.183***	-0.114***	-0.158***	-0.168***	-0.182***	-0.184***	-0.149***	-0.119***	-0.137***	-0.131***	-0.172***
	(0.038)	(0.043)	(0.134)	(0.038)	(0.040)	(0.044)	(0.043)	(0.038)	(0.039)	(0.047)	(0.044)	(0.038)	(0.036)	(0.045)	(0.049)	(0.038)	(0.040)	(0.044)	(0.046)	(0.038)
Lending Rate	-0.010	-0.004	0.018	-0.009	-0.003	0.001	0.002	-0.003	-0.008	0.067***	-0.002	-0.005	0.079***	0.069***	0.071***	0.068***	-0.008	-0.004	-0.006	-0.005
	(0.011)	(0.011)	(0.018)	(0.011)	(0.009)	(0.009)	(0.009)	(0.009)	(0.011)	(0.017)	(0.011)	(0.011)	(0.015)	(0.018)	(0.019)	(0.016)	(0.011)	(0.011)	(0.011)	(0.011)
GDPGrowth	0.005	-0.002	0.004	0.006	0.004	-0.003	-0.004	0.005	0.004	0.001	-0.005	0.005	0.019***	-0.001	0.000	0.019***	0.004	-0.003	-0.003	0.005
	(0.004)	(0.004)	(0.010)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
CVInflation	0.001***	0.001*	-0.000	0.001**	0.002***	0.001**	0.001**	0.001**	0.002***	0.001	0.001*	0.001**	0.001***	0.001	0.001	0.001***	0.002***	0.001**	0.001**	0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	0.451***				0.464***				0.467***				-0.335***				0.457***			
	(0.146)				(0.149)				(0.152)				(0.082)				(0.151)			
Obs.	554	554	508	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.30	0.30	0.37	0.30	0.29	0.30	0.29	0.30	0.29	0.31	0.30	0.30	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.30
Sagan Test	15.11	13.51	8.96	13.80	15.13	13.53	12.90	14.09	15.57	22.47	14.05	13.91	28.84	22.18	22.73	26.89	15.09	13.07	13.0	13.82
Sagan P. Value	0.12	0.19	0.34	0.18	0.12	0.19	0.22	0.16	0.11	0.43	0.17	0.17	0.14	0.44	0.41	0.21	0.12	0.21	0.21	0.18

Table A22 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on liquidity ratio, on **developed market sampled banks only,** using GMM analysis. All models are at lag of 2. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A23: Developed market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	LogZ-Index																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	0.060	0.038	-0.515***																	
	(0.051)	(0.054)	(0.164)																	
MkD1*Legal			0.354***	0.047																
			(0.093)	(0.031)																
MkD2					0.031	-0.004	-1.240**													
					(0.063)	(0.069)	(0.625)													
MkD2*Legal							0.744**	0.025												
							(0.355)	(0.036)												
MkD3									-0.523***	-0.564***	1.636***									
									(0.171)	(0.195)	(0.561)									
MkD3*Legal											-1.480***	-0.442***								
											(0.368)	(0.115)								
MkD4													0.014	0.028	0.078					
													(0.040)	(0.043)	(0.571)					
MkD4*Legal															-0.030	0.007				
															(0.356)	(0.026)				
MkD5																	0.053*	0.034	-0.691**	
																	(0.028)	(0.023)	(0.276)	
MkD5*Legal																			0.444***	0.029*
																			(0.163)	(0.016)
Legal		0.113	0.635			0.199	0.239			-0.197	-0.162			0.185	0.169			0.093	0.057	
		(0.392)	(0.421)			(0.366)	(0.370)			(0.402)	(0.372)			(0.388)	(0.421)			(0.381)	(0.387)	
H-Stat	-0.397***	-0.411***	-0.436***	-0.396***	-0.410***	-0.410***	-0.429***	-0.411***	-0.405***	-0.410***	-0.413***	-0.401***	-0.404***	-0.416***	-0.415***	-0.401***	-0.440***	-0.436***	-0.418***	-0.436***
	(0.065)	(0.073)	(0.077)	(0.064)	(0.072)	(0.074)	(0.073)	(0.072)	(0.063)	(0.071)	(0.072)	(0.061)	(0.078)	(0.082)	(0.082)	(0.078)	(0.075)	(0.077)	(0.075)	(0.075)
CAPR	-0.000	0.000	0.000	0.000	-0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.001	-0.001	-0.001	-0.001	-0.000	-0.001	0.000	-0.001	0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
INTL	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001*	-0.000*	-0.000	-0.001*	-0.002	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
TLTA	-0.947***	-0.939***	-0.931***	-0.920***	-0.966***	-0.967***	-0.970***	-0.942***	-0.980***	-0.930***	-0.784***	-0.906***	-0.949***	-0.925***	-0.929***	-0.927***	-0.985***	-0.949***	-0.953***	-0.949***
	(0.171)	(0.165)	(0.169)	(0.162)	(0.142)	(0.142)	(0.140)	(0.138)	(0.157)	(0.147)	(0.178)	(0.154)	(0.159)	(0.152)	(0.150)	(0.152)	(0.151)	(0.143)	(0.144)	(0.143)
OPE	-0.034***	-0.034***	-0.034***	-0.034***	-0.034***	-0.033***	-0.029***	-0.034***	-0.044***	-0.048***	-0.053***	-0.049***	-0.034***	-0.035***	-0.035***	-0.035***	-0.035***	-0.035***	-0.034***	-0.035***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)	(0.011)	(0.012)	(0.014)	(0.013)	(0.010)	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)
LogTA	-0.017	-0.010	-0.009	0.009	-0.010	-0.000	0.002	0.011	-0.004	0.013	-0.006	0.011	-0.023	-0.027	-0.026	-0.011	-0.068	-0.041	-0.029	-0.040
	(0.064)	(0.058)	(0.055)	(0.052)	(0.061)	(0.053)	(0.052)	(0.050)	(0.065)	(0.059)	(0.063)	(0.057)	(0.062)	(0.057)	(0.060)	(0.051)	(0.073)	(0.057)	(0.056)	(0.054)
Lending Rate	-0.021	-0.023	-0.023	-0.022	-0.027	-0.031	-0.029	-0.027	-0.012	-0.017	-0.017	-0.012	-0.023	-0.022	-0.023	-0.025	-0.022	-0.021	-0.021	-0.021
	(0.021)	(0.021)	(0.022)	(0.021)	(0.022)	(0.023)	(0.023)	(0.023)	(0.022)	(0.022)	(0.021)	(0.022)	(0.024)	(0.024)	(0.025)	(0.024)	(0.022)	(0.022)	(0.021)	(0.022)
GDPGrowth	0.031***	0.026**	0.024**	0.030***	0.031***	0.025**	0.029**	0.030***	0.027***	0.024*	0.021*	0.024**	0.032***	0.023*	0.024**	0.030***	0.030***	0.024**	0.025**	0.028**
	(0.010)	(0.012)	(0.012)	(0.011)	(0.010)	(0.012)	(0.012)	(0.011)	(0.010)	(0.012)	(0.012)	(0.012)	(0.010)	(0.012)	(0.012)	(0.011)	(0.010)	(0.012)	(0.012)	(0.011)
CVInflation	-0.002	-0.002*	-0.002**	-0.002*	-0.002	-0.002*	-0.002	-0.002	-0.002*	-0.002**	-0.002**	-0.002*	-0.002*	-0.002**	-0.002**	-0.002*	-0.002	-0.002**	-0.002*	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Political	-0.250				-0.224				-0.220				-0.166				-0.255			
	(0.324)				(0.313)				(0.307)				(0.321)				(0.329)			
Obs.	543	543	543	543	543	543	543	543	543	543	543	543	543	543	543	543	543	543	543	543
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.11	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.12	0.14	0.13	0.15	0.11	0.12	0.12	0.12	0.11	0.13	0.12	0.13
Sagan Test	35.49	35.34	35.66	35.69	35.20	34.94	34.66	35.20	35.01	34.74	34.60	34.70	36.53	0.28	36.08	36.36	34.94	35.06	35.01	35.14
Sagan P. Value	0.30	0.31	0.29	0.29	0.31	0.32	0.34	0.31	0.32	0.33	0.34	0.34	0.26	36.07	0.28	0.27	0.32	0.32	0.32	0.32

Table A23 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on LogZ-Index, on **developed market sampled banks only,** using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.

Table A24: Developed market_ Effects of individual market discipline constructs and their interactions with Legal infrastructures on performance Cont.

Variables	H-Stat																			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MkD1	-0.036***	-0.035***	-0.254***																	
	(0.010)	(0.011)	(0.037)																	
MkD1*Legal			0.136***	-0.019***																
			(0.021)	(0.006)																
MkD2					-0.023**	-0.014*	-0.028													
					(0.011)	(0.008)	(0.062)													
MkD2*Legal							0.010	-0.012*												
							(0.037)	(0.006)												
MkD3									0.020	0.039*	0.016									
									(0.021)	(0.022)	(0.084)									
MkD3*Legal											0.015	0.014								
											(0.050)	(0.013)								
MkD4													0.009	0.008	-0.175**					
													(0.006)	(0.007)	(0.075)					
MkD4*Legal															0.112**	0.005				
															(0.044)	(0.004)				
MkD5																	0.030***	0.031***	0.158***	
																	(0.003)	(0.003)	(0.055)	
MkD5*Legal																			-0.078**	0.018***
																			(0.033)	(0.002)
Legal		0.330***	0.526***			0.343***	0.321***			0.320***	0.317***			0.307***	0.341***			0.296***	0.298***	
		(0.080)	(0.095)			(0.072)	(0.068)			(0.073)	(0.072)			(0.075)	(0.069)			(0.073)	(0.072)	
CAPR	0.002***	0.002***	0.003***	0.002***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.002***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTL	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TLTA	-0.061**	-0.055**	-0.053**	-0.057**	-0.065***	-0.052**	-0.050**	-0.062***	-0.048*	-0.035	-0.035	-0.043	-0.053**	-0.042	-0.037	-0.048*	-0.061**	-0.048*	-0.048*	-0.056**
	(0.027)	(0.027)	(0.027)	(0.027)	(0.024)	(0.023)	(0.023)	(0.024)	(0.029)	(0.028)	(0.028)	(0.029)	(0.026)	(0.027)	(0.026)	(0.026)	(0.027)	(0.027)	(0.027)	(0.026)
OPE	-0.010***	-0.010***	-0.009***	-0.011***	-0.009***	-0.010***	-0.011***	-0.009***	-0.009***	-0.009***	-0.008***	-0.010***	-0.009***	-0.010***	-0.011***	-0.010***	-0.010***	-0.011***	-0.010***	-0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
LogTA	-0.097***	-0.097***	-0.094***	-0.097***	-0.098***	-0.098***	-0.102***	-0.096***	-0.102***	-0.100***	-0.098***	-0.101***	-0.097***	-0.097***	-0.102***	-0.096***	-0.108***	-0.108***	-0.109***	-0.107***
	(0.009)	(0.010)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.007)	(0.009)	(0.010)	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.009)	(0.011)	(0.011)	(0.010)
Lending Rate	-0.014***	-0.014***	-0.014***	-0.014***	-0.017***	-0.017***	-0.016***	-0.017***	-0.014***	-0.015***	-0.015***	-0.015***	-0.015***	-0.014***	-0.014***	-0.015***	-0.013***	-0.013***	-0.013***	-0.013***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
GDPGrowth	0.016***	0.014***	0.014***	0.016***	0.017***	0.015***	0.015***	0.017***	0.016***	0.015***	0.015***	0.016***	0.016***	0.015***	0.015***	0.016***	0.017***	0.015***	0.015***	0.017***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CVInflation	-0.000***	-0.001***	-0.000***	-0.000***	-0.000***	-0.001***	-0.001***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.001***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Political	-0.041				-0.076**				-0.059*				-0.051*				-0.050			
	(0.037)				(0.035)				(0.036)				(0.031)				(0.032)			
Obs.	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554	554
No. of BankID	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
AR2	0.28	0.25	0.25	0.28	0.28	0.25	0.25	0.29	0.28	0.25	0.25	0.28	0.28	0.25	0.25	0.28	0.28	0.25	0.25	0.28
Sagan Test	39.15	39.50	40.24	39.09	40.10	41.54	42.45	40.28	39.48	40.16	40.4	39.59	39.13	40.34	41.15	39.21	40.28	41.50	41.75	40.36
Sagan P. Value	0.17	0.16	0.15	0.18	0.15	0.12	0.10	0.14	0.17	0.15	0.14	0.16	0.18	0.14	0.12	0.17	0.14	0.12	0.11	0.14

Table A24 details the individual effect of market discipline constructs and their individual interaction with legal institution variable on H-Statistics (H-Stat), on **developed market sampled banks only,** using GMM analysis. All models are at lag of 1. Standard errors in parentheses, while ***, **, * represent significant levels at1%, 5%, 10%, respectively.