ESSENTIAL COMPONENTS OF AN EFFECTIVE BANK REGULATORY AND SUPERVISORY FRAMEWORK AGAINST CRISIS

BY TSERENNADMID GANTUMUR

M.A SHORT THESIS

ECONOMIC DEPARTMENT

CENTRAL EUROPEAN UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ARTS (M.A)

SUPERVISORS: ANDRZEJ BANIAK, CATERINA SGANGA

BUDAPEST, HUNGARY

2015

Abstract

This paper analyzes essential components of an effective bank regulatory and supervisory framework against crisis. Among broad ranges of bank law covering different aspects and scopes of banking businesses, some of them are employed as a macroeconomic policy tools to prevent financial crises that cause great destructions to the whole economy. These regulatory and supervisory frameworks include deposit insurance, capital adequacy requirement and reserve ratio requirement¹. While these three elements have their own distinctive functions that address different risks and threats faced by banks that may lead to the crisis situation, they are employed together as a prudential regulatory package in order to maximize its efficiency. Each of these elements has its own weaknesses due to the coverage and scope of them and due to the fact that there are negative regulatory externalities arise from them, therefore they are usually implemented together as a package.

Deposit insurance arrangement is a commonly adopted technic by most of the countries and the Basel Committee recommends it. This is an effective precautionary arrangement against crisis because it can avert wide spread bank run by preserving public trust in the system. However, its weakness stands in a negative regulatory externality it causes, namely moral hazard. Capital adequacy requirements and reserve ratio requirements are micro-prudential regulations that are widely applied to ensure safe business conducts by banks and that address different risks that banks suffer from. By employing these requirements, countries can keep building blocks - individual banks in the system safe and sound and they can deal with the negative regulatory externalities arise from deposit insurance² arrangements.

Key words: Deposit insurance scheme, Capital adequacy requirement, Reserve Ratio requirement, Bank run, Systematic risk, Basel Committee, Free banking, Laissez faire

¹ There are other elements available, but my main focus is on the three elements listed above.

² Lender of the last resort is also implemented in a similar purpose of deposit insurance scheme.

Table of Contents

<u>ABS</u>	STRACT	II
<u>INTI</u>	RODUCTION	1
<u>CHA</u>	APTER 2 BANKING	3
2.1	NATURE AND ROLE OF BANKS AND BANKING ACTIVITIES	3
2.2	Types of Banks	7
2.2.1	1 RETAIL BANKING	7
2.2.2	2 WHOLESALE BANKING	8
2.2.3	3 UNIVERSAL BANKING	9
2.2.4	4 ISLAMIC BANKING	9
2.2.5	5 MICROFINANCE	10
2.3	RISKS OF BANKS	11
2.3.1	1 CREDIT RISK	11
2.3.2	2 LIQUIDITY AND FUNDING RISK	11
2.3.3	3 Settlement/Payments Risk	12
2.3.4	4 INTEREST RATE RISK	13
2.3.5	5 OPERATIONAL RISK	14
2.3.6	6 SOVEREIGN AND POLITICAL RISK	14
2.3.7	7 MARKET RISK	14
2.3.8	8 FOREIGN EXCHANGE OR CURRENCY RISK	15
<u>CHA</u>	APTER 3 BANK FAILURES AND CRISIS	<u>15</u>
3.1	BANKING CRISIS AND ITS COST	15
3.2	SPILL-OVER EFFECT AND SYSTEMATIC RISK	17
3.3	BANK RUN	
3.3.1	1 BANK RUN MODEL	19

<u>CHAF</u>	PTER 4 BANKING REGULATION	.22
4.1	ELEMENTS OF BANK LAW	.22
4.2	RATIONALE FOR BANK REGULATIONS	.22
4.2.1	ARGUMENTS FOR FREE BANKING	23
4.2.2	ARGUMENTS FOR BANK REGULATIONS	25
4.3	INTERNATIONAL BANKING REGULATION	.28
4.3.1	BASEL COMMITTEE	28
4.4	PRUDENTIAL REGULATORY PACKAGES	.31
4.4.1	DEPOSIT INSURANCE SCHEME	32
4.4.2	CAPITAL ADEQUACY REQUIREMENT	41
4.4.3	RESERVE RATIO REQUIREMENT	48
<u>CHAF</u>	TER 5 CONCLUSION	<u>. 52</u>
BIBL	IOGRAPHY	.54

Introduction

The banking crises that we have experienced during last several decades have been intensively damaging, thoroughly costly and contagious. Unlike any other economic sector, collapse of banking sector affects soundness of every other sector in the economy through payment system and financial intermediation. Consequences of banking failure affect not only a country's economy where it starts but also spread universally. Aftermaths of crisis linger over periods of time and cause huge loss in economic output, in social wealth and unemployment and these are foregone costs caused by crisis. Besides, increased government intervention and reforms in regulatory and supervisory framework to relax the crisis cost tremendously. Therefore, countries prefer preventing from banking crisis or stopping the collapse at the earliest stage possible once it has started.

Here in this paper, I attempt to study the most efficient and commonly applied macro and micro prudential regulations, namely deposit insurance arrangement, capital adequacy requirement and reserve ratio requirement that are implemented in preventing from the crisis.

The thesis consists of three main chapters and each chapter consists of subsections. The first chapter demonstrates importance of a bank in the economy by discussing unique roles and functions of the bank. Moreover, inherent vulnerability of banks is illustrated in this chapter with explanations of risks that a bank faces. This chapter about importance and sensitivity of banks is intended to be a foundation for the following chapters. The second chapter attempts to present seriousness of the banking crisis and how an individual bank plays a role in universal banking crisis by discussing spill-over effect, systematic risk and bank run. This chapter again is intended to be a ground for the following chapter of the paper. The third chapter includes four subsections all of which is about banking regulation. The first section of the third chapter exposes elements of bank law in general and the following section analyses rationale for bank regulations in comparison of free banking system. The third section focuses

on international banking regulation, in particular, it is about the Basel Accords. And the fourth and the last section in this chapter is about prudential regulatory packages that are implemented by governments. These are three elements that I think the most efficient elements of bank regulation in the context of crisis management.

Chapter 1 Banking

1.1 Nature and role of banks and banking activities

Bank is a financial institution that acts as intermediary between depositors and borrowers. In its very nature, bank is a profit-maximizing firm but there are several distinctive characteristics that make banks different and special from other non-financial firms. Banks are big players in the economy; in many countries they are main financial institution that carries out most of the transactions in the whole economy. One of the special features of bank is that bank's products are deposit and loans. In other words it is in the business of managing liabilities and generating banks assets with them by lending. On the other hand, bank is in the business of managing assets that is funded deposits and other liabilities. The reason why lenders and borrowers demand service from banks is due to the different requirements they have. Firstly, while borrowers usually seek higher amount of funds for a project or long term investments, most lenders have only a small amount of surplus fund, thus in the absence of banks, borrowers will have to engage with several lenders that will incur unnecessary costs. Secondly, while borrowers prefer their funds to be long term due to the timing of their project and ventures, lenders usually require their funds to be liquid and readily accessible due to uncertainty and possibility of an unexpected event. Thirdly, borrowers will need to engage in risky activities (new business ventures etc.) with the fund they borrow, while lenders will want their funds to be secure, and not risk prone. With these different requirements and preferences of the borrowers and lenders, the role of bank as a financial intermediary exists.

In addressing the different preferences of both borrowers and lenders, the presence of banks provides several transformations that would otherwise not be available – 'Size Transformation', 'Maturity Transformation', 'Risk Transformation'¹. Size transformation refers to the banks activity in which the bank acquires a large number of small lenders and

¹ (Matthews & Thompson , 2014)

pools the fund to meet the larger size of fund required by borrowers. In other words, the bank addresses the problem of different size requirements (size mismatch) by acting as an intermediary between large quantity of lenders and small number of borrowers, thus eliminating the cost that would otherwise have incurred to the borrowers. Maturity transformation refers to the banks activity that the bank makes the funds available to lenders on demand, while providing the borrower with long period loans. The underlying assumption that makes this operation available is that banks have large number of depositors and the likelihood of them drawing their funds out at the same time is low (an exception can be run on banks). This enables the bank to keep certain percentage of their assets as repayable on demand (varies between countries, and is usually determined by the central banks of their respective countries i.e. – in U.K. it is 33% of sterling assets¹), and use the remaining funds as long-term loans to borrowers. Risk transformation is that banks are not risky for the lenders, while the borrowers can use the fund acquired from banks on the activities agreed in the loan contract (even if it's risky, banks can agree on these after checking the credibility of the project when issuing the loan). There are two types of risk that both lender and borrower overcome by the use of banks (the bank bears the risk): default risk and price risk. Default risk is the possibility of the borrower going bankrupt or default, and becomes unable to repay either the interest due, the principal or both. Whereas according contemporary literature on banking, the risk of banks going default is low (banks are treated specially by governments) but not non-existent, because there are several incidents where banks went bankrupt. But even in the case of bankruptcy, in most countries deposits are insured, and the lender will get their funds or a substantial amount of it back. Also the method of deposit insurance helps prevent bank run, thus the risk of banks going bankrupt goes ever lower². Price risk refers to the discrepancy in the price of financial claims, thus banks are free of this risk as the deposits and

¹ (Bank of England, 2006)

² These terms will be analyzed in details in further chapters

their returns are fixed within nominal terms. Though the fund is still subject to the real-value risk it can be due to any discrepancies in the general price level of the currency. On the borrower's side, the bank has several tools to decrease their risk, first is banks diversify their loans, thus having lesser risk from any single economic sector. Secondly, in the case of borrowers going default, banks obtain the collateral, thus the risk to the bank will be reduced by the value of the collateral. Furthermore, as mentioned before, banks hold a significant amount of repayable on demand, so in the case of borrower going default, the bank can meet the losses incurred. With the above-mentioned transformations, the bank functions as a unique intermediary (that even other financial institution cannot function) between borrowers and lenders, meeting both their requirements.

In addition to meeting different requirements from borrowers and lenders in terms of size, risk and maturity, the existence of banks significantly reduces the transaction costs that would have incurred otherwise. In the absence of banks, borrowers and lenders will need to engage in several activities before and after the transaction. Firstly, search costs are incurred when either the borrower or the lender searches for agents of opposite interest. Also both sides will need to make research on the counterparty, and negotiate relevant details, and this will incur costs. Secondly, verification costs are incurred, as the lender will need to verify the credibility of the proposal by the borrower. Thirdly, monitoring costs are also incurred because the lender will need to verify whether the borrower is using the funds for the committed purpose. Finally, in case of a violation to the agreement, enforcement cost incurs, the lender will need to enforce the borrower's repayment. In the existence of banks, these costs are at minimal or none, banks bear and reduce these costs in the following ways. Banks are located in central streets, town centers, central squares and so on, thus there would be no cost incurred in searching for banks. Also the banks use standard format contracts, thus the cost of arranging contracts are minimized. Monitoring costs are also minimized due to the fact that banks are specialized in monitoring and their operation is centralized. In other words, the number of hours required by the bank to monitor will be significantly lower than the lender will incur in the absence of banks. In terms of verification costs, banks require project proposal from borrowers in order to verify the credibility of the borrower and the validity of the proposal. As banks are subject to thousands and thousands of proposals every month they are drastically experienced in analyzing it, furthermore banks have access to confidential financial data of companies and borrowers for the analysis. This in turn decreases the likelihood of asymmetry of information. In the absence of banks, even though borrowers are aware of all the risks that the project has, but might choose not to report it, or the borrower may inflate the profitability of the project, due to fear of being rejected. But banks can overcome this problem with the help of its experts and because banks have access to confidential information about the company so they will know whether they are inflating their profits. Moreover banks monitor the borrower through their finances and in the case of borrower getting likely to go default, the bank steps in and takes necessary actions, either to obtain collateral or make additional loans and have greater income in the long term. Overall, banks act as an extremely valuable intermediary between borrowers and lenders, minimizing the costs incurred by them.

Due to the unique roles and functions to connect surplus and deficit sides, banks play an important role in payment and money creating system and serves as an accelerator or engine of the economic system.

In its very nature a bank has an inherent fragility due to their capital and asset structure with high leverage (short term debt) and fractional reserves¹. It operates and makes profit by managing its assets and liabilities. More specifically, it balances size mismatch and maturity mismatch of its leverage and loans as defined before. In order to be able to be an intermediary

¹ (Benston & G. Kaufman, 1996)

bank must be trusted by its debtors. Therefore bank is very sensitive to loss in public trust and damage in its reputation.

1.2 Types of Banks

There are several different types of banks that have slightly different operations but the basic operation of all types of the bank is the same. Many banks diversify their operations and offer wide ranges of products besides the traditional banking service - "loan and deposit" due to the complication on need of costumers. However, five different types of bank operation can be recognized: retail banking, wholesale banking, universal banking, international banking and Islamic banking. Depending on operational and structural difference types of bank have different level of sensitiveness to risks and they may require different form of regulations and supervision.

1.2.1 Retail banking

Retail banking is involved heavily in operation of payment system with its small in value, large in volume transactions. It is the most commonly used type of bank in our everyday lives; the main activities of retail banking involve receiving deposits and making loans and issuing loans to small businesses. The value of the loans and deposits are small, though large in volume, thus the loan is usually issued to individuals and small businesses, vis-à-vis receiving deposits. So one of the characteristics of retail banking is larger volume of transactions with lesser value per transaction. The risk associated with retail banking are liquidity and asset risks, liquidity risk refers to the demand of repayment by lenders exceeds the liquid resources of the bank, asset risk refers to the risk of loans not being repaid or the incurrence of market price change in investment securities. The reason why retail banks are subject to these problems is the maturity transformation conducted by banks. With retail banking, the time period of loans is longer while the deposits are of short term. To overcome

these risks retail banks draw in large quantities of customers, and the likelihood of depositors drawing out money at the same time will decrease substantially, as long as they trust the bank can repay them. Thus banks needs to keep enough coins and notes only enough to service those customers. Other layers of protection against these risks include, increasing the liquid assets they hold i.e. keeping a portfolio of securities that mature overtime. In terms of asset risks, by having a large quantity of loans the bank will be less dependent on a borrower going default, moreover the screening of loan applications will reduce the asset risk for retail banks.

1.2.2 Wholesale banking

Contrary to retail banking, wholesale banking deals with smaller number of customers with a larger amount of funds for each account. Furthermore, as the sizes of the loans that wholesale banks maker are large, wholesale banks use syndication and one bank will be designated as a lead bank. The use of syndication has many inherent advantages, one of which is it will reduce the risk from a single customer. Furthermore the syndicating allows the wholesale bank to diversify its' loans while still meeting the requirements of the borrower. As wholesale banks aren't subject to payments mechanism, they are able to hold lesser amount of cash at the central banks. The characteristics that differentiate wholesale banking are, the use of foreign currency is much higher than retail banking, lesser sight deposits and larger trading assets, it relies more on off-balance-sheet activities thus decreasing the reliance on interest income. Wholesale banking also has greater role within the interbank market in comparison with retail banking in order to gain access to wider range of funds. Moreover the operation of wholesale banking within the interbank market gives them the advantage of interbank loans, in the event of liquidity risk wholesale banks are able to raise funds from other banks. Overall, the wholesale banking operates with more corporate customers with larger value accounts, transactions and loans, and it has its' advantages and its' risks.

1.2.3 Universal banking

Universal banking refers to banks that functions and serves every financial services, starting from the traditional banking service of receiving deposits and making loans to insurance, security, services, underwriting, and purchasing shares from client companies etc... Universal banking itself can be divided into four different types (Saunders & Walter, 1993), first is a completely universal bank servicing all financial needs and consists of a single firm. Second, partially integrated universal bank that conducts both the functions of commercial banks and investment bank, while other functions are carried out by different subsidiaries. Third type is a bank that not only carries out the traditional roles of banking, but also runs a wide array of financial services. Final type of universal banking is holding companies, while having other functions; it also provides banking and other financial services via its subsidiaries. The advantages of universal banking is that due to its' diversification of services provided, it is able to attract a large number of customers and as well as keep them. Further advantages are subject to the economies of scale and scope, in terms of economies of scale, that the long-term cost is rather flat, and in terms of scope the diversification of its' services and portfolios will reduce the likelihood of risks as well.

1.2.4 Islamic banking

Another type of banking is Islamic banking, due to the religion and Qur'an it is considered that charging interest is illegal and unjust. Banks operating within the Islamic sphere operates without charging any interests, thus they use Mudaraba – where one side provides the financial capital while the other side provides the human capital, Musharakah – where several individuals syndicate and form a financial pool to invest in businesses. The above mentioned methods are of profit-sharing only, meaning that profit is shared between financial capital providers, while the risk sharing part is characterized as the

human capital provider has depleted its human capital, thus the financial capital providers' capital should be depleted, and they are considered as of equal value. Moreover, all transactions are required to be backed up by a tangible asset, all parties to transaction can't be exploited, in addition Islamic banks are not allowed to finance sinful activities considered in the Qur'an (i.e. alcohol, gambling, pork, smoking etc.). In recent years, Islamic banking has been expanding considerably fast, though it still can't be compared to other types of banks. Islamic banking currently takes up to 1.1% of the total assets of global banking assets. Furthermore, depositor enter into contract with the bank, and will be able to share the bank profit, on the other hand borrowers will share the profit they earn with the bank, according to the agreed contract.

1.2.5 Microfinance

Though it is not another type of banking, it should be noted that micro financing has been spreading rapidly over the past decade. Microfinance refers to banks' activity of making loans to poor and disadvantaged people, on the basis that they form up a group of 5 or more. Then the bank gives loans to the first person than the second person then the next and so on... but in an instance of default the bank will stop the loan to the person and everyone in the group, also will ban them from future credits.

Thus the above-mentioned banking types have different operations, different functions, different customers, and are associated with different types of risks and different types of advantages. Thus in order to address the risks faced by these types of banks, different regulations needs to be in place, with specific requirements addressing their specific nature of their problems.

1.3 Risks of banks

Any type of profit maximizing organizations including banks will face risks, at the macroeconomic and microeconomic levels, such as recession, competition, conflict, political interference etc. In addition to these, banking entails other types of risks that are unique to itself and other financial institutions. As banks are a profit maximizing organization, to increase their profits and shareholder value added, it is essential to manage the risks threatening the business. Within banking, the risks associated with it can be taken into several levels, i.e. branches, units, or the whole firm. As banks are in the business of managing risks, if they fail to manage it or if the risk is poorly managed it will affect the solvency of the bank and might result in insolvency. The risks they manage are as follows: credit risk, liquidity and funding risk, payments risk, interest rate risk, market risk, legal risk, operational risk, sovereign and political risk, foreign exchange or currency risk, and off-balance sheet risk. In the following sections the risks will be discussed in turn.

1.3.1 Credit Risk

Credit risk refers to the risk that a borrower might either default on the loan or isn't able to service the loan in time, thus leading to a decrease in the bank's assets and undermining the bank's solvency. In order to address this problem banks conduct research before they issue the loan, monitor the borrower after the loan, and if any abnormalities occur within the borrowing firm, the bank has the option to take actions beforehand.

1.3.2 Liquidity and Funding Risk

Liquidity risk refers to the bank's risk of insufficient liquidity, meaning that the bank is not able to serve its liabilities when it's due, thus defaulting on the depositor. Funding risk refers to the bank's inability to fund its' day to day operations. Liquidity is one of the special features of banks, as depositors put their money in banks they have confidence that they will be able to withdraw the money when it was necessary. When that confidence is questioned, the depositors will want to withdraw their deposits back and lead to the insolvency of the bank. One way to address this problem would be to maturity match, by investing deposits to assets of matching maturities, thus every liability will have its opposite asset at the same time. Even so this method isn't used at all, because asset transformation is the main source of profit for banking institutions. In other words, if we analyze this within macroeconomic terms, withdrawal of one deposit will become a deposit in another bank, thus if banks went with a strict maturity match then the competition between banks would lead to higher amount of loans. As banks are a profit maximizing organization, the maturity matching is not a good option, thus banks accept a certain amount (varies between banks) of maturity mismatch.

1.3.3 Settlement/Payments Risk

Settlement or Payment risk refers to that one party to a deal transact its assets before the other side does the same, thus being exposed to a potential loss of asset. For instance, in 1974 the German bank – Herstatt became insolvent due to a loss within foreign exchange. As settlement of foreign exchange requires the central banks of their respective countries to get involved, the process is rather complex. In other words, the settlement or payments risk is the trouble of paying of assets the other party but receiving the agreed asset from the other party with delay. Because interbank exchanges are done in rather high amounts, the delay of this assets can cause a major problem to the bank and possibly to the country. One way to deal with the settlement risk is by using the netting. Netting is the process of offsetting the gross payments that should be done between banks, and just paying one net amount from one party to another party. This process results in a drastic reduction of payments volume, so that it would reduce the risk. There are some private netting systems which was agreed by party banks, for example the ECHO (Exchange Rate Clearing House Organization) between 14 European banks, 'Multinet' serves the same function between North American banks as well.

Netting is used to address many problems, in case of a default of a firm, the firms that did business with the defaulting firm, calculates the assets and liabilities in concern with the defaulting firm, offsets the two, then comes up with a figure which can be either an asset or a liability. With increasing efficacy of banks and the modern technological achievements, banks are becoming more and more able to hold real time gross settlements as well, allowing banks to make multiple gross payments real-time. Though the technological advancement has allowed this opportunity, one can never be too sure about the reliability of the advancements.

1.3.4 Interest Rate Risk

Interest rate risk refers to the risk banks encounter when they have made a long term loan (longer than the deposit time), and the possibility of a change in interest rate during that time. In other words, it just means that the bank is taking a risk with the fluctuations in interest rates, if an interest rate rises during that time the profit for the bank will decrease, if the interest rate decreases the bank will have more profit. Though banks have two types of interests for loan, fixed and variable rate interest, variable rates change in coordination with their perspective central bank rates. In other words, having an excess amount of fixed rate assets means the bank will be more vulnerable to an increase in interest rate. Consequently, having an excess amount of fixed rate liabilities mean that the bank will be more vulnerable to drops in interest rates. Thus banks try to address this problem by matching the duration of their assets and liabilities, analyze interest rate futures, and interest rate swaps. Interest rate swap, is a process where the bank (Bank A) negotiates with another bank (Bank B), Bank A will swap the interest rate with Bank B, meaning that any fluctuation in interest rate will apply to bank B instead of Bank A, both the future profit or the future loss will be accountable to bank B instead of bank A.

1.3.5 Operational Risk

Operational risk refers to losses from scam or any unexpected expenses, like court processes or legal suits. So in other words operational risk can be caused by legal changes or legal suits, for instance in a region in UK had been taking out interest rate swaps, and in the face of local taxpayers facing tens of millions of pound bills, in 1991, UK House of Lords declared all contracts null and void; it led to several banks having a loss of over 400 million pounds and spending over 15 million in legal fees.

1.3.6 Sovereign and Political Risk

Sovereign risk refers to the risk of a sovereign national government defaulting on a loan owed to private banks. Though, it is similar to credit risk, there are some inherent differences. For example, if the government defaults on a loan, the private bank has no means to recover its funds, contrariwise, with private borrowers the bank is able to obtain collateral. While in the case of a sovereign states that is not possible.

Political risk refers to the possibility of changes in regulation or political status, national status etc... In other words if a country goes into a civil war, the bank will face losses. Though every business is exposed to political risks, banks are particularly more exposed due to the important role it plays in country's economic status and operation.

1.3.7 Market risk

Market risk refers to when a bank is holding equities, bonds, or other types of financial instruments, and then is exposed to instability of the market price. Market risk can be separated into two types, systematic – instability in all market prices, and unsystematic – instability of price on the specific instrument that the bank holds (this can be due to an event that affected the issuer of the instrument).

1.3.8 Foreign exchange or currency risk

Foreign exchange or currency risk is part and parcel of market risk, and under flexible exchange rates all operations of any type of firms, especially banking is subject to this risk. The more countries the bank operates in, the more currency or exchange risks the bank gets exposed to. As banks are doing foreign exchange businesses it can be subject to the slightest change exchange rate fluctuations, thus may make more profit if the risk management has been successful or experience losses if the risk management has failed.

As banks are a profit maximizing organization, losing profits is the main subject of all the risks mentioned above.

Chapter 2 Bank failures and crisis

2.1 Banking crisis and its cost

There are several types of crisis including external sovereign debt default, domestic sovereign debt default, currency crashes, inflation outbursts and so on. Banking crisis is merely one of them and resulted from failure of the banking system but not necessarily from an individual bank's failure. Practically, banking crisis may involve a large bank's failure or several small banks' failure and distorts a country's payments system. Many countries have experienced significant banking sector crisis that are caused by *"the traditionally attended commercial banking problems"* such as poor credit control, connected lending, insufficient liquidity and capital. Historically, the world has experienced many banking crisis throughout the last two centuries and they have caused great foregone costs including output loss, unemployment, reduction in a country's ranking and reputation, lost investments etc. as well as direct costs related to governments interventions and policy reforms such as establishing amendments in the regulatory and supervisory frameworks, make adjustments in policies and subsidies to the sectors in need etc. It is much cheaper for authorities to take precautionary actions of crisis

¹ (Goodhart et al., 1999)

than dealing with aftermaths of crisis. Their common approach is making to individual banks safe and sound with prudential regulatory and supervisory packages to avoid the bank crisis. Reforms in bank regulatory and supervisory framework are usually resulted from these harmful bank crises. Coase (1988) argued that unregulated private actions create outcomes whereby social marginal costs are greater than private marginal cost¹. As mentioned in the first chapter, banks play a main role in the payment system as their liabilities serve as money and their role as intermediaries is a vital component of the whole economic system. Hence, failure of banking system creates huge output loss that is estimated to be "some 15-20 per cent of GDP"2. Many empirical studies have made to indicate statistical evidence on cost of crisis. Even though the 2007-2009 financial crisis had a global effect, it is near impossible to calculate the cost with that scale. The Federal Reserve Bank of Dallas has estimated the total cost that the financial crisis had entailed on the U.S. to be \$6 trillion to \$14 trillion, 40% to 90% of one year's output (Atkinson et al., 2013). In calculating the 2007-09 crisis had cost the U.S, it can be divided into 4 types of costs and consequences; the cost of lost output, the cost of reduced wealth, the cost of national trauma, the consequence of government intervention. The cost of lost output refers to the difference between an estimated GDP where a crisis hasn't occurred, to the real GDP that the U.S. had during that time. Current literature on the crisis suggests that the estimated cost of lost output to be around \$7.3 trillion (Boyd & Heitz, 2012). The cost of reduced wealth can be seen from the household wealth index, the U.S. household net worth decreased by \$16 trillion in the two year time span from 2007 to 2009, accounting to a drop by 24%. Though the index also shows that the household net worth was stabilizing till 2011 (Gottschalck et al., 2012), and current non-official sources suggest that it is having a major increase in household net worth in 2015 due to surging realestate market (Berkowitz, 2015). The cost of national trauma refers to the reduction in

¹ (Matthews & Thompson, 2014)

² (Cranston, 2002)

unemployment, reduced opportunity, and damaged public trust. In 2009 the unemployment rate of U.S. including – searching for jobs, discouraged and not searching, and finding only part-time work – had risen by almost 94% from the start of the recession.

Practically, individual cost of an individual bank's failure exceeds the social cost from it in a great extent because the failure of a bank can be destructive to other banks in the system and may create systematic risk by spill over effect.

2.2 Spill-over effect and systematic risk

Spillover effect is any kind of unforeseen effect that follows the primary or intended effect of activities. When it comes to a banking sector, an individual bank's failure is seen as a possible threat to the whole banking sector as well as the whole economic system due to a spillover effect of bank panic. There are several ways in which a failure of an individual bank spreads in the system and generates systematic risk. Firstly, it becomes problematic when a default of a single bank may affect the public confidence in other banks. "It is better to be safe than sorry" can describe behavior of an average depositor because people prefer their money to be secure. Therefore, depositors in other banks start withdrawing their money and this is called bank run¹. When a bank crashes in an economy widespread bank run threatens healthy banks in the system and may cause them liquidity risk and even lead to bankruptcy. Therefore public policy makers are concerned about possible damage in confidence in the banking system due to the default of an individual bank. Another channel of spillover effect from a collapse of a sole bank is a linkage in interbank activities. Interbank is an arranged operation between banks in the system under which banks can borrow from one another. Interbank market "enables banks to manage their assets and liabilities at the margin to meet daily fluctuations in liquidity requirements"². Linkage between banks is due to the fact that "the asset sides of the bank balance sheets contain mutual exposures in the interbank deposit market and

¹ This phenomenon is explained in details in the next section.

² (Hefferman, 2001)

participations in syndicated loans. "¹ Spillover effect can occur through interbank linkage when other banks have large interbank deposits with the crashed bank, they may suffer illiquidity. This channel is enabled because of the inherent fragility of banks' capital and asset structure mentioned in the part 1.1. Authorities are not concerned when there is a bank failure but they are troubled when they see possible spillover of the failure to the whole sector.

2.3 Bank run

Bank run occurs when a large number of depositors withdraw their deposits simultaneously or over very short time due to concerns about the bank's solvency. Like any other creditors, depositors have willingness to protect themselves against risk of loss in the absence of deposit insurance or guarantees. Possibility of the bank default increases as more people withdraw their funds. This encourages even more depositors to withdraw. Consequently, sudden drop in the liability side of bank balance sheet can force the bank to liquidate its interest earning assets with lower interest or even at a loss. Major withdrawals that a bank experience cause liquidity gap and distort the maturity transformation role and urgent liquidation of assets at low price drives bank to default. There are cases when bank run is resulted from panic or rumor about a bank's financial situation rather than a true insolvency and caused a real default situation to the bank. Bank panic occurs more than one bank experience runs at the same time. More dramatically, a shout of a bank run to affected bank may cause depositors at other banks run on their banks. Therefore, "a run on one bank is frequently believed capable of not only of causing the failure of a large number of other banks nationwide in domino fashion and destabilize the financial system, if not the economy as a whole"². Mismatch between assets and liabilities (in bank balance sheet) establish the ground for bank panic as well. This is addressed in the capital adequacy requirements. Theoretical approach to the bank run was first developed by Douglas W. Diamond (University of Chicago) and Philip H. Dybvig (Yale

¹ (Vries, 2003)

² (G.Kaufman, n.d.)

University) in 1983 in their article "Bank Runs Model, Deposit Insurance and Liquidity"¹. In general, banks possess advantageous position in competitive financial market by issuing demand deposits and try to provide better risk diversifying system for people who need to allocate their consumption and surplus income at the different time path. In the event of undesirable equilibrium such as bank run or bank panic, depositors panic and withdraw their fund from deposit accounts immediately or over very short time, this applies to people who would keep holding their deposit in bank if there were no such situation. As a result, bank run can transform even healthy and sound banking system into disastrous default situation and deforms role of banks as a "blood in the veins" in the economic system. Hence, governments pay great attention to protect banking system and to keep it safe and sound. Banking sector is a sector that is more regulated and supervised than other economic sectors.

2.3.1 Bank run model

Here is a simplified system with two types of consumers: Type 1 consumers who consumes in the first period of their life and Type 2 consumers consume in the second half of their life after birth². Number of people in the system is constant and denoted as "N". Each person has "y" units of wealth (consumption good) that was given to him or her only in the first period of their life. A single homogeneous consumption good exists at each period.³

Decision about one's consumption path depends on which type of consumer he or she is and no one wants to consume entire wealth in the first step of his or her life. People are better off when they consume in both time periods. People are rational and they have possibility to make storage or invest in capital. Investment in capital requires that people need to wait for two periods until the capital is produced. Rate of return on Capital is X (X>1); gross rate of return on storage is 1. People have option to sell capital that has not yet been produced

¹ (Dybvig, n.d.)

² This model is taken from Freeman who built on ideas and framework of Bryant and Diamond and Dybvig.

³(Yu, 1994)

between generations at discount price (reduced), however the capital loses its return (capital does not yield any good for each invested good) Verification cost for capital is θ (θ >X-1); ϑ denotes value or price of capital at the period before it matures. If someone sells his/her capital before it produces her/she gets " $\vartheta - \theta$ " due to the transaction cost " θ ". The Effective Rate of Return will be as below:

Table 1 The Effective Rate of Return

	Т0	T1	T2
Storage		1	1
Capital		ϑ – θ	Х

We can observe from above table that bank offers rate of return 1 after only a single period if the consumer is the "Type 1" person while it offers "X" to the "Type 2" person. We can see that the overall wealth in the system is "Ny" (population multiplied by each individual's wealth). As an financial intermediary a bank can finance the return by investing half on capital and half on storage¹. The bank is required to keep certain proportion of its deposits as reserve and it relies on the difference between withdrawal periods of the two types of consumers. When both Type 1 and Type 2 consumers withdraw their deposits at the same time bank is not able to return the fund immediately, yet it is required to return on demand. Bank makes its decision to invest based on promise of type 2 consumers to withdraw at the second period (not at the 1st period). If the consumer is rational, any Type 2 consumer would withdraw his/her deposit when it realizes that other Type 2 costumers are withdrawing due to the rumor or suspicion of insolvency. In non-bank run situation the bank expects to return funds of Type 1 depositors, that is why they keep sufficient storage of liquid assets for repay the promised return of y goods only to N/2 number of depositors. When all the Type 2 depositors suddenly request to withdraw, the banks is left with no choice except for selling a unit of capital for " $\vartheta - \theta$ " goods which is less than 1. Bank sells its capital (X) that could nbe

¹ (Bruce Champ, Third Edition)

used to finance the returns for honest type 2 people who really waited. When the bank is not able to liquidate its capital easily, it faces difficulty.

Chapter 3 Banking regulation

3.1 Elements of bank law

Bank is a profit-maximizing firm like any other company. However scope of banking regulation and supervision is far more extensive than company law; they cover broader range and take many different forms because banks are special due to their unique and essential roles and their influence in the economy. Coverage of bank regulatory and supervisory framework lies in wide range of areas. Likewise, regulation and supervision can take many different forms as well. For instance: Bank Regulation and Supervision Survey that is conducted by World Bank covers the following 14 broad areas: "(1) entry into banking, (2) ownership, (3) capital, (4) activities, (5) external auditing requirements, (6) bank governance, (7) liquidity and diversification requirements, (8) depositor (savings) protection schemes, (9) asset classification, provisioning and write-offs, (10) accounting and information disclosure, (11) discipline/problem institutions/exit, (12) supervision, (13) banking sector characteristics, and (14) consumer protection"¹. In addition to these, there are other regulation related to the banking such as anti-crime law, competition (antitrust) regulation, monetary policy tools, regulation on confidentiality, and so on. Nowadays, scope of banks' businesses is widening, getting more complicated and becoming ubiquitous. These multifunctional banks require more complicated and extended banking regulations to cover as much as operations as possible. Due to the limitation of my topic, I have analyzed the regulations that I consider to be effective in terms of preventing crisis.

3.2 Rationale for bank regulations

Debate on having government interventions such as controls, rules etc. in banking sector or laissez faire banking has been broadly controversial among scholars and the strength of controversy and doubt on that disagreement have been intensified by "common, large and

¹ (The World Bank)

expensive crisis^{"1} that was studied previously. In this part, I will give main arguments to promote bank regulations by comparing rationales for and against banking regulations. This section is also written to be a foundation of further parts on essential components of bank regulations that are implemented in prevention of financial crisis.

3.2.1 Arguments for free banking

Main arguments for free banking are based on a general argument for free trade. In the economic field, free trade is broadly agreed to be the most efficient and desirable because it achieves an optimal allocation of recourses without much effort.² Advocates of laissez faire banking demonstrate their arguments by criticizing the most common bank regulations that are commonly adopted by Central banks and other monetary authorities. These are deposit insurance, capital adequacy and lender of last resort (that I have my main focus on). The first criticism they raise is against assistances that creates guarantee for the banks and these includes deposit insurance scheme and lender of last resort. They claim that the regulations mentioned generate negative regulatory externalities such as moral hazard³ to the banks. In the absence of such arrangements, banks operate prudent and in order to maintain their reputation and trust of the costumers. They will be careful about the risks they are taking and they will have tighter internal supervision. In this self-assessing system, government does not have to carry out heavy supervisions and controls. However, the deposit insurance arrangement, or lender of the last resort regulation makes banks less risk averse by sharing their burdens from possible failure, therefore encourages excessive risk taking activities. Furthermore, it reduces banks' incentives to maintain their costumer's confidence and keep their profile up. Imprudent banks that take excessive risks can destruct risk averse banks by drawing costumers with attractive, yet risky activities. Even the safest banks are forced to act imprudent due to the raised competition. Consequently, banking system becomes more fragile

¹ (Goodhart, Hartmann, Llewellyn, Rojas-Suarez, & Weisbrod, 1999)

² (Dowd, 2003)

³ Moral hazard caused by deposit insurance arrangement is studied in details in part 3.4.1.2

as banks become riskier thus bank regulations fail to promote efficiency and stability of the banking system. The above-mentioned guarantees affect not only behavior of the banks' but also that of the depositors and other investors. In the absence of aids that backs up banks, depositors have incentive to monitor banks because they prefer their funds in safe hands. Practically, in most of the cases, medium and small size depositors tend to free ride on fellow depositors' monitoring due to the cost of this activity. However, deposit insurance and lender of the last resort regulations make depositors reluctant to monitor banks as they guarantee safety to the investors' money. In the market economy with high competition, not only the banks tend to become transparent, but also the customers monitor firms and their assessment determines the firms' reputation and popularity. Especially bank are the firms that depends greatly on their reputation and clients' trust in them. When the government (other institutions with high reliance) assures the security of investors' money, they stop their supervision over banks and the evaluation mechanism losses its function under the back up regulatory system for banks. As a result, healthy banking system with healthy competition becomes a rule-less battlefield of frantic players.

Once self-robustness of a free banking system is distorted, a need to restore order in the system arises immediately. Promoters of laissez faire banking states that micro prudential regulation packages that usually are implemented in parallel with deposit insurance such as capital adequacy requirement and reserve ratio requirements exist to fill the gap in the banking regulatory system to restrict the moral hazard. In that manner they are considered to be conditional regulations that would not be needed in case there were no moral hazard creating bank regulations. Albeit they can be (and they are) very expensive to implement. Both lawmakers and agents affected by the law bear costs of these regulations. And even prudential requirements are met without any enforcement under free banking system. Their viewpoint is that when the government starts intervening, further steps of intervention are

needed to make the system complete. Again there are unforeseen externalities and consequences causing another problems to deal with. Rather than creating an incomplete system that requires continuous expensive maintenance, they prefer intervention free system that sustains its own maintenance.

3.2.2 Arguments for bank regulations

In theory, free banking may look as the most desirable low-cost system that has ideal banks with optimal risk taking. However success of financial liberalization is not supported by historical evidence. "The most infamous free banking era"¹ was in the USA that began in 1837. Scholars who are in favor to laissez faire banking tries to justify failures of free banking by stating "Free banking in the United States was not the disaster portrayed by some, but it also was not problem free"². They claim that free banking had troubles like any other system in the world and the problems could be solved if they could make the right decision. However, during the period of financial liberalization in the USA "many banks lasted only a short time and failed to pay out their depositors in full³³ and it generated a great distortion in public trust in banking system. Besides, bank failure rate was very high comparing to the regulated times and widespread bank runs and failures happened four times during the whole era. It was impossible that the government would wait for the system to settle down by itself without intervening. "In the United Kingdom a great deal of prudential regulation has been triggered by particular crisis"⁴. For example, Banking Act 1979 was primarily a result of the secondary banking crisis of the early 1970s before which banking was unregulated. In practice arguments that bank regulations cause crisis looks questionable (but consequence of overregulation should be examined as well). Looking at the cases of the US and UK free banking period, we can see that regulations are triggered by crisis not other way around.

¹ (Matthews & Thompson, 2014)

² (Gerald & Dwyer)

³ (Matthews & Thompson, 2014)

⁴ (Cranston, 2002)

Therefore I have concluded that even though laissez faire banking is considered to work well theoretically, it has shown that the market discipline does not work for banking system in reality. Along with the empirical evidence against financial liberalization, one of the main reasons for bank regulations is a ubiquitous distraction and social cost of crisis that is examined previously in this paper. In practice, making and implementing regulation are not costless processes as imposing regulation causes direct regulatory costs to the lawmakers as well as compliance costs to the regulated part. Therefore it is legitimate to compare these regulatory costs with costs of crisis in order to evaluate the efficiency of the regulation. We have seen in the previous part that cost of crisis is too high that the whole economy suffers from it tremendously over periods of time. Hence, cost of crisis exceeds regulatory costs in a great extent.

Due to the likelihood of systematic risk caused by wide spread bank run, authorities try to guard depositors' trust and prevent from financial crisis by legislating guarantees to the funds of investors or backing up the banks.

As stated before, one of the arguments given by promoters of financial liberalization is that government interventions disable market discipline. It is valid in some extent but it does not mean that it is unfavorable. Their argument is that regulations prevent market competition from doing its job to achieve optimal allocation of recourses and to make participants act prudent. This is the statement that I personally disagree with. Historical evidence has shown that the market discipline does not achieve the greatness that is claimed by its advocates. In addition I argue that competition can be fierce and unfavorable in any circumstances even when there is no regulatory backups for the banks. When there is a strong competition, market participants' efforts for survival may include aggressive marketing and excessive risk taking activities. Especially nowadays competition in banking sector has gone stronger as they have to compete with new entrants (as a result of entry requirement loosening), other non-banking

institutions (due to relaxation of operational restrictions) and their foreign rivals who pursue regulatory arbitrage. Banks can gain short run benefits from excessive risk taking but it is unsustainable in long run. Banks that focus on their long term perspectives would not pursue short run gains in fact. However, even safest and risk-averse participants that have long run missions are forced to act imprudent in order to be competent enough and survive. Hence I argue that prudential regulation packages are required regardless of the existence of moral hazard generating regulations mentioned above. I can not deny the fact that banks should be regulated prudentially to restrict negative externalities and moral hazard caused by government imposed deposit insurance or lender of last resort regulations because banks really tend to take excessive risks since they are no longer concerned with maintaining customers' confidence under these protective regulations. Nevertheless prudential regulations have their independent functions and roles that are essential regardless of the deposit insurance arrangement and availability of lender of the last resort. Prudential technics such as controls on structure of asset and liability, operations, management and bank activities are also tools of preventing systematic risks as long as they make sure each and every bank in the system runs safely. Thus I think prudential regulations such as requirement of capital adequacy and reserve ratio requirements are essential elements of bank regulations that promote financial stability. Restricting negative externalities and moral hazard is only one of the functions of prudential regulations. Micro-prudential regulation is a package of financial stability promoters because it enforces every single player in the system to operate safely.

By all means preventing from crisis and terminating causes of crisis at their earliest stage are essential that is why package of prudential regulations is the most efficient elements of bank regulation. Prudential regulation can take several forms; in the next section I have examined capital adequacy requirement and reserve ratio requirements in detail. It is non-arguable that consumers have less advantage in a contractual relationship between consumer and firm. Because a whole ranges of financial expert teams are in bank's side making contracts that minimizes risks that the bank may bear. Their decision-making is based on different analyses and forecasts made by professionals while consumers are less informed and lack market power. Even if consumers are sophisticated and well informed enough to monitor banks, many of the consumers tend to free ride other's monitoring. Therefore, consumers must be protected against information exploitation and monopolistic behavior by banks. Consumer protection regulation can take many different forms. For example, one of them is deposit insurance or guarantee scheme that protects depositors from bank failure. Another approach to consumer protection is setting depositors prior over other creditors and in case of failure depositors' remedy is taken first. According to (Goodhart et al., 1999) financial regulations are less about restricting monopoly power but more about maintaining systematic stability and consumer protection. I agree with statement and in my paper I focused on regulations that promote systematic stability.

3.3 International banking regulation

3.3.1 Basel committee

The bankruptcy of Herstatt bank and Franklin National Bank initiated the establishment of the first Basel Accord. The set up of the New Basel Accord attributed to 1998 Financial Crisis in Southeast Asia while the 2007 American Financial Crisis resulted in the proposal of Basel III. The ever-changing economic environment and new attributes of crisis induce improvements of banking regulations; each modified set of rules has its own particular features and advantages and addresses different risks and threats.

From the year 1975 up to now, there have been three proposed Basel accords the latest ot which (Basel III) will be implemented in 2019.

3.3.1.1 Basel I

When lending out the deposits, banks engage activities bearing some level of risks and it may leave depositors' money at risk. Therefore authorities have preference to make money of the bank owners engaged with the bank activities along with the depositors' funds. The percentage level of capital that banks should invest depends on the judgment of bank's risk, and this requirement is called capital adequacy. In Basel I, capital adequacy ratio for banks mainly depends on the country of the bank's location. The Basel Committee believes that the OECD countries are safer and thus no special rules for their banks to apply while the non-OECD countries should obey the 8% rule¹. There are three main features for the first Basel Accord.

- 1. Set a uniform benchmark for the management of bank risk;
- 2. Emphasized the importance of capital adequacy, which transferred the concentration of international banking from operating scale to other factors such as capital and assets quality;
- 3. Under the influence of debt crisis in developing countries in 70s century,

Basel I highlighted the significance of country risk to banks' credit risk, thus set different level of ratio for risk-weighted assets. Many things had changed and they have saw that countries and cities such as Singapore and Hong Kong that did not have OECD membership showed high level of security. Therefore they decided to make for adjustments in Basel rules.

3.3.1.2 Basel II

In 2004, in order to readdress the problems associated with Basel I, the Basel Committee on Banking Supervision issued the Basel II Accord. Principally, Basel II consists of 3 essential recommendations: capital requirements, supervisory review and market discipline. To ensure that there is enough capital within the international banking system, Basel I was heavily concentrated on credit risk. Thus creating the appropriate environment for facilitating global

¹ Countries are divided into two groups: Organization for Economic Co-operation and Development (OECD) countries and non-OECD countries

competition. Though, the method it used for measuring the credit risk is questionable, it lacks the detailed measures to reveal the true risk that banking assets are subject to. To facilitate further improvements for measuring out more accurate risk levels, Basel II included operational risk to the accord, by including operational risk the Basel II's scale widens to almost all the risks that contemporary banking system faces. Furthermore they ruled out three means for calculating the risk by using estimated risk parameters of the bank: Basic indicator model, Standardized method, and advanced measurement approach. The new criterions that the Basel II have implemented better reflects the level of risk the bank faces. In comparison to Basel I, the new Basel II's 3 recommendations has attached increased significance to prevention and early supervision, i.e. it permitted regulatory authorities to exceed the 8% minimum ratio also, it removed the bias in loans given to OECD member governments and banks. The goal of this supervision is not only to provide adequate capital but also to encourage banks developing new methods towards better management. The final recommendation is greater disclosure, highlighted the critical points for marketing restraint scheme and the implication of transparency of international banking capital management. The greater disclosure also serves as a supplementary recommendation to the previous 2 recommendations of Basel II.

Overall, the Basel II Accord has been more specific and flexible in terms of methods, and is considered a breakthrough of traditional banking limits, in terms of the emphasis on the combination of qualitative and quantitative factors.

3.3.1.3 Basel III

As international banking requires for banks to interact across borders, it brings new challenges to the table, which are systematically of importance. For the first time in international history, Basel III has introduced a specific macro prudential measure to address

the contemporary threats to the systemic stability and the countercyclical buffer of the global banking system. There are 3 major points in the Basel III proposal, capital requirements, cyclical capital provisions and liquidity ratios. The Basel III Accord will enter into force in 2019. Moreover, capital has been detailed according to the level of riskiness, and introducing a risk based capital requirement. In addition to this, Basel III has also introduced a minimum leverage ratio and tier 1 capital to risk adjusted assets. By creating countercyclical buffers and setting a future oriented provisions, Basel III provides the facilitation to reduce procyclicality. Capital requirements are also more strongly enforced and specified to different type of assets. The cyclical provisioning of banks act as a cushion, by encouraging banks to build up its capital during the increase in credit boom. But the downfall of this is that when banks have higher liquidity ratio, they face lower interest earning and lower net interest margin. Thus, banks without any significant off-balance sheet businesses, may earn a lower return on equity rather than the target required to return, thus their total capital would decrease. Moreover, it is expected that the Basel III might have lesser effect on eastern or third world countries due to the traditional operational differences, composition of capital and less financial derivative instruments. As it is difficult to reach a specific conclusion on how to reform the economy, policy makers should be more considerate of the risks this can entail.

By increasing the capital of banks is by far the most probable and safest way of reducing risk, even so whether if it is worth the sacrifice is still debatable. Thus further research on this issue should be done, and as contemporary economy is always changing and new problems are always arising.

3.4 Prudential regulatory packages

Prudential regulatory packages are designed to secure individual banks and the banking system. Macro prudential regulations aim to mitigate systematic risk while micro prudential regulations focuses on robustness of individual banks' financial position. Prudential regulations function, in their nature, as preventive measures rather than treatment. The followings are prudential regulation elements that I consider the most effective in terms of preventing from wide spread crisis.

3.4.1 Deposit insurance scheme

As mentioned previously deposit insurance scheme is a type of government help intended to minimize bank panic and stave off widespread bank runs by keeping depositors' confidence in banks. Promoting public trust is only one of the roles or functions of the scheme. This system is implemented to "clarify the authority's obligation to depositors (or if it is a private system, its members", limit the scope for discretionary decisions, contain the costs of resolving failed banks and provide countries with and orderly process for dealing with bank failures and a mechanism for banks to fund the cost of failures"¹. Within the scope of the paper, its role as a promoter of public confidence is superior to others. Among several other methods to prevent bank panic, deposit insurance arrangement is considered to achieve high level of public trust from depositors. Bank system is inherently more vulnerable than other player in the economic system even a minor distrust can damage whole banking operational system. The Government Supported Insurance Scheme is listed in the header of bank panic prevention tools due to the fact that it promotes public confidence by clarifying the authority's obligation to depositors. Deposit Insurance mechanism, in practice, can be offered by private institutions such as highly capitalized and low-risk banks. However the level of creditability that the private institution can create might not be as high as that of state because private agents are not authorized to allocate deposit insurance adjusted taxation. In case of destructions that can disrupt trust in banks the vast majority of depositors who have trust in government guarantee tend to keep their deposits in banks. Therefore possibility of occurring bank runs is lower and the government does not necessarily need to bail out as it has

¹ (Basel Commitee on Banking Supervision and International Association of Deposit Insurers joint project, 2009)

guaranteed because precautionary role of this type of government guarantee schemes comes prior to its role to protect of deposit holders and settle down the crisis situation. Deposit insurance arrangement is also implemented to protect small and medium deposit holders or risk-averse depositors. Dewatripont and Tirole highlight the protection of small depositors (who may lack of the ability or the motivation to monitor banks)¹. Small and medium depositors contribute high proportion in the society as well as in bank clients. Therefore the insurance (specially government sponsored ones) is effective tool to deal with threat of bank failure that spreads widely and quickly². Deposit insurance scheme also enables authorities to distribute burden of the crisis among members in the society because it is usually financed by lump-sum taxation that government levies to all agents in economy. Alternatively, the state can levy with extra taxation for agents or individuals who withdraw deposits earlier. Let's now move on to the part on the design of explicit deposit insurance system and a brief overview of the key challenges and supportive tools related with this issue. We have seen that deposit insurance is one of the specific tools of financial safety net in the regulatory and policy framework, however a question about effectiveness of its working needs further analysis. It is well supported that number of occurrences of bank panics has fallen since the introduction of deposit insurance. The deposit insurance package can be offered as "coinsurance" or partial insurance in which insurance mitigates part of (less than 100 per cent of) individual deposits and holders of deposits still bear some risks. Therefore partial insurance is not fully eligible to diminish bank panics³. However, the system has its advantages that the full deposit insurance scheme lacks. "Partial insurance or so called co-insurance for smaller

¹ (Dewatripont, 1994)

² (Dowd, 2003)

³ (Schich, 2008)

deposits could be removed where it still exists, as the recent experience seems to suggest that it may reintroduce incentives for retail investors to run (on) a bank."¹

3.4.1.1 International regulatory framework for deposit insurance

In July 2008 the Basel Committee on Banking Supervision (BCBS) and The International Association of Deposit Insurers made decision to jointly work on internationally agreed set of "Core Principles for Effective Deposit Insurance Systems" using the IADI Core Principles as a ground. "Core Principles for Effective Deposit Insurance Systems" was developed by collaborated efforts of the Basel Committee and International Association of Deposit Insurers (CBRG-IADI) joint project and aimed to develop the core principles that enhance arguments for supporting effective deposit insurance system². The Core Principles, as any other guidelines and standards established by Basel Committee, are intended as a voluntary framework for effective deposit insurance practices, any supplementary measure and variation can be made by national authorities. The followings are preconditions proposed by the Basel Committee:

- \Box An ongoing assessment of the economy and banking system; (
- □ Sound governance of agencies comprising the financial system safety net; (
- \Box Strong prudential regulation and supervision; and (
- $\hfill\square$ A well developed legal framework and accounting and disclosure regime. (

The followings are 18 Internationally Agreed Core Principles.³:

Principle 1- Public Policy objective:

Before adopting a deposit insurance system or reforming the existing system, public policy objectives that reflect stability of the financial system and protection of depositors are specified.

Principle 2- Mitigate Moral hazards:

¹ Keynote speech at the Second Symposium of the ECB-CFS research network on "Capital Markets and Financial Integration in Europe", 13 February 2008.

² (Basel Commitee on Banking Supervision and International Association of Deposit Insurers joint project, 2009)

³ All of the principles and their explanations were taken from "Core Principles for Effective Deposit Insurance System" written by Bank for International Settlements Press and Communications.

Moral hazards issue¹ that results from the deposit insurance arrangement can be mitigated by applying limitations on deposit insured and implementing risk adjusted premiums.

Principle 3- Mandate:

The mandate selected for a deposit insurer should be clear and formally specified. Published public policy objectives and the deposit insurer's powers and responsibilities should be consistent.

Principle 4 – Powers:

After acquiring mandates the deposit insurer can require necessary power and entitlement and this should be formally realized. The power includes the right to enter into contracts, set internal operational budget and access to appropriate set of information files purpose of accelerating financial reimbursements.

Principle 5- Governance:

"The deposit insurer should be operationally independent, transparent, accountable and insulated from undue political and industry influence."

Principle 6 - Relationship with other safety-net participants.

Close coordination and information sharing between deposit insurer and other financial system should be formalized. There should be requirements for accuracy and timing of the information sharing and the communications.

Principle 7- Cross-border issues:

Specified bank may have some branches operating in foreign countries. This principle makes objective to exchange of relevant information between deposit insurers in different jurisdictions.

¹ This is discussed in details in the following part.

Principle 8 - Compulsory membership:

Membership in the deposit insurance system should be compulsory for all financial institutions accepting deposits.

Principle 9 – Coverage:

Definition of insurable deposit should be made in law. "*The level of coverage should be limited but credible and be capable of being quickly determined*". Coverage of large majority of depositors is recommended.

Principle 10- Transitioning from blanket guarantee to a limited coverage deposit insurance system.

It gives recommendation to the countries that are making a transition from a blanket guarantee to a limited coverage deposit insurance system, or to change a given blanket guarantee.

Principle 11 – Funding:

All necessary funding mechanisms should be available for deposit insurance system. Cost of deposit insurance should be borne primarily by banks. Explicit deposit insurance system can be either funded or unfunded. Funding section divides to two subsections: ex-ante funding and ex-post funding. In ex-post funded regulation system issues come out as how funds should be collected after default of bank occurs. Likewise, ex-ante funding system ensures that funds will be available for deposit compensation when it will be requested.¹

Principle 12 - Public awareness:

As a deposit insurance mechanism developed to enhance public trust it has to be disclosed for public attention. Depositors should be frequently informed about ongoing procedures and also about benefits and limitations.

Principle 13 – Legal protection

¹ Financial Turbulence: Some Lessons Regarding Deposit Insurance, Sebastian Schich, Financial Market Trends @ OECD, pp. 71.

Legal protection of deposit insurer (or its workers) should be defined in legislation and administrative procedures in case the individuals make decisions and take actions in good faith while discharging their mandates.

Principle 14- Dealing with parties at fault in a bank failure

"A deposit insurer, or other relevant authority, should be provided with the power to seek legal redress against those parties at fault in a bank failure."

Principle 15 - Early detection and timely intervention and resolution

This principle is about deposit insurer's role and power to detect and intervene in troubled banks.

Principle 16 – Effective resolution process

This principle points out characteristics of effective resolution:

- facilitate the ability of the deposit insurer to meet its obligations including reimbursement of depositors promptly and accurately and on an equitable basis
- minimize resolution costs and disruption of markets; maximize recoveries on assets
- reinforce discipline through legal actions in cases of negligence or other wrongdoings.¹

Principle 17 – Reimbursement of deposits:

This principle defines right of depositors to access to their insured funds.

Principle18 - Recoveries.

"The deposit insurer should share in the proceeds of recoveries from the estate of the failed bank. The management of the assets of the failed bank and the recovery process (by the deposit insurer or other party carrying out this role) should be guided by commercial considerations and their economic merits."²(

¹ These are quoted from the direct source

² (Basel Commitee on Banking Supervision and International Association of Deposit Insurers joint project, 2009)

3.4.1.2 Moral hazard problem resulted from deposit insurance

Like any other regulations, moral hazard has a negative regulatory externality, namely moral hazard problem that requires adjustments. Generally speaking, moral hazard occurs when the provision of insurance results actions by insurant that increase the probability of undesired outcomes (outcomes that are insured against). In a context of deposit insurance arrangement, once the government (any other insurer) insures the liability side of bank balance sheet, banks loosen its internal supervision over the level of risks it takes and start engaging in risky activities to get the highest profit. In the absence of deposit insurance banks allocate their portfolio between risky and risk free assets, and carefully evaluate, forecast and account the average returns on assets due to the need of banks to attract shareholders and depositors. Otherwise banks bear too much risk and their net worth driven to zero and shareholders would no longer desire to invest on these banks. In contrast, under the deposit insurance system, depositors and investors would not care much about the ranking, financial position and trust worthiness of the banks and they become reluctant to monitor banks' risk taking. Instead, they would start caring about the return on their investment or deposits. Specifically, they would choose a bank that promises the highest interest rate or the highest rate of return. The reason why the banks show moral hazard is that they do not have to worry about increasing their costumer's confidence and keeping their profile up, instead they need to worry about attracting depositors and investors by offering higher interest rate and inviting products offers. Unfortunately, in order to increase the interest rate and increase attractiveness of products, banks have to take excessive risk and have to accept contract conditions that they would not accept otherwise. There are still risk-averse banks that care for their long run perspectives, but they face increased competition due to other players in the sector that are interested in gaining short term profits. In this respect, moral hazard problem is inevitable for each and every bank in the system for the sake of their survival.

The government can make several types of adjustment to restrict the moral hazard problem resulting from the deposit insurance scheme including limitations on the amount of deposits insured, micro-prudential regulations, or creation of incentives for banks to keep their profile high. The limitation can be implemented by applying co-insurance or partial insurance arrangement where a fraction of deposits insured and there still is an uninsured part of the depositors' fund. Under this arrangement, the depositors' incentive to track and monitor banks' operations and make a claim when banks undertakes excessive risk still exists.

Alternatively, governments can set up micro-prudential requirements to make banks operate safely. These include capital requirement ratio or capital adequacy ratio and reserve ratio requirement etc. that will be examined in details in the following two sections.

The regulation of Capital Adequacy ratio is essential to cope with moral hazard problem related with deposit insurance system.1 The Capital Adequacy regulation can be used as a tool to protect the small depositors without government sponsored deposit insurance mechanism because high capital adequacy ratio indicates the level of soundness in the banking system. However, cost of keeping the depositors' fund is borne by the depositors themselves. In order to get higher level of safety, they will have to accept lower interest rate.²

¹ Benton and Kaufman, 1996

² (Dowd, 2003)

Table 2. Coverage limits in constitutencies of CMF participants				
Country NameExplicit deposit insurance coverage limitsLimits to f at exchange 2008, route		Limits to full coverage (in USD at exchange rates as of early 2008, rounded)		
Australia	No explicit deposit insurance system	Not relevant		
Austria	EUR 20 000, 10% co-insurance for non-individuals (companies etc.)	29000.00		
Belgium	EUR 20 000	29000.00		
Canada	CAD 100 000	99000.00		
Finland	EUR 25 000	37000.00		
France	EUR 70 000	104000.00		
Germany	Private: not to exceed 30% of bank's equity capital. Public: no coverage limit; Obligatory minimum of EUR 20 000 is generally exceeded	> 29,000.00		
Greece	EUR 20 000	29000.00		
Hong Kong, China	HKD 100 000	13000.00		
Hungary	100% for up to HUF 1 million, 90% for the amount in access of it, up to maximum of HUF 6 million	34000.00		
Ireland	90%, not to exceed EUR 20 000	29000.00		
Italy	EUR 103,291.38	153000.00		
Japan	JPY 10 million	93000.00		
Korea	KRW 50 million	53000.00		
Luxembourg	EUR 20 000	29000.00		
Mexico	MXP 1,602,844.40	148000.00		
Netherlands	100% up EUR 20 000, 90% of next EUR 20 000, i.e. from EUR 20 000 to 40 000	29000.00		
New Zealand	No explicit deposit insurance system	Not relevant		
Norway	NOK 2 million	375000.00		
Portugal	EUR 25 000	37000.00		
Russia	RUB 190 000	16000.00		
Singapore	SGD 20 000	14000.00		
Spain	EUR 20 000	29000.00		
Sweden	SEK 250 000	40000.00		
Switzerland	CHF 30 000	28000.00		
United Kingdom	GBP 35 000	68000.00		
United States	USD 100 000	100000.00		

Source: OECD Secretariat estimates based on information available from deposit insurance websites

3.4.2 Capital adequacy requirement

In regards to financial stability of an economy that is free of financial crisis countries attempt to establish financial safety net that mostly includes prudential regulation and supervision, a lender of last resort and deposit insurance. "A deposit insurance system is not intended to deal, by itself, with systemically significant bank failures or a "systemic crisis""¹. Even the deposit insurance system does not have a capacity to deal with systematic crisis due to its weakness that it creates a behavioral fault in its receivers. The Basel Committee has recommended countries to have other financial system safety-net participants and make their own public policy choice that matches their circumstances the most. I believe that risk capitalasset ratio is an effective element of a prudential regulation package, as it requires individual participants of the system act under safe condition. Growing competition has encouraged aggressive marketing and excessive risk taking by participants internationally. Additionally, moral hazard resulted from the deposit insurance and the lender of last resort requires a regulation that constrains excessive risk taking by banks. Bhattacharya et al. argue that it is the existence of deposit insurance that provides the motivation for regulation². Hannan International Trust Company bankrupt is an example of consequence of low capital adequacy in China's earlier financial market explore. Capital adequacy as a part of prudential regulatory package is mainly related with consumer protection. Because of defective (asymmetric) consumer information and agency problems related to the nature of intermediation business, consumers are not in a position to judge the safety and soundness of banks. To construct the safety and soundness of banks, it is important to maintain domestic and international confidence, protect consumers and taxpayers and maintain financial stability. With safe and

¹ (Basel Commitee on Banking Supervision and International Association of Deposit Insurers joint project, 2009)

² (Bhattacharya, 1998)

sound banks, a country's payment system is well grounded and participants willingly extend credit that stimulates the growth of economy¹.

The gearing ratio and the risk capital-asset ratio are the two typically used measures of capital adequacy of requirements that central banks and other regulatory agencies establish². The risk capita-asset ratio of the Basel Accord set out a common minimum risk capital-asset ratio recommendation for international banks³. A bank's capital could be defined as the value of its net assets; in particular, total assets minus total liabilities. This capital is the sum of the bank's paid-up protection of its consumers in practice, therefore for the maintenance of general confidence in its operations as well as the base material of its longer-term stability and growth, capital adequacy is the essential components of an effective bank regulatory and supervisory framework⁴. Here is an example to show why the capital adequacy requirement is essential: Let's assume Bank A has assets of £80 billion and £10 of capital, and £75 billion in loans and £70 in deposits as shown in the table 3:

Table 3 Bank A balance sheet				
Liabilities	(£)	Assets (£)		
Capital	10 billion	Cash and liquid assets	5 billion	
Deposits	70 billion	Loans	75 billion	
Total	80 billion	Total	80 billion	

Then assume bank A has created some risky loans and £7 billion-worth of loans does not perform and considered not to be repaid. Thus Bank A has to bear the loses by the capital cushion. Overall capital of Bank A is reduced to £3 billion and asset dwindles to £73 billion, as shown in the Table 4:

Table 4 Bank A balance sheet after £7 billion-worth of loans go bad				
	Assets (£)			
3 billion	Cash and liquid assets	5 billion		
70 billion	Loans	68 billion		
Total73 billionTotal73 billion				
	t after £7 billion-worth o 3 billion 70 billion 73 billion	t after £7 billion-worth of loans go badAssets (£)3 billionCash and liquid assets70 billionLoans73 billionTotal		

^{1 (}Barbara Casu, 2006)

² (Matthews & Thompson, 2014)

³ (BIS, 1988)

⁴ (Barbara Casu, 2006)

The bank's capital is able to cover the losses in this case, however, if the losses exceed capital that of Bank A, it decreases total amount of deposit into nothing. This time, let's assume that ± 15 billion-worth of loans go bad as shown in Table 5:

Table 5 Bank A balance sheet after £15 billion-worth of loans go bad				
Liabilities (£)		Assets (£)		
Capital	0 billion	Cash and liquid assets 5 billion		
Deposits	65 billion	Loans	60 billion	
Total	65 billion	Total	65 billion	

It shows that Bank A has used all of its capital to cover the losses from its nonperforming loans and £5 billion of deposits will be used to cover the losses as well. In this case the bank cannot repay all its depositors or consumers will bear a loss. Reasonable consumers try to avoid banks with this kind of financial position. Therefore any such loss that may occur to a bank has to be covered by its capital, in order to for a bank to maintain confidence of its depositors as well as to protect the depositors' funds.

The adequacy of capital not only depends on the complete amount of assets to be covered, but also depends on the quality of assets (the riskier the assets are the larger the amount must be covered by capital funds ceteris paribus in order to maintain a given level of capital adequacy)

3.4.2.1 Basel Committee recommendations on capital adequacy

The Basle Committee on Banking Supervision was established in 1974 by central bank governors to approach measurements of capital adequacy and the prescription of minimum capital standards. There are there Basel accords each of which reflects amendments and improvements of the previous ones.

The main focus of the Basel I is on credit risk and appropriate risk weighting of assets. Basel I categorizes assets of banks in 5 different classifications. Basically banks are required to hold capital equal to 8% of their risk-weighted assets (RWA) and to report off-balance-sheet items including letters of credit, unused commitments, and derivatives etc. under the Basel I. The

regulation was applied in 1993 and it sets at a minimum of 8%, which is made up of tier-1 (at

least 4%) and tier-2 capital¹. Here is:

- Tier 1 capital (core capital) = stock issues (equity) + disclosed reserves
- Tier 2 (supplementary capital) =all other capital + loan loss reserves²

The minimum capital requirements are given in the Table 6 that summarizes how to

distinguish five capital-adequacy categories of banks.

Table 6 Five capital-adequacy categories of banks
1) Well-capitalized:
Total capital to risk-weighted assets 10%
Tier 1 capital to risk-weighted assets 6%
Tier 1 capital to total assets 5%
2) Adequately capitalized (fulfilling minimum requirements):
Total capital to risk-weighted assets 8%
Tier 1 capital to risk-weighted assets 4%
Tier 1 capital to total assets 4%
3) Undercapitalized:
Fails to meet one or more of the capital minimums for an adequately capitalized bank
4) Significantly undercapitalized:
Total capital to risk-weighted assets <6%
Tier 1 capital to risk-weighted assets <3%
Tier 1 capital to total assets <3%
5) Critically undercapitalized:
[(Common equity capital + perpetual preferred stock – Intangible assets)/total assets] = < 2%

Please refer to the table presented below to see an example of the categories.

¹ (Kent Matthews, 2008)

²Tier 2 capital may not exceed 100% of Tier 1 capital

Table 7 Risk - asset ratio - an illustrative example				
Asset	£m	Weight fraction	Weighted (\pm m)	
Cash	25	—	—	
Treasury bills	5	0.1	0.5	
Other eligible bills	70	0.1	7.00	
Secured loans to discount market	100	0.1	10.00	
UK government stocks	50	0.2	10.00	
Other instruments – government	25	0.2	5.00	
-company	25	1.0	25.00	
Commercial loans	400	1.0	400.00	
Personal loans	200	1.0	200.00	
Mortgage loans	100	0.5	50.00	
Total assets	1000		707.50	
Off-balance-sheet risks				
Guarantees of commercial loans	20	1.0	20.00	
Standby letters of credit	50	0.5	25.00	
Total risk-weighted assets			752.50	
Capital ratio 8%			60.2	

Source: Bank of England 'Banking Supervision' Fact Sheet, August 1990.

Basel II includes several new adjustments including allowing some lenders to use their own risk measurement models to calculate required regulatory capital; Basel II reflects variation in the banks' internal capital allocations for individual loans therefore it states that capital requirements should be high for banks that hold risky assets and low for banks that hold safer portfolios or that have collateralized their credit exposure with certain types of eligible collateral. By allowing this kind of discrimination, they started avoiding unnecessary regulatory arbitrage such as securitization, and selling or locating their risky assets in less-regulated companies and so on. The capital requirements rule requiring banks to hold a minimum capital level as a function of their risk level is included in Basel I as well as in Pillar 1 of Basel II. Risk sensitive capital rule requires that the higher the assets risk the higher the fraction of these assets that have to be funded with capital. Compared with Basel I, which has already listed some fraction of limited degree of risk sensitivity, Pillar 1 of Basel II increases the risk sensitivity of the capital rule. Definition of capital has been revised and thus substantially raises the quality of capital. Capital consists of various elements with a complex set of minimums and maximums for each element in old definition. Each tier- element has

their own limits and weaknesses and sometimes becomes a function of other capital elements. These definitions are not transparent enough that is why it is impossible to make a comparison for capital adequacy of banks globally.

The goal of the Basel Committee on Banking Supervision is to improve the quality of capital base, and to increase the scope and scale of the recommendations to reduce risk. Capital ratio requirement refers to the ratio of capital in accordance with the risk-weighted assets. The above mentioned recommendations and amendments, enables the banks to withstand the loss even at times of crisis, by requiring the capital ratio to be at that level. In other words, banks will be required to hold no less than 7% common equity ratio, constituting from at least a 4.5% of risk-weighted assets in tangible common equity (2% as in Basel II), in addition a capital conservation buffer of 2.5%. Consequently, to achieve the 7% requirement put forward by Basel III, banks will be required to increase their total capital, given that the risk weighed asset is covered.

Let's see the details of the minimum of 8%, which is made up of tier-1 (at least 4%) and tier-2 capital¹. Here is:

- Tier 1 capital (core capital) = stock issues (equity) + disclosed reserves
- Tier 2 (supplementary capital) =all other capital + loan loss reserves²

Deductions from total capital (Tier 1 + Tier 2) consist of investments in unconsolidated banking and financial subsidiaries, reciprocal holdings of capital securities, and other deductions (such as other subsidiaries or joint ventures) as determined by supervisory authorities with handling a case-by-case basis or as a matter of policy after formal rule making. Required total capital (Tier 1 + Tier 2 - deductions) equals to Risk weight *8% of weighted risk assets.

¹ (Kent Matthews, 2008)

²Tier 2 capital may not exceed 100% of Tier 1 capital

However, the Basel Accord only considered credit risk. The minimum capital requirements are given in the Table 6 that summarizes how to distinguish of five capital-adequacy categories of banks.

Table 8 Five capital-adequacy categories of banks
1) Well-capitalized:
Total capital to risk-weighted assets 10%
Tier 1 capital to risk-weighted assets 6%
Tier 1 capital to total assets 5%
2) Adequately capitalized (fulfilling minimum requirements):
Total capital to risk-weighted assets 8%
Tier 1 capital to risk-weighted assets 4%
Tier 1 capital to total assets 4%
3) Undercapitalized:
Fails to meet one or more of the capital minimums for an adequately capitalized bank
4) Significantly undercapitalized:
Total capital to risk-weighted assets <6%
Tier 1 capital to risk-weighted assets <3%
Tier 1 capital to total assets <3%
5) Critically undercapitalized:
[(Common equity capital + perpetual preferred stock – Intangible assets)/total assets] = < 2%

Please refer to the table presented below to see an example of the categories.

Table 9 Risk - asset ratio - an illustrative calculation				
Asset	£ million	Weight fraction	Weighted (\pm m)	
Cash	25	—	—	
Treasury bills	5	0.1	0.5	
Other eligible bills	70	0.1	7.00	
Secured loans to discount market	100	0.1	10.00	
UK government stocks	50	0.2	10.00	
Other instruments - government	25	0.2	5.00	
-company	25	1.0	25.00	
Commercial loans	400	1.0	400.00	
Personal loans	200	1.0	200.00	
Mortgage loans	100	0.5	50.00	
Total assets	1000		707.50	
Off-balance-sheet risks				
Guarantees of commercial loans	20	1.0	20.00	
Standby letters of credit	50	0.5	25.00	
Total risk-weighted assets 752.50			752.50	
Capital ratio 8%			60.2	

Source: Bank of England 'Banking Supervision' Fact Sheet, August 1990.

3.4.3 Reserve ratio requirement

Within contemporary banking, most banks are required to hold funds as a reserve that is equal to certain percentage of their liabilities and this is mandatory in more than 90% of the countries. This basically is the reserve ratio requirement. Under current banking regulations, all depository institutions including: commercial banks, savings banks, thrift institutions, and credit unions; are required to hold the amount specified as reserves against transaction deposits; including: demand deposits, negotiable order of withdrawal accounts, and other highly liquid funds¹. The reserve ratio requirement is determined by their respective national central banks and varies between sovereign states, i.e. for U.S. it is the Federal Reserve. Firstly, by holding reserve funds the banks will be able to repay their depositors and guarantee them liquidity. Secondly, by adhering to the reserve ratio requirement, banks will be able to have capital settlement. Finally, at the policy level, by requiring all banks to hold a reserve ratio, it will shield the banking system from unexpected incidents, thus reducing the risk of financial crisis happening. The reserve ratio requirement is an essential part of the modern financial market, and is usually enforced as a mandatory financial regulatory framework. Although most countries have adapted this policy, there are several nations that don't have any reserve ratio requirement for their banks, i.e. United Kingdom, Australia, Canada, Mexico, Sweden and Hong-Kong. However. For example, in the U.S. the reserve ratio requirement is 10%, while it is 20% in Tajikistan and 80% in Jordan (80% is considered to be an extremely high ratio).

Practically, the reserve ratio requirement functions as follows: if a country's reserve ratio requirement is 10%, commercial banks will need to deposit 10'000\$ if they have liabilities of 100'000\$, leaving the bank with 90'000\$ for issuance of loans. Most of the institutions that engage in depository services hold cash within a vault to ensure their reserve ratio

¹For a formal definition of depository institutions and transaction accounts, see Federal Reserve Regulation D (Reserve Requirements of Depository Institutions), sections 204.1 and 204.2

requirements and to ensure the liquidity of their assets for depositors. The cost of adhering to the reserve ratio requirement can vary from institution to institution; the cost for a financial institution to increase their reserve ratio will incur costs, which will be inflicted by a decreased amount of possible funds for loaning.

3.4.3.1 Reserve ratio as taxation

Furthermore, there are some ambiguities about whether the banks receive interests when the banks deposit their reserve asset ratios to the central bank. For instance, the U.S. Federal Reserve didn't pay any type of interest on the reserves until 2008, and in 2008 the U.S. Federal Reserve started paying interests on required balance and excess balances, under Regulation D 12 CFR Part 204 (Board of Governors of the Federal Reserve System, 2015). This was initiated to restrain banks' act of avoidance of the reserve ratio requirements. Reserving funds at the central bank without interest in accordance with the perspective reserve ratio requirement, it is the same as imposing taxes on banks with the equal amount that they would earn in an interest paying reserve¹. Accordingly, these unpaid interests would influence the banking system, and possibly the depositors and borrowers who engage with the bank. This might act as a discouraging factor to the bank (depository institutions), giving the banks incentive to ignore the reserve ratio requirement (seeking for a regulatory arbitrage) thus leading to lesser efficacy of the policy. Additionally, when banks adhere the reserve ratio requirement, the efficiency of the bank will be lower and the bank won't be able to operate in its full economic capability. To decrease the effect that reserve ratio requirement has on the bank, the bank aims to produce more financial products. Nonetheless, we can see how exactly the non-interest reserve ratio requirement affects people and institutions because of the complexity of calculating the degree of competitive pressure within the market, deposits, loans and the associated sensitivity of borrowers, lenders, price changes and interest rate

¹ Reserve Requirements: History, Current Practice, and Potential

changes. Empirically the burden associated with reserve ratio requirement without interest payments is not only borne by owners of the bank, but also is borne by the borrowers and depositors as well (i.e. decreased interest rate for depositors, increased interest rate for borrowers). Even so, depending on the size of the financial institutes, the burden they bear is different, i.e. smaller companies might not have enough customers to pass on their burdens of reserve ratio requirements, and thus the owners themselves have to carry the burden. But in some countries, the reserve ratio requirements are different for companies with different sizes, i.e. in U.S. the Federal Reserve has designated 0% reserve ratio requirement for \$0 to \$14.5million, 3% for \$14.5 million to \$103.6 million, and 10% for \$103.6 million and above. Though the reserve ratio requirement has its downfalls, it plays an essential part in reducing the risk of an economic crisis based in the banking sector. There are three main achievements that the reserve ratio can make.

Prudential purpose:

As the reserve ratio requires the bank to hold high proportion of its liquid fund and a large amount of vault cash (which was gold in the past when gold was regarded as the circulating currency but now it is U.S. dollars) in the absence of bank run or bank panic banks are less likely to face liquidity risk. As it reduces a probability of liquidity risk, reserve ratio requirement has a great contribution in maintaining financial stability. Most depository institutions usually hold gold directly as their reserve instead of holding issued banknotes, with regard to the requirement. This structure is called "fractional banking" because banks maintain the reserve equal to the fraction of their liability that usually is the short-term deposit they have received. This is because of the fact that short-term deposit has higher liquidity. International banks must hold foreign currency reserve while banks that focus on the domestic market must hold enough reserve to cover the requirement of domestic drain. The existence of bank reserve requirement has increased the public confidence. Increased confidence in them, in other hand, encourages banks to hold reserves dutifully.

Monetary Control

The uses of reserve requirement by central bank in monetary control can be has two channels. First one is as a money multiplier, and another one is the impact of reserve requirement on interest rate spreads. Central bank can increase or decrease money supply by changing reserve ratio requirement because as we have discussed in the first chapter, banks play a role in money creation process by creating loans (issuing loans increases money supply as the money is invested directly) The method of controlling bank reserve requirement under the fiat money environment to monitor the growth rate of credit is an indirect way of using interest rates in practice. A package of these three prudential regulation elements can promote financial stability because they address different risks that mostly cause default of banks and systematic risk.

Chapter 4 Conclusion

Due to its unique functions and contribution to the growth of the economy, banking system is a vital element in the economy. However, failure in the banking system also has a great impact on the economy as well. For this reason, banking sector is regulated more than any other economic sectors and substantial part of economic policy focus on safety and soundness of the banking system. Policy makers and lawmakers have to keep in their mind that banks are naturally vulnerable and many different types of risks can deteriorate banks depending on types of their operational direction.

Heavily regulated banking system is criticized and considered to be inferior to free market by some scholars. Although their arguments and rationales for financial liberalization that they raise are quite compelling, historical evidence does not prove their validity. Yet, learning their arguments helps understand how important the role of regulatory and supervisory frameworks in banking sector. Practically, reforms in bank regulation are usually resulted from crisis, for instances: Basel Accord was initiated by an incident of widespread banking crisis while amendments and changes are made due to collapse of banking system as well. Even though power and efficiency of the market system is praised by most of the economists, it has shown that market discipline does not work in case of banking. There is a great cost from crisis consisting of foregone costs (lost economic outputs etc.) and direct costs (cost of government intervention and reforms). It is even worse that the interconnection of the national markets make crisis global. Therefore economic policy on banking sector and banking regulation get great attention of authorities in every country. They prefer taking precautionary actions against crisis rather than restoring an economy with crisis because social costs of crisis go beyond regulatory costs.

As a building block in the system every single bank contributes to the system and due to spill over effect, widespread bank run could happen and a failure of an individual bank can lead to systematic risk. Hence authorities are cautious about protecting trust of customers in banks (banking system) and sets deposit insurance, government guarantee or lender of last resort regulations to protect reputation of banks. In my paper, I choose deposit insurance as one of the efficient elements of bank regulations and studied it. Indeed it is efficient as it has great role in preventing wide spread bank runs in which default of an individual bank spreads and causes systematic risk. In case of post crisis, deposit insurance scheme allows distribution of burden among the society (taxpayers) and prevents from harassing the depositors and investors only. Besides the deposit insurance, there are many other regulations in many different forms that cover different scopes and aspects of bank structure and different sides of the business operations. Among them there are two types of micro prudential regulation that I have chosen as effective elements. These regulations: capital adequacy requirement and reserve ratio requirements are applied to make bank operate prudent, therefore they are effective preventive regulations against crisis. One of the efficient elements that promote financial stability is the capital adequacy requirement that restricts excessive leverage and risk takings by banks and averts insolvency by banks. This type of regulation is vital and inevitable when the government sets deposit insurance because it can limit moral hazard created by government guarantees. Another efficient element of prudential regulation is reserve ratio requirement that prevents particularly liquidity risk. It is also employed as a tool of monetary policy.

53

Bibliography

Alman, E.I.a.S., 2001. An analysis and critique of the BIS proposal in capitl adequacy and ratings. *Journal of Banking and Finance*, 25, pp.25-46.

Anon., 13 February 2008. Keynote speach at the Second Symposium of the ECB-CFS reaserch network. In "Capital Markets and Financial Integration in Europe"., 13 February 2008. Sebastian Schich.

Anon., n.d. *The World Bank*. [Online] Available at: http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTGLOBALFINREPORT/0,c ontentMDK:23267421~pagePK:64168182~piPK:64168060~theSitePK:8816097,00.html [Accessed 17 April 2015].

Atkinson, T., Luttrel, D. & Rosenblum, H., 2013. *How Bad Was It? The Costs and Consequences of the 2007-09 Financial Crisis*. Dallas: Federal Reserve Bank.

Bank of England, 2006. *Bank of England Statistics*. [Online] Available at: <u>http://www.bankofengland.co.uk/statistics/Pages/bankstats/2015/mar.aspx</u> [Accessed 14 May 2015].

Barbara Casu, C.G.P.M., 2006. *Introduction to banking*. Harlow: Financial Times Prentice Hall.

Basel Commitee on Banking Supervision and International Association of Deposit Insurers joint project, 2009. *Core Principles for Effective Deposit Insurance Systems*. Basel Switzerland: Bank of International Settlements Press and Communications.

Benston, G.J. & G. Kaufman, G., 1996. The appropriate role of bank regulation. *The Economic Journal*, 106, pp.688-97.

Berkowitz, B., 2015. *Fed: Household net worth hits record \$83 trillion in 4th quarter of 2014*. [Online] Available at: http://www.cnbc.com/id/102500289 [Accessed 1 June 2015].

Bhattacharya, S..B.A.W.A.a.T.V., 1998. The economics of bank regulation. *Journal of Money, Credit and Bnaking*, pp.30(4),745-770.

BIS, 1986. *Recent Innovations in International Banking*. Basel, Switzerland: Bank for International Settlements.

BIS, 1988. International Covergence of Capital Measurement and Capital Standards(July).Basel, Switzerland: Basel Committee on Banking Supervision, Bank for International Settlements.

BIS, 1988. International Covergence of Capital Measurement and Capital Standards(July).Basel, Switzerland: Basel Committee on Banking Supervision, Bank for International Settlements.

BIS, 2004. International Covergence of Capital Measurement and Capital Standards(June).Basel, Switzerland: asel Committee on Banking Supervision, Bank for International Settlements.

BIS-II, 2004. International Covergence of Capital Measurement and Capital Standards(June). Basel, Switzerland: asel Committee on Banking Supervision, Bank for International Settlements.

Board of Governors of the Federal Reserve System, 2015. Interest on Required Balances andExcessBalances.[Online]Availableat:http://www.federalreserve.gov/monetarypolicy/reqresbalances.htm[Accessed 2 May 2015].Boyd, J.H. & Heitz, A., 2012. The Social Costs and Benefits of Too-Big-To-Fail Banks: A

Bounding Exercise. University of Minnesota.

Bruce Champ, S.F.a.J.H., Third Edition. *Modeling Monetary Economies*. Cambridge University Press.

Cameron, d., 2004. Europeam Banking Survey 2004. Financial Timess, p.8 October.

Cranston, R., 2002. *Principles of Banking Law*. Second edition ed. Oxford, UK: Oxford university press.

Dewatripont, M.a.T.J., 1994. *The Predential Reputation of Banks*. Cambridge: MA:MIT Press.

Dowd, K., 2003. Free banking. Handbook of International Banking, pp.173-90.

Dowd, K., n.d. Free Banking. The case for bank capital adequacy regulation, pp.181-82.

Dybvig, D.W.D.a.P.H., n.d. Bank Runs, Deposit Insurance and Liquidity. *Journal of Political Economy*, p.402.

Feinman, J.N., 1978. Reserve Requirements History Current Practice and Potential Reform. *Federal Reserve Bulletin*, July. pp.605-10.

G.Kaufman, G., n.d. Bank runs: Causes, Benefits, and Costs. *Cato Journal*, 7, No. 3 (Winter 1988).

Gerald & Dwyer, n.d. Wildcat Banking, Banking Panics, and Free Banking in the Unites States.

Goodhart, C. et al., 1999. Financial Regulation, Why, how and where now? Routledge.

Gottschalck, A., Vornovytskyy, M. & Smith, A., 2012. *Household Wealth in the U.S.: 2000 to 2011*. Washington D.C.: United States Census Bureau.

Hefferman, S., 2001. *Modern banking in theory and practice*. West Sussex, England: Wiley.

Kent Matthews, J.T., 2008. The Economics of Banking. Chichester: Hoboken, NJ : Wiley. pp.194-201.

MacDonald, S.S. & Koch, T.W., 2006. *management of banking*. Sixth Edition ed. Mason, Ohio: Thomson/South-Western.

Matthews, K. & Thompson, J., 2014. *The economics of banking*. Third edition ed. Cornwall, UK: Wiley.

Pierre, S., 2001. Money, Banking, and Financial Institutions: Canada in the Global Environment. Toronto: McGraw-Hill Ryerson., 2001.

Saunders, A. & Walter, I., 1993. *Universal Banking in America, What can we gain? and What can we lose?* New York: Oxfor University Press.

Schich, S., 2008. Financial Turbulence: Some Lessons Regarding Deposit Insurance. *Financial Market Trands @OECD*, pp.57-62.

Schich, S., 2008. Financial Turbulence: Some Lessons Regarding Deposit Insurance. *Financial Market Trends @ OECD*, pp.57-62.

Thompson, K.M.a.J., Second Edition. *The Economics of Banking*. John Wileys and Sons LTD.

Vries, C.G.D., 2003. The simple economics of bank fragility.

Yu, T.-M.a.M.-T., 1994. Do Bank Runs Exist in the Diamond-Dybvig Model? *Journal of Institutional and Theoretical Economics*, p.537.