Role of BASEL Regulations in the Relationship between External Factors and Liquidity Creation: Evidence from Emerging Economies

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Abstract

The purpose of this study is to investigate the impact of three external factors, stock market liquidity, economic policy uncertainty and bank competition on liquidity creation of banks in emerging economies. The sample data encompasses annual observations of commercial banks from 11 emerging economies from 2011 to 2019. The two-step system GMM technique is utilized to test our developed hypotheses and achieve objectives of the study. The results indicate that stock market liquidity has significant positive whereas economic policy uncertainty and competition has significant negative impact on liquidity creation. Both of BASEL regulations have significant negative effect on liquidity creation.

Stock market liquidity show significant negative effect on liquidity creation under the combined moderation of both BASEL regulations and it reverses as capital level increases but the magnitude is lesser at higher levels of funding liquidity. Liquidity requirement reduces liquidity creation by limiting available funds whereas capital improves risk absorption capacity and induces banks to create liquidity. The net effect is dominated by capital.

The impact of EPU on liquidity creation remains negative under combined moderation of BASEL regulations. The intensity of this adverse effect of economic policy uncertainty reduces as capital increases and aggravates as required funding liquidity increases. Larges banks are more deterrent to adverse effect of economic policy uncertainty, compare to small banks, when comply with both BASEL regulations.

The bank competition has negative impact on liquidity creation under moderation of BASEL regulations and the intensity decreases(increases) with increase in capital and funding liquidity levels. However, for small banks, the effect is quite opposite and changes from positive to negative as capital and funding liquidity increases.

The study provides important policy implications for regulators and investors. Although BASEL regulations are aimed at improving stability of financial system globally. The results evidence that BASEL regulations influence large and small banks in quite opposite manner and should be reviewed to eradicate inefficiencies raised in this regard. The research offers valuable outcomes for academic and research students and a number of avenues are explored for further studies in banking literature.

Keywords: Liquidity Creation, Stock Market Liquidity, Economic Policy Uncertainty, Bank Competition, BASEL Regulations, Capital, Funding Liquidity.

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List of Abbreviations

2SLS	Two Stage Least Square
ABS	Asset-backed Securities
ASF	Available Amount of Stable Funding
BCBS	BASEL Committee on Banking Supervision
BRICS	Brazil Russia India China South Africa
CAP	Capital
CBOE	Chicago Board Options Exchange
CDS	Credit Default Swap
COM	Bank Competition
CPI	Consumer Price Index
DCC GARCH	Dynamic Conditional Correlation GARCH model
DIV	Diversification
ECB	European Central Bank
EPU	Economic Policy Uncertainty
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GDPR	Growth Rate of Gross Domestic Product
GEPU	Government Economic Policy Uncertainty
GFC	Global Financial Crisis
GMM	Generalized Method of Moment
GPR	Geopolitical Risk
HHI	Herfindahl–Hirschman index
IMF	International Monetary Fund
LC	Liquidity Creation
LCN	Normalized Liquidity Creation
LCR	Liquidity Coverage Ratio
LSDVC	Least Squares Dummy Variable Corrected
MP	Monetary Policy
NSFR	Net Stable Funding Ratio
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
ROA	Return on Assets
RSF	Required Amount of Stable Funding
SL	Stock Market Liquidity
SVL	Stock Market Volatility
VAR	Vector Autoregression
WUI	World Uncertainty Index
ZS	Z-Score

Chapter 1

Introduction

1.1 Background of the Study

This chapter documents background followed by rationale of research. Then problem statement is presented in brief which is followed by research gap. On the basis of research gap our research objectives and questions are presented. Thereafter, the significance of study and theoretical background is documented that describes the related theories.

The financial system is crucial for economic growth, both short and long term (Hussain & Chakraborty, 2012). The function of banking institutions as liquidity creators is being acknowledged by economic experts since at least Smith (1776). It is believed that liquidity creation is the most suitable proxy of output of banking institutions (Berger & Bouwman, 2009) and contributes to economic development (Fidrmuc, Fungáčová & Weill, 2015). By transforming liquid funds (deposits) into illiquid assets (loans for borrowers), banks are engaged in creating liquidity in the economy that ultimately favours economic growth (Berger & John, 2017; Horavath et al., 2013). While providing productive resources to the economy through liquidity creation, banks, on the other hand expose themselves to various risks (Bouwman, 2013). A massive literature focuses and confirms the influences of various determinants on liquidity creation like bank size, profitability, bank risk, diversification market capitalization, and economic growth. However, there are some factors including market liquidity, funding liquidity, market uncertainty, economic policy uncertainty, competition and divarication that are still debatable. The literature documents mixed results about their impact on liquidity creation and thus needs to be investigated in more detail, specifically, after the Global Financial Crisis of 2008. It is anticipated that regulatory measures after financial crisis would have lasting effects on the industry structure of financial institutions (Acharya & Mora, 2012) and consequently lead to mitigate the capacity of banking institutions in advancing funds to lenders and creating liquidity.

The recent emergence market based financial system throughout the world has rekindled the old-age argument over the relationship between stock liquidity and liquidity creation, that has attained theoretical interest but few empirical investigations. Liquidity in the stock market is the capacity of investors to exchange their shares rapidly and cheaply without significantly affecting

stock value (Bisias et al., 2012; Daiz & Escribano, 2020; Sarr & Lybek, 2002). The previous literature hypothesized opposing views regarding stock liquidity effect on liquidity creation.

Levine (1991) and Diamond (1997), among others, show that stock liquidity offers investors the readily available exit choices when their intended securities holdings change unexpectedly, may be as a result of unexpected needs. Thus, they are encouraged to invest in securities instead of depositing in banks that leads to reduction in available funds with banks to be transformed into illiquid assets investments resulting in squeezed liquidity creation. On the other hand, Song and Thakor (2010), Mattana and Panetti (2014), Chatterjee (2015) and Toh et al. (2019) find favorable effect of stock liquidity on liquidity creation. They argue that liquid stock market alleviates investors' liquidity demands from banks that encourages banks to reduce their liquid holding by transforming them into illiquid assets leading to increased liquidity creation. In addition, reduction in cost of equity due to liquid stock market provides banks an opportunity to raise equity capital to enhance their lending and liquidity creation. The only study of Toh et al. (2019) provides empirical evidence of this view in the context of Malaysia banking sector. Which of these two perspectives better explains how market liquidity relates to liquidity creation is an empirical question. The importance of market based financial system with regard to banking system and the scarce empirical research on their relationship, several questions are still to be answered. Whether banks in emerging economies behave in the same manner as those in developed ones in response of variation in stock liquidity? How large and small banks react to highly liquid stock market to create liquidity? This study is, therefore, an attempt to examine the effect of stock liquidity on liquidity creation of banking institutions in emerging economies.

After the epidemic of Global Financial Crisis of 2008, an increased uncertainty is being recognized on account of complex modifications in global economic and political policies (Bloom, 2009; Nelson & Katzenstein, 2014; Bloom et al., 2018). The political division and increased intervention of state in economic affairs are significant factors of recent raise in uncertainty (Baker et al., 2013). A series of developments including US president election, refugee crisis in Russia, increased terrorism, and event of Brexit are some of examples that has led to a state of political and economic instability globally. It has been recognized by various studies that the uncertainty has significant influence on many economic activities including economic growth, corporate behaviour, financial markets, and institutions (Bernanke, 1983; Dixit & Pindck, 1994). The past literature posits that economic policy uncertainty may has a

positive and negative effect on bank lending. Some studies explained that financial institutions are more likely to have cautious stance when are faced by peaked policy uncertainty. As a result, they tend to suspend lending and investments (Gilchrist Sim & Zakrajˇsek, 2014). In addition, banks face with limited funding due to rise in external financing cost due to economic policy uncertainty (Brogaard and Detzel, 2015). Consequently, liquidity creation may be reduced by banks. On the other hand, some studies argue that banks are motivate to take risks in times of high economic policy uncertainty. Firms postpone their investment in anticipation of worse effects of uncertainty. The household's consumption is also reduced resulting in an increase of saving (Giavazzi & McMahon, 2010; Aaberge, Liu, & Zhu, 2017). The overall effect leads to abundant liquidity available with banks that induces banks to become less cautious about risk and thus increase lending Acharya and Naqvi (2012). Most of the literature regarding effect of economic policy uncertainty on bank activities has focused on developed countries like U.S. and Europe (e.g. Choi, 2018). Very scarce research has addressed the issue of uncertainty in emerging and developing economies (e.g. Chi & Li, 2017, Bhattarai et al., 2019 and Demir & Danisman, 2020). In addition, the work of Berger et al. (2018) is the only study that analyses the impact of economic policy uncertainty on bank liquidity creation in U.S. Hence, many interesting questions need to be answered such as whether the effect of economic policy uncertainty is positive or negative on bank liquidity in context of emerging economies. How large and small banks behave in response to these uncertainties? Thus, this study aims to fill this gap in existing literature by investigating the effect of economic policy uncertainty on bank liquidity creation.

With emergence of world as global village, the financial industry along with other business actives have been grown rapidly. This has led to increase competition in financial industry and therefore provoke discussion on the relationship between competition and baking actives. The past literature mainly provides discussion on the potential effect of market power on bank solvency, risk-taking and credit (Hainz et al., 2013; Sahyouni and Wang, 2019). However, limited empirical work exists regarding bank competition and liquidity creation. Theoretically, both favorable and adverse effect of market power on bank liquidity can be justified. One view suggests that in competitive market, banks through research and development, innovate new product and services to attract new customers (Horavath et al., 2013). In addition, the competition promotes stable banking system with low credit risk and leads contribute welfare by

easy access to banking services by public at lower rates (Berger et al., 2010; Toh et al, 2019). On contrary, the second view suggests that increased competition results in squeezing of profit margins of banks and compel them to reduce liquidity rather prefer to hold available funds as buffer for any possible liquidity risk (Carletti and Leonello, 2019; Jiang et al., 2019; Horvath et al., 2016; Chioi, 2017). In light of opposing views, there is, still, a need to examine the relationship in other contextual setting. Moreover, most of the studies address advanced countries like U.S. Germany, OECD (Chioi, 2017; Berger et al., 2010; Kim, 2012). However, a few studies focus developing and emerging economies like studies of Shah et al. (2019) and Toh et al. (2019) for China and Malaysia, respectively. This study, therefore, fill this gap in exiting research by investigating the impact of market power on liquidity creation in emerging economies.

It is acknowledged that illiquidity issues and inadequate liquidity risk management in financial institutions are the root cause of financial crisis of 2007-08 and its rapid expansion (Gorton & Winton, 2017; Brunnermeier, 2009). Erkens et al. (2012) argues that the aggressive risk-taking stance of banking institutions are one of the reasons of financial crisis. Therefore, the financial crisis 2008 has highlighted the importance of regulating banks' liquidity. Among others, the formulation of BASEL III regulations introduced by Committee of Banking Supervision is an initiative to promote resilient banking sector. The two regulations introduced are capital and liquidity requirements. The minimum capital requirements aim at stretching banks to absorb huge losses during stress periods. Whereas liquidity requirements intended to ensure availability of sufficient funds (short term and long term) of banks in order to survive in stress periods.

On the other hand, a part from theoretical literature, the empirical studies address the role of BASEL regulations on banks activities like lending, credit, risk taking (Bonner, 2016; DeYoung and Jang, 2016; Dahir et al., 2019; Khan et al., 2017) but provide inconclusive results. Hence, the role of BASEL regulations on bank liquidity posits various questions that open new avenues on this issue. For instance, what would be banks' behaviors towards highly liquid stock market when they fulfil these requirements of capital and liquidity? Similarly, the response of banks in face of competition and economic policy uncertainty would be crucial concern to be investigated. Moreover, the question whether there is any difference between banks that comply with these regulations and those unable to retain minimum levels of capital and liquidity when there is high liquidity asset market or uncertainty or competition in the banking sector. This research, thus

shed light on these important questions by investigating the role of BASEL regulations on the relationship between three external factors (stock market liquidly, economic policy uncertainty and bank competition) and bank liquidity creation in emerging economies.

1.2 Theoretical Background

This section discusses the relevant theories that are presented by earlier economists and literature in the context of financial institutions and various activities they are engaged with. Furthermore, it describes the relevance of these past theories in explaining the relationship between stock market liquidity, economic policy uncertainty and bank competition, with bank liquidity creation. In addition, the role of BASEL regulations in bank liquidity creation is described in light of past theories.

1.2.1 Financial Intermediation Theory

The study of Gurley and Shaw (1960) serves as the foundation of theory of financial intermediation. They theory posits that the presence of intermediaries is justified because of the inefficiencies caused by market imperfections that hinder savers and investors from engaging in efficient bilateral transactions. The basic reason of existence of financial intermediaries is to mitigate risks, reduce transaction costs, and comply with regulations. Banks acting as agents of savers can reduce information asymmetry between savers and investors since they have more expertise and knowledge compare to both of them. Moreover, banks provide a payment, settlement, and clearing mechanism to ease transactions between economic parties. In this way, they engage in qualitative asset transformation operations. The liquid stock market facilitates quick trading of securities without significant decline in price. Since stock price reflect all intrinsic features of assets thus liquid stock market promptly adjust any new information about the security and may be perceived to eliminate information asymmetry. Thus, the liquid stock market may function as a substitute of financial intermediaries and affect the liquidity creation by banks adversely due to reduced deposits in banks by depositors and also by reduced demand of their loans by firms. in addition, the economic policy uncertainty may result in increase in information asymmetry in the market and hence may affect banks' activities including liquidity creation. Furthermore, the enhancement in banking sector competition leads to squeeze information asymmetry that may hamper the need and demand of bank advances and liquidity

creation. However, neither stock market is efficient enough to completely eliminate disparities in information nor perfect competitive financial markets are in existence (Modigliani & Miller, 1958). On account of deficiencies in both stock and financial markets, the role of banks is recognized as vital for the economic growth of a country (Theil, 2001). Banks on the one hand transform liquid liabilities (deposits) to illiquid assets (loans/investments) and on the other hand facilitate trading between parties. Moreover, banks, while creating liquidity are faced by various risks and failure. The banks with higher level of equity capital are capable of absorb default risk and it also enhance the risk-taking stance of banks. Similarly, the higher funding liquidity enables banks to meet their short-term liabilities (customer claims) but to retain a minimum level of liquidity, banks have to reduce their lending which consequently reduce their liquidity creation.

1.2.2 Agency Theory

This theory suggests that managers are agents of owners. On account of difference in interest, priorities and risk-taking stance between both parties there may issue of agency. On the same line, the banks act as agents for the providers of funds while executing their quantitative asset transformation. As a result, they need to provide several services like monitoring, risk management, insurance, and create liquidity in order to keep the stakeholders' liquidity and profitability at a satisfactory level. When an intermediary offers solution (such as hedging, capital cushions, or insurance) to ensure that its customers' obligations will be fulfilled, it incurs agency fees. Diamond and Dybvig (1983) view banks as a coalition of depositors whose primary function is to safeguard depositor's need of liquidity. Banks work in collaboration in order to provide information (Leland & Pyle, 1977) whereas Diamond (1984) consider banks as representatives of their clients and are capable of taking advantage of economies of scale. That is why savers entrust their money to intermediaries; the money may then be invested in anything the savers deem to be a good idea, and their funds are available for withdrawal at any time, under their terms of service. The banks are engaged in transforming clients' deposits into illiquid assets by advancing long term loans to firms. On the one hand, they convert idle resources into productive investment and contribute to economic growth at macro level and on the other hand they are exposed to various risk like default and liquidity risks. Banks have to satisfy their depositors as well as owners. However, in achieving higher profits they have to increase risk levels. The financial crisis of 2008 is attributed to illiquidity positions of financial intermediaries

and deficiency in their solvency due to lower capital levels. The BASEL regulations are intended to strengthen banks by increasing their capital as well as liquidity levels. These may reduce their capability to create liquidity in the economy. Thus, there may trade of between stationarity and liquidity creation of banks. The effect of stock market liquidity on bank liquidity creation is crucial as it may act as substitute or complement to banking institutions. Further, the economic policy uncertainty exerts negative effect on liquidity creation and reduce their profits at micro level and economic growth at macro level. In addition, the competitive banking market reduces banks' profits and liquidity creation. The imposition of BASEL regulation of higher capital and liquidity requirements may change the ability of bank risk taking and risk absorption capacity that may affect bank behaviour towards changing stock market liquidity, economic policy uncertainty and competition. Thus, the analysis of BASEL regulations with liquidity creation in context of external factors is of crucial.

1.2.3 Competition Fragility Hypothesis

According to the theory, fierce bank competition limits banks' profits margins that leads to lower charter value of the bank. This decline in charter value motivates banks to take risker stance in order to increase their profits which then adversely affects their soundness and consequently reduces their liquidity creation. This theory proposes that dominant financial institutions are less affected by the switching decisions of their borrowers (Hauswald & Marquez, 2006) and therefore have more inclination of providing loans to new and riskier clients as existing lending are hard to provide profits. Based on their postulates, Petersen and Rajan (1995) propose that banks intend to develop credit ties with new opaque businesses in less competitive market and compensate for initial information costs associated with doing so. High levels of bank competition in the face of information asymmetries make it harder for banks to take advantage of credit terms without quickly dissolving such agreements, reducing the likelihood of banks internalizing those gains. This is because the borrowers will go for the banks offering lower financing pricing, while competitor banks take advantage of initial evaluation conducted by first bank and provide better credit terms. Petersen and Rajan's (1995) theoretical prediction that banks with market power create more liquidity can be considered as an interpretation of this phenomenon; banks with market power are inclined to advance more credits by taking advantage of established relationship with clients. This in turn brings more deposits to them on account of strong bindings with them. The increased competition will reduce the motivation for them to

create new liquidity. In addition, the in struggle of earning higher profits, banks incline to reallocate their assets toward riskier one and expose of excessive risk and moral hazards that compel them to retain higher capital to absorb these risks. However, the higher capital in turn acts as motivator for banks to take on more risks. Thus, more capital acts as tax on banks that shrinks their profits and liquidity creation.

1.2.4 Competition Stability Hypothesis

According to the theory, higher competition in banks leads to stable banking industry that is characterizes by lower credit risks associated with lower financing cost on loans for firms (Boyd & De Nicoló, 2005). This idea is consistent with the widely held belief in the field of industrial organization that dominant businesses (banks in this example) gain monopoly rent by selling their wares at prices higher than market price (Chamberlin, 1969; Klein, 1971). This results in a poorer return on deposits and an inefficiently low supply of loans for borrowers. The theory proposes that more rivalry among banks is good for liquidity generation because it encourages banks to provide more competitive loan and deposit rates in response to increased demand along with more deposit competition (Boot & Thakor, 2000; Carbó-Valverde et al., 2009). The banks with more market power offers advances at higher rates that increases the probability of default of borrowers due to inability to repay higher prices of the loans. Thus, according to Boyd & De Nicoló (2005), higher market concentration is associated with fragility of bank. Although competition results in lower profits margins for banks that reduces liquidity creation by individual banks but overall, the gross liquidity creation may increase in the economy in more competitive banking industry. In addition, the fewer banks operating in concentrated market, it leads to problem of 'too-big-to fail' as regulators are more anxious about failure of important banks. These incentives promote risk taking stance among banks leading to instability of banks (Mishkin, 2001).

1.2.5 Capital Buffer Theory

This theory may be perceived as a dynamic version of Charter Value Theory. The theory envisages that banks, by retaining a buffer capital above minimum required level, enable them to absorb loss in periods of stress (Jokipii & Milne, 2008). This theory suggests both positive and negative association, in the long run, between capital level and risk taking of banks which is consistent with Charter Value theory. However, in the short run, the degree of capitalization

determines the direction of relationship between capital buffer and risk of banks. The relationship is positive (negative) for high (low) capitalized banks. Thus, in short run, an increase in capital requirement leads to reduction in risk level that consequently reduce the liquidity creation of banks.

1.3 Gap Analysis

The study considers the recommendations given by various research studies and attempts to fill these gaps during current research.

1.3.1 Bouwman (2013) identifies a potential research gap of investigating the moderating effect of BASEL regulations (capital and funding liquidity) and considers it critically vital to understand the interaction. Thus, this research thesis intends to fill this research gap by extending literature on liquidity creation by investing the moderating role of BASEL regulations (Capital and Liquidity) simultaneously, particularly, on the relationship between stock market liquidity, economic policy uncertainty and bank competition with bank liquidity creation. This provides important insight of bank behaviour that may change in response to the external factors when they retain minimum capital and liquidity levels.

1.3.2 Allen (2014) argues, after review of recent literature, that massive literature addresses the impact of capital (one of the BASEL regulations) on liquidity creation, however no research has investigated the role of funding liquidity (the second BASEL regulation) on bank liquidity creation. Thus, the study highlights this research gap and recommends to analyze the impact of both BASEL regulations (capital and liquidity) on relationship of stock market liquidity, economic policy uncertainty and bank competition with bank liquidity creation. In addition, Toh et al. (2019) envisage that bank liquidity creation is stimulated when the stock market liquidity improves in Malaysian market. Moreover, the study documents that capital has adverse moderating effect on liquidity creation. This study, however, does not address the combined moderating effect of Capital and funding liquidity on the said relationship. Thus, there is need to examine the role of both of BASEL regulations on bank liquidity creation as moderator that may change the impact of stock liquidity on liquidity creation. Hence, this thesis contributes to body of knowledge by

providing analysis of the interconnection of stock market liquidity and bank liquidity creation under presence of BASEL regulations.

1.3.3 Umar and Sun (2016) document the stock market liquidity as a significant determinant of liquidity creation. They recommend to investigate the role of capital on this relationship as moderator. Thus, this study attempts to fill this research gap and investigate the effect of liquid market on bank liquidity creation with moderating role of capital and funding liquidity in emerging economies.

1.3.4 Berger et al. (2018) investigate the effects of Economic Policy Uncertainty (EPU) on total liquidity creation of US banks and find that increase in Economic Policy Uncertainty results in decreased total bank liquidity creation. They suggest that many independent topics on Economic Policy Uncertainty and liquidity creation are yet to be explored and therefore, further research in this direction is needed. This study is, therefore, an extension of Berger et al. (2018) as it examines the relationship of Stock market liquidity, Economic Policy Uncertainty and bank competition with liquidity creation in emerging economies. Moreover, this study presents a new dimension of these relationship by analyzing the role of BASEL regulations on these said relationships as moderator.

1.3.5 Toh et al. (2019) envisage an adverse effect of bank competition on liquidity creation. They recommend other factors to be scrutinized that may alter this effect. Hence, more research is needed to examine other factors that may change the impact of market power on liquidity creation. It would be, therefore, worth investigating the influence of market power on liquidity with the influence of BASEL regulations. Since both capital and liquidity may alter the bank behaviour and capacity to react in face of changing competition in the banking sector and provides new direction of this relationship.

1.3.6 Since, review of past literature evidence that most of the research on liquidity creation has been undertaken in advance economies like U.S., Europe and GCC countries (Berger et al., 2018; Chatterjee, 2015). Whereas very little has addressed the developing and emerging economies. The macroeconomic, institutional and environmental situations in advanced countries are different than in emerging economies. Therefore, more research in the context of emerging economies is needed that may unhide interesting outcomes. This thesis, therefore, is an attempt to fill this contextual research gap by analyzing the impact of external factors (stock market liquidity, economic policy uncertainty and competition)

on bank liquidity creation in emerging economies with a sample data of 11 Asian emerging economies.

1.4 Rationale of Study

The well recognized role of banks in the economy has been the motivation of this thesis. Banks creates liquidity in the economy by transforming liquidity deposits (liabilities) into illiquid assets (loans to borrowers) and contributes to economic development (Fidrmuc, Fungáčová & Weill, 2015). In creating liquidity banks are exposed to various risks including its stability. On account of their crucial role in the economy, it is desirable to undertake detail research concerning banking activities and liquidity creation. A massive literature focuses and confirms the influences of various determinants on liquidity creation however, there are some factors that require more detail research in this area. This thesis therefore, analyses three important external factors that influence bank liquidity creation namely, stock market liquidity, economic policy uncertainty and competition.

One of the key motivations of this research is to investigate the impact of asset market illiquidity on bank liquidity creation. A few past studies proves that illiquidity of asset market adversely affects liquidity creation (Diamond, 1997; Levine 1991), whereas some of recent studies find its favourable impact (Chatterjee (2015); Toh et al., 2019). Thus, with inconclusive results provided by past literature, this being important to examine the issue as asset market liquidity may has adverse effect on bank liquidity and consequently hamper economic growth. In addition, most of literature addresses advanced economies and the study of Toh et al. (2019) is the only study that address emerging economy (Malaysia). Therefore, there is dearth of research in context of emerging markets that has significantly different conditions of economic growth, stock markets and financial institutions. This thesis therefore, examine this relationship by analyzing comprehensive sample data of 11 emerging economies of Asia. Further the study provides comparative analysis of large and small banks since bank size has been proved to behave differently and significant determinant of liquidity creation. It is possible that both negative and positive effect of stock market liquidity is observed for different sizes of banks.

Moreover, after the epidemic of financial crisis the BASEL and other regulations have been introduced in order to strengthen banks soundness and liquidity position. Although past literature provides handsome evidence of significant effect of capital (one of the BASEL regulations) on

liquidity creation, however, it ignores the role of BASEL regulations for banks since banks may change their behaviour in response to changes in stock market liquidity in the presence of BASEL regulations. Hence, there is need to explore the role of these regulation on liquidity creation with changing situations of stock liquidity which is one of the motives of this thesis.

Second, after Global Financial Crisis 2008 an increased uncertainty is being recognized due to complex modifications in economic and political policies globally (Bloom et al., 2018) and has attracted the research to explore the impact of economic policy uncertainty on economic activates and banks. Some of these studies envisage an adverse effect of economic policy uncertainty on bank lending and investments (Gilchrist Sim & Zakrajˇsek, 2014). However, there is only one study of Berger et al. (2018) that analyse U.S. banking system and finds significant negative impact of economic policy uncertainty on bank liquidity creation. According to our knowledge, no study has investigated the role of economic policy uncertainty in context of emerging economies. The level of economic policy uncertainty has been higher in emerging economies as compare to US and advance countries. Therefore, the need for research in emerging economies become more vital. Hence, it is another motivation for this thesis that provides analysis of relationship between economic policy uncertainty and bank liquidity creation with a comprehensive sample of emerging economies.

In addition, this study also provides a new dimension by examining the role of BASEL regulation that may cause bank behaviour to change when facing economic policy uncertainty. The banks that retain capital and liquidity levels in accordance to BASEL regulations, may have different capabilities to cope with economic policy uncertainty and thus behave differently as compare to those banks that have lower levels of capital and liquidity. This thesis, therefore, contributes to existing body of knowledge by analysing the role of BASEL regulations as moderator for the relationship between economic policy uncertainty and bank liquidity creation.

Third, the intended role of regulations to promote competition in banking industry is well recognized. Since competition may influence bank risk taking capacity that ultimately may enhance/reduce the liquidity creation of banks. The existing literature provides contradictory views for the influence of bank market power on liquidity creation. The majority of the studies focus advance countries and only a few studies address emerging economies like Shah et al. (2019) and Toh et al. (2019) for China and Malaysia, respectively. The situations in emerging economies differ with respect to economic development, stock market development, banking

industry structure and competition than those in advance economies like U.S. Thus, it is possible that banks in emerging economies have dissimilar capabilities and features to response to competitive banking market. This thesis, therefore, contribute to literature of competition and liquidity creation by analysing banking sector of Asian emerging economies. Further, the banks of different size behave differently to their external environment and it is possible that large banks have more market power are less or more effected by increasing competition compare to small banks. This thesis provides a comparative analysis of large and small banks in this context.

Moreover, the introduction of minimum capital and liquidity requirement by BASEL regulations are expected to affect banks abilities and constraints by changing their capacity to absorb risks and available funding associated with capital and liquidity requirements, respectively. Thus, the net effect of both regulations capital and liquidity may result favourable or hostile consequences for banks in creating liquidity in the economy. None of the studies has addressed the role of BASEL regulations in determining the relationship between bank market power and liquidity creation and there are some important questions that need to be answer. This thesis, thus, provide some important insight of the role of BASEL regulations to effect relationship between bank competition and liquidity creation in emerging economies.

1.5 Problem Statement

The function of banks as liquidity creators is being acknowledged that has attracted researchers and policymakers to further understand the various consequences of liquidity creation (like economic growth, investment, financial crisis) as well as factors that affects liquidity creation. A massive literature confirms the influences of various determinants on liquidity creation. However, there are some factors including market liquidity, economic policy uncertainty, and competition that are still debatable and thus needs to be investigated in more detail.

The effect of stock market liquidity on bank liquidity creation has been the topic of much theoretical interest but few empirical investigations that hypothesized its positive (Chatterjee, 2015; Toh et al., 2019) and negative (Levine, 1991; Diamond, 1997) impact on liquidity creation. A rapid increase in economic policy uncertainty, after global crisis 2008, has been evidenced to have positive (Acharya and Naqvi, 2012) and negative (Brogaard and Detzel, 2015) influence on liquidity creation. In recent past, the competition has been increased due to

globalization and literature proves positive (Toh et al., 2019) and negative (Horvath et al., 2016) impact of bank competition on liquidity creation.

The financial crisis 2008 has highlighted the importance of regulating banks' liquidity. Among others, two BASEL regulations (capital and liquidity) have been introduced that may mitigate the capacity of banks creating liquidity. Hence, the dearth of research on the effect of BASEL regulations on bank liquidity posits various questions that open new avenues on this issue. For instance, what would be banks' behaviours towards highly liquid stock market, economic policy uncertainty and competition when they fulfil these requirements of capital and liquidity? Whether there is any difference between banks complying with these regulations, when there is high liquidity asset market or uncertainty or competition in the banking sector? This research, thus sheds light on these important questions by investigating the role of BASEL regulations on the relationship between three external factors and bank liquidity creation in emerging economies. The study utilizes quantitative methods to analyze data set consisting of annual observations of banks in 11 Asian emerging economies. The research presents effectiveness of BASEL regulations in the context of external factors and liquidity creation in emerging economies. In addition, the study provides important implications for policymakers, regulators and bankers and also offers new avenues for future academic research.

1.6 Research Questions

The present study thus attempts to answer to the following questions.

1. Does stock Market Liquidity Impact Liquidity Creation in emerging economies?
2. Does Economic Policy Uncertainty affect Liquidity Creation in emerging economies?
3. Does Bank Competition Influence Liquidity Creation in emerging economies?
4. Have BASEL regulations moderating effect on relationships between selected external factors and Liquidity Creation in emerging economies?
5. Does the impact of Stock Market Liquidity on Liquidity Creation in emerging economies change under moderating role of Bank Capital and Funding Liquidity?
6. Does BASEL regulations moderate the relationship between Economic Policy Uncertainty and bank liquidity creation in emerging economies?

7. Do BASEL regulations alter the influence of bank competition on liquidity creation in emerging economies?

1.7 Research Objectives

Motivated by identified gap in research literature regarding bank liquidity creation and its relationship with external factors like stock market liquidity, economic policy uncertainty and bank competition, this research is devoted to analyze these relationships. Furthermore, with importance of role of BASEL, this research also attempts to explore the role of BASEL regulations in determining the effects of these variables on liquidity creation. Hence, the present study focuses on achieving the following objectives.

1. To investigate the impact of Stock Market Liquidity, Economic Policy Uncertainty and Bank Competition on Liquidity Creation in emerging economies.
2. To explore the direct impact of BASEL regulations (Capital and Funding Liquidity) on bank liquidity creation in emerging markets.
3. To examine the moderating effect of Capital on the relationship between Stock Market Liquidity and bank Liquidity Creation in emerging economies.
4. To find out the moderating role of Funding Liquidity on the relationship between Stock Market Liquidity and bank Liquidity Creation in emerging economies.
5. To investigate the combined moderating effect of Capital and Funding Liquidity on relationship between Stock Market Liquidity and bank Liquidity Creation in emerging economies.
6. To analyze the moderating effect of Capital on relationship between Economic Policy Uncertainty and bank Liquidity Creation in emerging economies.
7. To inspect the moderating role of Funding Liquidity on relationship between Economic Policy Uncertainty and bank Liquidity Creation in emerging economies.
8. To find out the combined moderating effect of Capital and Funding Liquidity on relationship between Economic Policy Uncertainty and bank Liquidity Creation in emerging economies.
9. To examine the moderating effect of Capital on the relationship between Bank Competition and bank Liquidity Creation in emerging economies.

10. To examine the moderating role of Funding Liquidity on relationship between bank Competition and bank Liquidity Creation in emerging economies.
11. To investigate the combined moderating effect of Capital and Funding Liquidity on relationship between bank Competition and bank Liquidity Creation in emerging economies.

1.8 Significance of Study

1.8.1 Theoretical Significance

The study has several distinct features. First, it explores the effect of external factors (stock market liquidity, economic policy uncertainty and bank competition) on bank Liquidity Creation in emerging economies. Second, not a massive empirical literature is available that focuses the impact of stock liquidity, Economic Policy Uncertainty and Bank Competition on bank liquidity creation. Third, the existing literature on these areas offers a static view of the impact of these factors (stock market liquidity, economic policy uncertainty and bank competition) on liquidity creation. This study contributes to the existing research by exploring moderating role of capital and funding liquidity on the relationship between these external factors (stock market liquidity, economic policy uncertainty and bank competition) on bank liquidity creation in emerging economies. Fourth, as regard to liquidity requirement, the second regulation of BASEL, there is no study that investigates its moderating role in determining the relationship between stock market liquidity, economic policy uncertainty and bank competition and bank liquidity creation. As stated by Allen (2014), a huge literature is available with regard to capital regulation, but we do not even know about liquidity requirement. This study is the first that investigates the role of liquidity requirement as moderator on the relationship between stock market liquidity, economic policy uncertainty and bank competition) and bank liquidity creation. Lastly, this study investigates the role of both of BASEL regulatory tools, capital as well as Funding Liquidity, simultaneously, as moderator, on the above three relationships. No previous research addresses the moderating roles of both Capital and Funding Liquidity simultaneously in this regard.

1.8.2 Contextual Significance

The review of literature on liquidity creation and impact of various other factors on liquidity creation evidence that most of the past literature address advanced economies like U.S., Europe and OECD (Chatterjee 2015; Choi, 2018; Kim, 2012; Berger et al., 2018; Horvath et al., 2016),

however, scarce research work is done that focus emerging and developing economies. The differentiation of developed and emerging economies is important because of significance variances of economic environments (Alvaro, 2008), socio-cultural norms (Halme & Laurila, 2009) and institutional factors (Charnes & Gneezy, 2012). Therefore, this research contributes, contextually, to existing body of knowledge by examining the impact of three important external factors, stock market liquidity, economic policy uncertainty and competition on bank liquidity creation in emerging economies. Further, the existing studies focusing emerging economies based on single country such as study of Toh et al. (2019), Shah et al. (2019) provide analysis of Malaysian and Chinese banking sectors, respectively with data set of five years from 2011 to 2015. The results of their studies cannot be generalized. Whereas this research thesis utilizes a larger and most recent data set of 11 emerging economies with most recent data from 2011 to 2019. Therefore, this study contributes to the research on the topic with comprehensive data set and generalizable results.

1.8.3 Practical Significance

In addition to above, the present research thesis provides a few practical significances that may be useful for policy makers, regulators, investors and banks. The research evidences that external factors are important determinants of liquidity creation and must be considered while developing policy or regulation. The results of the study suggest that BASEL regulations have significant moderating role on all the three relationships under study (that are stock market liquidity, economic policy uncertainty and competition with bank liquidity creation) and may be effective tools that can alter the effects of these three external factors on liquidity creation. These results are of serious concern for regulators, especially for financial and banking institutions since banks liquidity creation favours economic growth. The regulators should consider these effects of BASEL regulations while reviewing and devising new regulations to avoid any policy trade off. Moreover, the results provide guidelines to bankers and managers about the advantages of higher capital and liquidity levels in periods of high stock market liquidity, high economic policy uncertainty and more competitive banking sector. In addition, the results provide important input to policy makers about the consequences of public policy uncertainty and promoting competition in banking industry for public welfare and economic development of the country. Furthermore, the interaction of stock market liquidity and bank liquidity creation assists investors in portfolio and risk management. Finally, the study is beneficial for international bodies regulating financial

institutions and banking systems in reviewing and enhancing existing policies in this regard. The study contributes to the existing body of knowledge and forms the basis for further research studies.

1.9 Organization of Study

The remainder of this study is organized as follows. Chapter 2 documents theories relating to selected external variables and liquidity creation. This is followed by empirical literature for each relation that leads to hypothesis development. The theoretical framework and empirical model are elaborated in chapter 3 that also outlines the measurements of variables. Results of data analysis is discussed in Chapter 4. And Chapter 5 is devoted to report conclusions, policy implications and future recommendations.

Chapter 2

Literature Review

2.1 Introduction

The review of existing studies on bank liquidity creation and its relationship with three external factors is revisited here. This is followed by literature regarding BASEL regulations and their relationship with liquidity creation. The chapter consists of eight main sections outlined as follows. Section 2.2 documents the theoretical foundation of bank liquidity creation. The next three sections are devoted to discuss past literature about three external factors: Stock Market Liquidity, Economic Policy Uncertainty and Bank Competition and their relation with liquidity creation. These sections start with brief definition, importance of these factors, and existing theoretical perspective of their relations with bank liquidity creation. This is followed by empirical literature on these relationships. These sections end up with the formulation of hypothesis in accordance to our main objectives. In Section 2.6 and Section 2.7, the theoretical understanding of bank Capital and Funding Liquidity in relation with liquidity creation is illustrated which is followed by empirical literature and development of hypothesis. Section 2.8 briefly explains and formulates the extended hypothesis in order to address our main objective of investigating the combined moderating effect of BASEL regulations simultaneously on relationship of three external factors and bank liquidity creation. Finally, Section 2.9 documents the theoretical framework developed in light of existing literature.

2.2 Bank Liquidity Creation Theories

The banks facilitate as middle man between two parties and perform their role of creating liquidity. the first party, the consumer, has saved money but is unaware about their consumption. They are reluctant to invest directly in assets because these investments have uncertainty in amounts and frequency of providing cash flows. Thus, they desire to have regular income generation source out of their savings and at the same time they could be to get back their money in cash when they need it. The second party is the producers or firms who has opportunities of generating income through investment of money in their business activities. They need funds to be invested in their business and offer return to lenders. The banks have such ability that they can facilitate both of parties by fulfilling their desires by making funds available (through creation of

liquidity) to both parties and charge reasonable fee on these services called interest (Diamond & Dybvig, 1983). The risk-sharing benefits of demand deposits among consumers with irregular consumption patterns are highlighted in this model, which place a focus on the liability part of balance sheet of bank. Demand deposits, a key component of liquidity creation, may be used to provide these people instantaneous access to their money, allowing them to more easily spread out their spending. Banks use customer deposit to invest in illiquid assets as part of their lending technology to firms. By investing in securities, the depositors are exposed to information asymmetry and risk. Whereas depositing money in banks they are secure from unexpected need of money and hence banks are better option compare to direct investment that may result in negative return in case of liquidation of illiquid securities even in competitive markets. When customers are unable to predict when they will need money, they put their money in demand deposits at banks, where the return on investment is more consistent over time and the underlying asset is easier to convert to cash.

The banks share risks by pooling funds (liquid assets) of customers and cross-subsidizing a balance where depositors' trust in the banks is preserved. There is a risk of insolvency faced by bank when a large share of capital structure is comprised of deposits. Because of the sequential service constraint, a bank run is an unfavorable in which all clients, including those who are not worried about the bank's failure, take their money at once. In these models, the bank reserve is similar to government deposit insurance that acts as lender of last resort to secure banks failure. These models lack in showing, implicitly, that deposits and loans work together. They lay the groundwork for one of the most crucial steps in the process of creating liquidity by connecting banks' illiquid assets with their liquid obligations.

Several studies have been conducted to expand and evaluate the Diamond and Dybvig (1983) model, with some findings that banks lose their competitive advantage when it comes to offering risk-sharing possibilities in a non-regularized and liquid capital market. Haubrich and King (1990), Diamond and Rajan (2001), Berger and Bouwman (2009), Horvath et al. (2016); and Chatterjee (2015) are among a few well-known examples of recent research on how banks generate new liquidity.

Bank deposits, although are essential for liquidity creation. They also act as a tool of market discipline in favor uninformed investor (Chatterjee, 2015). The production investment is irreversible and has low immediate resale value, making loans to business illiquid. Banks are unable to recover all advances made to businesses and borrowers in situation when all depositors claim their money. However, demand deposits on the liability side help banks meet their liquidity needs, provided the depositors are assured that bank would use its specialized collecting powers in the future. Banks are restrained by the risk of a depositor run due to lower capital level from withholding its collection skills against depositors' interests. To avoid this possibility, banks will make commitments, increasing liquidity. Berge and Bouwman (2009) shows that stabilization measures like capital restrictions, limited banking, and suspension of convertibility are expensive and counterproductive.

Holmstrom and Tirole (1998) showed that the private sector can benefit from an effective liquidity allocation if banks provide loan commitments beyond the scope of their balance sheets. Loan commitments are like demand deposits in that they allow consumers to access their bank for immediate cash. Kashyap et al. (2002) argue that banks through loan commitments and deposits may achieve significant collaboration. When the economy is in its normal form where not all depositors run the banks, the stock of idle liquid assets may be efficiently employed to meet the needs of incumbent borrowers for committed lending. Otherwise, financial instability and bank runs may occur from any sector of the economy growing at a disproportionate rate. Kashyap et al. (2002) not only detail two crucial empirical discoveries supporting the theory, but they also provide supporting evidence for it. As a first point, banks that issue more demand deposits also engage in more commitment-based lending. Second, since they accept deposits, banks are able to provide more commitment-based lending than non-bank intermediaries like financing businesses.

For the benefit of the non-bank public, banks store illiquid non-monetary assets and provide liquid items for their demands, hence fostering welfare and economic growth through increased consumption and output. Financial institutions are always at risk of collapse due to a liquidity mismatch between their assets and obligations; yet, this instability serves as a mechanism for incentivizing the banks to look out for the best interests of their less-informed clients (Marozva, 2017).

2.3 Stock Market Liquidity and Liquidity Creation

Liquidity in capital market is the ease with which substantial amounts of equity securities may be traded among market participants without significantly impacting the pricing of such assets (Borio, 2000; Sarr & Lybek, 2002). Stockholders' transaction costs, or the effort required to turn their holdings into cash, are implicit in the concept of liquidity (ECB, 2012). The success of any stock exchange depends on the ease with which investors may buy and sell the numerous securities that are traded there (Sarr & Lybek, 2002).

According to fundamental assumption, depositor are savers who rely on banks for investment and firms on the other hand obtain funds from banks. The theory of liquidity creation states that deposits are essential part of funds for bank to create liquidity. The incentive issues formerly associated with depositors' investment preferences, corporations' financing options, and banks' liquidity provision have shifted, however, as the financial system develops and becomes more liberalized (Chatterjee, 2015). There have been studies that have explored theoretically, the effect of stock market liquidity on liquidity creation of banks including studies of Mattana and Panetti (2014); and Toh et al. (2019). There exist two opposing strands of theory in past literature about Stock Market Liquidity and Liquidity Creation. These two theoretical strand points are discussed in this section.

2.3.1 Market-Bank Liquidity Crowding out Hypothesis

An extension of Diamond and Dybvig (1983) model is presented in a research study by Jackline (1987) and proves that in comparison with equity shares in the market the risk sharing of depositors increases, on account of distinct consumption needs. However, in times when market is liquid, the risk sharing in both (deposits as well as equity shares) are equalized that provides the investors an additive opportunity to earn higher long-term return through asset market and motivate them to directly invest in the market rather than go for the deposit in banks. Jackline (1987) suggests that capital market may be a potential competitor of banking institutions since these are liquid to provide trading facility with no cost and hence this competitive advantage markets may lead to reduce the demand of funds from banks and thus results in decline of their liquidity creation.

Furthermore, Wallace (1988) discovers that capital markets of current age are equipped with technology are capable of offering investor prompt and over the counter trading facility. This provides the investor to switch from banking deposits to involve directly in the capital market for trading activities and they are able to finance their unexpected liquidity needs by borrowing short term funds from the market against their share assets. Based on these findings, if the capital market is accessible to investors, it can serve as an alternative trading mechanism to bank deposit arrangements. Haubrich and King (1990) and von Thadden discover similar things concerning banks' diminished liquidity generation function as a result of rising capital market liquidity (1998). Both articles contend that, if a country has a perfectly liquid capital market, there is no need for banks since investors can get their money if they need it without worrying about banks going out of business.

Levine (1991) and Bencivenga et al. (1995) echo the findings of earlier theoretical works in arguing that investors are deterred from putting money into illiquid firm capital because of the risk of losing money on their investments if a liquidity shock hits. They state that investors are relieved of the burden of a long-term capital commitment in a liquid stock market because they may make inexpensive portfolio adjustments in tandem and they are also able to sell their holdings in the companies at higher amount that they would receive if the companies were liquidated early. Meanwhile, enterprises with limited access to capital are protected against losses in productivity thanks to insurance against having to sell up assets too soon. This in turn boosts long-term investment and economic growth.

Diamond (1997) theoretically shown that the liquidity of the capital market affects both the liquidity creation and equity share of capital of banks. When financial market is not entirely liquid, banks do two things to make up for it: (i) they store illiquid that are unable to provide funds quickly, and (ii) they subsidize depositors by paying them greater short-term rates than the market. Market liquidity improves as a result of increased investor activity, and this in turn encourages the redeployment of savings that would otherwise be kept in banks into financial asset investment.

Additionally, due to liquid market, the corporations are able to reduce maturity gaps between actual assets and stock issued by issuing longer term securities. As the market nears full

liquidity, the maturity spread tends to disappear. Therefore, Diamond (1997) believes that there is comparatively more decline for long term assets as compare to short term assets of banks when the capital market is fully participated (or liquid). Because of this, there is a reduction in the total amount of money that can be generated by banks and the financial system.

2.3.2 Market-Bank Liquidity Enhancement Hypothesis

Song and Thakor (2010) suggest a liquid stock market to grow due to financial institutions. This is highlighted by the recent theoretical literature that takes a disjointed view of banks and capital markets. Borrowers' financing options between banks and capital markets are heavily influenced by financing cost because it is one of the major obstacles to obtaining cash. Companies are more likely to choose market financing over bank financing as a result of greater market liquidity, which decreases the friction associated with financing on a stock market. When bank equity is included, however, an "enhancement effect" is seen going from stock markets to banks, suggesting that stock market liquidity increases the size of liquidity creation by banks. To retain higher capital, in order to advance more lending to server those borrowers that we neglected previously, the banks may obtain funds from liquid market. This means that banks may extend credit to a wider range of borrowers if they can generate adequate funds at reasonable rates from the stock market's liquid assets.

Although Mattana and Panetti's (2014) provides an enhanced view of traditional theory and suggests that banks are inclined to hold more of illiquid assets when stock market is liquid. This is similar to some theoretical model that characterize an economic welfare where banks and stock markets compete each other to attract clients by offering more returns and liquidity options to meet their unexpected needs for funds. Depositors choose between the both depending their predicted have a choice of making investments choose between the market channel and the bank channel to invest their funds based on their predicted preferences of liquidity and return. Banks need to have some cash on hand before investing in illiquid assets so that they may continue to cross-subsidize riskier deposits from more impatient customers. To fulfil the demands of their restless customers, banks invest less in the liquid reserves they need and more in illiquid assets as their customers' income improves and they become more comfortable investing in the stock market. That is to say, as stock market liquidity improves, the banks no longer need to hold

liquidity, allowing them to cut their balance sheet liquidity holdings and redirect the savings into more productive capital investments.

The positive effect of stock market liquidity on bank liquidity creation is evident from off-balance sheet commitments of banks like guarantees and contractual agreements with their borrowers and firms. Unlike direct bank lending, where one unit of liquid reserve supports just one business, commercial banks achieve optimum liquidity creation when they provide off balance sheet products since one unit of liquid reserve may support multiple enterprises in a stable economic condition (Holmstrom & Tirole, 1998; Kashyap et al., 2002). Large companies seek these commitments and pledges as an alternate financing at times they are unable to acquire adequate cash to the projected amount through direct capital from investors, which is made easier by a liquid stock market (Rajan, 1998). Hence, although active stock markets pose a threat to banks, they also present an alternative to them to generate liquidity along with utilize their existing funds efficiently through off-balance sheet commitments.

2.3.3 Empirical Literature on Stock Market Liquidity and Liquidity Creation

There is a dearth of empirical research that directly investigates the impact of stock market liquidity on banks' ability to create liquidity. According to Demirgüç-Kunt and Maksimovic (1996), the corporate finance options change as the stock market evolves. In advanced economies, a rise in equity leads to reduction in bank lending. Whereas in developing markets, leverage of large companies tends to increase with improvement of their equity financing through markets. This leads to increase demand for debt by these enterprises. Their study suggests a positive association between stock market liquidity and bank lending which in turn envisages a positive impact of stock liquidity on liquidity creation.

Chatterjee (2015) uses data of U.S. commercial banks and reports that stock market liquidity positively affects both the rise in aggregate bank liquidity production and the growth in liquidity creation by major banks. This research contends that larger banks that use a higher proportion of non-deposit capitals for investments benefit from improved stock market liquidity since this alleviates their financial restrictions. Chatterjee (2015) also shows that banks create more off-balance sheet liquidity as asset market progress and claims that liquid stock markets encourage the increased usage of off-balance sheet commitments.

Between 2007 and 2014, Umar and Sun (2016) analyze the relationship between stock liquidity, liquidity creation, and funding liquidity for listed banks in BRICS nations. Liquidity creation variation does not account for stock illiquidity variation, although stock illiquidity is a major predictor of liquidity creation. For smaller financial institutions, stock liquidity and liquidity creation are unrelated processes. For large banks, however, the illiquidity of stocks is a major factor in the creation of liquidity on the balance sheet, and this link is negative.

When the liquidity of the Malaysian stock market improves, Toh et al. (2019) predict that banks will be encouraged to provide more liquidity. The findings are in line with those of Chatterjee (2015) for U.S. banks, illuminating the significance of stock market liquidity in facilitating economic growth of a country via the liquidity creation channel regardless of whether the country adopts a bank-oriented or market-oriented financial system. Finally, the paper provides empirical evidence that higher capital and liquidity requirements have a chilling impact on banks' ability to create new liquidity.

It is evident from the review of past literature that the opposing theoretical hypotheses (positive and negative) are supported by various research works with regarding impact of stock market liquidity and bank liquidity creation. The work of Chatterjee (2015) favors Market-Bank Liquidity Enhancement Hypothesis, whereas empirical study of Umar and Son (2016) evidences Liquidity Crowding Out Hypothesis. Moreover, most of the research work is devoted to advanced countries of U.S. including the study of Chatterjee (2015). However, only a small number of studies including Toh et al. (2019), Umer et al. (2017) have focused emerging economies. It is, therefore, questionable as to what is impact of asset liquidity on bank liquidity creation in emerging economies and which among two theoretical hypotheses would be dominating in these economies. Hence our main hypothesis is formulated as:

H1: *There is a significant impact of stock market liquidity on bank liquidity creation in emerging economies.*

In accordance to existing literature that poses conflicting strands for stock market liquidity impact on liquidity creation, we formulate two contrasting hypotheses as follows:

H1a: *There is a significant positive impact of stock market liquidity on bank liquidity creation in emerging economies.*

H1b*: There is a significant negative impact of stock market liquidity on bank liquidity creation in emerging economies*.

2.4 Economic Policy Uncertainty and Liquidity Creation

An increased uncertainty is being recognized after the epidemic of Global Financial Crisis of 2008. On account of complex modifications in global economic and political policies, the level of uncertainty has been increased drastically in the last decade (Bloom, 2009; Nelson & Katzenstein, 2014; Bloom et al., 2018; Tran & Nguyen, 2019). A series of developments including US president election, refugee crisis in Russia, increased terrorism, event of Brexit are some of examples that has led to a state of political and economic instability globally. The GFC 2008 is also considered as a consequence of several uncertainties related to economic, monetary and fiscal policies of US and European authorities. The political division and increased intervention of state in economic affairs are significant factors of recent raise in uncertainty (Baker et al., 2013). In fact, uncertainty in government policies has a crucial role in economic growth of countries and particularly for those where uncertainty is higher. As a result of globalization and technological advancement, the spillover of influences has increased across the countries. The epidemic of GFC 2008 has forced policy makers and regulators to seek and develop and sound and stable financial system globally. Particularly, BASEL regulations are central in this respect.

Theoretically, it has been recognized by various studies that the uncertainty has significant influence on many economic activities including economic growth, investment, saving, consumption, corporate behavior, firms' performance, and financial markets (Bernanke, 1983; Dixit & Pindck, 1994). More specifically, the impact of uncertainty on banking activities has been envisaged by a massive literature empirically. Theoretically, there are two aspects about the impact of uncertainty on banking decisions related to credit, interest rate, deposits, dividends and risk-taking activities. The following section sheds light on these two aspects of theory about economic policy uncertainty and its impact on banks.

2.4.1 Uncertainty-Credit Crunches Hypothesis

According to this hypothesis, economic uncertainty has a deteriorating impact on bank lending. Various research studies support this strand and provide empirical evidence in support of this hypothesis. These include studies of Greenwald and Stiglitz (1990) and Pastor and Veronesi (2012). More recently, other studies explained that financial institutions are more likely to have cautious stance when are faced by peaked policy uncertainty. As a result, they tend to suspend lending and investments (Gilchrist Sim & Zakrajˇsek, 2014). On the other hand, Brogaard and Detzel (2015) argue that external financing costs rise due to economic policy uncertainty and banks face with limited funding. This eventually, compel the banks to reduce or suspend their lending. Moreover, banks mangers, when facing economic uncertainty take stance of risk aversion (Panousi and Papaniko-laou, 2012). The reduced lending and risk aversion behavior is responded, homogeneously by all the banks in high uncertainty periods (Chen & Funke, 2003; Calm`es & Th´eoret, 2014). Gulen and Ion (2016) argue that policy uncertainty is a short-term phenomenon and the flexible behavior of banks for reducing loans provides them opportunities to make profits in future.

2.4.2 Uncertainty-Credit Expansion Hypothesis

This strand supports the argument that bank are motivated to take risks in times of high economic policy uncertainty. In anticipation of negative consequences of policy uncertainty, firms postpone their investments projects and retain liquidity, to safeguard them from these negative consequences or uncertainty. On the other hand, household consumption is also reduced resulting in an increase of saving (Giavazzi & McMahon, 2010; Aaberge, Liu, & Zhu, 2017). The overall effect of decreased investment from firm side and consumption form household leads to increased saving and abundant liquidity available with banks. This abundant liquidity induces banks to become less cautious about future risks attached with economic policy uncertainty, and thus increases lending (Acharya & Naqvi, 2012). Another factor that motivates banks to take risk is state programs to extend insurance facility to banks in times of economic uncertainty in order to protect banks default (Tran & Nguyen, 2018). These types of protective measures adopted by government also have adverse influence on banks (Cubillas, Fonseca, &

Gonz´alez, 2012; Berger & Turk-Ariss, 2014) and provide another channel to motivate bank mangers to have risk taking behavior and increase lending.

2.4.3 Empirical Literature on EPU and Liquidity Creation

This section reviews the past empirical literature focusing on the possible effects of Economic Policy Uncertainty on overall economy, market agents, house hold and corporations and financial markets. In general, the past literature envisage that all economic agents are compelled to adopt conservative stance during high uncertainties. The study of Bake et al. (2013) envisages that economic policy uncertainty caused deterioration of economy by reducing output, employment and investment. These eventually implies to adversely affect economic growth of the country.

A massive literature addresses the impact of economic policy uncertainty on corporate behavior and various proxies for economic policy uncertainty are applied in order to quantify its impact. The study of Tian and Ye (2017) suggests that EPU impede not only merger and acquisition but also compel firms to cut back venture capital investments (Bonaime, Gulen, & Ion, 2017; Nguyen & Phan, 2017). In addition, Waisman, Ye and Zhu (2015) find an increased cost for debt financing for corporates due to increase in economic policy uncertainty. Reduction in capital expenditure by firms is reported by Gulen and Ion (2016) whereas Straks and Sun (2016) document significant change in mutual funds of firms as a response to economic policy uncertainty. Tan (2020) documents a significant decline in pay-out ratio by the firms due to unexpected consequences of economic policy.

The study of Panousi and Papanikolaou (2012) suggests that a rise in economic policy uncertainty results in a reduction of investment by firms. Afterwards, Kaviani et al. (2017) also evidences the same effect of EPU on investment and suggestes the cause of this effect as the rise in cost of financing and risk aversion behaviour of top managers. Gulen and Ion (2013) further identify that the adverse effect of policy uncertainty on investment is more significant where firm investment is dependent on public expenditure. Similar results are documented by Li and Yang (2015) by analyzing investments of Chinese firms and confirm that EPU has significantly negative impact on investment, specifically for the firms that are attributed to more dependent on government expenditure, lower leaning capabilities, lower institutional shareholding and more

concentrated ownership. A recent literature confirms that economic policy uncertainty results in reduction in investment and the effect prolongs during higher EPU (Baker, Bloom, & Davis, 2016; Gulen & Ion, 2016). The result of deteriorating effect of EPU on investment is endorsed by Baker et al. (2016) and Kim and Kung (2017). Increased EPU induces firms to retain more liquidity as precaution during times of uncertainty (Wang et al., 2014). Aaberge, Liu, and Zhu (2017) conduct research with sample data for Chinese household expenditures and results of their study envisage a decline in household expenditure (increase saving) on account of political uncertainty raised after Tian'anmen Square event.

A massive literature focuses on investigating the relationship between economic policy uncertainty and stock market in past three decades. Brogaad and Detzel (2014), and Liu and Zhang (2015). Antonakakis et al. (2013) provide analysis of correlation between economic policy uncertainty, stock return and volatility of stock return in US stock market. Using DCC GARCH model, their study evidence a significant negative correlation between EPU and US stock return and EPU has reduced the stock return during period of high economic uncertainty. On similar lines, Kang and Ratti (2015) conduct research and apply VAR model in order to investigate association between uncertainty in policy and US stock market. Their study supports the results of Antonakakis et al. (2013) that economic uncertainty Granger causes significantly the market return negatively. Moreover, by analyzing stock prices, volatilities of stock prices of OECD countries and economic policy uncertainty, Chang et al. (2015) confirms a significant negative impact of EPU on stock returns of these countries and generalizes the inverse relationship between stock prices and economic policy uncertainty. Another evidence is provided by Arouri et al. (2016) by investigating US stock market with a sample period spanning from 1990 to 2014 and utilizing linear model as well as market switching model. The results depict similar negative relationship between EPU and stock returns. The adverse effect of EPU on stock return remained persistent during high stock volatility times. On the other hand, the studies of Pastor and Veronesi (2013) and Kelly, Pastor and Veronesi (2016) document that EPU cause an increase in risk premiums of stock market and equity option prices, respectively.

Chi and Li (2017) study the relationship between EPU and bank credit risk and lending of Chines commercial banks. With a sample data from 2000 to 2014, they find that credit risk measured by non-performing loans is positively affected by increase in economic policy uncertainty whereas

EPU is found to impact lending negatively and significantly. The results of the study also demonstrate a significant and negative correlation between EPU and loan to deposit ratio. They argue that the performance of commercial banks may be enhanced by reducing loans in times of higher EPU. Moreover, the study shows a decline in the negative influence of EPU on credit risk and augmentation of positive impact on loans due to marketization level and in-depth financial development.

By developing a general equilibrium model of sovereign debt in developing countries, Pouzo and Presno (2016) investigate the factors of higher sovereign risk in these countries. One of the reasons for higher sovereign risk found by them is the lack of reliability of international investors on official data as well as model for estimating risk in developing countries. Pan et al. (2019) also scrutinizes the impact of political and economic uncertainty on sovereign CDS (Credit Default Swap) contracts by using a sample data of over 75 countries (developed and developing). The results reveal that higher levels of economic and political uncertainty in these countries increase CDS spreads. These results remain significant for all CDS maturities level and for countries with homogeneous conditions of sovereign risk following the European debt crisis. Also, the robust tests of domestic and global risk factors, fixed effects of time and country do not change the results.

Jeon (2019) undertakes research addressing bank risk and focuses on banking system of emerging countries. With a panel data set of 34 countries and 1500 banks, the study finds a significant positive impact of EPU on bank risk. In addition, the study reveals a significant negative influence of EPU on stability of these commercial banks which is indicative of positive relationship of EPU with bank risk. The study provides evidence of translating economic uncertainty into bank risk through return and volatility of returns channel.

Some other studies explore inefficient asset allocation along with economic uncertainty to be crucial factors responsible for adverse effect of economic policy uncertainty on bank risk. Baum et al. (2005) and Quagliariello (2009) envisage higher economic uncertainty leads to rise in bank risk and show homogeneous behaviour of bank in lending decision as well as lower loan to asset ratio dispersion of selected banks. A recent study of Tan (2023) for Chinese banks finds that

internal control significantly affects bank liquidity creation and this effect is enhanced by increased Economic Policy Uncertainty.

Similarly, the association between economic policy uncertainty and bank soundness is explained by other research studies through lending standards, holding of capital and homogeneity in managers' decision. Among them, Alessandri and Bottero (2020) investigate Italian banking sector with sample data of 10 years from 2003 to 2012. They suggest that banks are reluctant to approve credits and attempts to prolong processing loan issuance on account of uncertain economic conditions. In addition, banks show up insensitive to response to short term interest rate changes. On contrary, the results of Bassett et al. (2014) based on the U. S. banking system, evidence a small impact of EPU on lending contraction of banks.

Ashraf and Shen (2019) provide evidence of significant and positive association between EPU and interest rates on loans given by bank. They utilize sample data for 15 years spanning from 1998 to 2012 and select banks from 17 countries around the world. They argue that by increasing economic policy uncertainty the banks are inclined to increase loan prices and thus increase default risk of borrowers. In addition, the analysis of political risk factors, measured by variables based on ICRG database, present consistent results even after controlling bank's own idiosyncratic default risk. Also, robust tests produce similar outcomes obtained by altering proxy of economic policy uncertainty with general elections and find significant positive impact of economic policy uncertainty on bank loan spreads.

Demir and Danisman (2020) conduct a study for comparison of economic policy uncertainty (EPU) and Geopolitical Risk (GPR) in 19 emerging countries of the world and provide similar results as to Bilgin et al. (2020). The study uses a sample of 2439 banks spanning from 2010 to 2019 and envisages that banks in these countries are sensitive to economic policy and not to geopolitical uncertainty. The results show that bank credit growth is negatively affected by economic uncertainty but not affected by geopolitical risks.

Baum, Caglayan and Xu (2019) attempt to provide an explanation of the effect of economic policy uncertainty on stability of banking system through available credit in economy, bank performance and liquidity. With development of an ample data set of bank level data for 89 countries for 20 years from 1996 to 2015, the study applies OLS along with GMM approach for

analysis. The study envisages that credit available for loan is reduced as economic uncertainty rise that further implies an increase in liquidity hoarding by banks. At the same time, the rise in uncertainty causes bank returns to decrease. All these factors lead to deterioration of bank health to be at risk. Further, the sensitivity analysis proves that financial depth weakens during time of uncertainty. Also, the evidence of decline in return on asset and non-interest income along with rise in non-performing loans and liquidity indicates the worsening of health of banking system due to proliferation in uncertainty. As robust check, the study augments the analysis by adding World Uncertainty Index (WUI) proposed by Ahir et al. (2018) and oil price uncertainty. The results produced with these two additional proxies of uncertainties are similar in sign and significance to those obtained by using inflation uncertainty.

Bilgin et al. (2020) perform a comparative analysis of Islamic Banks against conventional banks regarding impact of economic uncertainty on credit growth. They construct a sample data of 416 banks from 12 countries from 2009 to 2018. Utilizing World Uncertainty Index (WUI) as proxy of economic policy uncertainty, they present that economic uncertainty influences negatively to credit growth of conventional banks whereas this influence is insignificant in case of Islamic banks. The in-depth analysis shows stronger immunity of Islamic banks that have explicit protection for deposit insurance, and in countries where Islamic banks have higher deposit and asset shares.

Another aspect of financial institutions is highlighted by Ashraf (2020) as bank hoarding level that is significantly affected by economic policy uncertainty. The study analyzes a comprehensive data set of 20 years (1998- 2018) for commercial banks of over 21 countries and using government economic policy uncertainty (GEPU) as indicator for economic policy uncertainty. The results show that economic policy uncertainty motivates bank managers to hoard more liquid assets in anticipation of expected adverse effects of economic uncertainty. Further analysis show that high level of hoarding in face of uncertainty, is achieved by attempting to increase deposits and prolong lending by banks. In addition, the expected loan losses play moderating role to strengthen the effect of government economic policy uncertainty on bank liquidity that is banks with more expected losses of loans tends to increase liquid assets more as compare to other counter parts with lower expected loan losses. Valencia (2016)

provides evidence that managers tend to increase bank capital as precautionary measure during higher uncertainty times.

All above mentioned studies provide a general review of impact of economic policy uncertainty on economy, households, firms and banking activities. However, the impact of economic uncertainty on bank output specifically has not been explored till 2018. Berger et al. (2018) carries out comprehensive research specifically addressing the role of economic policy uncertainty for bank liquidity creation. By setting up an ample data set of commercial banks of US. for about 30 years from 1985 to 2016, they investigate the effect of EPU on bank liquidity creation and on its various components. The results show that EPU has significant negative impact on total liquidity creation of banks for whole sample data set as well for small, large and medium banks. Consistent outcomes are seen with control variables such market volatility, bank size, capital ratios and pre-and post-BASEL III regulations.

After epidemic of GFC 2008, global uncertainty has been documented to be higher in recent years (Ozturk & Sheng, 2018). Particularly, the level of uncertainty has been higher in emerging and developing countries as compared to advanced counties (Bloom, 2013). A massive literature has been found to address the impact of economic policy uncertainty on various aspects of financial institutions and their activities. However, most of the literature has focused on developed countries like U.S. and Europe (e.g. Choi, 2018). Very scarce research has addressed the issue of uncertainty in emerging and developing economies (e.g. Chi & Li, 2017, Bhattarai et al., 2019 and Demir & Danisman, 2020). The review of literature asserts two opposing influences of economic policy uncertainty on banking activities including liquidity creation. On the one hand, some of the studies support Uncertainty Credit Expansion hypothesis and on the other hand, some other studies confirm Uncertainty Credit Crunch Hypothesis. To the best of our knowledge, the work of Berger et al. (2018) is the only one that investigates the impact of economic policy uncertainty on bank liquidity creation in U.S. In this regard, it would be interesting to investigate how banks in emerging markets behave in response to economic policy uncertainty and whether the impact would be positive or negative. Thus, the main hypothesis developed is as follows:

H2: *There is a significant impact of Economic Policy Uncertainty on Bank Liquidity Creation in emerging markets.*

On the basis of above literature with contradictory consequences of Economic Policy Uncertainty for bank liquidity creation, the following hypotheses are developed:

H2a: *There is a significant positive impact of Economic Policy Uncertainty on bank liquidity creation in emerging economies.*

H2b: *There is a significant negative impact of Economic Policy Uncertainty on bank liquidity creation in emerging economies.*

2.5 Bank Competition and Liquidity Creation

Financial institutions are expected to be affected by various government regulations including BASEL introduced in responses to financial crisis, and these effects will have repercussions for industry structure and competitive behaviour (Acharya & Mora, 2012). As a result, this might hamper banks' capacity to lend money and boost economic liquidity. The effects of bank competition on different bank activities have been the primary focus of previous studies. Yet the impact of banking competition on liquidity creation is not discussed nearly enough. There are two competing theories on how rivalry among banks affects the development of bank liquidity: the "Competition Stability Hypothesis" and the "Competition Fragility Hypothesis". Both of these hypotheses are discussed in detail in Section1.2.3 and 1.2.4 in chapter 1. Here we briefly discuss these postulates.

According to the "Competition Stability Hypothesis", a positive relationship exists between bank competition and liquidity creation. This idea is consistent with the widely held belief in the field of industrial organization that dominant businesses (banks in this example) gain monopoly rent by selling their wares at prices higher than market price (Chamberlin, 1969; Klein, 1971). This results in a poorer return on deposits and an inefficiently low supply of loans for borrowers. The theory proposes that more rivalry among banks is good for liquidity generation because it encourages banks to provide more competitive loan and deposit rates in response to increased credit demand as well as deposit competition (Boot & Thakor, 2000).

According to "Competition Fragility Hypothesis", fierce bank competition limits banks' profits margins leading to lower charter value that motivates banks to take risker stance in order to increase their profits which then adversely affects their soundness and consequently reduces their liquidity creation. Proposed by Petersen and Rajan (1995) argue negative impact of competition on liquidity creation. They claim that in competitive market banks attempts to develop credit ties with new opaque businesses and compensate for initial information costs associated with doing so. But in this way banks are not able to get gains because business easily go for the banks offering the lowest financing price. Reduced economic access to credit is one effect of increased bank rivalry. Banks with market power are inclined to advance higher credits by taking advantage of established relationship with clients that increases their deposits.

2.5.1 Empirical Literature on Competition and Liquidity Creation

The past literature related to bank competition addresses areas of markup rates, credit spread, lending and liquidity provision by banks. Some of research highlights the influence of government regulations on the banking behavior in face of competition and some studies present comparison of Islamic and traditional banks with respect to competition. A very few studies focus on impact of bank competition on liquidity creation. It has been found, however, that the influence of bank rivalry on bank lending is varied (Beck et al., 2004; Jeong & Joh, 2010; Petersen & Rajan, 1995). The following section briefly documents these areas by taking into account the two fundamental views of theories as stated above.

Berger and Hannan (1989) evidence that rivalry among banks has a considerable impact on interest rates for all types of deposits in the United States. A part from U. S. banking sector, other studies focusing on advanced countries include Heitfield and Prager (2004); Fischer and Pfeil (2004); and Corvoisier and Gropp (2002). All of these studies support the price channel hypothesis of competition. Heitfield and Prager (2004) study the relationship between concentration and interest rates in varied states whereas Fischer and Pfeil (2004) investigate the German banks. Higher interest rate margin is observed in banks of European countries by Corvoisier and Gropp (2002). With a larger sample size of 70 countries worldwide Hainz et al. (2013) also evidence that higher competition in banks leads to easy availability of credits to borrowers because banks, in order to attract customer, relax their requirements of contracts of

credit. These studies report the domination of "Competition Stability" hypothesis that determines the impact of completion on bank lending and interest spread.

In case of investigating the response of small enterprises to banking competition, some studies are of interest that encompass developed and developing countries. Sapienza (2002) studies small firms in Italy, whereas Berger et al. (2007) and Zarutskie (2006) study small enterprises of U.S. These studies report information opaqueness of small firms as a reason of banks' behavior in advancing loans in face of competition. For the emerging economies, the study of Shen et al. (2009) report that bank competition exerts positive impact on SME's borrowing from bank in China as increased competition in banks results in credit constraints to decrease. Similarly, Chong et al. (2013) investigate Chinese banks and reports that bank competition causes banks to lower prices that attracts small and medium enterprises to move towards banks for borrowing. They argue that this effect is not due to customer relationship but due to decreased credit constraints and cost for SMEs.

With regard to lending activities of banks, Beck et al. (2004) investigate banks of both developed and developing countries and evidences a positive influence of competition on credit to due to enhanced access of business to loans. On the same line, the studies of Canales and Nanda (2012) and Cetorelli and Strahan (2006) come up with the same results. In addition to interest rates on deposit and loans, some studies explore the role of bank power on bank lending. Sahyouni and Wang (2019) find positive relationship between bank competition and bank lending activities. They argue that when banks are in higher competition, they increase interest rates on deposits and decrease credit rates on loans. This in turn increases demand of loans in the market and induces household to save more and deposit in banks. Thus, it facilitates both savers and investors. Also, this enhances available funds with banks and reduces hindrances for providing loans (Perera & Skully, 2010). Another aspect of reduced competition among banks is lowering willingness of banks to forward loans to new customers and in such situation, relationship with existing customers becomes more valuable (Cestone & White, 2003).

On the other hand, "Competition Fragility" hypothesis is supported by other researchers theoretically and empirically. Carletti and Leonello (2019), for instance, report that banks in face of competition turn out to be more prudent. They argue that banks find themselves more

beneficial to retain liquidity reserves instead of providing loans due to lesser income on lower credit rates. In contrast, retaining more liquidity protects banks from losses of credit and enhances their stability in times of economic recession. When banks have more concentration in the market, they earn more for higher prices of loans and thus they are induced to advance loans and avoid retaining liquid reserves. On empirical basis, the study of Jeong and Joh (2010) provide evidence from emerging country in support of fragility channel hypothesis by analyzing banking sector of Korea. Calderon and Schaeck (2012); Love and Pería (2015) also document a positive effect of bank market power on lending. For advanced countries, Molyneux (2014) reports the impact of banking reforms in Europe after GFC 2008 and proves that the new reforms compelled banks to adopt cautious stance and banking system become less competitive. On same grounds, after analyzing U.S. banking system Ivashina and Scharfstein (2010) envisage an adverse effect crisis on bank lending and compaction. Acharya and Mora (2015) are other research studies analyzing U.S. banking system and document that banks increase deposit rates and reduce lending on account of illiquid asset portfolio.

The dearth of specific empirical data on the impact of bank rivalry on liquidity generation persisted until Horvath et al. (2016). They discovered that less liquidity was created by Czech banks from 2002-2010 when there was more competition in the banking sector (as measured by a lower Lerner index of market strength). In their view, banks limit liquidity generation to lessen the risk of bank runs since increasing competition lowers banks' profitability and solvency. Jiang et al. (2019) and Joh and Kim (2012), both authors of working papers, find that in the United States and the 25 OECD nations, respectively, bank rivalry has a negative impact on the production of liquidity for banks. The research supports the competition fragility hypothesis of banking competition, which postulates that in the face of intense competition, banks would become more selective in their lending and deposit practices.

Chioi (2017) investigates empirically bank competition effects on liquidity creation and finds that using bank level competition, when competition in a market increases, banks reduce the amount of liquidity they produce. Using intra- and interstate banking deregulation as well as interstate banking branching deregulation, the study reveals that banks generate less liquidity when interstate branching limitations are lifted, but that they do not significantly react to intra- and interstate banking deregulation. Analyses conducted at the state level reveal, however, that

bank deregulation events have little effect on the overall amount of liquidity generation in state banks. Lei and Song (2013) find that liquidity creation increases with market power in China. In investigation of emerging markets, the study of Shah at el. (2019) examines the potential impact of bank market power on bank liquidity creation by analyzing a comprehensive data set of Chinese banks from 2006 to 2017. The results show competition destroys liquidity creation whereas larger banks remain less affected due to dysfunctional impact of increased competition.

In addition, the role of diversification is also investigated by Toh et al. (2019) by analyzing 47 Islamic and Conventional banks in Malaysia with annual data ranging from 2001 to 2017. They conclude that the level of rivalry among banks has a negative impact on liquid creation in total, both on and off their balance sheets. The findings demonstrate that banks' intermediation margins are under pressure from rising levels of competition, and that banks are not adequately reimbursed for the risks they take when lending to consumers with low levels of transparency. This leads financial institutions to tighten their controls over extending loans. Further investigations reveal that banks with more diversified banks are less impacted by the adverse influence of bank rivalry on liquidity creation.

A more recent study is conducted by Khouri and Arouri (2019) on GCC countries and presents a comparative analysis of the effect of competition on bank liquidity creation by utilizing annual data from 2002 to 2014 for a sample of 69 banks (conventional and Islamic) of GCC countries. They present compare the behavior of Islamic banks against conventional counterparts in response to competition in liquidity creation. Their overall results depict a significant negative relationship between competition and liquidity creation and finds a significant difference in Islamic and Conventional banks in response to competiton.

Finally, the study of Bawazira et al. (2018) presents a comprehensive work on the relationship between bank competition and liquidity creation with consideration of government intervention and global financial crisis. They analyze a quite large sample of 22 European countries consisting of over 2500 banks and annual data of ten years spanning from 2006 to 2015. They utilize instrumental variables technique to find out the impact of market power on liquidity creation. The findings of their study endorse fragility channel hypothesis with significant positive impact of market power on bank liquidity creation in catastrophe period. In addition, the

analysis depicts that government intervention, measured by guarantees combined by low market power in periods of GFC 2008 compels banks to reduce liquidity creation. This implies that intervention policy would be effective for reducing liquidity creation when there is higher competition in banks. Further investigation for moderating role of capital is checked by introduction of interaction term of capital ratio with market power.

The above literature mainly encompasses the studies that study the effect of competition on bank activities, lending, loan rates and particularly liquidity creation. Generally, the past empirical work revolves around two fundamental but opposing theories. Some of the studies support "Competition Stability" hypothesis like Shen et al. (2009); Hainz et al. (2013); Chong et al. (2013); Berger et al. (2010); and Sahyouni and Wang (2019). Whereas the research work endorsing "Competition Fragility" hypothesis includes Horvath et al. (2016); Jiang et al. (2019); Joh and Kim (2012); Chioi (2017); Bawazira (2018); Shah et al. (2019); and Toh et al. (2019). Further, a massive literature on the relationship between bank competition and liquidity creation addresses advanced countries including U.S., Germany, Czech Republic, GCC and OECD countries. However, a very few research works on the issue focuses on emerging economies like China, Korea and Malaysia. The economic, political, social and market conditions are different in emerging economics as compare to developed and advanced countries. Therefore, some important questions raise as to what will be the impact of bank competition on liquidity creation in emerging economies, can we generalize any of the hypothesis (competition stability and fragility) and if yes, which hypothesis would be dominating in case of emerging markets. Thus, our first baseline hypothesis is:

H3: *There is a significant impact of bank competition on bank liquidity creation in emerging economies.*

Since past literature presents two opposing views for competition effect on liquidity creation, we formulate two contrasting hypotheses:

H3a: *There is a significant positive impact of bank competition on bank liquidity creation in emerging economies.*

H3b: *There is a significant negative impact of bank completion on bank liquidity creation in emerging economies.*

2.6 Bank Capital and Liquidity Creation

Several factors contribute to equity capital (sometimes called the equity capital ratio or regulatory capital ratio) of bank including market, regulatory, managerial, macroeconomic, and industry. The capital ratio is a key factor in determining the entire capital structure, which also involves the choice of deposit mix, debt, preferred and common stock, bonds of different maturities. Banks with a larger capital ratio are seen to be safer in general (e.g., Boot & Greenbaum, 1993), albeit it could be compensated by a much riskier portfolio. The incentives for the bank to keep an eye on its borrowers improve with more capital (Mehran and Thakor, 2011). However, bank forgoes tax shield when equity is used instead of debt in the capital structure (Merton, 1977). Since bank liquidity creation is a key route via which banks carry out their fundamental intermediation job and may be an essential component of economic growth, investigating capital effect on liquidity creation becomes essential alongside this prudential purpose of bank capital. Here, we take a look at both the theoretical and empirical reasons about the effect of bank capital on bank liquidity creation. The link between three selected external factors (Stock Market Liquidity, Economic Policy Uncertainty, and Bank Competition) and liquidity creation is then hypothesized, with bank capital playing the role of moderator.

Based on financial intermediation theory, two contradicting propositions provide the theoretical foundation for the connection between bank capital and liquidity creation. Here both of the strands of theory are discussed.

2.6.1 Financial Fragility Crowding out Hypothesis

According to this hypothesis, there are two ways in which bank capital might reduce the efficiency with which new liquidity can be created: the "Financial Fragility Structure" and the "Crowding-out of Deposits." When capital is low, liquidity generation is encouraged (Diamond & Rajan, 2000, 2001a), but when capital is large, deposits may be discouraged (Gorton & Winton, 2017). The following is a simplified explanation of the chain of events that leads to the "financial fragility structure" impact. In exchange for interest, the bank loans depositors' money

to those who need it. The bank gains access to confidential information that helps it evaluate the profitability of its borrowers by keeping tabs on them. The bank may try to extract rents from its depositors by demanding a bigger part of the loan revenue because of the informational advantage it has. Depositors will not be monitored or have loans collected on if they do not pay the additional fee. Customers are wary of banks because of the risk of having their deposits mismanaged. Therefore, the bank needs to adopt a financially precarious structure with a high proportion of liquid deposits in order to gain the trust of its customers. Because depositors can withdraw their money if the bank threatens to stop trying, a depositor contract can help reduce the bank's hold-up risk. As a result, a weakened financial system is good for liquidity generation since it frees up the bank to accept more deposits and provide more loans. Higher capital, on the other hand, tends to reduce the bank's financial vulnerability and increase its negotiating power, both of which undermine the bank's trust with its depositors. As a result, more capital usually results in less new liquidity being created. In addition, "crowding-out of deposits" is demonstrated by Gorton and Winton (2017) as another impact of a larger capital ratio that might impede liquidity formation. They argue that agents are better able to protect their liquidity with deposits than with bank equity investments. Funds deposited here are fully or partially protected against loss, and can be withdrawn at any time. In contrast, the value of bank capital is stochastic; it fluctuates based on market conditions and the health of banking fundamentals. As a result, increased capital ratios cause a transfer of cash from investors' more liquid deposits to the bank's more illiquid capital. As a result, a greater capital ratio results in less money being created by the bank.

2.6.2 Risk Absorption Hypothesis

The second hypothesis holds that banks are better able to produce liquidity when they have more capital on hand. In order to meet clients' liquidity needs, banks must create more liquid assets, increasing their exposure to risk (Allen & Gale, 2004). The ability of a bank to take on more risk is made possible by the bank's capital (Repullo, 2004). According to the second theory, a bank's ability to create new money depends on its capitalization ratio. Recent hypotheses of the connection between capital and liquidity generation are experimentally tested by Berger and Bouwman (2009). Using data on commercial banks in the United States from 1993 to 2003, they discover that the correlation is positive for the largest institutions but negative for the smallest.

Neither of these camps includes the latest theoretical work by Donaldson, Piacentino, and Thakor (2018), which demonstrates formally that greater capital leads to more liquidity generation. Their research reveals that a bank's efforts to offer the necessary intermediation services increase in proportion to the bank's capital. As a result, it becomes more expensive for debtors to go into default and lose access to the bank's intermediation service. In turn, this creates additional liquidity since the bank is incentivized to lend more money.

2.6.3 Empirical Literature on Bank Capital and Liquidity Creation

Similar to theoretical literature on causal relationship between bank capital and liquidity creation, the empirical literature provides mixed results for various countries, bank types and situations. We document a brief overview of past studies that addresses impact of capital on liquidity creation. We start with studies on advanced countries and then review studies on emerging economies.

Based on an examination of yearly data from US banks between 1993 and 2003, Berger and Bouwman (2009) find evidence for and against these conflicting theoretical expectations. They find evidence to support both hypotheses, with large banks (which make up the bulk of the banking sector's assets) favouring the "risk absorption" impact (a positive link) and small banks (which face more risks due to their size) favouring the "financial fragility-crowding out" effect (negative relation). These findings are in line with what was anticipated. Large banks are more likely to have a larger "risk absorption" impact than small banks because large banks are exposed to more regulatory oversight and market discipline. However, small banks are more prone to experience the "financial fragility-crowding out" effect due to their greater involvement with enterprising small enterprises. Another difference between large and small banks is that the latter can more readily obtain money from national or international capital markets, while the former often raises funds locally, which might "crowd out" deposits.

Using a sample of publicly-traded commercial banks in the United States and 20 European nations and data from 2000-2006, Distinguin, Roulet, and Tarazi (2013) investigate the direction and directionality of causality between regulatory capital and on-balance sheet liquidity generation. When banks are confronted with more illiquidity, they reduce their regulatory capital

levels, the authors discover. In their subsample of U.S. listed banks, the effect of capital on on-balance-sheet liquidity generation was not statistically significant.

Liquidity provision is shown to be influenced by regulatory participation and bank capital, as discovered by Berger et al. (2016). By analysing data from all German banks, the study concludes that regulatory participation reduces bank liquidity generation since it serves the goal of reducing banks' risk-taking and ensuring their continued safe and smooth operations. The results, however, indicate that these interventions have a significant effect on the liabilities side of the balance sheet but have little to no effect on the development of liquidity in the assets side of the business. Granger-causality tests on a comprehensive data set of Czech banks, primarily small banks from 2000 to 2010, were conducted by Horvath, Seidler, and Weill (2014) using a dynamic Generalized Method of Moments (GMM) panel estimator framework. They provide evidence for a negative Granger-cause relationship between capital and the emergence of liquidity. However, they also note that the lowering of capital is a Granger-caused effect of the development of liquidity.

The purpose of this research is to analyse the impact of bank capital requirement on liquidity creation for a selection of UK and French banks from 2000 to 2014. Now we can look at the findings from Quantile Regression, which show that the effect of bank capital on liquidity generation is negative and statistically significant across all quantiles. Quantiles of liquidity creation show little variation in estimated coefficients, but there is some variation. These results show that the detrimental impact of bank capital is consistent across different quantiles.

Using Russian banking data collected between 1999 and 2007, Fungacova, Weill, and Zhou (2017) analyse the impact of deposits on the connection between bank capital and liquidity generation. Both before and after Russia's deposit insurance plan was put into place in 2004, a negative correlation was shown between the production of capital and liquidity. Both scenarios have the same consequences. However, the ownership structure and size of the bank have a significant role in determining the nature of the relationship. For domestic small and medium banks, as well as foreign big banks and the government, the correlation is very negative, but for international large banks and the government it is negligible.

For his thesis, Xie (2016) analysed data from a panel consisting of 28 commercial banks in China spanning the years 2004 and 2014. There is no statistically significant link between the production of liquidity and capital, they conclude, for state-owned commercial banks. There is a favourable relationship between liquidity creation and capital at national shareholding commercial banks. Strongly positive influence of regional commercial banks' capital on liquidity generation, but negative effect of liquidity creation on capital.

Using data from a cross-section of Chinese financial institutions between 1988 and 2009, Lei and Song (2013) examine how capital structure affects a bank's ability to provide liquidity. They put the "financial fragility-crowding out" effect and the "risk absorption" hypotheses to the test empirically. Bank capital has a negative effect on liquidity generation, they discover, lending credence to the "financial fragility-crowding out" argument. They also find that the "risk absorption" theory is supported by their data showing a lower correlation between the generation of new liquidity and the size of international banks' capital than between these two variables for domestic banks. In addition, Vu and Ngo (2023) presents analysis of Vietnam banks and indicate that higher capital ratio results in decline in liquidity creation and consequently enhance bank stability.

Casu et al. (2016) analyzed banking sector of Eurozone countries by using GMM method and report financial fragility crowding out hypothesis is supported by the results that higher capital requirement of Basel has adverse impact on liquidity creation by reducing maturity transformation risk. The result show negative and two-way causality between capital and liquidity creation. Umar et al. (2017) conduct an in-depth examination of the impact of variations in bank capital on liquidity creation for a selection of Indian banks, both public and unlisted, from 2000 to 2014. When testing the "financial fragility-crowding out" hypothesis using the liquidity creation measure developed by Berger and Bouwman (2009), they discover a negative and statistically significant link between bank capital and a limited measure of bank liquidity creation.

Recent studies of Hsieh and Lee (2020); Tang et al. (2021); and Evans and Haq (2022) envisage significant negative impact of bank capital on liquidity creation in Asian and US banks, respectively. The “risk absorption” hypothesis is supported by Kayani et al. (2021) in their

analysis of banking industry in emerging countries. While Zelenyuk et al. (2021) evidence higher on-balance sheet lending with higher capital ratio in US banks

Similarly, Zelenyuk et al. (2021) observe that banks voluntarily disclosing their capital adequacy information are successful in creating more on-balance sheet liquidity, particularly lending, as it helps in reducing information asymmetry and the cost of capital. Chen et al. (2021) report negative impact of capital on liquidity creation and significant positive effect taking into account the influence of shadow banking. In addition, financial fragility crowding out effect is reported by Mdaghri and Oubdi (2022) and Mohanty and Mahakud (2021) for MENA and emerging countries, respectively. Gupta et al. (2023) present a non-linear (U-shape) relationship between capital and liquidity creation in banks of Asia Pacific countries. Their findings envisage that risk absorption effect is higher for large banks compare to small banks.

In sum, the empirical literature offers inconclusive results regarding influence of capital on bank liquidity creation. Most of the studies focus advance countries like U.S., Europe and German banks. A handful research work has been addressed emerging markets individually for example China, Russia, and India. However, no study has analyzed emerging economies with comprehensive data set that may lead to generalization of the results for emerging markets. Since economic, political conditions as well as financial markets situation are different in these economies as compared to those in advance countries, thus some important questions may be pointed out as what would be impact of bank capital on liquidity creation in these economies and what theoretical view point would be dominating. Accordingly, we set up our main hypothesis as:

H4*: There is a significant impact of Capital on bank liquidity creation in emerging economies.*

Since, theoretical and empirical literature offer evidence in support of both views of Financial Fragility Crowding Out Hypothesis and Risk Absorption Hypothesis, thus we explicitly formulate our hypotheses as:

H4a: *In accordance to Fragility Crowding out Hypothesis, capital has a significant adverse influence on the bank liquidity creation in emerging markets.*

***H4b**: With respect to Risk Absorption Hypothesis, capital has a significant positive influence on bank liquidity in emerging markets.*

2.6.4 Moderating Role of Capital

There are two main regulations that BASEL has introduced for banks that are Capital requirement and Funding Liquidity requirement. Both are described in previous chapter in detail. The past literature evidences mixed results for the impact of bank capital on liquidity creation. The studies of Berger et al., (2016), Tang et al., (2021) and Vu and Ngo (2023) report negative influence of capital on liquidity creation. Whereas, Kayani et al. (2021) and Zelenyuk et al. (2021) present positive influence of capital on liquidity creation. Despite a handsome literature addressing the role of capital on liquidity creation, still there are some important questions that need to be answered. These thesis attempts to tap a few of the unanswered questions like what would be impact of bank capital on bank behavior in response to various determinants of liquidity creation. Specifically, we are interested to analyze the impact of capital on three relationships as formulated in hypothesis H1, H2, and H3 above, i.e. relationship between Liquidity Creation and its three selected determinants namely, Stock Market Liquidity, Economic Policy Uncertainty and Bank Competition. So, we extend above hypothesis as follows:

***H5:** There is a significant moderating impact of capital on the relationship between Stock Market Liquidity and Liquidity Creation in emerging economies.*

***H6:** There is a significant moderating impact of capital on the relationship between Economic Policy Uncertainty and Liquidity Creation in emerging economies.*

***H7:** There is a significant moderating impact of capital on the relationship between Bank Competition and Liquidity Creation in emerging economies.*

2.7 Funding Liquidity and Liquidity Creation

Funding liquidity is the institution's capacity to pay its debts when they come due (IMF, 2008). Bank stability depends in large part on funding liquidity, which is also a major element in what causes a financial crisis (Hugonnier & Morellec, 2017). When a bank's long-term assets and

short-term obligations are out of whack, the institution faces funding liquidity risk. The current worldwide financial crisis brought to light the negative impact of financing liquidity risk on bank lending as the fundamental cause of the financial system's collapse (Roulet, 2018). Additionally, there is continuing evidence that most banks operate with unacceptably large maturity mismatches (Entrop, Memmel, Ruprecht & Wilkens, 2015). This might lead to a repeat of their previous liquidity problems and a subsequent liquidity crisis.

Aside from major flaws in the BASEL II regulation system, the 2008 liquidity crisis also exposed flaws in bank risk management (Brunnermeier & Pedersen, 2009). As a result, in 2010, the BASEL Committee on Banking Supervision (BCBS) unveiled a more extensive set of worldwide rules, the Basel III package, to deal with issues associated with both short-term and long-term liquidity. The purpose of this revised set of regulations is to make financial institutions more robust in downturns (BCBS, 2010a). Basel III introduces additional measures for managing liquidity risk. The objective of the LCR and the NSFR is to strengthen the financing security and liquidity cushion of financial institutions. Particularly, the LCR's purview is to make sure banks have adequate cash on hand to safeguard bank in short-term (month-long) periods of stress. In contrast, the NSFR is designed to mitigate maturity transformation risk by guaranteeing banks have consistent funding to last for at least a year. Banks should finance long-term assets with more stable sources of funding on a continuing basis to reduce funding risks, hence the NSFR is intended to address greater structural alterations of the liquidity mismatches between assets and liabilities than the LCR.

Although the Basel III standards and implementation of the new binding liquidity requirements are intended to increase banks' resilience in the face of financial and economic crisis, they have been the subject of heated dispute. The rationale for these regulations was the idea that increasing banks' liquidity would increase their capacity for intermediation, making them more resilient to external economic shocks and less likely to cause another financial crisis in the future (Kim & Sohn, 2017). Since asset liquidity is linked to asymmetric information (i.e., adverse selection and moral hazard) and higher opportunity costs, it is used less frequently by banks (Mensi, Hammoudeh, Reboredo, & Nguyen, 2014). The availability of credit, which increases actual output and supports economic activity, is largely dependent on the financial strength of banks (Ibrahim & Rizvi, 2018).

Many scholars have wondered what effect bank liquidity has on bank lending. Some have theorized that banks drastically cut back on lending when they have trouble getting their hands on financial liquidity (i.e., deposit financing) and are exposed to increased credit line drawdowns (Ivashina & Scharfstein, 2010). Furthermore, when banks boost their liquidity as a result of increasing liquidity requirements from legislation, bank lending decreases (Cornett, McNutt, Strahan, & Tehranian, 2011). Due to economic risk, some people believe that investors should make deposits instead of direct investments, but others believe that banks with more financial liquidity would boost bank lending anyhow (Acharya & Naqvi, 2012).

2.7.1 Empirical Literature on Funding Liquidity and Liquidity Creation

The effect of Basel III liquidity ratios on banking operations is examined in this section. There is a possibility for the Basel liquidity requirement (LCR and the NSFR) to have an effect on risk taking, lending, and liquidity production at banks, as will be discussed below.

According to Drehmann and Nikolaou (2013), funding liquidity risk occurs when banks are unable to immediately pay depositor claims over a certain time period, whereas funding liquidity is defined as a bank's capacity to pay depositor claims in a timely manner. Based on publicly accessible data on 171 major reference operations conducted by the European Central Bank (ECB) between June 2005 and October 2008, they utilize insurance premiums as a measure of financing liquidity risk. They conclude that the recent worldwide financial crisis significantly increased funding liquidity risk. Furthermore, they demonstrate that market liquidity is inversely related to funding liquidity risk.

Vazquez and Federico (2015) analyze the pre-crisis funding mechanisms and their consequences for the financial system. To do this, they utilize data from a random selection of 11,000 institutions throughout the United States and Europe that were active between 2001 and 2009. They find that default risk increased in banks that had larger debt and lower structural liquidity levels before the crisis. Additionally, the default risk encourages taking unnecessary risks. Furthermore, they demonstrate that local banks are more exposed to liquidity risk than their foreign counterparts. Khan et al. (2017), on the other hand, use a dataset of US bank holding corporations from 1986 to 2014 to examine the correlation between financing liquidity and bank risk-taking. They prove that a rise in bank liquidity is associated with an increase in risk.

Using a sample of banks from BRICS nations between 2006 and 2015 using a system generalized method of moments (system GMM) estimator, Mohamed et al. (2018) investigates the connection between financing liquidity risk, liquidity risk, and bank risk-taking. They demonstrate that funding liquidity risk and liquidity risk are inversely connected to banks' willingness to take risks.

To better understand the impact of the financial crisis on the supply of new credit by US banks, Cornett et al. (2011) assess quarterly changes and compare them to the pre-crisis era. According to the research, lending is curtailed more by institutions that have more variable credit lines and by institutions that have a lesser share of steady financing during times of crisis. Evidence is provided by Pessarossi and Vinas (2015) that banks with lower funding risk and a smaller ratio of long-term loans to long-term financing and deposits offer more loans.

Bonner (2016) investigates the impact of capital and liquidity requirements on Dutch banks' lending practices and discovers a "replacement effect" analogous to that seen in the UK. Dutch banks significantly altered their capital needs by switching from Dutch government bonds to other bonds (such as financial bonds, covered bonds, and ABSs) as a result of the preferential regulatory treatment of government bonds in capital and liquidity requirements. Unlike what is found in the UK, Bonner (2016) discovers that liquidity constraints have an effect on private lending.

For their study, DeYoung and Jang (2016) look at the reaction of US banks to shocks in the loan-to-deposit ratio, which stands in for the NSFR, between 1992 and 2012. According to their estimates, U.S. banks may respond to NFSR regulations by actively managing their funding and turning to bigger sums of reliable funding rather than actively managing their assets and going to lower-yield (but higher-quality) assets. They also reveal that large US banks have a more difficult time adjusting to the NSFR because they manage liquidity less aggressively than smaller, local banks.

Adding liquidity restrictions on top of capital requirements may severely impede maturity transition, as found by De Nicol et al. (2014)’s analysis of bank behavior in a dynamic partial equilibrium model. In order to meet the new standards, banks will have to divert their retained earnings to buying bonds (instead of making new loans or paying down debt). If banks are

allowed to use the greater income from risky loans to build capital, then lower capital requirements, rather than no capital requirements at all, can lead to more lending. However, due to liquidity needs, capital ratios rise through the inefficient means of increased bond holdings. In spite of the fact that these measures improve bank security, the demand for loans falls by 26% as a result of the wide range of possible loan spreads. Simion et al. (2024) by analyzing European banking system, evidence that Basel liquidity regulation leads to increase creditor expectations of a credit event resulting an increase in CDS spread. Their results shows that CDS spread is positively moderated by bank capital ratios and provisions of bad loans.

Most of past research on the topic of bank liquidity and its effects on banking activity focus developed nations, but scarce literature is available for developing nations. Using the Least Squares Dummy Variable Corrected (LSDVC) technique, Dahir et al. (2019) analyze the impact of financing availability and capital on bank loan growth (i.e., bank lending) in BRICS nations. The impact of funding availability and capital on bank lending, as well as their relationship, is analyzed in detail. The findings show that in BRICS nations, financial availability has a negative and statistically significant influence on bank lending, which indicates that it slows the growth rate of bank loans. On the flip side, an increase in bank capital will increase bank lending.

Umer and Sun's study on liquidity and bank liquidity generation is the only one that has been published previously (2016). Using data on a subset of listed banks operating in the BRICS nations from 2007 to 2014, this analysis emphasizes the interplay between financing liquidity, liquidity generation, and stock liquidity. Their findings show that the generation of new liquidity is inversely connected to the availability of new funding. However, funding liquidity is positively correlated with stock liquidity whereas creation liquidity is adversely correlated with stock liquidity.

In view of above literature, it is evident that a massive literature has addressed the role of bank capital in determining banking activities including profitability, risks, stability, and lending (Demirgüç-Kunt & Huizinga, 2010; Berger & Bouwman, 2013; Gorton & Winton, 2017; Thakor, 2014), while less attention has been devoted to explore the impact of funding liquidity in banking activities. Moreover, a limited literature is available that on the impact of funding liquidity on various banking activities like risk, stability, failure and lending. However, only one

study of Umer and Sun (2016) examines the impact of funding liquidity on bank liquidity creation. In addition, most of the studies focus advance countries like U.S., UK, France and German banks. A very limited number of studies are found to address emerging and developing countries in this context. Hence, some important questions still need to be answered as to what would be the impact of funding liquidity on bank liquidity creation, what would be the influence of BASEL liquidity regulations on bank liquidity creation in emerging economies. Thus, we develop our initial hypothesis to address this question as follows:

H8*: There is a significant impact of Funding Liquidity on bank Liquidity Creation in emerging economies.*

2.7.2 Moderating Role of Funding Liquidity

There exists limited research on the topic of bank liquidity and its impact on baking activities including lending (Bonner, 2016), loan to deposit ratio (DeYoung and Jang, 2016), loan growth (Dahir et al., 2019) and credit spread (Simion et al., 2024). The only study of Umer and Sun (2016) presents relationship between funding liquidity and liquidity creation. The review of past literature confirms that there is no study that investigates the moderating role of BASEL funding liquidity on the relationship between three selected external factors (Stock market liquidity, Economic Policy Uncertainty and Bank Competition) and Liquidity Creation. It would be interesting to examine the question that what would be the impact of BASEL liquidity regulation on the relationship between three external factors and bank liquidity creation in emerging markets. Thus, this study will be the first to address the moderating role of BASEL liquidity regulation on these relationships (as formulated in Hypothesis H1, H2 and H3 above). Accordingly, the hypotheses formulation is presented explicitly as:

H9: *There is a significant moderating impact of Funding Liquidity on the relationship between Stock Market Liquidity and bank Liquidity Creation in emerging economies.*

H10: *There is a significant moderating impact of Funding Liquidity on the relationship between Economic Policy Uncertainty and bank Liquidity Creation in emerging economies.*

H11: *There is a significant moderating impact of Funding Liquidity on the relationship between Bank Competition and bank Liquidity Creation in emerging economies.*

2.8 Combined Moderating Effect of BASEL Regulations

The review of past literature on BASEL regulations mostly highlights the role of bank capital in determining the banking activities including profitability, risks, stability, and lending (e.g. Demirgüç-Kunt & Huizinga, 2010; Berger & Bouwman, 2013; Gorton & Winton, 2017; Thakor, 2014). While, scarce literature has been devoted to explore the impact of BASEL funding liquidity requirement on banking activities. Moreover, past literature addresses the direct effect of Capital and Liquidity on banking system and research work that investigates the moderating impact of Capital or Liquidity on banking is hardly found. In addition, no study has been found that examines the combined moderating impact of Capital and Liquidity on Liquidity Creation. Since the review of past literature documents mixed results of the effect of Capital as well as of Liquidity on banks including liquidity creation in different time spans, countries, and conditions. Thus, an unexplored question is worth interesting to be investigated as to what would be the net effect of both of these regulations as moderator on the relationships between our three selected external factors (Stock Market Liquidity, Economic Policy Uncertainty and Bank Competition) and Bank Liquidity Creation. Thus, we further extend our previous hypothesis (H5, H6, H7 and H9, H10, H11) and formulate comprehensive hypotheses as follows:

H12: *There is a significant combined moderating impact of Capital and Liquidity on the relationship between Stock Market Liquidity and Bank Liquidity Creation in emerging markets.*

H13: *There is a significant combined moderating impact of Capital and Liquidity on the relationship between Economic Policy Uncertainty and Bank Liquidity Creation in emerging markets.*

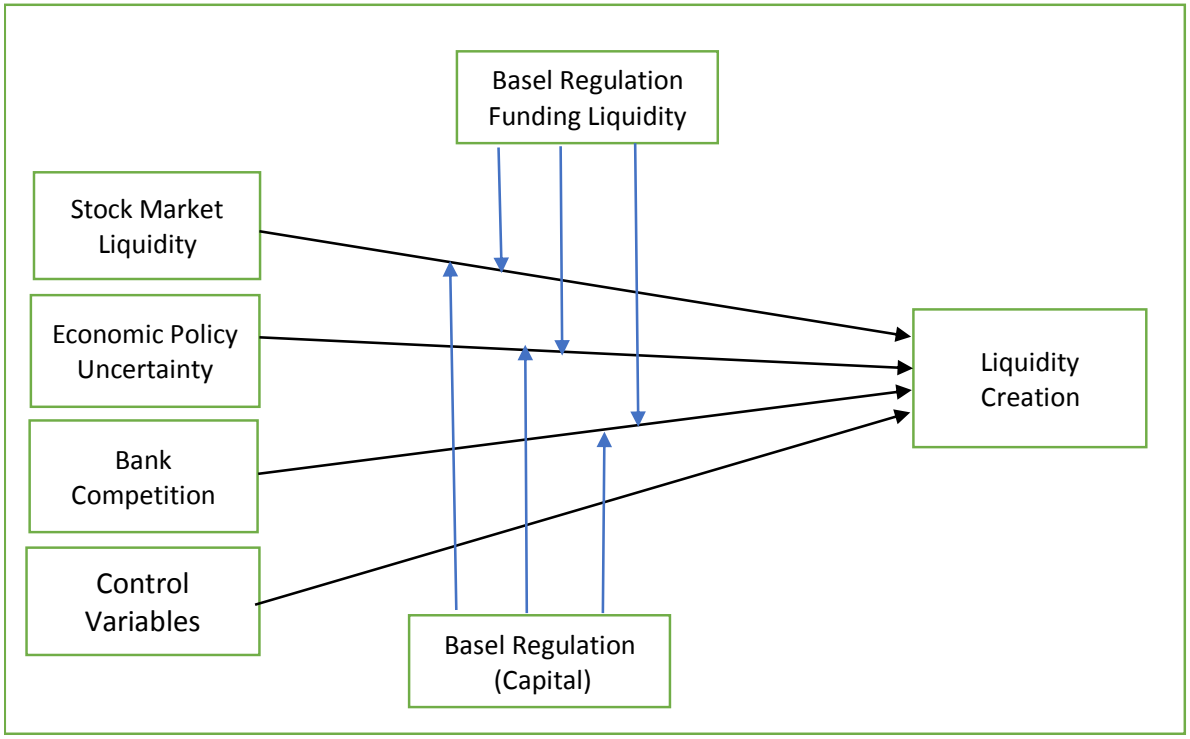
H14: *There is a significant combined moderating impact of Capital and Liquidity on the relationship between Bank Competition and Bank Liquidity Creation in emerging markets.*

2.9 Theoretical Framework

In view of theoretical framework described in Section 1.2 and theoretical/empirical literature documented in earlier sections of this chapter, we elaborate the theoretical framework of this

study. For the purpose of investigating the effect of three external factors under study (i.e. stock market liquidly, economic policy uncertainty and bank competition) on bank liquidity creation we develop following conceptual frame work with three external factors as independent variables along with certain bank specific and macroeconomic factors as control variables. In addition, two main BASEL regulations, namely capital and funding liquidity are also included in our model to capture the impact of these regulations on liquidity creation. Since the main objective of this thesis is to investigate the moderating effect of BASEL regulations, we extend our model by including these regulations (Capital and funding Liquidity) as moderating variables in our model. In light of past literature, a comprehensive conceptual framework is depicted in Fig 2.1 below.

Figure 2.1: Conceptual Framework



Chapter 3

Research Methodology

3.1 Introduction

This chapter describes the research philosophy, approach, and strategy which is followed by sample selection process and sources of sample data. Then, description of econometric models and their extension for incorporation of moderating variables is documented. This is followed by defining the variables (dependent and independent) and then construction of variables under study are illustrated. Lastly panel data estimation techniques used in the analysis are explained.

3.2 Research Philosophy

Philosophy is a study to examine and understand certain fundamental issues about the nature of reality or knowledge and the manner it is obtained (Greenwood & Mir, 2018). It emphasizes not only the issue to be identified but also the concern about the way it is acquired. The foundation of philosophy comprised of foundations ontology, epistemology, methodology and ethics (Duberley & Johnson, 2016). The meta-theoretical assumptions of philosophy are positivism, realism, critical realism and constructivism. The present research adopts the ideology of positivism to test the developed hypotheses about role of BASEL regulations on the relationships between external factors and liquidity creation in emerging economies. The positive is based on the observability of entities. Positivism presumes that human intellect arrives at certainty about rules that govern a phenomenon through skepticism. The statistical methods employed to analyze observable data of all the variables of concern.

3.3 Research Approach

Research paradigms provide guidance when deciding between inductive and deductive approaches. Among several approaches to research, two mains are inductive and deductive research approaches. The former is intended to theory development and later involves in investigating a theory that already exists (Bryman & Bell, 2011). The deductive approach of research proceeds from general to specific observations whereas inductive goes the other way around (Kothari, 2014). This thesis follows the deductive approach. Instead of introducing new theory, it aims at testing the hypotheses that have already been generated by examining the

causation between the dependent and independent variables. By creating problem statement based on existing theories the testable hypotheses are formulated. The data on target variables is collected and analyzed by statistical tools to accept/reject the hypotheses (Saunders el al., 2012).

3.4 Research Strategy

Generally, two research strategies, quantitative and qualitative are used in research. The qualitative approach, instead of focusing on discovering a causal link between variables, emphasizes on the collection of data using non-numerical or descriptive means such as interviews, to better understand a phenomena or social behaviour (Berg, 2004; Feilzer, 2010). The quantitative approach, on the other hand, is concerned with numerical data obtained from a large sample of respondents or the corporations themselves and measured using a variety of quantitative approaches, such as a questionnaire or the use of secondary sources (Goddard & Melville, 2004; Bryman, 2012). A mixed-methods study allows the researcher to combine qualitative and quantitative techniques.

Quantitative information may be broken down into three distinct types: time series, cross-sectional, and longitudinal panel data. With time-series data, information about a single entity is gathered over time, whereas in cross-sectional data, information on a number of respondents or entities is gathered at once. Panel data, on the other hand, collects information on a variable across time from a number of sources (Gujarati, 2003).

This research thesis makes use of quantitative approach of research to achieve its objectives to investigate the role of BASEL regulations on the relationship between external factors and bank liquidity creation by analyzing secondary data of variables from Bankfocus database through described statistical tools (explained in depth in following section).

3.5 Sample Selection Process

The objective of the study is to investigate the effect of three important factors on bank liquidity creation of banks in emerging countries with moderating role of BASEL III regulations. The target population for this study is all commercial banks of emerging economies. The Morgan Stanley Capital International (MSCI) provides categories of the world countries into various classifications like developed, developing and emerging economies. This thesis refers to this organization’s categories for selecting emerging economies that have been recognized for

research. There are 25 emerging economies according to MSCI. Our sample consists of 11 emerging countries of Asian region. These include Pakistan, India, China, Bangladesh, Malaysia, Indonesia, Philippines, Thailand, Taiwan, Russia, and Korea. The sample countries are selected on the basis of convenience sampling on account of unavailability of data and constraint of access to databases. These emerging countries have some common characteristics of economic development, economic policy uncertainty, stock market capitalization, and financial sector development (IMF). All commercial banks of these economies are selected as sample because commercial banks are major contributor of total liquidity creation in the economy. Table 3.1 presents selected countries and number of banks in these countries. Panel data set consisting of annual observations of all commercial banks in these economies.

Our sample period ranges from 2011 to 2019 because data before 2011 is scarcely available in Bankfocus database. Our sample is completely dependent on the availability of data on this database. Thus, banks are selected for which data is available in Bankfocus database. Then those banks are excluded from our initially collected sample whose annual observations are less than four years within selected sample period (from 2011 to 2019). Further, after careful screening, the banks that are found repeated in data set are excluded. Finally, total of 587 banks are selected with total of 5283 annual observations. The final panel data is unbalanced because some observations of some banks are missing in the selected period of time. The data set is winsorised at 1% and 99% percentiles of all variables to cater for outliers in the data.

3.6 The Sources and Characteristics of Data Sample

An authentic source of data is important for the reliability and validity of collected data. In accordance with Shah et al. (2019), the bank-level observations are extracted from Bankfocus database. This database has some crucial features that makes it beneficial to be used by researchers. It is internationally recognized and in compliance with International Financial Reporting Standards (IFRS) developed by the International Accounting Standards Committee (IASC). Moreover, about 90% of banks assets are covered by this database. The individual bank stock data is obtained from Datastream database that is in line with Toh et al. (2019). The data for macroeconomic indicators is attained from World Bank website. Whereas annual observations of World Uncertainty Index (WUI) that is used as proxy of Economic Policy

Uncertainty (EPU), is drawn from website of world uncertainty index (https://www.policyuncertainty.com).

Table 3.4: Composition of Banks in Sample

Country	All Banks	(%age)	Large Banks	Small Banks	Large Banks (%)
China	82	14.0	60	22	73.2
Hong Kong	41	7.0	17	24	41.5
India	77	13.1	50	27	64.9
Indonesia	42	7.2	8	34	19.0
Korea	69	11.8	51	18	73.9
Malaysia	54	9.2	8	46	14.8
Pakistan	29	4.9	6	23	20.7
Philippines	40	6.8	29	11	72.5
Russia	72	12.3	34	38	47.2
Sri Lanka	31	5.3	3	28	9.7
Thailand	50	8.5	14	36	28.0
Total	**587**	**100**	**283**	**304**	**48.2**

Table 3.4 depicts some features of the composition of selected banks from these countries. China, India, Russia and Korea constitute almost half of the sample size, each with approximately 13% of total number of banks. There are 283 large banks (out of 587 banks) in sample that is about 48% of whole sample. The country-wise composition of large and small banks shows that large banks comprise 73% of banking industry in China, Korea and Philippines. Whereas small banks constitute more than 80% of the banking sector in Indonesia, Malaysia and Sri Lanka.

3.7 Empirical Model

As described in the previous chapter we formulate various hypotheses that address our objectives. Following Toh et al. (2019) and Berger et al. (2018), we start developing econometric models in accordance with previously formulated hypothesis. First, we develop the baseline model that addresses the first three hypothesis (H1, H2 and H3) to test the impact of Stock Market Liquidity, Economic Policy Uncertainty and bank Competition, respectively, on bank liquidity creation. Liquidity creation is dependent variable and Stock Market Liquidity, Economic Policy Uncertainty and Bank Competition, along with other bank specific, and macroeconomic variables are independent variables. In addition, this base line model

incorporates the BASEL regulations (capital and funding liquidity) to capture their direct impact on bank liquidity creation (that is, H4 and H8). The base model is expressed in equation (3.1) below:

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_4 CAP_{ijt} + \beta_5 FL_{ijt} + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \text{.....} (3.1)$$

where i, j, and t denote individual bank, country and year; LCN is bank liquidity creation, normalized by total assets; SL is stock market liquidity measured by Amihud Index; EPU is measure of World Uncertainty Index; Com shows bank Competition measured by Lerner Index; CAP and FL represent BASEL III regulatory measures (Capital and Funding Liquidity, respectively); Z represents a set of control variables including Size, Profitability, Diversification, Risk, Capital Market Uncertainty, Monetary Policy, and Economic Growth; □ represents bank fixed effect; ϕ represents time fixed effect; u is the idiosyncratic error term; and β and δ are the coefficients to be estimated. The estimated values of parameters β1, β2, and β3 also reflect hypotheses H1, H2, and H3, respectively. Coefficients β4 and β5 test the hypotheses H4 and H8, respectively that is estimate the direct impact of BASEL regulations (capital and funding liquidity, respectively) on bank liquidity creation.

Next, we extend our base model to address the moderating role of BASEL regulations. We develop two sets of models separately for Capital and Funding Liquidity. To test hypothesis H5, H6 and H7, that is, to examine the moderating effect of Capital on relationships of Stock Market Liquidity, Economic Policy Uncertainty and Bank Competition with bank liquidity creation, the following three explicit models are expressed in equations (3.2), (3.3) and (3.4), respectively.

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_5 (SL_{ijt} \times CAP_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \text{.....} (3.2)$$

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_6 (EPU_{ijt} \times CAP_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \text{....} (3.3)$$

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_7 (COM_{ijt} \times CAP_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \text{...} (3.4)$$

Where β5, β6 and β7 are coefficients of one-way interaction terms (SL x CAP), (EPU x CAP) and (COM x CAP), respectively, that capture the moderating effect of Capital on three relationships.

Similar to the above lines, the second set of models addresses the moderating role of Funding Liquidity on three relationships, that is, Stock Market Liquidity, Economic Policy Uncertainty and bank competition with bank Liquidity creation. In this way our hypothesis H9, H10 and H11 are tested through these models. The models are expressed in equations (3.5), (3.6) and (3.7) as:

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_9(SL_{ijt} \times FL_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \quad \ldots\ldots\ldots \quad (3.5)$$

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_{10}(EPU_{ijt} \times FL_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \ldots\ldots\ldots \quad (3.6)$$

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_{11}(COM_{ijt} \times FL_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \ldots\ldots\ldots \quad (3.7)$$

Where β9, β10 and β11 are coefficients of one-way interaction terms (SL x FL), (EPU x FL) and (COM x FL), respectively, that capture the moderating effect of Funding Liquidity on three relationships.

Finally, in order to investigate the combined moderating effect of both BASEL regulation (Capital and Funding Liquidity) on the relationship between Stock Market Liquidity, Economic Policy Uncertainty and bank competition with bank liquidity creation, the three models expressed in equations (3.8), (3.9) and (3.10) are developed that address our hypothesis H12, H13, and H14.

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_{13}(SL_{ijt} \times CAP_{ijt} \times FL_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \ldots (3.8)$$

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_{14}(EPU_{ijt} \times CAP_{ijt} \times FL_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \ldots (3.9)$$

$$LCN_{ijt} = \beta_0 + \beta_1 SL_{ijt} + \beta_2 EPU_{ijt} + \beta_3 COM_{ijt} + \beta_{15}(Com_{ijt} \times CAP_{ijt} \times FL_{ijt}) + \delta_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \ldots (3.10)$$

Where β13, β14 and β15 are coefficients of two-way interaction terms (SL x CAP x FL), (EPU x CAP x FL) and (COM x CAP x FL), respectively, that capture the combined moderating effect of Capital and Funding Liquidity on three relationships.

3.8 Measurement of Variables

3.8.1 Bank Liquidity Creation Measures

In accordance to approach established by Berger and Bouwman (2009), the measure of bank liquidity creation is calculated. Given the lack of information on off-balance sheet items, only on-balance sheet liquidity is used in the analysis. First, using the criteria of convenience, expense, and time, all of the items on the bank's balance sheet are categorized as liquid, semiliquid, or illiquid. This stage uses category information on bank activities rather than maturity information since the liquidity transformation mechanism (asset securitization and cross-subsidization of deposits) is more important in practice than the maturity transformation mechanism (Berger & Bouwman, 2009; Chatterjee, 2015). According to the theory of liquidity creation of similar effect of every item of assets and liabilities to liquidity creation, we then assign a weight of 1/2, 0 or 1/2 to each activity categorized in step 1. Bank liquidity is created by adding the weighted values in third step. Detail construction of Liquidity Creation is described in Table 3.1 as follows:

Step 1: Classification of bank activities as liquid, semi-liquid, or illiquid on the basis of product category.

Table 3.2: Liquidity Creation Measurement

Illiquid Assets	**Semi-Liquid Assets**	**Liquid Assets**
• Commercial real estate loans (CRE) • Loans to finance agricultural production • Commercial and industrial loans (C&I) • Other loans and lease financing receivables • Other real estate owned (OREO) • Investment in unconsolidated subsidiaries • Intangible assets • Premises • Other assets	• Residential real estate loans (RRE) • Consumer loans • Loans to depository institutions • Loans to state and local governments • Loans to foreign governments	• Cash and due from other institutions • All securities (regardless of maturity) • Trading assets • Fed funds sold
Liquid Liabilities	**Semi-liquid Liabilities**	**Illiquid Liabilities**
• Transactions deposits • Savings deposits • Overnight federal funds purchased • Trading liabilities	• Time deposits • Other borrowed money	• Subordinated debt • Other liabilities • Equity

Step 2: Assignment of weights to each classification of activities.

	Illiquid Assets	Semi-Liquid Assets	Liquid Assets
Weights	1/2	0	-1/2
	Liquid Liabilities	Semi-liquid Liabilities	Illiquid Liabilities
Weights	1/2	0	-1/2

Step 3: Syndicate bank activities and as weights to construct the liquidity creation (LC).

LC = +½ (Illiquid Assets) + 0 (Semi Liquid Assets) - ½ (Liquid Assets)

+½ (Liquid Liabilities) + 0 (Semi-Liquid Liabilities) - ½ (Illiquid Liabilities)

We calculate liquidity creation for each of the bank in all countries. Next, we calculate normalize the liquidity creation (LCN) by dividing total liquidity creation (LC) by total asset of respective bank.

3.8.2 Stock Market Liquidity Measure

We use Amihud's (2002) illiquidity ratio, a commonly used proxy of stock market liquidity and captures breadth and depth dimension of stock liquidity. The index is calculated by dividing absolute daily return (r) and trading volume (VA) for t days (Dt) in the year. A lower value of the index means higher liquidly stock market and vice versa.

$$AMMIHUD = \frac{1}{D_t} \sum_{t=1}^{Dt} \frac{|r_t|}{VA_t}$$

3.8.3 Economic Policy Uncertainty Measure

The Economic Policy Uncertainty (EPU) metric developed by Baker, Bloom, and Davis (2016) is widely used in previous research. The Economic Policy Uncertainty (EPU) index is based on a textual analysis of newspaper articles that compiles data on policy uncertainty about government expenditure, inflation risk, and tax code expiry. The overall rating EPU(Composite) is a weighted average of the four individual constituents. To calculate EPU(News), the contents of ten major newspapers are analyzed; EPU(Govt.) uses the government expenditure; EPU(CPI) is calculated using inflation risk; and EPU(Tax) is developed on the basis of federal tax code provisions.

The World Uncertainty Index (WUI) is a relatively new way to gauge the uncertainty of economic policy. Based on a word count of "uncertainty" and its variations from Economist Intelligence Unit country reports, Ahir, Bloom, and Furceri (2018) created an index for 143

developed and developing nations. These studies follow a universal format and focus on narrow aspects of political and economic change in each country. We used WUI as a proxy of economic policy uncertainty in this study. WUI is built from country reports from the same Economic Intelligence Unit source that are customized to national economic and political trends, whereas the EPU draws on a wide range of newspapers. Having consistency and biasness the WUI is preferable compared to EPU. In addition, WUI facilitates the comparison across countries.

3.8.4 Measurement of Competition

Several proxies are used in literature to measure competition. Degryse and Ongena (2008) categorize these measures into two main categories, that is, structural approach and non-structural approach. The former is subject to criticism by many researchers on account of its intrinsic nature of reflecting market power and is less determined by individual bank behavior (Borenstein & Bushnell, 1999 and Carbo-Valverde e al., 2009). Claessens and Laeven (2004) and Borenstein and Bushnell (1999) argue that bank competition is determined more by its ability to compete as compared to market structure and hence structural measure does not address the demand elasticity. Moreover, structural measures are inconsistent with un-structural measure unless the effect of elasticity of demand is controlled (Carbo-Valverde et al., 2009). Thus, it is argued by Aghion et al. (2005) that non-structural measure directly gauges competitiveness of banks. Some of the proxies of bank competition used in recent literature include Lerner Index (Lerner, 1934), Boone Index and P-R-H-statistic that are used in recent literature including Berger et al. (2009); and Horvath et al. (2016). Lerner Index measures the pricing power of banks. The index takes the value between 0 and 1 that refers to perfect competition and monopolistic power, respectively. The index is calculated using the equation (i) as follows:

$$LI_{ijt} = \frac{P_{ijt} - M_{ijt}}{P_{ijt}} \qquad \text{.....(i)}$$

Where $LIit$ denotes Lerner Index for bank i, country j and year t. $Pijt$ shows interest rate earned and $Mijt$ stands for marginal cost of producing an additional loan. The total cost, in accordance with Toh et al. (2019) is a function of three inputs namely, labor, physical capital and funds borrowed. Formally this is expressed in the following equation (ii).

$$lnTC_{it} = \pi_{0i} + \pi_1 lnQ_{it} + \frac{1}{2}\pi_2 (lnQ_{it})^2 + \sum_1^3 \lambda_j lnW_{jit} + \frac{1}{2} \sum_1^3 \sum_1^3 \eta_{jk} (lnW_{jit} * lnW_{kit}) +$$

$$\sum_1^3 \delta_{jq} lnW_{jit}\, lnQ_{it} + \gamma_1 T + \frac{1}{2}\gamma_2 T^2 + \gamma_3 T\, lnQ_{it} + \sum_1^3 \varphi_j T\, lnW_{jit} + \varepsilon_{it} \quad \text{.....(ii)}$$

Where i and t show bank and year. TC denotes total cost, Q is output, W_j are input prices (labor, physical assets, and deposits), T for trend (years), and ε is error term. By taking derivative of trans-log function of total cost we get marginal cost as shown in equation (iii).

$$M_{ijt} = \frac{\Delta TC_{ijt}}{\Delta TO_{ijt}} \quad \text{.....(iii)}$$

Where ΔTC refers to change in total cost of bank consisting of interest and non-interest costs. ΔTO refers to total output of bank consisting mainly of advances and investments for bank. Once the marginal cost is calculated by equation (iii), the Lerner Index is calculated by equation (i).

3.8.5 Equity Capital

The past literature evidences a vital role of capital (CAP) on liquidity creation and documents two opposite effects (positive and negative) of equity capital on liquidity creation (Berger & Bouwman, 2009; Horváth, Seidler, & Weill, 2014; Evans and Haq, 2022). The capital requirement, according to BASEL III is measured by Tier 1 capital as percentage of risk weighted assets. All banks are compelled to hold 8% of Tier 1 capital in order to comply with this regulation. Past studies that use Tier 1 capital as percentage of risk weighted assets include Tran, Lin, and Nguyen (2016), Distinguin, Roulet, and Tarazi (2013). Since the implementation of BASEL III regulations was to be initiated from 2013 onwards, thus banks before this year were not bound to fulfil this regulation. In addition, the availability of risk weighted assets and weights attached to certain asset type were subject to vary by BASEL III. Furthermore, on account of unavailability of data about these risks weighted assets in financial statements of banks of some of countries included in our sample, Tier 1 capital and Tier 2 capital cannot be used as measure of Capital requirement. Thus, this study uses alternate proxy of capital regulation that is equity capital which is in line with several previous studies (Horváth, Seidler & Weill, 2014; Berger et al., 2018; Xei, 2016; Berger et al., 2009; Al-Khouri & Arouri, 2019) that address the influence of capital requirement on liquidity creation and other banking actives. Capital (CAP) is calculated by dividing bank total equity capital by total assets.

3.8.6 Funding Liquidity

The literature posits a significant negative impact of funding liquidity on credit (De Nicolò et al., 2014; Pessarossi & Vinas, 2015) and liquidity creation (Hong, Huang, and Wu (2014); Roberts, Sarkar and Shachar (2018) and Alaoui and Oubdi (2022). Various proxies are also used in literature to measure funding liquidity including: the ratio of total loans and deposit (DeYoung & Jang, 2016); total deposits to total assets ratio (Khan et al., 2017; Mohamed et al., 2018); Liquidity Cover Ratio (LCR), and Net Stable Funding Ratio (Pessarossi & Vinas, 2015). BASEL III has introduced, in 2010, two new liquidity regulations in 2010 namely, Liquidity Cover Ratio (LCR) and Net Stable Funding Ratio (NSFR). To calculate Liquidity Cover Ratio (LC), monthly data for various assets and liabilities items is required that is not available publically and thus, this measure is not used in this thesis. The second measure, Net Stable Funding Ratio (NSFR) is calculated by the ratio of amount of available to required stable funding of a bank. The long-term elements (1 year and more) of liability side of balance sheet (capital and liabilities) constitute stable funds available to bank. The liquidity and various assets held by the bank comprise the required stable funds of the bank. The Net Stable Funding Ratio is calculated by assigning weights to all items of asset and liabilities in accordance with BASEL III. The components and corresponding weights of ASF and RSF are given in Table 3.2 below. The mathematical expression for NSFR is given below in equation (iv).

$$NSFR_{ijt} = \frac{Available\ Amount\ of\ Stable\ Funding}{Required\ Amount\ of\ Stable\ Funding} \quad \text{..... (iv)}$$

Table: 3.3: Items included in NSFR

Components of ASF Category	Weights
Tier 1 and 2 Capital Instruments Other preferred shares and capital instruments in excess of Tier 2 allowable amount having an effective maturity of one year or greater Other liabilities with an effective maturity of 1 year or greater	1
Less stable deposits of retail and small business customers (no maturity or residual maturity < 1yr)	0.85
Less stable deposits of retail and small business customers that are not covered by effective deposit insurance, high-value deposits, internet deposits and foreign currency deposits (no maturity or residual maturity < 1yr)	0.7
Wholesale funding provided by nonfinancial corporate customers (no maturity or residual maturity < 1yr)	0.5
All other liabilities and equity not included above	0

Components of RSF Category	Weights
Cash Short-term unsecured actively traded instruments (< 1 yr) Securities with exactly offsetting reverse repo Securities with remaining maturity < 1 yr Nonrenewable loans to financials with remaining maturity < 1 yr	0
Debt issued or guaranteed by sovereigns, central banks, BIS, IMF, EC, non-central government, multilateral development banks	0.05
Unencumbered non-financial senior unsecured corporate bonds (or covered bonds) rated at least AA, maturity ≥ 1 yr	0.2
Unencumbered listed equity securities or nonfinancial senior unsecured corporate bonds (or covered bonds) rated at least A-, maturity ≥ 1 yr Gold Loans to nonfinancial corporate clients having a maturity < 1 yr	0.5
Loans to retail clients having a maturity < 1 yr	0.85
All other assets	1

According to BASEL III, all banks are compelled to maintain both of these measures at 100%. The liquidity regulations were to be implemented gradually in phases starting from 2013 to 2019. However, our sample encompasses data from 2011 to 2019 and several banks in emerging economies that are our selected sample, have not fulfill this criterion by 2015 and before. There is no homogeneous year (time period) to set to differentiate banks that comply with NSFR with those that do not. Thus, we adopt a different method similar to Hong, Huang, and Wu (2014); Roberts, Sarkar and Shachar (2018) and Alaoui and Oubdi (2022) that investigate the impact of funding liquidity on liquidity creation. These studies use dummy variable for Net Stable Funding Ratio (NSFR) with value of zero and one for pre and post periods of implementation of regulation, respectively. Following these studies this thesis incorporates dummy (FL) for Net Stable Funding Ratio. The difference between our dummy variable (FL) in this study and dummies of above studies is that they used pre and post time period dummies with 2015 as the year when BASEL liquidity regulation was imposed in the countries address by their research. In our study, we use value of Dummy (FL) as 1 for those banks who comply with the BASEL liquidity regulation with value of net stable funding ratio (NSFR) of 100% and above. Whereas value of dummy is set as zero for those banks whose net stable funding ratio is less than 100%. The BASEL III regulations were introduced in 2010 but the liquidity requirement regulation was to be fully implemented by 2018. However, many banks in the world have started implementing these regulations (Capital and Funding Liquidity) the following year 2010, though may not fully complying with these regulations. Our data set encompasses period from 2011 to 2019, many

banks have been observed to comply these regulations fully and those who have not implemented yet. Thus, we assign dummy (FL) the value of 1 for those banks fulfil the liquidity requirement of 100% and dummy (FL) with zero value for banks who have not retain NSFR up to 100%.

3.9 Control Variables

There are three main external factors that are focus of this study including stock market liquidity, economic policy uncertainty and bank competition. We include two moderating variables capital and funding liquidity to analyze their impact on the relationship between above mentioned external variables and liquidity creation. In addition, various control variables are also included in our analysis. These include bank-specific characteristics, stock market uncertainty, and macroeconomic factors. The descriptions of these variables is as follows.

3.9.1 Bank Size

A massive literature document that bank size has significant role for several activities of the bank. The banks of different size may behave differently. For instance, the adoption of technology, access to international capital market, market share. Thus, bank size is an important determinant of bank liquidity creation. Some of the past studies confirm that large banks create more liquidity as compare to small bank (Fungacova, Pessarossi, & Weill, 2013); Berger & Bouwman, 2016). In accordance to Berger and Bouman (2016) and Fungacova et al. (2017), the natural logarithm of total assets is considered as proxy of bank size which is used in this study.

3.9.2 Bank Risk

Credit risk shows the inability of borrower to repay the loan at maturity, taken from bank. In order to isolate the effect of capital on liquidity creation, the credit risk is to be included in the model, since banks primarily retain capital to absorb risk (Berger and Bouwman, 2009). A significant negative relationship between credit risk and liquidity creation is reported by Khouri and Arouri (2019) and Shah et al. (2019) who use Non-Performing Loans as proxy of credit risk. Whereas significant positive effect of credit risk is suggested by Toh et al. (2019). Yeddou and Pouroy (2020) report significant relationship between risk and liquidity creation. There are several indicators used in past literature for measuring bank risk. The study of Berger and Bouwman (2009) uses credit risk whereas Horváth, Seidler, and Weill (2016) introduce z-score as measure of bank risk. We use credit risk to measure bank risk in this study following Rauch

(2014). In accordance with Shah et al (2019), we measure credit risk (CrdRisk) by ratio of net loan loss to previous year loan loss provision expressed in equation (vi) below. The larger value of this ratio indicates higher risk for bank. The literature on emerging economies envisages significant negative (Shah et al., 2019) as well as positive (Toh et al., 2019) impact of credit risk on liquidity creation.

$$Credit\ Risk_{i,t} = \frac{Net\ Loan\ Losses_{i,t}}{Loan\ Loss\ Provisons_{i,t-1}} \ldots\ldots\ldots\ldots\ldots (vi)$$

3.9.3 Profitability

Bank profitability is measured in the past literature by Return on Assets (ROA) and Return on Equity (ROE). The relation between bank profitability and liquidity creation remains unclear. Berger et al. (2016) posit that ROA is negatively correlated with bank liquidity creation whereas Khouri and Arouri (2019) report positive effect of ROA on liquidity creation. Following Berger et al. (2016), we use Return on Assets (ROA) as proxy of bank profitability in this study.

3.9.4 Diversification

Banks may increase their earnings and manage the risks by effectively utilizing diversification strategy. The banks with more income diversity may be more stable and have higher incomes from distinct operations. The banks with diversified assets portfolio are capable of managing their risks. Thus, diversified banks may behave differently in their activities and creating liquidity. Toh et al. (2018) document a significant negative influence of bank diversity (income and asset) on liquidity creation. This study uses income diversification (DIV) as indicator of bank diversity which is calculated by formula expressed in equation (vii).

$$Income\ Diversity = \frac{Non.interest\ Income}{Total\ Income} \ldots\ldots\ldots\ldots\ldots (vii)$$

3.9.5 Market Uncertainty

Following prior research studies of Bonaime, Gulen, and Ion (2017) and Berger (2018), we include market uncertainty to investigate the other sources of uncertainty. However, due to unavailability of implied volatility of stock markets (like CBOE's VIX index) of individual countries selected for our study, we use, following Berger (2018), the standard deviation of stock market return over the year as a measure of market uncertainty (SVL). The volatile stock market is found to affect positively the liquidity creation (Berger, 2018).

3.9.6 Economic Growth

We also control for economic growth in our analysis. Economic growth of a country also influences banks activities and is important determinant of liquidity creation (Berger and Bouwman, 2009, Toh et al., 2018). The studies of Toh et al. (2019); Niu (2022); Danishman (2018) and Khouri and Arouri (2019) report significant positive effect of economic growth on bank liquidity creation. This study uses growth rate of real gross domestic product (GDPR) to measure economic growth.

3.9.7 Monetary Policy

To control for macroeconomic factors, monetary policy stance of central bank is also included in the analysis of this study. The past literature provides mixed results for the effect of interest rate on liquidity creation. It is calculated by real interbank rate (MP) which is in accordance with Berger and Bouwman (2017), Toh et al. (2019), Dang and Dang (2021), Pham et al. (2021).

Table 3.4: Measurement of Variables

Variables	Symbol	Measurement	References
		Dependent Variable	
Liquidity Creation	LNC	LC divided by Total Assets	Berger and Bouwman (2009)
		Independent Variables	
Stock Market Liquidity	SL	Amihud Index	Shah et al. (2019), Toh et al. (2019)
Economic Policy Uncertainty	EPU	World Uncertainty Index	Ahir, Bloom, and Furceri (2018)
Bank Competition	COM	Lerner Index	Shah et al. (2019), Toh et al. (2018)
		Control Variables	
Capital	CAP	Equity Capital /Total Assets	Horvath, Seidler, and Weill (2014); Xei (2016); Berger et al. (2018)
Funding Liquidity	FL(Dummy)	= 1 for NSFR≥100% =0 for NSFR< 100%	Hong, Huang, and Wu (2014); Roberts, Sarkar and Shachar (2018); Alaoui and Oubdi (2022)
Bank Size	SIZE	Log of Total Assets	Fungacova, Pessarossi and Weill (2013); Berger and Bouwman, 2016)
Profitability	ROA	Net Earnings/Total Assets	Berger et al. (2016)
Income Diversification	DIV	Net interest income/Total income	Toh et al. (2019); Elsas, Hackethal, and Holzhäuser (2010); Hsieh et al. (2013)
Credit Risk	CrdRisk	Net Loan Loss/Previous year Loan Loss Provisions	Berger and Bouwman (2009); Toh et al. (2019)
GDP Growth Rate	GDPR	Growth Rate of Real GDP	Beck, Demirguc-Kunt, and Maksimovic (2004); Joh and Kim

			(2012)
Interest Rate	MP	Real Interbank Interest Rate	Aydin and Igan (2012); Berger and Bouwman (2017)
Stock Volatility	SVL	Standard Deviation of Stock Market Return	Bonaime, Gulen, and Ion (2017); Berger (2018)

3.10 Estimation Methods

For the estimation of econometric models described in previous section, we use two stage generalized method of moments (GMM). A brief description of these methods is documented below.

3.10.1 Panel Data Regression Methods

Asteriou and Hall (2007) state that panel data is the merger of time series and cross-sectional data. The proportions of each group in a panel may be equal or unequal. Unbalanced panel data lacks complete observations for some time periods and some cross-sectional units, while balanced panel data contains complete data of cross-sections and throughout time. Panel data has been widely used in recent research studies because it is comprised of various cross-sections (N) over time (T).

Panel data has more degrees of freedom that enhances its accuracy of results (Hsiao et al., 1995). The panel data provides more variability of observations that may allow various transformations in order to identify an unidentified model (Aigner et al., 1984). When there are cross-sectional units independent to each other, then the proposition of central limit theorem can be used that estimators are asymptotically normal (Binder et al., 2005).

3.10.2 Methods of Estimation of Panel Data

For the estimation of panel data, various models are used in past literature including Ordinary Least Square (OLS) method, Fixed Effect and Random Effect model, Two Stage Least Square (2SLS) regression model and a variety of generalized method of momentum. It is tested fact that several issues are involved in estimation of OLS when applied on panel data.

Looking at the base model presented with equation (1) above, we believe that several issues may involve in estimation of this model by using Ordinary Least Squares method, Fixed Effect Model, Random Effect model, or Two Stage Lease Square model. One of the major issues is of endogeneity, since there may be two-way causal effects between dependent variable (Liquidity Creation) and independent variables (Stock Market Liquidity, Competition and Capital in our

model). Further, the independent variables may correlate with error term. In addition, the number of cross section (N) are greater than number of years (t). These reasons may cause endogeneity while using above static regression models. In order to test endogeneity empirically, in our model, we applied Durbin-Wu-Hausman tests. The test (with 0.000 prob-value of the test) does not reject the existence of endogeneity due to three independent variables (Stock Market Liquidity, Competition and Capital).

There are several dynamic estimation techniques developed by analysts and researchers. Among them the Two Step Generalized Method of Moments (2SGMM) is generally considered as the best one to apply on panel dataset (Windmeijer, 2005). The two step GMM methodology provides the BLUE estimator that are best, linear, unbiased and efficient (Arrelano & Bon, 1991 and Roodman, 2009). This technique effectively eradicates the problem of endogeneity arising from correlation of explanatory variables with residuals or/and two-way causality between dependent and independent variables. The past literate proves that Generalized Method of Moment (GMM) is utilized by several researchers including Berger and Bouwmen, (2008), Horvath et al. (2015); Shah et al. (2019) and Tran et al. (2016). Following these studies, this thesis adopts two step system GMM (2SSGMM) estimation in order to analyze the effect of three main external factors on bank liquidity creation in emerging economies. We have executed estimations of two step system GMM (2SSGMM) on the whole sample of banks as well as on sub-samples of large banks and small banks. The results of each sample are expressed separately in three columns of all the tables. Also, diagnostics are applied to ensure the validation and consistency of parameters. *Hansen J* test statistics indicates the joint validity of instruments whereas AR2 test statistics confirms the second order autocorrelation. The initial data processing is carried out in MS-Excel software whereas all further analysis of descriptive analysis, correction analysis and regression estimations are performed in STATA software.

Chapter 4

Results and Discussion

4.1 Introduction

This chapter is composed of nine sections. Section 4.2 demonstrates the statistical features of all variables of interest, particularly dependent variable (bank liquidity creation), three main external factors (stock market liquidity, economic policy uncertainty and bank competition), BASEL regulations (capital and funding Liquidity) and other control variables (bank specific and macroeconomic factors). This is followed by section 4.3 that presents correlation analysis for variables of study. Section **4.5** explains the baseline regression of two-step system GMM estimations. This is followed by Section 4.5 that is devoted to introduce the moderating role of BASEL regulations with regard to external factor under study. We elaborate this discussion in separate three sections (4.7, 4.8, and 4.9) that document in detail the effect of three external variables (stock market liquidity, economic policy uncertainty and bank competition) on liquidity creation with moderating role of BASEL regulations. All these three sections end up with brief conclusion.

4.2 Descriptive Statistics

In this section, we discuss the various features of all the variables that are focus of this study. As described in research methodology (chapter 3) our sample data comprised of 11 emerging countries and annual data for all variables is collected from 2011 to 2019. There are 587 banks that gives total of 5283 observations after excluding the missing observations. Table 4.1 below documents the descriptions of all these variables.

This study uses normalized liquidity creation (LCN) for analysis in order to address our objectives. The normalized liquidity creation is measured by ratio of individual bank liquidity creation divided by its total assets. The results (from Table 4.1) show that average value of this ratio is 0.014 which means, on average, the liquidity creation of banks in emerging countries is 1.4 percent of their total assets during 2011 to 2019. The standard deviation is about 0.316 around its mean with maximum value of 0.386 and minimum of -0.429. These results are

consistent with results of Toh et al. (2018); Toh et al. (2019); and Shah et al. (2019) that undertake research in emerging economies.

Our main explanatory variables are stock market liquidity, economic policy uncertainty and bank competition. We measure stock market liquidity by inverse of Amihud Illiquidity Index (SL), the larger the value, the lower is liquidity of stock market and vice versa. The mean value of Amihud illiquidity index is 2.17 with standard deviation of 2.98 for full sample during the period. This indicates weak stock market liquidity in emerging economies as compare to advanced economies. This is consistent with previous studies on emerging markets like Toh et al. (2019) and Umar and Sun (2016). The uncertainty of economic policy (EPU) is quantified by World Uncertainty Index the higher value indicates higher level of uncertainty. The EPU shows up an average of 0.15 and standard deviation of 0.036 which is in line with world uncertainty index of emerging economies as confirmed by studies of Demir and Danisman (2021); Ahir, Bloom, and Furcei (2022); and Bilgin et al. (2021). Lerner Index is used to measure bank market power and its inverse is a measure of bank competition (denoted by COM). The larger value of Lerner index shows lesser competition in banking industry i.e. the value near to 1 means monopoly and close to zero indicate perfect competition. Overall, the bank power shows the average value of 0.415 for all banks in emerging economies that fluctuates by 0.10 about the mean with maximum and minimum values of 0.69 and 0.096, respectively. This clearly indicates that banking industry in these economies is more competitive (i.e. 41.5% market power). Also, the deviation from this average is low (i.e. 0.09) which shows banks are consistently facing this competition in these countries over the sample period. The past studies on emerging markets including Toh et al. (2018) and Shah et al. (2019) endorse these findings.

The Capital is used in our study to gauge the first BASEL regulation. Bank equity capital (CAP) is the ratio of total equity to total assets of banks. The results show that on average the equity capital is 24.8% of total assets for banking industry in emerging economies. This varies with 0.187 above and below this average. The highest and lowest capital ratios of banks in emerging economies are 72% and 24% of total assets, respectively. Our results of capital ratio are supported by past literature on emerging economies (Toh et al. 2018; Toh et al., 2019; Grover and Sinha, 2021; Shah et al., 2019). Funding Liquidity (FL) is second measure of BASEL regulation that is another important focus of this study. It is measured by Net Stable Funding

Ratio (hereafter NSFR) which is calculated (elaborated in methodology) as the ratio of available amount of stable funding and required amount of stable funding. It can be seen that on average, banks in emerging economies retain 85.2% of stable funds of total required stable funds. This means these banks are deficient by 15% in fulfilling their requirement of stable funding. The fluctuation from this average is about 41%. The highest value retain by any bank is 1.9, that is, more than required amount of stable funding is retained by the bank; and least value of 0.33 shows only 33% of required stable funding is contained by the bank. The statistics presented in Table 4.1 are in line with those of Umer and Sun (2016) for NSFR of emerging economies.

Table 4.1: Descriptive Analysis

Variable	Mean	Std. Dev	Median	Min	Max	Skewness	Kurtosis
LCN	0.014	0.316	0.065	-0.429	0.386	-0.206	1.401
SL	2.172	2.98	1.101	0.21	1.85	3.043	3.333
EPU	0.149	0.036	0.114	0.021	0.181	1.196	2.458
COM	0.415	0.099	0.412	0.096	0.69	-0.134	2.52
CAP	0.248	0.187	0.173	0.241	0.724	0.973	2.696
FL	0.852	0.414	0.201	0.333	1.895	2.384	1.213
SIZE	7.094	2.534	7.195	1.099	12.987	-0.086	2.767
ROA	0.016	0.024	0.013	-0.068	0.067	-0.468	3.576
DIV	0.179	0.264	0.051	0.013	0.931	1.71	2.792
CrdRisk	0.701	1.921	0.833	-0.317	1.023	3.031	1.6
GDPG	0.043	0.022	0.044	-0.02	0.091	-0.211	3.036
MP	0.056	0.039	0.051	0.005	0.17	0.973	3.479
SVL	1.219	0.706	1.561	0.87	2.885	2.578	3.326

Bank size (SIZE) calculated as log of total assets which shows an average value of 7.094 for all banks during the period with a standard deviation of 2.53. The largest bank has size of 13 and smallest bank size of 1.09. The previous studies document similar size of bank in emerging economies and these studies include Toh et al. (2018) and Grover and Sinha (2021). The average profitability measured by return on assets (hereafter ROA) of banks is 1.6% of total assets for banks in these countries with standard deviation of 0.024. The maximum and minimum value of ROA are -6.8% and 6.7%, respectively. All the banks, on average, have diversification (DIV) of 18% with 0.26 of standard deviation. The bank credit risk (CrdRisk) shows a mean value of 0.70, ranging from -0.317 to 1.02. Regarding macroeconomic factors, the real economic growth rate shows 4.3% on average for all the selected countries. The interest rate (MP) varies between 0.5% and 17% during the period of study. Whereas stock market uncertainty (SVL), measured by

standard deviation of stock index of each country, envisages a fluctuation from 0.87 to 2.8 during the study period. The results presented in Table 4.1 are confirmed by previous studies analyzing emerging markets including Toh et al. (2018), Toh et al. (2019), Shah et al. (2019), Grover and Sinha (2021), and Demir and Danisman (2021).

4.3 Correlation Matrix

The purpose of correlation analysis is to explore strength and direction of association between pair of variables included in our study, that is stock market liquidity, economic policy uncertainty, bank competition, BASEL regulations, bank liquidity creation and other control variables. The correlation analysis also assists in assessment of multicollinearity between pairs of variables. Since continuous panel data is used for this study therefore, Pearson correlation has been used for the analysis.

As presented in Table 4.2, the Amihud Index (SL) has a negative sign meaning that stock market liquidity has week and significant positive association (at 1% level) with bank liquidity creation. This implies that when stock market improves, the liquidity creation increases and vice versa. Economic Policy Uncertainty (EPU) shows week and significant negative association with bank liquidity at 1% level which indicates that these variables move in opposite direction that means in times when there is uncertainty of policy in the economy, the liquidity creation decreases. The Lerner Index (COM) has positive sign that means bank competition has significant negative association at 1% level with bank liquidity creation. This indicates that bank liquidity creation reduces in more competitive banking industry and vice versa. Although the magnitude of association is not strong (about 30%) but these results are in line with our expected theoretical direction of movement of these three pair of variables and also confirmed with previous studies focusing emerging markets including Shah et al. (2019), and Umer and Sun (2016). As for BASEL regulations, the coefficients of correlation of both capital (CAP) and funding liquidity (FL) with bank liquidity creation come up with negative signs with 1% and 5% level of significance. Capital shows 27% strength of association whereas funding liquidity has 16% strength of association with liquidity creation. These results reveal that both the BASEL regulations tend to discourage banks in creating liquidity in the economy as supported by Berger and Bouwman (2013) and Toh et al. (2019). Now we turn up to explain the co-movement of

BASEL regulations and our selected external variables stock market liquidity, economic policy uncertainty and bank competition. It can be seen from Table 4.2 that SL has negative coefficient of correlation with Capital (CAP) and funding liquidity (FL) with 1% and 10% levels of significance, respectively. This reveals that stock market liquidity is directly related to both of BASEL regulations (capital and funding liquidity), though the association is not strong with only 10% and 5% strength, respectively. For economic policy uncertainty, the negative coefficients of 0.03 and 0.011 confirm week and negative associations of EPU with capital and funding liquidity, respectively. Finally, for bank competition, as Lerner Index is inverse measure of bank competition, the positive correlation coefficient between COM and capital (0.44) leads to modest but negative co-movement of capital with bank competition. Funding liquidity, on the other hand, indicates (-0.16) week and positively associated with bank competition. Another interesting correlation coefficient is of capital and funding liquidity that is 17% of strength. This implies that when bank equity capital is raised, the funding liquidity of bank also tends to increase and vice-versa.

Next, we turn up to interpret the association between control variables and liquidity creation. The results in Table 4.2 depict that bank size (SIZE) is positively correlated with liquidity creation with 40% strength. This reveals the larger banks tend to create more liquidity than smaller banks. Bank profitability and asset diversity indicate positive co-movement with liquidity creation with 25% and 42% of magnitude, respectively. This means that banks with profitability and more diversified sources of income are creating more liquidity. In contrast, bank credit risk (CRSK) has negative but very minute association with bank liquidity creation (i.e. 6%). The higher credit risk indicates banks creates less liquidity. The economic growth (GDPR) measured by growth rate of real Gross Domestic Product (GDP) reports a positive association with bank liquidity creation with 18% strength which means when economy is at boom, banks are engaged in creating higher level of liquidity and vice versa. The monetary policy (MP) has inverse but weak (4%) association with liquidity creation. Stock market volatility (SVL) also shows very week and negative correlation with bank liquidity. Overall, most of the coefficients of correlation are less than 50% in magnitude. According to Lewis-Beck (1993) the multicollinearity problem is of concern when correlation is above 0.80 between independent variables. This confirms that our model is free of issue of multicollinearity among all the variables. The results obtained from our analysis are consistent with previous studies including: Toh et al. (2018), Toh et al. (2019),

Grover and Sinha (2021), and Shah et al. (2019), Demir and Dsnisman (2021), Umer and Sun (2016), and Bilgin et al. (2021).

Table 4.2: Correlation Analysis

	LCN	SL	EPU	Com	Cap	FL	Size	Div	ROA	CRsk	GDPR	MP	SVL
LCN	1												
SL	-0.18***	1											
	(0.000)												
EPU	-0.03***	0.24***	1										
	(0.001)	(0.000)											
Com	0.29***	-0.05	-0.12***	1									
	(0.000)	(0.753)	(0.000)										
Cap	-0.27***	0.13*	-0.03***	0.46***	1								
	(0.000)	(0.045)	(0.000)	(0.000)									
FL	-0.15***	-0.05***	0.01	-0.16***	0.17***	1							
	(0.000)	(0.007)	(0.346)	(0.000)	(0.000)								
Size	0.39***	0.06***	-0.03**	-0.19***	-0.34***	0.14***	1						
	(0.000)	(0.000)	(0.015)	(0.000)	(0.000)	(0.000)							
Div	0.42***	-0.09***	-0.03**	0.15***	0.28***	-0.07***	-0.13***	1					
	(0.000)	(0.000)	(0.044)	(0.000)	(0.000)	(0.000)	(0.000)						
ROA	0.25***	0.040	-0.11**	0.51***	0.32***	-0.12***	-0.07***	0.24	1				
	(0.000)	(0.183)	(0.029)	(0.000)	(0.000)	(0.007)	(0.004)	(0.201)					
Crsk	-0.062**	-0.12***	-0.15***	-0.26	-0.17**	-0.04*	0.19***	0.14	0.033	1			
	(0.017)	(0.000)	(0.000)	(0.979)	(0.039)	(0.078)	(0.000)	(0.877)	(0.189)				
GDPR	-0.18***	-0.28***	-0.33***	-0.28***	-0.12***	-0.21***	0.12***	0.17***	0.26***	0.08**	1		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.000)	(0.000)	(0.005)	(0.000)	(0.028)			
MP	0.142***	-0.08***	0.13***	-0.14***	-0.31***	-0.11***	-0.24***	-0.18***	-0.27***	-0.29***	-0.31***	1	
	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
SVL	-0.056***	-0.25***	0.38***	0.24***	0.19***	-0.08***	-0.12**	0.17***	0.21**	0.17***	0.04***	0.07	1
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.038)	(0.000)	(0.027)	(0.005)	(0.003)	(0.212)	

P-values are shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively.

4.4 Regression Analysis

The descriptive statistics presented in previous section provides some comprehensions about the relationship between the dependent variable (bank liquidity creation) and external factors. This section, therefore, presents detail insight about these relationships by utilizing panel data estimation techniques. As mentioned in methodology section, the static estimation techniques lack in tackling the three fundamental problems of autocorrelation, endogeneity and heteroscedasticity that cause to produce biased results. The Durbin-Wu-Hausman test confirms the presence of endogeneity in our model due to three independent variables (stock market liquidity, competition and capital). The probability value of the test is found to be less than 0.05 that leads to rejection of null hypothesis of exogeneity in favor of endogeneity of above mention variables. The dynamic estimation approach, therefore, is considered efficient in overcoming these issues. Among several dynamic estimation techniques, the two-step System Generalized Method of Moments is generally considered as the best one to apply on panel dataset (Windmeijer, 2005). The two-step system GMM methodology provides the BLUE estimators that are best, linear, unbiased and efficient (Arrelano & Bond, 1991; Roodman, 2009). This technique effectively eradicates the problem of endogeneity arising from correlation of explanatory variables with residuals or/and two-way causality between dependent and independent variables. The estimation of two step system GMM is adopted in this study in order to analyze the effect of three main external factors on bank liquidity creation in emerging economies. The sample data set consists of 587 banks from 11 emerging economies with annual observations spanning from 2011 to 2019. We have executed estimations of two-step system GMM on sample of all banks and sub-samples of large banks and small banks. The results of each sample are tabulated separately in three columns of all the tables. The diagnostics are also applied to ensure the validation and consistency of parameters. For instance, *Hansen J* test statistics indicates the joint validity of instruments, whereas AR2 test statistics confirms the second order autocorrelation. All the estimations are performed in STATA software.

4.5 Baseline Model Analysis

In our baseline model we attempt to achieve our first objective, i.e. to examine the impact of three external variables (stock market liquidity, bank competition and economic policy

uncertainty) on bank liquidity creation. This baseline model also includes two BASEL regulation measures (capital and funding liquidity) as independent variables to investigate the direct impact of these external factors and BASEL regulations, along with other control variables on bank liquidity creation with a sample data of 587 banks in 11 Asian emerging economies. The model econometric form is presented as equation (4.1):

$$\mathbf{LCN_{ijt} = \beta_0 + \beta_1\, SL_{ijt} + \beta_2\, EPU_{ijt} + \beta_3\, COM_{ijt} + \beta_4\, CAP_{ijt} + \beta_5\, FL_{ijt} + \delta_0\, Z_{ijt} + \square_{ij} + \phi_t + u_{ijt}} \quad \ldots . \mathbf{(4.1)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. Whereas Z denotes the vector of control variables that includes bank size, profitability, credit risk, real GDP growth rate, interest rate and stock market volatility. $\square$ and $\boldsymbol{\phi}$ capture bank and time effects, respectively. And u is error term. We also test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effect are excluded from our models in this study. The results of two-step system GMM model are presented in Table 4.3.

The table shows p-values of *Hansen J* test and AR2 test that shows null hypotheses cannot be rejected at 1% level. This confirms the consistency of our results obtained by two-step System GMM models. Also, the number of instruments is less than the number of groups that qualify the criteria for valid instruments used for estimation.

The model includes first lag of the dependent variable (LCN) in order to estimate the persistence of liquidity creation. Table 4.3 shows a positive value of coefficient of lag value of liquidity creation as highly significant at 1% level. This suggests all banks in emerging economies are persistent in maintaining liquidity, year to year. The corresponding coefficients in all the models with large banks as well as small banks confirm that all banks in emerging economies behave in same manner that current year liquidity creation depends on lag year liquidity creation. The findings are comparable with Toh et al. (2018) and Toh et al. (2019) in context of Malaysian bank; Shah et al. (2019) for Chinese banking sector; and Grover and Sinha (2021) for Indian banks. In addition, the results match with Horvath et al. (2013) in context Czech Republic banks.

The result depicts a significant positive impact of stock market liquidity on liquidity creation at 1% level leading to rejection of null hypothesis (H1a). The improvement in stock market liquidity encourages banks to create more liquidity in the market and thus contributing positively towards economic growth of the economy. One of the probable reasons of this may be the risk-smoothing feature of liquid stock market. Diamond and Dybvig (1983) argue that savers with surplus liquidity have to compromise the higher returns on their investments in illiquid assets with liquidity assurance to meet their uncertain future needs. A liquid stock market provides investors the ability to easily liquidate their assets without significant transaction cost in a liquidity stock market and their need for liquidity from banks is reduced (Mattana & Panetti, 2014). The banks, in turn, are able to absorb greater asset-liability mismatch by allocating more liquidity from their liquid reserves to illiquid assets (Sarr & Lybek, 2002) and thus increase liquidity creation. The second reason for this positive relationship may the external financial premium that determines liquidity creation. The rise in asset market liquidity leads to a decline in implied cost of capital (Acharya and Pederson 2005). As argued by Chatterjee (2015), the liquid stock market provides opportunity to banks to raise equity capital with lower cost and to provide a wider range of lending to underserved borrowers. Hence, bank liquidity creation is increased. Another reason may be the stimulated foreign investment inflow attracted by liquid stock market, that results in a stronger growth in the amount of deposit capital available with banks that consequently enhance liquidity creation. A growing stock market further stimulates market development and expansions of business. The ability of large enterprises to finance themselves with equity tends to improve their borrowing capacity and their demand for loans with enhances credibility (Demirguc-Kunt & Levine's, 1996a) that leads to increased liquidity creation by banks.

The results contradict with traditional view of adverse effect of stock market liquidity on liquidity creation (Diamond, 1997). An increased stock liquidity provides the investor the liquidity assurance as well as higher return on investments in illiquid assets thus, exerting competitive pressure on banks' liquidity creation. It can be argued that these theories assume the traditional products of deposits and loans provided by banks. Whereas the present globalized and integrated banking industry has introduced various new products like risk bearing instruments, off balance sheet commitments, and other dynamic pool of clients and borrowers that enables banks to have competitive edge over stock market. Hence, the traditional view of adverse effect

of stock market liquidity on bank liquidity is dominated by positive relationship between the two. Our results are in line with Chatterjee (2015), Song and Thakor (2010) and Toh et al. (2018).

For the sack of analyzing the impact of economic polity uncertainty (EPU), this study utilizes the World Uncertainty Index (WUI) to measure economic policy uncertainty. Table 4.3 shows that slope coefficient of EPU is negative and significant at 5% level. This leads to rejection of null hypothesis and acceptance of H2a. This suggests that the response of banks to economic policy

Table 4.3: Effect of External Factors and BASEL Regulations on LCN

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
L.LCN	0.406***	0.410***	0.587***
	(0.082)	(0.104)	(0.108)
SL	-0.0122*	-0.0359	-0.0611***
	(0.006)	(0.021)	(0.019)
EPU	-0.406**	-0.409**	-0.402**
	(0.187)	(0.215)	(0.202)
Com	0.577***	-1.209**	0.585*
	(0.217)	(0.481)	(0.306)
Cap	-1.466***	-1.798***	-0.712***
	(0.207)	(0.343)	(0.22)
FL	-0.11	-0.00385	-0.0914
	(0.157)	(0.172)	(0.073)
Size	0.00452	-0.00442	0.0208
	(0.009)	(0.015)	(0.018)
ROA	2.096***	3.575***	2.582***
	(0.524)	(1.173)	(0.766)
DIV	0.292**	0.395***	0.293
	(0.126)	(0.129)	(0.179)
CRSK	-0.00783	-0.0101	-0.00698
	(0.008)	(0.011)	(0.008)
GDP	0.424	0.659	0.291
	(0.594)	(1.135)	(0.829)
MP	-0.0205	-0.2	-0.836
	(0.293)	(0.416)	(0.57)
SVL	-0.0000183	-0.000109	-0.000272

	(0.000)	(0.000)	(0.000)
Constant	0.215*	0.0677	-0.282
	(0.119)	(0.224)	(0.22)
AR(1)	0.01	0.056	0.004
AR(2)	0.344	0.851	0.24
Hansen	0.67	0.618	0.435
Sargan	0	0.008	0.012
Number of Groups	263	165	116
Number of Instruments	68	57	66
Observations	1212	770	351

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

uncertainty is negative. The results confirm Uncertainty Credit Crunches hypothesis. According to this hypothesis, economic uncertainty has a deteriorating impact on bank lending. The reason for this negative relationship is that banks mangers, when facing economic uncertainty take stance of risk aversion (Panousi and Papaniko-laou, 2012). Moreover, external financing costs rise due to economic policy uncertainty and banks face with limited funding. This eventually, compel the banks to reduce or suspend their lending (Brogaard and Detzel, 2015). Further, this effect of EPU on liquidity creation is endorsed by the results of large and small banks. Our results are consistent with Berger et al. (2018) that undertakes research study by using a comprehensive data set from 1985 to 2016 for all U.S. banks and uses various proxies for economic uncertainty and liquidity creation. Three among four proxies confirm inverse effect EPU on bank liquidity creation. It is worth noting that the magnitude of impact of policy uncertainty is larger in emerging economies (0.353) as compared to advance economy U.S. (0.034). This indicates that economic policy is of more concern for government and policy makers in emerging economies. Several past studies evidenced the reduced lending and risk aversion behavior responded, homogeneously by all the banks in high uncertainty periods (Chen & Funke, 2003; Calm`es & Th´eoret, 2014).

To measure bank competition, this study uses inverse of Lerner Index. Regarding the effect of bank competition (COM) on liquidity creation, our results show a positive coefficient of COM that envisages significant negative influence of bank competition on LCN at 1% level. Thus, we accept our hypothesis (H3b). The coefficient (0.438) indicates that on average, with 1 percent

increase in bank market power, the liquidity creation of bank will decrease by almost 0.44 percent when all other factors are kept constant. One reason of this decline in liquidity creation by banks is that the client-bank relationship becomes less valuable for banks because clients intend to invest their money in asset market with more returns or switch to other bank (Petersen & Rajan, 1995; Hauswald & Marquez, 2006; Horvath et al., 2013, 2016). Another reason may be the strict bank regulations that require collateral and previous history of borrowers for approval of loans to customers. Consequently, those credit worthy borrowers are rejected by the banks on the basis of these requirements that would be approved otherwise (Toh et al., 2018). In addition, it can be argued that bank profit margins are reduced due to competitive pressure among banks and banks seek other means of income like fee, cash management (Amidu & Wolfe, 2013). These non-interest activities become more attractive and beneficial for bank as compare to interest-based activities during more competitive market situation. Thus, banks eventually reduce liquidity creation.

Large banks in emerging economies, on the other hand, are reported to create more liquidity when competition increases in the banking sector. Large banks concentrate in hard-information-based lending mechanism like collateral, historical performance and credit rating that also facilitate reducing agency problem (Berger & Black, 2011; Berger & Udell, 2006; Berger et al., 2005; Cole et al, 2004; Stein, 2002). This advantage allows them to accommodate a large number of customers and corporations through vast nation-wide branch networks. The adoption of hard-information for approval of loans to new customers mitigate their credit risks and bad debts. Therefore, in competitive market, large banks are less effected by the cost associated with scrutinizing new risky customers at initial stage as well as their switching to other options.

In addition, large banks, as opposed to small banks have some features that enhance their capabilities to create more liquidity in the economy even in times of increased competition in banking sector. The capabilities of large banks are most readily apparent in their widespread branching and delivery routes, solid reputations, big workforces, and widespread use of cutting-edge technologies. Moreover, as large banks provide a wider range of competitive financial goods and services, and can attract a more diverse client base and tolerate weaker pricing power in order to expand into new and current markets more quickly. As a result, the banks may increase the amount of money they lend out by accepting more deposits. Furthermore, large

banks are generally ahead to adopt new technology because they can afford to invest in new technologies and have wider scope of clients both at liability and asset sides that make them major shareholder of the market. Therefore, large banks on account of wider serving of products and services, access to markets, adoption of technology, are capable of creating more liquidity even in high competition in the market.

On contrary, small banks envisage significant negative impact of competition on their liquidity creation. The reasons for this negative relationship can be attributed to less capabilities of small banks, narrow profit margins compare to large banks and characteristics of small banks that compel them to reduce liquidity in face of competition with their peers. Small banks have limited branch networks and focus only certain segment of clients like SME, retail banking, trade financing, subsidiaries of corporations. These groups are main sources of profits for small banks and banks are inclined to establish stronger relationship with these entities in order to benefits larger share of their gains. Another attribute of small banks is their flat organizational structure that facilitates prompt decision making and swift communication that provides soft-information of clients to be used in approval of advances and services to these clients (Berge & Black, 2011; Berger & Udell, 2006), Berger et al., 2005b; Cole et al, 2004; Stein, 2002). Small banks in face of competition, tend to focus on improve relationship with existing clients and are reluctant to capture new risky customers that are associated with higher costs (Dell'Ariccia & Marquez, 2004) and liquidity creation through new customer is reduced. On account of narrow target market, slower technological adoption, small banks have limited scope to attract new deposits and loans (Siow, 2016). Thus, competition cause reduction in their liquidity creation.

In sum, the results endorse the findings of the studies on advanced economies such as study of Horvath et al. (2016) on Czech banks and study of Jiang et al. (2019) on U.S. banking sector with data set from 1984 to 2006. In addition, our results are in line with those of Grover and Sinha (2021), Shah et al. (2019) and Toh et al. (2019) to provide evidence for individual emerging countries like India, China, and Malaysia. Our results confirm, empirically, the "Competition Fragility" view of bank competition relationship with bank liquidity creation in emerging economies.

In pursuance of achieving second objective of the research we, here, discuss the role of BASEL regulations (Capital and Funding Liquidity) in determining bank liquidity creation in emerging economies. The direct impact of two BASEL regulations is reported in Table 4.3. The negative coefficient (-1.466) of capital (CAP) is significant at 1 % level, implying significant adverse effect of bank equity capital on total normalized liquidity creation (LCN) in our model. Thus, we reject null hypothesis in favor of H4b. The results provide evidence controverting the "Risk Absorption" hypothesis in favor of "Financial Fragility Crowding out" hypothesis. Since equity capital is relatively illiquid to be claimed against banks (Gorton & Winton, 2017) and incentive for investors is minimized to monitor borrowers in high capitalized banks (Coval & Thakor, 2005), the credit terms tend to be tightened by banks and banks are discouraged to create liquidity. Our results are in accordance with past studies in emerging economies like Toh et al. (2018) for Malaysian banks; Grover and Sinha (2021) for Indian banks; and Ilyas and Sarwar (2018) for Pakistani banks. Also, our results are in line with studies on advanced economies including Berger and Bouwman (2009) for U.S. banking system; Fungacova, Weill, and Zhou (2010) for small banks in Russia; Horvath, Seidler, and Weill (2014) for Czech banks; Fu et al. (2016) for Asian Pacific economies and Distinguin et al. (2013) for European and U.S. banks. On comparing large with small banks, we find negative and highly significant (at 1% level) influence on liquidity creation of both types of banks. However, for large banks, equity capital has larger impact (almost double) on liquidity creation as compared to that of small banks that proves that large banks are more risk averse than small ones. Thus, concluding results favor "Financial Fragility Crowding out" Hypothesis for all types of banks and higher intensity in large banks in emerging economies.

The second part of our second research objective is to evaluate the role of Funding Liquidity (FL) with regard to bank liquidity creation. Table 4.3 shows that there is negative influence of FL on bank normalized liquidity creation for all banks in emerging economies. The p-value shows that result is insignificant. We find consistent results for large and small banks with small banks indicate more sensitive to FL compare to large banks. The BASEL liquidity regulation is proxied by net stable funding ratio which is measured by available stable funds divided by required stable funds. The available funds are composed of equity capital, short term liabilities, and demand deposits of one year maturity. The equity capital is least affected by liquidity requirement as against deposit-based funds and short-term liabilities because of highest and

lowest (100% and 50%), weights assigned to them, respectively. Since large banks generally have larger share of equity-based funds in total available funds as compare to small banks. Small banks depend mostly on deposit-based funds that are more sensitive to limiting effect of funding liquidity compare to non-deposit funds. Thus, liquidity requirement has more deteriorating effects for small banks compared to large banks (Bouwman, 2013).

We include number of control variables in our model that are incorporated in past empirical studies. Table 4.3 depicts results pertaining to bank size (SIZE) that envisages positive but insignificant impact of bank size on bank liquidity creation in emerging markets. This result is in accordance with the previous studies conducted in emerging economies including Berger and Bouwman (2009); Toh et al. (2018); Grover and Sinha (2021). Further, it is evident that the coefficient of size (0.00442) for large banks is greater than that of small banks (0.00208). This result implies that relative to total assets large banks create more liquidity compare to small banks with increase in total assets. Large banks have wider lending technologies and have funding from national or international capital markets that enhances their capacity to provide more loans to customers (Berger & Black, 2011; Stein, 2002). Whereas small banks are more inclined towards entrepreneurial type businesses to raise funds locally.

Bank profitability (ROA) shows positive coefficient (2.096) which is highly significant at 1% level. This implies, in emerging economies, the banks that have more capabilities of earning profit out of their assets, are inclined towards creating more liquidity in the economy. Moreover, statistically significant and positive results are revealed for both large well small banks. The profits lead to higher retained earnings that in turn contributes to more equity funds available for lending and liquidity creation. Large banks increase more liquidity creation when profitability increases as against small banks that create liquidity in response to increased profitability. The result affirms studies of Khouri and Arouri (2019) for GCC countries and Shah et al. (2019) for Chinese banking sector.

As for bank diversity (DIV), the results of our study show that bank diversity, measured by asset diversity, has positive effect on bank liquidity creation in emerging markets. The positive coefficient (0.292) is significant at the 5% level which suggests that 1 percentage rise in asset diversity leads to increase in liquidity creation by 0.292%. It is evident that income diversification provides new ways of income generation that enhances their profitability (Sanya

and Wolfe, 2011). In addition, earing from non-intertest activities squeezes fluctuations in income and bring consistency in revenues that improves their solvency. Thus, income diversification enhances both returns and solvency that contributes towards banks inclination to create more liquidity. Similar results are obtained from our two sub-samples (large and small banks). It can be concluded that the intensity of effect of diversification is more for large banks (with coefficient 0.395) as compared to small banks (with coefficient 0.293). It means that larger banks increase more liquidity creation when they increase diversification compare to small banks. Since larger banks offer wider range of products and services and have more access to local as well as international markets compare to small banks. Our results support Toh et al. (2019) for Malaysian banks that envisage a significant positive impact of asset diversity as well as of income diversity on liquidity creation when examined with interaction with bank competition.

Our result reveals a negative but insignificant effect of credit risk (CrdRisk) on liquidity creation of banks. We suggest that credit risk on bank loans may require banks to be more vigilant in approving further lending and banks are reluctant to create liquidity. Furthermore, the credit risk increases the default risk that leads to increase in investors premium and compel banks to reduce liquidity creation. Similar results are envisaged for large and small banks. These results are consistent with study of Shah et al. (2019) for Chinese banks and Khouri and Arouri (2019) for GCC countries.

The estimation includes growth of real GDP as measure of economic growth. The coefficient (GDPR) shows a positive but insignificant relation of GDP growth with bank liquidity creation. In growing economy, the overall consumption as well as investment tend to raise. Firms expand their businesses to increase supply in face of higher demands of their products and services that requires more financing through debt and equity (Kiss et al., 2006). Thus, demand of bank loans increases and consequently increases the bank liquidity creation (Ibrahim, 2016). This behavior is similar in all banks irrespective of their size. In addition, the large coefficient of large banks indicates that large banks take lead to small banks in creating liquidity in good times. The results are supported by Toh et al. (2018) and Toh et al. (2019) that address inter-relation of stock liquidity and competition, with bank liquidity creation in Malaysian banking sector and confirm positive and insignificant impact of GDP growth on bank liquidity for Malaysian banking sector.

Furthermore, the negative coefficient of interest rate (MP) in our model suggests a rise in interest rate by government compels banks to reduce creating liquidity. The primary reason for this contraction is that the available funds become more expensive with rise in interest rate (Berger & Bouwman, 2017) leading to decline in available funds with banks for lending that consequently, decreases liquidity creation. The studies of Hackethal et al. (2010); Aydin and Igan (2012); Berger and Bouwman (2017); Toh et al. (2018); and Toh et al. (2019) are among those that provide empirical evidence for the same results.

Finally, the coefficient of stock market volatility (SVL) is negative but insignificant. The magnitude of coefficients in all models are very small that implies very little or no significant role of stock market volatility on bank liquidity creation. The stock volatility measures the fluctuations in stock returns that signals uncertainty in the market. The firms in face of stock market uncertainty are reluctant to expand business activities and their demand for bank loans reduces. Thus, liquidity creation is adversely affected by volatile stock market. Although the result is insignificant, the negative impact of stock market uncertainty is supported by study of Berger (2020) who analyzes effect of EPU on bank liquidity creation in U.S. banks.

As we proceed to next section, we conclude our results with respect to our objectives. For our first objective, on the basis of above analysis, this study confirms that there is a significant impact of selected external variables that is, stock market liquidity, bank competition and economic policy uncertainty on bank liquidity creation in emerging economies. With regard to second objective, this study confirms the significant negative direct effect of BASEL regulations (Capital and Funding Liquidity) on bank liquidity creation in emerging markets. The results are in line with previous studies that address some of the individual emerging countries like Toh et al. (2019) and Shah et al. (2019). Thus, this study provides more generalized results for the emerging economies.

4.6 External Factors, Liquidity Creation and Moderating Role of BASEL Regulations

The role of BASEL in determining the banking activities are addressed in past literature (Berger & Bouwman, 2013; Gorton & Winton, 2017; Thakor 2014). There are mainly three measures under BASEL III Acord. This study intended to focus on two BASEL regulations that is, Capital

and Funding Liquidity. We attempt to achieve our subsequent objectives (objective 3 to 11) by demonstrating the moderating role of BASEL regulations on the three relationships being focus of this study that is, the relationship between stock market liquidity, economic policy uncertainty and bank competition with bank liquidity creation. Since there are three main external variables, so we segregate our reporting in three main sections (Section 4.5, 4.6, 4.7) one section for each external variable. As there are two BASEL regulations (capital and funding liquidity) considered in this study for analysis, we perform three analyses in each of the three sections. First, we introduce capital in our model as moderating variable and consider the second regulation (Funding Liquidity) as independent variable along with other independent variables. This gives us the moderating effect of first regulation (capital) on the relationship between three targeted external variables and bank liquidity creation. Second, we introduce the second BASEL regulation (funding liquidity) as moderator in our model and consider capital as independent variable along with other independent variables. These two analyses attempt to provide the moderating role of individual regulation (capital and funding liquidity) separately in separate models. Third, we introduce both regulations (capital and funding liquidity) as moderators in our model. This gives the simultaneous or combined moderating impact of both regulations on the relationship between the external variable and bank liquidity creation.

4.7 Stock Market Liquidity, Liquidity Creation and BASEL Regulations

In this section we present the effect of stock market liquidity (SL) on bank liquidity creation (LCN) under the influence of BASEL regulations (capital and funding liquidity). We begin with demonstrating the role of capital as moderator while considering funding liquidity as independent variable along with other independent variables in our model. Then we proceed to include funding liquidity as moderator keeping capital as independent variable. Finally, we include both capital and funding liquidity as moderating terms in our model. The following sections document all these analysis in detail.

4.7.1 Moderating Role of Capital

The extended model is presented in equation (4.2) below that includes capital as moderating variable that may alter the effect of stock market liquidity on bank liquidity.

$$\mathbf{LCN_{ijt} = \psi_0 + \psi_1\, SL_{ijt} + \psi_2\, EPU_{ijt} + \psi_3\, COM_{ijt} + \psi_4\, CAP_{ijt} + \psi_5\, FL_{ijt} + \psi_6\, (SL_{ijt} \times CAP_{ijt}) + \delta_0\, Z_{ijt} + \square_{ij} + \phi_t + u_{ijt}} \quad \ldots\ldots \mathbf{(4.2)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (SLxCAP) shows moderating effect of Capital on the relationship between stock market liquidity and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size, profitability, stability, real GDP growth rate, interest rate and stock market volatility. □ and **ϕ** capture bank and time effects, respectively. And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effect are excluded from our models. The results of two-step system GMM model expressed in equation (4.2) are presented in Table 4.4.

Table 4.4: Moderating Role of Capital on SL-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
SL*Cap	-0.374**	-0.392**	-0.502**
	(0.144)	(0.178)	(0.235)
SL	0.0550**	0.0557**	0.185***
	(0.024)	(0.021)	(0.068)
Cap	-0.211	-0.274	-0.301
	(0.235)	(0.257)	(0.38)
L.LCN	0.795***	0.834***	0.532***
	(0.065)	(0.085)	(0.084)
EPU	-0.0843	-0.279	-0.467
	(0.186)	(0.175)	(0.383)
Com	0.298*	0.269	0.285
	(0.168)	(0.268)	(0.272)
FL	0.00814	0.0108	-0.0581
	(0.025)	(0.029)	(0.058)
Size	-0.0185**	-0.0244*	-0.0517
	(0.009)	(0.013)	(0.046)
ROA	-2.044***	-0.81	-2.629***
	(0.661)	(0.529)	(0.876)
Div	-0.237***	-0.245***	-0.364***

	(0.084)	(0.085)	(0.103)
CrdRisk	0.00214	0.000755	-0.0180*
	(0.004)	(0.004)	(0.009)
GDP	0.0994	-0.171	-0.464
	(0.343)	(0.446)	(0.834)
MP	-0.453	-0.538	0.0058
	(0.328)	(0.355)	(0.681)
SVol	-0.000119	-0.0000342	0.000539*
	(0.000)	(0.000)	(0.000)
Constant	0.21	0.293*	0.289
	(0.13)	(0.156)	(0.383)
AR(1)	0.006	0.05	0.001
AR(2)	0.869	0.396	0.114
Hansen	0.228	0.128	0.755
Sargan	0	0	0.001
Number of Groups	219	150	102
Number of Instruments	101	84	81
Observations	884	625	307

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

The coefficient of (SLxCAP**)** in Table 4.4 shows the conditional effect of stock market liquidity on bank liquidity creation under moderation influence of capital. It can be seen from the table that ψ_6, coefficient of interaction term (SL x CAP) is negative and significant at 5% level. The significance of ψ_6 implies the rejection of null hypothesis (H5). This reveals that on average, the positive influence of SL on bank liquidity is significantly strengthen under moderating effect of CAP. By neglecting interaction, it is observed from table that coefficient of CAP is also significant and negative at 1% level of significance which advocates the "Financial Fragility Hypothesis". Further, the negative and significant coefficient of SL coincides with our baseline results ignoring moderation term. Similar results are documented for large and small banks with slightly more intensity for small banks.

To explore the marginal effect of CAP on the said relationship we take partial derivative of equation 4.2 with respect to SL as shown in equation (4.3) below:

$$\frac{\partial LCN}{\partial SL} = \psi_1 + \psi_6 \, CAP_{ijt} \quad \ldots\ldots \textbf{(4.3)}$$

The derivative term in equation (4.3) shows that the impact of SL on liquidity creation is not linear, rather it is conditional on different levels of CAP which means the marginal effects of stock market liquidity on bank liquidity creation varies with varying levels of capital. These results are presented in Table 4.5.

Table 4.5: Conditional Effect of SL on LCN given Levels of Capital

Capital at	All Banks	Large Banks	Small Banks
25%	0.014	0.013**	0.131***
50%	-0.009**	-0.01	0.098***
75%	-0.080***	-0.087**	0.003

*, ** and *** indicates the significance at 10%, 5% and 1% respectively.

It can be seen that, for sample of all banks, the marginal effect changes from negative to significantly positive when capital level increases. Banks with lower level of capital (say 25% or below) the improvement in stock market liquidity reduces liquidity creation by 1.4%. It is worth observing that magnitude (absolute) of marginal effect is increasing with higher levels of capital. For the banks with 50% level of capital (higher level) the increase in stock market liquidity enhances bank liquidity by 0.9% whereas this positive effect is further exaggerated to 8% when capital level is 75% or above.

The large banks show similar results but with slightly greater magnitude of the effects. Large banks have strong networks and greater access to market (local as well as international) that assist them to raise funds (Berger & Bouwman, 2012). This leads to increase their risk-taking behavior when they have more capital to advance more loans (Risk Abortion effect). Moreover, big firms have generally good ties with large banks that have ability to meet their needs of larger amount of loans as a result of expansion in times of progressing stock market (Berger & Bouwman, 2009). Thus, more risk taking (as a result of ability of raising capital) as well as demand for loans is greater for large banks. Hence, for large banks, the adverse effect of stock liquidity on liquidity creation is reversed to positive one as capital increase.

In contrast, for small banks, the marginal effect of stock liquidity on liquidity creation remains negative at all levels of capital but with decreasing magnitude as capital level improves. As

argued by Berger and Bouwman (2009) that small banks are more prone to experience the "financial fragility-crowding out" effect due to their greater involvement with small enterprises. Small banks often raise funds locally, which might "crowd out" deposits. Therefore, increase in capital level reduces capability of creating liquidity by small banks and thus net effect of stock liquidity is negative on liquidity creation with increasing levels of capital for small banks.

These results have important implication with respect to BASEL regulation. It suggests that for large banks, though, on average, the stock market liquidity negatively affect bank liquidity creation, the BASEL capital regulation alters this effect to positive for banks with higher equity capital ratio. However, the effect of stock liquidity remains negative even in presence of higher capital for small banks. Overall, BASEL regulation (capital) is favorable for banks that stimulate bank liquidity creation in response of progressing stock market liquidity. Thus, "Market-bank liquidity Enhancement" view is dominant for banks with higher level of capital, in presence of BASEL regulation moderating effect. However, the opposite is the case with small banks as "Market-bank liquidity crowding out" view prevails.

4.7.2 Moderating Role of Funding Liquidity

Here we examine whether the effect of stock market liquidity on liquidity creation is influenced by funding liquidity of bank. Funding Liquidity is included in this model shown below as equation (4.4) as moderating variable that interact with stock market liquidity.

$$LCN_{ijt} = \gamma_0 + \gamma_1 SL_{ijt} + \gamma_2 EPU_{ijt} + \gamma_3 COM_{ijt} + \gamma_4 CAP_{ijt} + \gamma_5 FL_{ijt} + \gamma_6(SL_{ijt} \times FL_{ijt}) + \psi_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \quad \text{.....(4.4)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (SLxFL) shows moderating effect of Funding Liquidity on the relationship between stock market liquidity and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size, profitability, stability, real GDP growth rate, interest rate and stock market volatility. $\square$ and ϕ capture bank and time effects, respectively. And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and

so the time fixed effect are excluded from our models. The results of two-step system GMM model are presented in Table 4.6.

Table 4.6: Moderating Role of FL on SL-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
SL*FL	0.0353**	0.0166**	0.110**
	(0.014)	(0.007)	(0.047)
SL	-0.00262	-0.00458	0.00233
	(0.008)	(0.005)	(0.042)
FL	-0.176***	-0.113**	-0.177
	(0.043)	(0.045)	(0.108)
L.LCN	0.409***	0.538***	0.450***
	(0.093)	(0.115)	(0.155)
EPU	-0.31	-0.37	0.45
	(0.219)	(0.226)	(0.527)
Com	0.121	0.102	0.86
	(0.397)	(0.355)	(0.625)
Cap	-1.421***	-1.523***	-1.119***
	(0.22)	(0.375)	(0.3)
Size	0.00993	0.00359	-0.000692
	(0.008)	(0.009)	(0.024)
ROA	-2.051***	-1.005	-2.960***
	(0.578)	(0.892)	(0.85)
Div	-0.293*	-0.263*	-0.202
	(0.159)	(0.148)	(0.311)
CrdRisk	0.00202	0.00397	-0.023
	(0.006)	(0.005)	(0.015)
GDP	0.51	0.222	1.301
	(0.449)	(0.506)	(0.852)
MP	0.0635	-0.514	1.204
	(0.336)	(0.314)	(0.873)
SVol	0.0000492	0.00000372	0.000385
	(0.000)	(0.000)	(0.000)
Constant	0.332*	0.387**	-0.139
	(0.185)	(0.164)	(0.374)
AR(1)	0.005	0.036	0.002
AR(2)	0.255	0.678	0.411

Hansen	0.629	0.341	0.211
Sargan	0	0.024	0.001
Number of Groups	260	162	122
Number of Instruments	41	41	38
Observations	1156	728	413

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

The table 4.6 reports estimation results of this model. The null hypothesis of coefficient of this interactive term (SL x FL) is rejected at 5 % level for all samples and our hypothesis H9 is accepted. It can be seen that stock liquidity is insignificant but still in accordance to our base model that SL has positive impact on liquidity creation. Funding liquidity also confirms the base model finding of negative impact of FL on liquidity creation ignoring moderation term. This implies that BASEL regulation (funding liquidity) restrains banks by creating liquidity when stock market liquidity is on boom. It is evident that funding liquidity as opposed to capital regulation, has adverse moderating impact on relationship between stock liquidity and liquidity creation. Moreover, the analysis envisages that the behavior of large and small banks is similar in response of second BASEL regulation, with smaller banks being more sensitive to this regulation.

To examine the economic effect of funding liquidity on the relationship between SL and LCN, we estimate marginal effect of SL on LCN, keeping everything else constant, from equation (4.5), by differentiating equation (4.4) with respect to SL and is shown below:

$$\frac{\partial LCN}{\partial SL} = \gamma_1 SL_{ijt} + \gamma_6 FL_{ijt} \quad \text{..... (4.5)}$$

The equation (4.5) confirms that this marginal effect is non-linear and conditional on funding liquidity. Table 4.7 portrays these marginal effects at funding liquidity values of 0 and 1 (1 means funding liquidity of 100% and above and zero means funding liquidity below 100%). It can be seen that for sample of all banks, the marginal coefficient (γ_6) is significant at 5% level but changes from negative to positive with increasing level funding liquidity. This means that, on average, there is 0.3% increase in liquidity creation when stock market liquidity improves by 1% for banks that retain lower funding liquidity (below 100%). However, there will be a decline of

3.3% in liquidity creation with 1% expansion in stock market liquidity for banks retaining funding liquidity at higher level (100% or above). Thus, increase in funding liquidity compels banks to reduce liquidity creation. In this way the BASEL liquidity regulation has a trade-off between enhancing banking liquidity position and economic wellbeing attain through liquidity creation. On one hand the progressing stock market contributes towards economic growth, the BASEL regulation (liquidity requirement), on the other hand, works in opposite direction by reducing liquidity creation and may nullify or overcome the positive effect of the former leading to net negative effect. The "Market-bank liquidity enhancement" view converts to "Market-bank liquidity crowding out" view. The net liquidity creation is aggregation of non-deposit funds and deposit-based sources of funds. Since non-deposit funds are more sensitive to changes in stock market (Chatterjee, 2005). Whereas deposit-based funds are more sensitive to funding liquidity. At lower level of funding liquidity, the stock market positively effects the non-deposit portion of available funds and liability side is less affected resulting in net positive effect. The higher level of funding liquidity suppresses the liability side funds leading to reduced liquidity creation. Whereas, the positive effect of stock market improvement on non-deposit funds remains the same resulting in net negative effect of stock liquidity on liquidity creation.

The outcomes of sample of large banks depict similar effect of funding liquidity to that of sample of all banks. However, for small banks, stock market liquidity has adverse effect on liquidity creation at lower level of funding liquidity and it further increases in intensity when banks fulfill 100% of required level of funding liquidity. Since deposit-based funds are more sensitive to limiting effect of funding liquidity compare to non-deposit funds and smalls banks generally have larger share of deposit-based funds in total available funds as compare to large banks. Liquidity requirement reduces the overall available funds for lending for both types of banks (large and small) but its limiting effect is more on small banks compared to large banks (Bouwman, 2013). Thus, the adverse effect of stock liquidity is greater in magnitude for small banks which is further aggravated when banks are compelled to retain higher level of funding liquidity. This implies that the liquidity regulation has more deteriorating effects for small banks particularly in reducing their liquidity creation in times of progressing stock liquidity. For large banks, the lower level of required liquidity is ruled out by non-deposit portion of funds, but higher required level of liquidity crowed out this effect, resulting in net negative effect of marginal effect.

Table 4.7: Conditional Effect of SL on LCN given Levels of FL			
FL at	All Banks	Large Banks	Small Banks
0	-0.003**	-0.005	0.002
1	0.033**	0.012	0.112***
*, ** and *** indicates the significance at 10%, 5% and 1% respectively.			

The implication of this result is that BASEL regulation reverses the impact of stock market liquidity on liquidity creation (from positive to negative) for large banks when funding liquidity increases and its adverse effect increases for small banks as funding liquidity increases.

4.7.3 Moderating Role of Capital and Funding Liquidity

Finally, we demonstrate one step further extension of base model by incorporating both of the BASEL regulations (Capital and Funding Liquidity) in our model as moderating variable that interact with stock market liquidity (that is SLxCAPxFL) as shown in equation (4.6) bellow. This moderating term captures the combined moderating effect of both Capital and Funding Liquidity on the relationship between stock market liquidity and bank liquidity creation. The results of this model are exposed in Table 4.8.

$$LCN_{ijt} = \delta_0 + \delta_1 SL_{ijt} + \delta_2 EPU_{ijt} + \delta_3 COM_{ijt} + \delta_4 CAP_{ijt} + \delta_5 FL_{ijt} + \delta_6(SL_{ijt} \times CAP_{ijt} \times FL_{ijt}) + \psi_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \quad \text{.....(4.6)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (SLxCAPxFL) shows the combined moderating effect of Capital and Funding Liquidity on the relationship between stock market liquidity and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size, profitability, stability, real GDP growth rate, interest rate and stock market volatility. $\square$ and ϕ capture bank and time effects, respectively. And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effects are excluded from our models. The results of two-step system GMM model expressed in equation (4.6) are presented in Table 4.8.

Table 4.8: Moderating Role of Capital and FL on SL-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
SL*FL*Cap	-1.264*	-1.887*	-1.21
	(0.658)	(0.98)	(0.847)
SL	0.0141	-0.00334	-0.00758
	(0.034)	(0.026)	(0.12)
Cap	-0.770**	-1.317**	-1.42
	(0.376)	(0.639)	(0.968)
FL	-0.273	-0.759*	-1.169
	(0.417)	(0.428)	(0.833)
L.LCN	0.735***	0.573***	0.417*
	(0.093)	(0.176)	(0.212)
EPU	0.01	-0.00913	-0.615
	(0.225)	(0.394)	(1.015)
Com	0.327	0.618	-0.0765
	(0.312)	(0.435)	(0.4)
Size	-0.00595	-0.00159	-0.218*
	(0.011)	(0.011)	(0.115)
ROA	-0.823	-0.981	-1.612
	(1.471)	(1.173)	(1.051)
Div	-0.2	-0.327*	-0.205
	(0.132)	(0.174)	(0.256)
CrdRisk	0.00166	0.0104	-0.0976
	(0.018)	(0.01)	(0.138)
GDP	0.195	0.285	1.255
	(0.668)	(0.573)	(3.524)
MP	-0.281	-0.369	0.771
	(0.403)	(0.352)	(2.04)
SVol	0.0000456	-0.000113	0.000276
	(0.000)	(0.000)	(0.000)
Constant	0.129	0.171	1.498*
	(0.181)	(0.159)	(0.77)
AR(1)	0.006	0.05	0.02
AR(2)	0.577	0.371	0.12
Hansen	0.101	0.302	0.972
Sargan	0.034	0.001	0
Number of Groups	222	148	40

Number of Instruments	58	48	56
Observations	789	529	90

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

The combined interaction term (SLxCAPxFL) is our prime focus of analysis. The coefficient of $\boldsymbol{\delta_6}$, captures the conditional effect of stock market liquidity on bank liquidity creation under the combined moderation effect of capital and funding liquidity. The coefficient ($\boldsymbol{\delta_6}$) is observed as negative and significant at 10% level of significance. That is, when liquidity of stock market is progressing, its impact on bank liquidity creation will be positive under moderating effect of both of the BASEL regulations. The significance of $\boldsymbol{\delta_6}$ implies the rejection of null hypothesis (acceptance of H12). The results provide important implication about effectiveness of BASEL regulations regarding stock market liquidity and banks liquidity creation. As evident from our results, that BASEL regulations (when both are implemented simultaneously) induce banks in creating liquidity in times of progressing stock market liquidity for all types of banks in emerging economies. Also, coefficients of capital and funding liquidity are significant and accord the base line model both with negative impact on bank liquidity creation for all types of banks in emerging markets.

Lastly, for the purpose of analyzing the combined marginal or conditional effect of BASEL regulations on relationship between SL and LCN, we partially, differentiate equation (4.6) with respect to SL and results are as shown in equation (4.7) below:

$$\frac{\partial LCN}{\partial SL} = \boldsymbol{\delta_1 SL_{ijt} + + \delta_6 (CAP_{ijt} \text{ x } FL_{ijt})} \quad \text{..... (4.7)}$$

We elaborate these effects for all banks, then for large and small banks in Table 4.9. For all banks, it can be seen that the coefficients of all combined marginal effects ($\boldsymbol{\delta_6}$) are significant at 5% level for all levels of both capital and funding liquidity. For low level of capital (25%) the intensity of marginal effect of stock market liquidity on liquidity creation aggravates 0.5% to 11.2% when bank funding liquidity increases. On contrary, for banks with capital of 75%, the combined marginal effect SL on liquidity creation is positive but it reduces from 23% to 1.4% as funding liquidity raises. BASEL liquidity regulation aims to strengthen the liquidity position of

banks by retaining sufficient (higher) funds so that banks are able to meet the depositors' claims. The banks are obliged to retain a larger portion of deposit funds and their capacity to advance loans decreases as do the liquidity creation. The capital on the other hand, improves the risk absorption capacity of banks that induces them to take riskier stance and create liquidity (Risk Absorption effect). Moreover, banks with higher equity capital have more funds to provide loans to borrowers because equity capital is not subject to limiting effect of liquidity requirement (funding liquidity). It can be seen that banks with lower level of capital are more effected by adverse effect of funding liquidity because the relatively larger proportion of deposits in total available funds results in more reduction in available funds. On the other hand, banks with higher proportion of equity capital in their total available funds are less effected by the imposition of funding liquidity. The results imply that the impact of stock market liquidity converts from negative to positive on liquidity creation as bank capital increases, but it is aggravated when funding liquidity increases. The net moderating effect of both capital and funding liquidity depends on the relative magnitudes of their effects (positive and negative). It can be seen that, in our results, the positive effect of capital has dominated the negative effect of funding liquidity. Overall, the stock market liquidity shows "Market-Bank Liquidity Crowding out" view for banks with lower level of capital and funding liquidity. Whereas for higher levels of BASEL regulations, our results support "Market-bank liquidity Enhancement View" and "Risk Absorption" hypothesis.

For large bank, the results are insignificant at lower levels of BASEL regulations, significant at moderate levels and highly significant at upper levels (75%) of BASEL regulations. This means, at level of capital (25%) the combined marginal effect converts from positive effect of stock market liquidity on liquidity creation to negative effect (from -0.5% to 15%), though insignificant, with increasing levels of FL. And for banks at higher levels (75%) of capital the positive impact of stock liquidity on liquidity creation augments (from 0.1% to 34%) with rise in FL. The large banks have greater share of equity capital in total available funds (total funds are sum of deposit-based funds and equity capital), that enables banks to provide further lending in the economy. With increase in liquidity requirement, banks are obliged to retain a large portion of deposit-based funds in liquid form in order to fulfill claims from clients. The increase in liquidity requirement is evident to has an adverse effect on the liquidity creation of banks due to reduced available funds. The results show that even at lower level of capital, the effect of SL is

positive at lower level of FL but it is converted to negative after the imposition of liquidity requirement which shows that funding liquidity contributes negatively to liquidity creation and rule out the positive impact of capital. However, for banks with higher capital, the SL depicts a positive effect on liquidity creation even after imposition of BASEL liquidity requirement, though its intensity is reduced. The higher level of capital come up to be the dominating contributor to strengthen the positive effect of stock liquidity on liquidity creation in larger banks in emerging economies. Thus, for large banks the "Risk Absorption hypothesis" superimposes the "Market-bank liquidity Enhancement" view at higher level of capital.

For small banks, the results indicate that at all levels of capital and funding liquidity, the effect of stock market liquidity remains negative on liquidity creation. The overall deteriorating effect of stock market liquidity on bank liquidity creation has been aggravating with higher levels of funding liquidity but reduces when capital increases. It can be argued that small banks have larger proportion of deposit-based funds (short term liabilities) in overall available funds which are more sensitive to changes in liquidity requirement. As banks are required to maintain higher level of funding liquidity, following BASEL regulation, the available funds are reduced and liquidity creation is also reduced. Thus, in contradiction to large banks, small banks experience adverse effect of stock market liquidity on liquidity creation. This negative effect, although slightly shielded by positive effect of capital but the net effect is aggravated due to increase in funding liquidity. These results evidence that BASEL liquidity regulation on top of capital is subject to a trade-off, particularly for small banks, between improved stability as well as liquidity of banks against well-being of the economy achieved through liquidity creation.

Table 4.9: Conditional Effect of SL on LCN given Levels of Capital and FL

Capital at	**FL at**	All Banks	Large Banks	Small Banks
25%	0	0.005**	-0.005	0.008*
	1	0.112***	0.151	0.312**
50%	0	0.001**	-0.006**	0.018**
	1	0.024**	0.024*	0.242*
75%	0	-0.230**	-0.011**	0.047*
	1	-0.014*	-0.340***	0.041**
*, ** and *** indicates the significance at 10%, 5% and 1% respectively.				

In sum, it can be concluded that combined marginal effect of BASEL leads to strengthen the influence of stock market liquidity on bank liquidity in emerging economies with increasing levels of both BASEL regulations and shift favoring from “Market-bank liquidity crowding out” view to “Market-bank liquidity Enhancement” view for overall banks. However, for small banks, “Market-bank crowding out” view strengthens at higher levels of capital and funding liquidity.

4.7.4 Conclusion

In this section we discuss the moderating role of BASEL regulations (Capital and Funding Liquidity) on the relationship between Stock Market Liquidity and bank Liquidity Creation. We split our analysis into three parts. First model considers Capital as moderator and rest of variables as independent variables. The second model considers Funding Liquidity as moderator along with other independent variables. The third model considers Capital and Funding Liquidity both as moderators. We analysis the marginal effects of these moderators with varying levels of capital and funding liquidity. All the models document significant moderation roles of BASEL regulations.

For the first model, the results indicate that the effect of stock liquidity on liquidity creation changes from negative to positive when capital levels of large banks increases. Large banks have greater capacity of liquidity creation, strong networks and greater access to market. The rise in capital leads to improve their Risk Abortion effect. In contrast, small banks are more prone to experience the "financial fragility-crowding out" effect due to their greater involvement with small enterprises. The results of our second model report that the effect of stock liquidity on liquidity creation under moderation of funding liquidity, changes from positive to negative with increasing level funding liquidity. Liquidity requirement reduces the available funds for lending and this limiting effect is more on small banks compared to large banks as large banks use greater non-deposit funds that are more sensitive to stock market liquidity and not to funding liquidity. In addition, large banks have higher capacity of raising funds, access to markets and wider range of products. Thus, liquidity creation of large banks is less deteriorated by limiting effect of higher funding liquidity requirement as compare to small banks. The third model shows that for large banks, the effect of stock market liquidity under moderation of both BASEL regulations, on liquidity creation is negative but it reverses as capital level increases. The liquidity requirement compels banks to retain a larger portion of deposit funds and capital improves the risk absorption capacity of banks. The net moderating effect of both regulations

(capital and funding liquidity) has been dominated by capital. For small banks, the negative effect of stock market liquidity on liquidity creation aggravates due to increase in funding liquidity as these have larger proportion of deposit-based funds that more sensitive liquidity requirement. These results evidence that BASEL liquidity regulation on top of capital is subject to a trade-off, particularly for small banks, between improved stability as well as liquidity of banks and well-being of the economy achieved through liquidity creation.

4.8 Economic Policy Uncertainty, Liquidity Creation and BASEL Regulations

This section is devoted for discussion of the third objective regarding the role of economic policy uncertainty on bank liquidity creation under influence of BASEL regulations. This analysis consists of three parts in this regard. First, we analyze the moderating role of Capital on the relationship between economic policy uncertainty and bank liquidity creation, keeping all other variables as independent variables. Second, we consider Funding liquidity as moderator instead of Capital and execute analysis. Third part incorporates both BASEL regulation (Capital and Funding Liquidity) as one moderator and attempt to analyze whether it changes the effect of economic policy uncertainty on liquidity creation in emerging markets. The in-depth examination is documented in following section.

4.8.1 Moderating Role of Capital

The model extension by including Capital as moderator in our base model is revealed in equation (4.8) below. This captures the possible moderating effect on the relationship between EPU and liquidity creation and Table 4.10 depicts the results.

$$\mathbf{LCN_{ijt} = \eta_0 + \eta_1\, SL_{ijt} + \eta_2\, EPU_{ijt} + \eta_3\, COM_{ijt} + \eta_4\, CAP_{ijt} + \eta_5\, FL_{ijt} + \eta_6(EPU_{ijt} \times CAP_{ijt}) + \psi_0\, Z_{ijt} + \square_i + \phi_t + u_{ijt}} \quad \ldots\ldots\ldots \mathbf{(4.8)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (EPUxCAP) shows moderating effect of Capital on the relationship between Economic Policy Uncertainty and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size, profitability, stability, real GDP growth rate, interest rate and stock market volatility. □ and **ϕ** capture bank and time effects, respectively.

And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effect are excluded from our models. The results of two-step system GMM model expressed in equation (4.8) are presented in Table 4.10.

Of most concern is the interaction term (EPU x CAP) in the model to be looked in. We, start describing our analysis by sample of all banks. The coefficient of η_6 is positive and significant at 5% level of significance. This reveals the Capital, as moderator has significant effect in altering the influence of EPU on bank liquidity creation. The positive sign of this interaction term shows that EPU motivates banks to create more liquidity as capital level of banks increases. The significance of η_6 implies the rejection of null hypothesis for H6. When ignoring the moderation, the table shows that EPU has significant negative impact on liquidity creation at 1% level. Capital on similar lines represents negative and significant impact on liquidity creation at 1% level of significance, neglecting moderation term. The moderation terms, for large and small banks, have opposite signs indicating that large and small banks response differently to economic policy uncertainty when their capital level changes.

The results have important implications for BASEL regulations in this regard. On average, the BASEL regulation (Capital) provides some relief to banks against the negative effect of economic policy uncertainty on liquidity creation by reducing its negative impact indicating presence of Risk Absorption effect. However, for small banks the higher capital level cause aggravating the adverse effect of economic policy uncertainty on liquidity creation showing Fragility-Crowding out effect.

Table 4.10: Moderating Role of Capital on EPU-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
EPU*Cap	7.300**	13.93**	-18.37***
	(3.073)	(5.49)	(6.282)
EPU	-1.397***	-2.119	2.213**
	(0.485)	(1.512)	(1.107)
Cap	-1.818***	-1.832***	0.732
	(0.211)	(0.493)	(0.579)
L.LCN	0.396***	0.397**	0.964***
	(0.082)	(0.158)	(0.164)

SL	0.00807*	0.0249	0.00369
	(0.004)	(0.044)	(0.006)
Com	0.496**	0.496**	0.131
	(0.196)	(0.227)	(0.279)
FL	-0.114***	-0.089	-0.00503
	(0.030)	(0.076)	(0.046)
Size	0.0118	0.0022	-0.00994
	(0.008)	(0.021)	(0.013)
ROA	-2.029***	-1.797***	-0.825
	(0.503)	(0.576)	(0.625)
Div	-0.330**	-0.272	-0.0904
	(0.136)	(0.237)	(0.136)
CrdRisk	0.00258	-0.0112	0.00331
	(0.006)	(0.013)	(0.004)
GDP	0.369	0.99	0.659
	(0.364)	(0.832)	(0.489)
MP	0.126	1.437*	0.0423
	(0.288)	(0.814)	(0.298)
SVol	-0.00000705	0.000732**	-0.000118
	(0.000)	(0.000)	(0.000)
Constant	0.235**	0.0413	-0.0416
	(0.114)	(0.261)	(0.183)
AR(1)	0.009	0.006	0.028
AR(2)	0.137	0.111	0.345
Hansen	0.166	0.177	0.165
Sargan	0	0	0
Number of Groups	262	124	153
Number of Instruments	70	37	30
Observations	1210	425	654

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

To understand the marginal effect of Capital as moderator on the relationship between EPU and liquidity creation, we take partial derivative of equation (4.8) with respect to EPU as shown in equation (4.9) below:

$$\frac{\partial LCN}{\partial EPU} = + \eta_1 + \eta_6 \mathbf{CAP}_{ijt} \quad \textbf{(4.9)}$$

The partial derivative in equation (4.9) shows that the non-linear impact of EPU on liquidity creation depending on different levels of CAP that is the marginal effects of EPU on bank liquidity creation varies with varying levels of capital. Table 4.11 portrays outcomes of these marginal effects for three samples. For sample of all banks, the marginal effect remains significantly negative for all levels of capital. However, the adverse effect of EPU on liquidity creation reduces from -0.61 to +0.152 with increasing levels of Capital. Increase in capital improve their sustainability and competitiveness of banks (Berger & Bouwman, 2009, Soedarmono et al., 2013). Therefore, Capital Buffering effect is dominated over the financial fragility-crowding out effect of raised capital. Banks when comply with minimum required capital, become more resilience and their risk-taking behavior enhances that leads to increase in liquidity creation. Therefore, the rise in capital level provide relief to banks by reducing adverse effect of economic policy uncertainty on liquidity creation. However, the net effect remains negative though weakens as capital increases. The results indicate that the effect of EPU on liquidity creation is different for large and small banks. For large banks, the effect of EPU reduces from -0.62 to -0.136 when capital increases. Whereas for small bank, the influence of EPU on liquidity creation increases from -0.245 to -1.45 as bank capital increases.

Table 4.11: Conditional Effect of EPU on LCN given Levels of Capital

Capital at	All Banks	Large Banks	Small Banks
25%	-0.610***	-0.620	-0.245
50%	-0.430	-0.290	-0.960
75%	0.152*	-0.136**	-1.450***

*, ** and *** indicates the significance at 10%, 5% and 1% respectively.

Large and well-capitalized banks are less sensitive to changes in EPU and are in a better position to be deterrent against economic policy uncertainty. Increase in capital improves their sustainability and competitiveness (Berger & Bouwman, 2009, Soedarmono et al., 2013). Therefore, Capital Buffering effect is dominated over the financial fragility-crowding out effect of raised capital. Banks when comply with minimum required capital, become more resilience and their risk-taking behavior enhances that leads to increase in liquidity creation. During uncertain period of government policies, when savers are reluctant to invest directly in the asset market, they choose banks as safe heaven to deposit their saving and earn risk free return that results in increase in deposit funds with banks. On the asset side, although the demand for loans

by firms is reduce as a consequence of policy uncertainty, large banks on account of their wider customer base continue providing loans to existing customers and invest in riskier investments. Thus, increase in capital works as shield to adverse effect of economic policy uncertainty which weakens as capital level increases.

Small banks, by increasing their equity capital, become more vigilant and risk averse in advancing loans in face of uncertainty. In addition, financial fragility-crowding out effect rules out the capital burring effect as a consequence of increased capital that enhances the risk-averse behavior of small banks (Panousi and Papaniko-laou, 2012). In addition, small banks have more proportion of deposit-based funds. Therefore, banks have to adjust their illiquid assets in order to raise capital ratio that provides cushion against external shock and improves their soundness. Further, small banks compare to large banks have less competitive advantages because their narrow scope of lending to small enterprises and products range. Thus, they are more porn to adverse effect of economic policy uncertainty on liquidity creation when there is reduced demand of loans by firms and sources of generating funds are also limited. Thus, when capital increases, the negative effect of EPU reduces more for large banks as compere to small banks.

These results, overall, has worth implications for BASEL regulation that Capital weakens the adverse effect of EPU on liquidity creation for banks. On contrary, the BASEL regulation (funding liquidity) strengthens the adverse effect of EPU on liquidity creation.

4.8.2 Moderating Role of Funding Liquidity

Next, we scrutinize the effect of EPU on liquidity creation under moderation of second BASEL regulation (Funding liquidity) of bank. Thus, Funding Liquidity is included in this model as moderator that interact EPU as shown in equation (4.10).

$$\mathbf{LCN_{ijt} = \theta_0 + \theta_1 SL_{ijt} + \theta_2 EPU_{ijt} + \theta_3 COM_{ijt} + \theta_4 CAP_{ijt} + \theta_5 FL_{ijt} + \theta_6(EPU_{ijt} \times FL_{ijt}) + \psi_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt}} \quad \ldots\ldots \mathbf{(4.10)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (EPUxFL) shows moderating effect of Funding Liquidity on the relationship between Economic Policy Uncertainty and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size, profitability, stability,

real GDP growth rate, interest rate and stock market volatility. □ and **ϕ** capture bank and time effects, respectively. And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effect are excluded from our models. The results of two-step system GMM model are reported in Table 4.12.

The estimation output is shown in Table 4.12. The moderation term of (EPU x FL) indicates negative and significant impact at 5% level of significance on liquidity creation for all three samples (all, large and small banks). This leads to rejection of null hypothesis of coefficient of this interactive term (EPU x FL) is rejected at 5% level of significance and our hypothesis is accepted H10. For all banks, on average, the moderation adversely effects liquidity creation of banks in emerging markets. This reveals that BASEL regulation (funding liquidity) further worsens the liquidity creation of banks in times of economic uncertainty. Further, the coefficient of EPU, ignoring moderation term is significant and negative for large and small banks that confirms with negative impact of EPU on liquidity creation keeping other factors constant. Also, neglecting moderation effect, funding liquidity shows significant negative for large and small banks and reinforce the results of base model. This indicates, the moderation of BASEL regulation (FL) increases liquidity creation for large as well as small banks.

Table 4.12: Moderating Role of FL on EPU-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
EPU*FL	-2.422**	-2.624***	-9.279**
	(1.185)	(0.994)	(3.645)
EPU	-0.0243	-0.473	-0.542
	(0.495)	(0.534)	(0.778)
FL	-0.317***	0.138**	-0.363*
	(0.11)	(0.059)	(0.193)
L.LCN	0.446***	0.688***	0.300***
	(0.082)	(0.17)	(0.107)
SL	0.0144*	-0.00304	0.0443
	(0.007)	(0.006)	(0.048)
Com	0.242	0.610**	0.279
	(0.237)	(0.279)	(0.377)
Cap	-1.334***	-1.195	-1.225***

	(0.207)	(0.881)	(0.238)
Size	0.0135	-0.0314	0.0203
	(0.008)	(0.027)	(0.032)
ROA	-1.344	-1.346**	-1.243
	(0.899)	(0.618)	(1.345)
Div	-0.404**	-0.627	-0.412
	(0.158)	(0.564)	(0.303)
CrdRisk	0.00112	0.031	-0.0263*
	(0.006)	(0.032)	(0.013)
GDP	0.258	0.173	0.868
	(0.413)	(0.634)	(0.961)
MP	0.0848	-0.447	1.367
	(0.322)	(0.548)	(0.894)
SVol	0.000176	-0.0000855	0.00104***
	(0.000)	(0.000)	(0.000)
Constant	0.211	0.345	-0.118
	(0.136)	(0.312)	(0.365)
AR(1)	0.002	0.048	0.001
AR(2)	0.4	0.538	0.547
Hansen	0.291	0.132	0.572
Sargan	0	0	0.042
Number of Groups	246	159	109
Number of Instruments	49	53	40
Observations	1013	688	328

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

To inspect the economic effect of funding liquidity on the relationship between EPU and LCN, we differentiate partially the equation (4.10) with respect to EPU and derivative results are displayed in equation (4.11).

$$\frac{\partial LCN}{\partial EPU} = \theta_1 + \theta_6 FL_{ijt} \quad \text{..... (4.11)}$$

The equation (4.11) affirms that the nonlinearity of marginal effect and conditional on levels of funding liquidity. Table 4.13 renders these marginal effects at 25%, 50% and 75% level of funding liquidity. According to Table 4.13, for sample of all banks, the coefficients (θ_6) is

significant at least at 10% level at all levels of funding liquidity. This means that, on average, there is a decrease in liquidity creation when EPU increases for bank that retain lower level of funding liquidity (below 100%). However, this effect is worsened for banks retaining higher level of funding liquidity (100% and above). With increase in liquidity requirement, banks are obliged to retain a large portion of deposit-based funds in liquid form in order to fulfill claims from clients that leads to reduction in available funds that may be lent to borrowers. The increase in liquidity requirement is evident to has an adverse effect on the liquidity creation of banks (Bouwman, 2013), due to reduced available funds. This implies the BASEL regulation (Funding Liquidity) aggravates the adverse effect of economic policy uncertainty on liquidity creation.

Table 4.13: Conditional Effect of EPU on LCN given Levels of FL

FL at	All Banks	Large Banks	Small Banks
0	-0.024	-0.473	-0.542
1	-2.446**	-3.097**	-9.821***
*, ** and *** indicates the significance at 10%, 5% and 1% respectively.			

These results of large banks show significant negative impact of EPU on liquidity creation and that aggravates with increasing level of funding liquidity. Similar results are produced for small banks but with more intensity. Large banks generally have more equity-based funds that are insensitive to funding liquidity limiting effect. Moreover, large banks have more integrated network and access to national and international markets that provides them sources of funds. In addition, these banks on account of their diverse services have competitive edge over small banks that makes them more deterrent against uncertainty raised due to economic policy destabilization. In addition, large banks on account of their competitiveness have more capabilities to create liquidity in times of uncertainty (Altunbas et al., 2010). The increase in funding liquidity limits the deposit-based funds of banks and large banks even after retaining the require funding liquidity are left with sufficient funds to be transformed into loans. Although the economic policy uncertainty reduces the liquidity creation of all types of banks including large banks, but large banks are still able to continue lending to their customers. The results indicate that after maintaining funding liquidity of 100%, the effect of economic policy uncertainty remains negative and is increased. But increase in its magnitude is less for large banks than that of small banks.

On the other hand, in order to fulfill liquidity requirements, the small banks adjust their asset portfolio and switch from illiquid assets to liquid securities and investment. Furthermore, their lending capacity is reduced when they are obliged to retain 100% funding liquidity. Thus, in times of uncertainty, the banks being more vigilant and cautious about approving loans, reduce their lending to avoid loan loss provisions and non-performing loans. On top of this, the increased funding liquidity further, squeezes their available funds to be lent as loans, and their liquidity creation deteriorates further. Thus, it can be seen from our results that the negative effect of economic policy uncertainty is negative when banks have low level of funding liquidity and its magnitude is increased (-0.54 to-9.82) when banks retain higher level of funding liquidity (100% or above). Further, the increase in magnitude is greater than that of large banks. Thus, worsening effect of economic policy is similar for both types of banks but small banks are affected more compare to large ones.

4.8.3 Moderating Role of Capital and Funding Liquidity

Finally, we establish third model by extending the base model by including combined moderating effect of both the BASSEL regulations (Capital and Funding Liquidity) and allow it to interact with EPU as shown in equation (4.12) bellow. This moderating term captures the combined moderating effect of both Capital and Funding Liquidity on the relationship between EPU and bank liquidity creation. The results of this model are displayed in Table 4.14.

$$\mathbf{LCN_{ijt} = \lambda_0 + \lambda_1\, SL_{ijt} + \lambda_2\, EPU_{ijt} + \lambda_3\, COM_{ijt} + \lambda_4\, CAP_{ijt} + \lambda_5\, FL_{ijt} + \lambda_6(EPU_{ijt} \times CAP_{ijt} \times FL_{ijt}) + \psi_0\, Z_{ijt} + \square_{ij} + \phi_t + u_{ijt}} \quad \ldots\ldots \mathbf{(4.12)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (EPUxCAPxFL) shows the combined moderating effect of Capital and Funding Liquidity on the relationship between Economic Policy Uncertainty and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size, profitability, stability, real GDP growth rate, interest rate and stock market volatility. □ and **ϕ** capture bank and time effects, respectively. And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effect are

excluded from our models. The results of two-step system GMM model expressed in equation (4.12) are expressed in Table 4.14.

The combined interaction term (EPUxCAPxFL) being our prime focus of analysis. Table 4.14 shows that the coefficient of λ_6 is negative and significant at 10% level for sample of all banks. This coefficient captures the combined moderating effect of both the BASEL regulations on liquidity creation through interaction with EPU. The significance of λ_6 implies rejection of null hypothesis (acceptance of H13). This implies given progressing levels of Capital and Funding liquidity, the impact of EPU on liquidity is significantly negative for all banks in emerging economies. The impact of EPU is negative on liquidity creation, ignoring the moderation effect

Table 4.14: Moderating Role of Capital and FL on EPU-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
EPU*CAP*FL	0.018**	0.0503***	0.0301***
	(0.0078)	(0.0192)	(0.0114)
EPU	-0.202	-0.507	-0.411**
	(0.755)	(0.417)	(0.187)
Cap	-1.034***	-1.137***	-1.355***
	(0.318)	(0.426)	(0.478)
FL	-0.668***	-0.259**	-0.336
	(0.223)	(0.109)	(0.305)
L.LCN	0.597***	0.673***	0.495***
	(0.072)	(0.101)	(0.101)
SL	-0.0000836	-0.0171	-0.00275
	(0.006)	(0.018)	(0.067)
Com	0.370*	0.533*	1.175
	(0.206)	(0.304)	(0.801)
Size	0.0139	0.00538	-0.0127
	(0.016)	(0.007)	(0.031)
ROA	-2.016***	-1.735**	-3.545**
	(0.723)	(0.755)	(1.754)
Div	-0.400***	-0.284***	0.122
	(0.129)	(0.091)	(0.347)
CrdRisk	0.00176	0.00268	0.0014
	(0.006)	(0.005)	(0.048)
GDP	0.462	0.0847	-0.175

	(0.415)	(0.695)	(2.082)
MP	-0.0298	0.132	0.395
	(0.431)	(0.284)	(1.269)
SVol	-0.00000491	-0.000275	0.000561
	(0.000)	(0.000)	(0.000)
Constant	0.0746	0.0942	-0.0179
	(0.216)	(0.16)	(0.567)
AR(1)	0.004	0.035	0.005
AR(2)	0.917	0.229	0.147
Hansen	0.632	0.256	0.611
Sargan	0	0	0.182
Number of Groups	235	165	108
Number of Instruments	78	77	68
Observations	923	770	273

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

that is in line with our expected hypnotized impact. The coefficient of capital indicates significant negative impact on liquidity, when moderation effect is neglected and support the "Financial Fragility Crowding out" hypothesis. The results for large and small banks are in consistency of the first model (for all banks) and confirms the validity of overall results. The results have vital implications for BASEL regulations. When both of the BASEL regulations are imposed on banks, the combine moderating effect leads to reduction of liquidity creation with increase in economic uncertainty for emerging economies.

Lastly, we present the analysis of combined marginal effect of both BASEL regulations on relationship between EPU and bank liquidity creation. For this purpose, we partially differentiate equation (4.12) with respect to EPU and results is represented in equation (4.13) below.

$$\frac{\partial LCN}{\partial EPU} = + \lambda_2 + \lambda_6 (CAP_{ijt} \text{ x } FL_{ijt}) \quad \text{..... (4.13)}$$

We begin with elaborating these effects from all banks, then for large and small banks as displayed in Table 4.15. The results of sample of all banks indicates that economic policy uncertainty has a deteriorating impact on bank lending because of risk averse stance of managers (Panousi and Papaniko-laou, 2012) and rise in external financing costs that reduces bank

liquidity creation. This, consequently compels banks to reduce or suspend their lending (Brogaard and Detzel, 2015). Furthermore, with increase in liquidity requirement, banks are obliged to retain a large portion of deposit-based funds in liquid form in order to fulfill claims from clients. The increase in liquidity requirement is evident to has an adverse effect on the liquidity creation of banks (Bouwman, 2013), due to reduced available funds. However, equity capital improves the risk-taking behavior of banks as well as enhances soundness and competitiveness of banks that consequently enables banks to provide further lending in the economy. Therefore, there are three forces exerting pressure on liquidity creation. The results evidence that the adverse effect of economic policy uncertainty is reduced as bank capital increases at all levels of funding liquidity. On contrary, the negative effect of economic policy uncertainty aggravates when required funding liquidity increases at all levels of capital. BASEL capital requirement provides shield, to some extent, against adverse effect of economic policy uncertainty on liquidity creation whereas BASEL liquidity requirement aggravates the economic policy uncertainty on liquidity creation.

Large banks have greater share of equity capital in total available funds that is why these banks adjust their risk-taking behaviors (Caglayan & Xu, 2019) that is Capital Buffering effect is evident. Equity capital in large banks contribute to improve competitiveness and risk-taking behavior that leads to increase liquidity creation. In addition, this greater equity proportion of total funds is less sensitive to limiting effect of increased funding liquidity. Thus, for large banks, the negative effect of economic policy uncertainty is suppressed as capital level of large banks increases. On the other hand, the increase in liquidity requirement aggravates the adverse effect of economic policy uncertainty on liquidity creation.

On the other hand, small banks have larger proportion of deposit-based funds (short term liabilities) in overall available funds which are more sensitive to changes in liquidity requirement. As banks are required to maintain higher level of funding liquidity, following BASEL regulation, the available funds are reduced and liquidity creation is also reduced. Thus, in contradiction to large banks, small banks experience more adverse effect of economic policy uncertainty on liquidity creation (Bouwman, 2013). This negative effect, although slightly shielded by positive effect of capital but the net effect is aggravated due to increase in funding liquidity. These results evidence that BASEL liquidity regulation on top of capital is subject to a

trade-off, particularly for small banks, between improved stability as well as liquidity of banks against well-being of the economy achieved through liquidity creation.

Table 4.15: Conditional Effect of EPU on LCN given Levels of Capital and FL

Capital at	FL at	All Banks	Large Banks	Small Banks
25%	0	-0.195***	-0.386***	-0.406**
	1	-0.208**	-0.402**	-0.414*
50%	0	-0.192*	-0.311*	-0.404*
	1	-0.203*	-0.324**	-0.409
75%	0	-0.181**	-0.097**	-0.381**
	1	-0.189**	-0.101**	-0.396*

*, ** and *** indicates the significance at 10%, 5% and 1% respectively.

Overall, it can be concluded that due to moderation of both BASEL regulation, the adverse effect of economic policy uncertainty on liquidity creation reduces as capital level increases whereas this effect aggravates when banks are obliged to retain funding liquidity of 100% or above. Larges banks are more deterrent to adverse effect of economic policy uncertainty when comply both BASEL regulations. However, for small banks BASEL regulations cause worsen the negative impact of economic policy uncertainty on liquidity creation of banks in emerging economies.

4.8.4 Conclusion

In this section we discuss the moderating role of BASEL regulations (Capital and Funding Liquidity) on the relationship between Economic Policy Uncertainty and bank Liquidity Creation. We split our analysis into three parts. First model considers Capital as moderator and rest of variables as independent variables. The second model considers Funding Liquidity as moderator along with other independent variables. The third model considers Capital and Funding Liquidity both as moderators. We analysis the marginal effects of these moderators with varying levels of capital and funding liquidity. All the models document significant moderation roles of BASEL regulations.

In first model, the negative effect of economic policy uncertainty on liquidity creation, under the moderation of capital, reduces with increasing level of capital. However, for small banks this effect is negative which aggravates with increase in capital. Large and well-capitalized banks are

less sensitive to changes in EPU and are in a better position to be deterrent against economic policy uncertainty because of increased sustainability and competitiveness. For second model, the negative effect of economic policy uncertainty on liquidity creation aggravates as banks are to comply with BASEL regulation of 100% funding liquidity. In addition, the intensity of this adverse effect is more for small banks as compare to large banks. Large banks generally have more equity-based funds that are insensitive to funding liquidity, integrated network, and have more competitiveness compared to small banks that make them more deterrent against adverse effect of economic policy uncertainty. The third model report that under the marginal effects of both BASEL regulations, the impact of EPU on liquidity creation is significant negative at all levels of capital and funding liquidity. The intensity of this adverse effect of economic policy uncertainty reduces as capital increases and aggravates when required funding liquidity increases. Larges banks are more deterrent to adverse effect of economic policy uncertainty when comply both BASEL regulations. However, for small banks BASEL regulations cause worsen the negative impact of economic policy uncertainty on liquidity creation of banks in emerging economies.

4.9 Bank Competition, Liquidity Creation and BASEL Regulations

The third external factor under study of this dissertation is bank competition. In this section, we highlight the effect of bank competition on bank liquidity creation under the moderating influence of BASEL regulations. Since there are two BASEL regulations namely, capital and funding liquidity. We perform three analyses by developing three models and discussed in following subsections. In first model, we incorporate the first BASEL regulation (capital) as a moderating variable to check its role while studying impact of bank competition on liquidity creation, while considering all other variables as independent variables. In second model, likewise, we keep second BASEL regulation (Funding Liquidity) as moderator and analysis its moderating role in determining the impact of bank competition on liquidity creation. The third model includes both of BASEL regulations as moderator and we estimate their role on the relationship between bank competition and liquidity creation.

4.9.1 Moderating Role of Capital

The first model here, is an extension of our base model that include Capital as moderator and shown in equation (4.14) below. This capture the possible moderating effect of capital on the relationship between competition and liquidity creation and results are documented in Table 4.16.

$$LCN_{ijt} = \pi_0 + \pi_1 SL_{ijt} + \pi_2 EPU_{ijt} + \pi_3 COM_{ijt} + \pi_4 CAP_{ijt} + \pi_5 FL_{ijt} + \pi_6 (COM_{ijt} \times CAP_{ijt}) + \psi_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \quad \text{....(4.14)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (COMxCAP) shows the moderating effect of Capital on the relationship between Bank Competition and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size, profitability, stability, real GDP growth rate, interest rate and stock market volatility. $\square$ and ϕ capture bank and time effects, respectively. And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effect are excluded from our models. The results of two-step system GMM model expressed in equation (4.14) are presented in Table 4.16. We elaborate our analysis separately for three samples of banks as depicted in three columns of Table 4.16.

Firstly, for all banks, it can be observed from table that the coefficient of interaction term (COM x CAP) is negative and highly significant. This leads to rejection of null hypothesis of H7. This reveals that on average, the impact of moderation term is positive on bank liquidity creation. The coefficient of COM is significantly positive that is in line with our base model results. Since Lerner Index is used in this study that measure bank power which is inverse of bank competition. The results envisage that, when ignoring the moderation term, bank competition has adverse effect on bank liquidity and enforces the "Competition Fragility" hypothesis. The capital, on the other hand shows positive but insignificant value that leads to positive impact of capital on bank liquidity, while ignoring the moderation effect in the model. Similarly, results of large banks are in accordance with results of all banks with regards to sign and significance of slopes of moderation and competition with slightly low magnitudes. This reinforces the "Competition

Fragility" view. On contrary, small banks, on average, depicts significant negative impact of moderation term on liquidity creation. While coefficient of Com is negative that signals towards "Competition Stability" hypothesis. The significant negative coefficient of capital supports the "Financial Fragility crowding out" hypothesis. Overall, these results have vital implication for BASEL regulation. For small banks in emerging economies, the BASEL regulation (capital) exerts significant adverse impact on liquidity creation, whereas for large banks, the role of BASEL regulation (capital) is vice versa.

Table 4.16: Moderating Role of Capital on Competition-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
Com*Cap	-3.769***	-3.600**	2.678***
	(0.998)	(1.52)	(0.921)
Com	1.308***	0.0611	-1.171***
	(0.34)	(0.36)	(0.376)
Cap	0.257	-3.053***	0.056
	(0.444)	(0.946)	(0.455)
L.LCN	0.415***	0.555***	0.386***
	(0.069)	(0.124)	(0.131)
SL	0.00779	0.0325	0.0519*
	(0.005)	(0.023)	(0.029)
EPU	-0.248	-0.373	-0.151
	(0.186)	(0.414)	(0.374)
FL	-0.143***	0.0252	-0.102
	(0.031)	(0.090)	(0.062)
Size	0.0160**	-0.00339	0.00201
	(0.007)	(0.010)	(0.021)
ROA	-1.976***	-2.023*	-2.000***
	(0.488)	(1.151)	(0.625)
Div	-0.240**	-0.380**	-0.409***
	(0.093)	(0.157)	(0.149)
CrdRisk	0.00433	0.00769	-0.0232**
	(0.008)	(0.009)	(0.010)
GDP	0.693*	0.729	0.418
	(0.383)	(0.952)	(0.672)
MP	0.154	-0.102	0.71
	(0.299)	(0.446)	(0.553)

SVol	-0.0000208	0.000431	0.000411
	(0.000)	(0.000)	(0.000)
Constant	-0.233	0.401*	-0.264
	(0.177)	(0.231)	(0.277)
AR(1)	0.006	0.037	0.004
AR(2)	0.474	0.956	0.162
Hansen	0.652	0.252	0.483
Sargan	0.002	0	0.024
Number of Groups	263	158	124
Number of Instruments	69	76	69
Observations	1212	669	425

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

Next, we demonstrate the marginal effect of Capital as moderator on the relationship between bank competition and liquidity creation, and for this we take partial derivative of equation 4.14 with respect to Com as shown in equation 4.15 below:

$$\frac{\partial LCN}{\partial Com} = \pi_3 + \pi_6 \mathbf{CAP_{ijt}} \quad \textbf{(4.15)}$$

Equation 4.15 shows that the partial derivative term is non-linear and its value depends on the level of capital. This means the impact of competition on liquidity creation is conditional on different levels of CAP that is the marginal effects of COM on bank liquidity creation varies with varying levels of capital. The output of marginal estimates is presented in Table 4.17 with three columns displaying three samples. For sample of all banks, the marginal effect remains significantly negative for lower levels of capital (25% and 50%) but changes to positive at higher level of capital (75% and above). The results indicate that the adverse effect of bank competition on liquidity creation reduces from (90.4%) and converts to positive (5%) with increasing levels of capital. Interesting to observe the marginal effects for large and small banks. For larger banks the positive impact of bank competition is improved from 32.4% to 124.5% with increase of capital level, while the positive effect of bank competition is reduced for small banks from 99.4% to 19.8% with progressing level of capital.

Table 4.17: Conditional Effect of Competition on LCN given Levels of Capital			
Capital at	All Banks	Large Banks	Small Banks
25%	0.904***	-0.324	-0.884***
50%	0.656***	-0.561*	-0.707***
75%	-0.050	-1.245**	-0.198
*, ** and *** indicates the significance at 10%, 5% and 1% respectively.			

For all banks, the results report that the bank competition influences the liquidity creation adversely for banks that have lower level of equity capital. But banks with higher equity capital experience favorable effect of increasing competition. The higher level of equity contributes to the stability and risk absorption capacity of banks and banks induce to take risky stance and their liquidity creation improves. Although increased competition exert pressure on profit margins of banks that leads to discourage banks in creating liquidity. But this negative effect on liquidity creation is ruled out due to positive effect of higher capital, resulting in net positive effect of increasing competition on liquidity creation.

For large banks, the competition exerts positive impact on liquidity creation on banks and it increases in magnitude from 32.4% to 124.5% when capital increases from low to high levels. The reason for positive impact on bank liquidity of large banks may be the greater resilience of these banks on account of greater capacity to create liquidity on account of their access to various markets, wider branch networks, prompt adoption of technology. In addition, the higher capability is superimposed by enhanced equity capital that works as shield to bank risks. Both the higher capability and higher risk taking of large banks leads to improved liquidity creation even in times of increased competition in banks.

Small banks, in contrast, depicts contracting results with respect to changes in capital level. The positive impact of increased competition declines as capital level increases (from 88.4% to 19.8%). It can be argued that small banks have certain segments to serve and limited capacity to create liquidity. Moreover, their product and services range are not as varied as large banks and these banks are not technology oriented. In face of competition, these banks rather intend to focus improving existing customer relationships instead of capturing new ones that leads to decline in their liquidity creation. The increase in equity capital cause aggravating “fragility-crowding out” in small banks (Berger and Bouwman, 2009) and thus liquidity is reduced by

these banks when in more competitive market. Thus, adverse effect of competition is strengthened by fragility-crowding out effect associated with higher capital of small banks in emerging economies.

4.9.2 Moderating Role of Funding Liquidity

We investigate the impact of bank market power on liquidity creation under moderation of second BASEL regulation (Funding liquidity) of bank. Therefore, funding liquidity (FL) is included in this model as moderator that interact with COM as shown in equation (4.16).

$$LCN_{ijt} = \tau_0 + \tau_1 SL_{ijt} + \tau_2 EPU_{ijt} + \tau_3 COM_{ijt} + \tau_4 CAP_{ijt} + \tau_5 FL_{ijt} + \tau_6(COM_{ijt} \text{ x } FL_{ijt}) + \psi_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \quad \text{..... (4.16)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (COMxFL) shows the moderating effect of Funding Liquidity on the relationship between Bank Competition and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size, profitability, stability, real GDP growth rate, interest rate and stock market volatility. $\square$ and ϕ capture bank and time effects, respectively. And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effect are excluded from our models. The results of two-step system GMM model are presented in Table 4.18.

The estimation output is shown in Table 4.18. The moderation term of (COM x FL) indicates negative and significant impact on liquidity creation for all three samples (all, large and small banks). This leads to rejection of null hypothesis of coefficient of this interactive term (COM x FL) and our hypothesis is accepted H11. For all banks, on average, the moderation adversely effects liquidity creation of all banks including sample of large and small banks in emerging markets. This implies that BASEL regulation (funding liquidity) aggravates the adverse effect of competition on liquidity creation of banks in emerging economies. The bank competition discourages banks to create liquidity when BASEL regulation (liquidity requirement) is in place.

Table 4.18: Moderating Role of FL on Competition-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
Com*FL	1.267**	1.360**	1.914**
	(0.613)	(0.595)	(0.847)
Com	-0.612**	-1.596***	-0.573
	(0.276)	(0.471)	(0.399)
FL	0.512*	0.724***	0.476
	(0.28)	(0.241)	(0.296)
L.LCN	0.465***	0.471***	0.661***
	(0.0734)	(0.13)	(0.127)
SL	0.00901	-0.00335	-0.0245
	(0.00732)	(0.00769)	(0.0387)
EPU	0.493	-0.625	-0.532
	(0.455)	(0.691)	(1.171)
Cap	-1.354***	-1.619***	-0.476
	(0.228)	(0.433)	(0.447)
Size	-0.000224	0.0213	-0.052
	(0.0166)	(0.0469)	(0.0777)
ROA	-1.600***	-3.386**	-2.455**
	(0.479)	(1.427)	(0.959)
Div	-0.331***	-0.319	0.167
	(0.127)	(0.225)	(0.497)
CrdRisk	0.00426	0.00905	-0.234**
	(0.00795)	(0.0324)	(0.106)
GDP	0.082	-1.434	-0.201
	(0.372)	(1.09)	(1.395)
MP	-0.179	-0.0745	-0.55
	(0.466)	(0.741)	(1.259)
SVol	0.000165	-0.000345	0.000737
	(0.00018)	(0.000411)	(0.000723)
Constant	0.135	-0.254	0.636
	(0.213)	(0.469)	(0.735)
AR(1)	0.006	0.042	0.001
AR(2)	0.644	0.701	0.673
Hansen	0.527	0.683	0.171
Sargan	0	0.007	0
Number of Groups	262	164	124

Number of Instruments	64	43	56
Observations	1210	749	425

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

To explore the economic effect of funding liquidity on the relationship between bank competition and liquidity creation, we differentiate partially the equation (4.16) with respect to COM and derivative results are displayed in equation (4.17).

$$\frac{\partial LCN}{\partial Com} = \tau_3 + \tau_6 FL_{ijt} \quad \textbf{(4.17)}$$

The equation affirms that the nonlinearity of marginal effect and conditional on levels of funding liquidity. Table 4.19 displays these marginal effects at funding liquidity values of 0 and 1 (1 means funding liquidity of 100% and above and zero means funding liquidity below 100%).

According to Table 4.19, for sample of all banks, the coefficients (τ_6) is significantly negative when banks' funding liquidity is below 100% which is converted to positive value for banks maintaining funding liquidity at 100% and above. This implies that competition works in favor of liquidity creation of banks as long as banks are not required to maintain funding liquidity at 100% as imposed by BASL. However, the implementation of minimum liquidity at 100% cause banks to reduce liquidity creation in more competitive banking market. Liquidity requirement of 100% proposed by BASEL reduces the overall available funds for lending for banks (Bouwman, 2013) that restrict banks to create liquidity. Moreover, in competition, due to high costs associated with developing relationship with customers become less valuable for banks. Instead, investment in short term securities and retaining liquid assets become more incentivize for banks. Thus, banks are inclined to shift available funds to securities and reluctant to advance new loans. Consequently, their liquidity creation reduces in tough competition. The negative effects of both competition along and funding liquidity sum up to higher negative net effect on liquidity creation.

The capability creating liquidity of large banks along with wider branch network and diverse products available for customers enables banks to be deterrent against adverse influence of competition. Instead, competition provides them more competitive edge over small banks and

increased their opportunity on both liability and asset sides. Consequently, available funds, on the one side, are increased and demand for their funds, on the other side, also increased. Thus, increased competition give rise to improved liquidity creation of large banks.

Small banks, in contrast, suffer adversely by the increased competition when they are compelled to retain 100% or above liquidity in compliance of BASEL regulation. On account of their limited capability of creating liquidity, narrow branch networks, lower access to international markets for both assets and liability sides contribute to their restricted creation of liquidity. In addition, the amiable funds of small banks are more porn to limiting effect of funding liquidity compare to large banks (Bouwman, 2013). As a result, increased funding liquidity strengthens the negative influence of competition on liquidity creation of small banks.

Table 4.19: Conditional Effect of Com on LCN given Levels of FL

FL at	All Banks	Large Banks	Small Banks
0	-0.611**	-1.596***	-0.572
1	0.650	-0.236	1.341*
*, ** and *** indicates the significance at 10%, 5% and 1% respectively.			

4.9.3 Moderating Role of Capital and Funding Liquidity

Finally, we elaborate our third model extension by including combined moderating effect of both the BASEL regulations (Capital and Funding Liquidity) and allow it to interact with COM as shown in equation (4.18) bellow. This moderating term captures the combined moderating effect of both Capital and Funding Liquidity on the relationship between bank competition and bank liquidity creation. The results of this model are reported in Table 4.20.

$$LCN_{ijt} = \chi_0 + \chi_1 SL_{ijt} + \chi_2 EPU_{ijt} + \chi_3 COM_{ijt} + \chi_4 CAP_{ijt} + \chi_5 FL_{ijt} + \chi_6(COM_{ijt} \times CAP_{ijt} \times FL_{ijt}) + \psi_0 Z_{ijt} + \square_{ij} + \phi_t + u_{ijt} \quad \text{(4.18)}$$

Where, LCN is normalized liquidity creation, SL shows stock market liquidity, EPU denotes economic policy uncertainty, COM is bank competition, CAP represents bank equity capital, and FL stands for funding liquidity. The term (COMxCAPxFL) shows the combined moderating effect of Capital and Funding Liquidity on the relationship between Bank Competition and liquidity creation. Whereas Z denotes the vector of control variables that includes bank size,

profitability, stability, real GDP growth rate, interest rate and stock market volatility. □ and **ϕ** capture bank and time effects, respectively. And u is error term. We test the model by including year dummies to capture time-specific effects in two-step system GMM. However, all the coefficients come up to be insignificant and so the time fixed effect are excluded from our models. The results of two-step system GMM model expressed in equation (4.18) are presented in Table 4.20.

The combined interaction term (COMxCAPxFL) being our prime focus of analysis. Table 4.20 shows that the coefficient (τ_6) is negative and significant at 5% level for sample of all banks. This coefficient captures the combined moderating effect of both the BASEL regulations on liquidity creation through interaction with COM. The significance of τ_6 implies rejection of null hypothesis (acceptance of H14). This implies that given progressing levels of Capital and Funding liquidity, the impact of bank competition on liquidity is significantly positive for all banks in emerging economies. By ignoring the moderation effect, the impact of competition is adverse on liquidity creation for sample of all banks, the "Competition Fragility" view is supported. In addition, the coefficient of capital indicates negative impact on liquidity, when moderation effect is neglected. Furthermore, the funding liquidity indicates significant negative impact on liquidity creation of banks, ignoring moderation effect. The results have key implication

Table 4.20: Moderating Role of Capital and FL on Competition-LCN Relationship

	All Banks	Large Banks	Small Banks
Variables	LCN	LCN	LCN
Com*FL*Cap	-4.030**	-23.08*	-8.244*
	(1.71)	(13.48)	(4.575)
Com	0.14	-0.505	-0.906
	(0.322)	(0.711)	(0.82)
Cap	-2.140***	-7.286**	-2.701**
	(0.476)	(3.316)	(1.031)
FL	-0.380*	-0.559	-1.804**
	(0.198)	(0.576)	(0.719)
L.LCN	0.500***	0.775***	0.338**
	(0.0676)	(0.0852)	(0.134)
SL	0.00918	-0.0273*	0.0323

	(0.00824)	(0.0162)	(0.0471)
EPU	0.155	0.275	1.045
	(0.357)	(1.843)	(1.157)
Size	-0.0159	-0.186*	-0.0925
	(0.0165)	(0.108)	(0.0813)
ROA	-1.938***	-2.329	-1.793***
	(0.703)	(2.264)	(0.647)
Div	-0.392***	-0.389*	-0.324
	(0.145)	(0.213)	(0.239)
CrdRisk	0.0442*	0.00613	-0.0147
	(0.0254)	(0.0124)	(0.0125)
GDP	-0.07	-4.283	0.576
	(0.533)	(3.391)	(1.44)
MP	-0.277	-3.806	0.75
	(0.5)	(2.311)	(0.899)
SVol	0.000102	0.0000511	0.000861*
	(0.00016)	(0.000482)	(0.000462)
Constant	0.460**	2.742*	1.1
	(0.214)	(1.507)	(0.704)
AR(1)	0.007	0.01	0.013
AR(2)	0.294	0.381	0.363
Hansen	0.556	0.459	0.597
Sargan	0	0	0.065
Number of Groups	246	157	109
Number of Instruments	107	31	53
Observations	1013	650	328

The robust standard errors of two-step system GMM shown in parenthesis. *, ** and *** indicate the significance at 10%, 5% and 1% respectively. AR(1) and AR(2) denote 1st and 2nd order serial correlation in residuals. Sargan-Hansen-test indicates the validity of instruments that are not correlated with residuals. The estimation controls for year, bank and country fixed effects.

for BASEL regulations that aim at achieving stability of banks along with improved liquidity position. When both of the BASEL regulations are imposed on banks, the combine moderating effect leads to rise in liquidity creation in response of increase in competition among banks in emerging economies.

Lastly, we present the analysis of combined marginal effect of both BASEL regulations on relationship between bank competition and liquidity creation. For this purpose, we partially

differentiate equation (4.18) with respect to Com and results is represented in equation (4.19) below.

$$\frac{\partial LCN}{\partial Com} = \chi_3 + \chi_6 (CAP_{ijt} \text{ x } FL_{ijt}) \quad \text{..... (4.19)}$$

We begin elaborating these effects from all banks, then for large and small banks. For all banks, Table 4.21 indicates that that all the coefficients of all combined marginal effects are positive and significant except at highest levels of capital (75%) and funding liquidity (FL=1). At lowest levels of Capital (25%) and Funding liquidity (FL=0), the bank competition has significant negative impact (0.306) on liquidity creation. The intensity (magnitude) of this negative impact decreases as level of capital increases but increases when level of funding liquidity increases. However, at highest levels of both capital and funding for all levels of capital and funding liquidity, the net effect of both capital and funding liquidity on liquidity creation is positive. It can be concluded that increase in equity capital enables banks to increase liquidity creation on due to their enhanced risk-taking capabilities (Risk Absorption effect). Therefore, banks with higher equity capital are motivated to create liquidity in times of more competition. On the other hand, BASEL liquidity requirement reduces available funds with banks and cause reduce their liquidity creation (Bouwman, 2013). Banks in high competition market banks, instead of improving relations with new customer, prefer to invest in short term securities and liquid assets. The negative effect of funding liquidity adds in adverse effect of competition to reduce liquidity creation. The net effect of these opposite forces depends on the relative size of both opposite forces. In our case, the net effect is negative that decreases when banks have more capital and it increases when banks retain funding liquidity of 100% and above. However, the results evidence that when banks have higher level of equity capital (75% and above), the effect of competition on liquidity is converted from negative to positive because the positive effect of capital dominates the negative effect of funding liquidity. But when banks are to hold more funding liquidity, the net positive effect is reduced slightly.

For large banks, the results indicate the negative effect of competition on liquidity at lower level of capital (below 50%) which is further aggravated (from 0.46 to 0.719) when banks compliance with BASEL minimum liquidity requirement of 100%. But this negative effect is reduced when bank equity capital is raised. At higher level of capital (75% and above) the competition

envisages to have positive impact on liquidity creation but its magnitude reduces when funding liquidity is increased. It can be argued that large banks have more capacity of creating liquidity since they have more access to markets, wider branch networks, prompt adoption of technology. The higher equity capital further enhances their capacities of creating liquidity by increasing their risk-taking. Both the higher capability and higher risk taking of large banks leads to improved liquidity creation even in times of increased competition in the banking sector. On contrary, the banks' compliance of 100% funding liquidity compels banks to reduce liquidity creation. Since large banks have higher proportion of non-deposit funds (equity capital) which is less effect by the funding liquidity. Thus, the negative effect of funding liquidity is dominated by positive effect of equity capital of large banks. Although the competition has negative impact on liquidity creation, but this negative effect of reduced due to increase in capital level and consequently converted to positive effect on liquidity creation when banks have higher capital (75% and above). Moreover, even with increase in held liquidity, the net effect of competition on liquidity creation remains positive at higher level of capital though it is reduced in magnitude (from 1.22 to 0.39).

Small banks, on the other hand, depicts contracting results of effect of competition on liquidity creation with respect to changes in capital and funding liquidity levels. The positive impact of increased competition declines (from 0.55% to 1.351) as capital level increases. Moreover, the intensity of effect is reduced as banks retain more funding liquidity. This reason for this behavior of small banks can be explained as small banks have certain segments to serve and limited capacity to create liquidity. Moreover, their product and services range are not as varied as large banks and these banks are not technology oriented. In face of competition, these banks rather intend to focus improving existing customer relationships instead of capturing new ones that leads to decline in their liquidity creation. The increase in equity capital cause aggravating "fragility-crowding out" in small banks (Berger and Bouwman, 2009) and thus liquidity is reduced by these banks when in more competitive market. In addition, the proportion of deposit-based funds is more in total available funds as compare to large banks (that contain equity capital as major share in total available funds) which is more sensitive to changes in funding liquidity. Thus, positive effect of competition on liquidity is weakens as capital and funding liquidity increases and finally converts to negative at higher levels of both capital and funding liquidity of small banks in emerging economies.

Overall, it can be concluded that for all banks in emerging economies, the bank competition exerts negative influence on liquidity. Its intensity decreases with increasing capital level and increases with increase in funding liquidity. However, large banks behave differently as compare to small banks. For large banks, with progressing level of capital, the magnitude of adverse effect of bank competition is diminished and converted to positive one at higher level of capital. For small banks, the effect of competition on liquidity changes from positive to negative with increasing levels of capital and it becomes more intensified when liquidity requirement is imposed on top of capital. In sum, the "Competition Fragility" view is dominating for all banks which strengthens (diminishes) with increase in funding liquidity (capital level) of banks. The "Risk Absorption" effect increases for large banks and "Fragility Crowding out" effect enhances for small banks.

Table 4.21: Conditional Effect of Com on LCN given Levels of Capital and FL

Capital at	**FL at**	All Banks	Large Banks	Small Banks
25%	0	0.306***	0.508**	-0.55**
	1	0.495**	0.741*	-0.34*
50%	0	0.409*	0.46*	0.277*
	1	0.332*	0.719*	0.626**
75%	0	0.706***	-1.22**	1.351*
	1	-0.13**	-0.39**	2.298*
*, ** and *** indicates the significance at 10%, 5% and 1% respectively.				

4.9.4 Conclusion

In this section we discuss the moderating role of BASEL regulations (Capital and Funding Liquidity) on the relationship between Bank Competition and bank Liquidity Creation. We split our analysis into three parts. First model considers Capital as moderator and rest of variables as independent variables. The second model considers Funding Liquidity as moderator along with other independent variables. The third model considers Capital and Funding Liquidity both as moderators. We analysis the marginal effects of these moderators with varying levels of capital and funding liquidity. All the models document significant moderation roles of BASEL regulations.

The first model proves that under moderation of BASEL regulation (capital) the negative effect of bank competition converts to positive impact on liquidity creation when equity capital of banks increases. The intensity of positive effect of bank competition increases (decreases) with rise in capital levels for large (small) banks. Large banks have greater capacity to create liquidity, access to various markets, prompt adoption of technology that improve their liquidity creation even in competitive market. On contrary, small banks have limited capacity to create liquidity, narrow product range, not technology oriented, and they focus improving existing customer relationships that leads to decline in their liquidity creation. The second model documents that the implementation of minimum liquidity at 100% causes banks to reduce liquidity creation in more competitive banking market and the intensity is more for small banks. The large banks have wider branch network, diverse products range and higher capability of creating liquidity. Whereas, available funds of small banks are more porn to limiting effect of funding liquidity. Thus, small banks are more effected by adverse effect of competition and increased funding liquidity as compare to large banks. The third model indicates that for banks in emerging economies, the bank competition exerts negative influence on liquidity under influence of moderation of both BASEL regulations. Its intensity decreases with increasing capital level and increases with increase in funding liquidity. Large banks behave differently as compare to small banks. The increase in equity capital enhances risk-taking capabilities of banks and motivates them to create liquidity in times of more competition. On the other hand, liquidity requirement reduces liquidity creation by limiting available funds. For large banks, with progressing level of capital, the magnitude of adverse effect of bank competition is diminished and converted to positive at higher level of capital. For small banks, the effect of competition on liquidity changes from positive to negative with increasing levels of capital and becomes more intensified when liquidity requirement is imposed on top of capital. In sum, the "Risk Absorption" effect increases for large banks and "Fragility Crowding out" effect enhances for small banks as capital and funding liquidity increases for banks in emerging economies.

Table 4.22: Observed Hypothesis

Hypothesis	Findings
Direct Impact of External Factors	
H1: There is significant impact of stock market liquidity on bank liquidity creation.	*Accepted*
H1a: There is significant positive impact of stock market liquidity on bank liquidity creation.	*Accepted*
H1b: There is significant negative impact of stock market liquidity on bank liquidity creation.	*Rejected*
H2: There is significant impact of Economic Policy Uncertainty on Bank Liquidity Creation.	*Accepted*
H2a: There is significant positive impact of Economic Policy Uncertainty on bank liquidity creation.	*Rejected*
H2b: There is significant negative impact of Economic Policy Uncertainty on bank liquidity creation.	*Accepted*
H3: There is significant impact of bank competition on bank liquidity creation.	*Accepted*
H3a: There is significant positive impact of bank competition on bank liquidity creation.	*Rejected*
H3b: There is significant negative impact of bank completion on bank liquidity creation.	*Accepted*
Direct Impact of Capital on Liquidity Creation	
H4: There is significant impact of Capital on bank liquidity creation	*Accepted*
H4a: In accordance to Fragility Crowding out Hypothesis, capital has significant adverse influence the bank liquidity creation.	*Accepted*
H4b: With respect to Risk Absorption Hypothesis, capital has significant positive influence on bank liquidity creation.	*Rejected*
Moderating Impact of Bank Capital on Liquidity Creation	
H5: There is significant moderating impact of capital on the relationship between Stock Market Liquidity and Liquidity Creation.	*Accepted*
H6: There is significant moderating impact of capital on the relationship between Economic Policy Uncertainty and Liquidity Creation.	*Accepted*
H7: There is significant moderating impact of capital on the relationship between Bank Competition and Liquidity Creation.	*Accepted*
Direct Impact of Funding Liquidity on Liquidity Creation	
H8: There is significant impact of Funding Liquidity on bank Liquidity Creation	*Accepted*
Moderating Impact of Funding Liquidity on Liquidity Creation.	
H9: There is significant moderating impact of Funding Liquidity on relationship between Stock Market Liquidity and bank Liquidity Creation.	*Accepted*
H10: There is significant moderating impact of Funding Liquidity on relationship between Economic Policy Uncertainty and bank Liquidity Creation.	*Accepted*
H11: There is significant moderating impact of Funding Liquidity on relationship between Bank Competition and bank Liquidity Creation.	*Accepted*
Combined BASEL - Moderating Impact	
H12: There is significant combined moderating impact of Capital and Liquidity on relationship between Stock Market Liquidity and Bank Liquidity Creation.	*Accepted*
H13: There is significant combined moderating impact of Capital and Liquidity on relationship between Economic Policy Uncertainty and Bank Liquidity Creation.	*Accepted*
H14: There is significant combined moderating impact of Capital and Liquidity on relationship between Bank Competition and Bank Liquidity Creation.	*Accepted*

Chapter 5

Conclusion

5.1 Introduction

This section of the thesis is devoted to provide summarized outcomes of the research study by assessment of our findings with past literature. In addition, contributions of this research are presented in this chapter. Further, we mention the limitation of our research work. Lastly, the possible implication of findings of the research along with future recommendation are also highlighted in brief.

The function of banking institutions as liquidity creators is being acknowledged by economic experts since at least Smith (1776). By transforming liquid funds (deposits) into illiquid assets (loans for borrowers), banks are engaged in creating liquidity in the economy that ultimately favours economic growth (Berger & John, 2017; Horavath et al., 2013). It is acknowledged that illiquidity issues and inadequate liquidity risk management in financial institutions are the root cause of financial crisis of 2007-08 and its rapid expansion (Gorton & Souleles, 2007; Brunnermeier, 2009). Erkens et al. (2012) argues that the aggressive risk-taking stance of banking institutions are one of the reasons of financial crisis. Therefore, the financial crisis 2008 has highlighted the importance of regulating banks' liquidity. Among others, the formulation of BASEL III regulations (capital and funding liquidity) introduced by Committee of Banking Supervision is an initiative to promote resilient banking sector. The past literature suggests mixed effects of BASEL III regulations on lending, credit and liquidity creation. This research study highlights three significant topics of role of external (market) factors namely, stock market liquidity, economic policy uncertainty and bank competition on bank liquidity creation with consideration of BASEL regulations, Capital and Liquidity requirements.

5.2 Summary of the Research

This section presents brief summary of results obtained in the study. The sample data set consist of 587 banks from 11 emerging economies with annual observations of 5283 spanning from 2011 to 2019. We utilized two stage GMM for analysis that provides efficient, and unbiased results (Arrelano & Bon, 1991). The analysis also provides comparison of large and small banks.

Our base-line model depicts a significant positive effect of stock market liquidity on bank liquidity creation in emerging economies whereas economic policy uncertainty and bank competition suggest significant negative influence on bank liquidity creation. Furthermore, the study confirms a significant adverse effect of both BASEL regulations (capital and funding liquidity) on liquidity creation in emerging markets. The results are in line with past research that address some of the individual emerging countries like Toh et al. (2019) and Shah et al. (2019). These results may be a generalization for the emerging economies.

We attempt to achieve our subsequent objectives by demonstrating the moderating role of BASEL regulations on the three relationships being focus of this study that is the relationship of stock market liquidity, economic policy uncertainty and bank competition with bank liquidity creation. For this purpose, we perform three estimations. First model considers Capital as moderator and rest of variables as independent variables. The second model considers Funding Liquidity as moderator along with other independent variables. The third model considers both Capital and Funding Liquidity as moderators. All the models document significant moderation roles of BASEL regulations.

First, for the analysis of impact of stock market liquidity on liquidity creation under moderation of BASEL regulations, we explain three models. The first model analysis of impact of stock market liquidity on liquidity creation under moderation of capital. The results indicate that the marginal effect of stock market liquidity on liquidity creation changes from negative to positive when capital levels of banks increases. The large banks show similar results but with slightly greater magnitude of the effects compare to small banks. Large banks have greater capacity of liquidity creation because of their strong networks and greater access to market (local as well as international) that assist them to raise funds. The rise in capital leads to improve their risk-taking behavior (Risk Abortion effect). Hence, for large banks, the adverse effect of stock liquidity on liquidity creation is reversed to positive as capital increase. In contrast, small banks are more prone to experience the "financial fragility-crowding out" effect due to their greater involvement with small enterprises. Small banks often raise funds locally, which might "crowd out" deposits. Therefore, increase in capital level increases capability of creating liquidity by small banks that suppress the adverse effect of stock liquidity to some extent. But net effect of stock liquidity on liquidity creation remains negative even with increasing levels of capital for small banks.

The results of our second model report that the effect of stock liquidity on liquidity creation under moderation of funding liquidity, changes from positive to negative with increasing level funding liquidity. Liquidity requirement reduces the overall available funds for lending for both types of banks (large and small) but its limiting effect is more on small banks compared to large banks. Compare to small banks, large banks use greater non-deposit funds that are more sensitive to stock market liquidity and not to funding liquidity. In addition, large banks have higher capacity of raising funds, on account of their access to markets and wider range of products and services, that assists them to raise funds. Thus, more funds are available with larger banks and liquidity creation of large banks is less deteriorated by limiting effect of higher funding liquidity requirement as compare to small banks.

The third model analyze moderation of both BASEL regulations. The results of combined marginal effect of stock market liquidity due to both BASEL regulations, on liquidity creation is negative but it reverses as capital level increases but the magnitude of increment is lesser at higher levels of funding liquidity. The liquidity requirement compels banks to retain a larger portion of deposit funds resulting in reduction of liquidity creation. The capital on the other hand, improves the risk absorption capacity of banks that induces them to take riskier stance and create liquidity (Risk Absorption effect). Moreover, equity capital is not subject to limiting effect of liquidity requirement (funding liquidity). Thus, banks at lower (higher) level of capital are more (less) effected by adverse effect of funding liquidity. The net moderating effect of both regulations (capital and funding liquidity) has been dominated by capital. For large bank, the combined marginal effect of stock market liquidity on liquidity creation converts from positive to negative as funding liquidity increase. The large banks, on account of greater share of equity capital in total available funds, are less effected by liquidity requirement. For small banks, the effect of stock market liquidity on liquidity creation remains negative and it further aggravates due to increase in funding liquidity but reduces slightly with increase in capital. The small banks with larger proportion of deposit-based funds are more sensitive to changes in liquidity requirement and thus experience sever adverse effect of stock market liquidity on liquidity creation. These results evidence that BASEL liquidity regulation on top of capital is subject to a trade-off, particularly for small banks, between improved stability as well as liquidity of banks and well-being of the economy achieved through liquidity creation.

For examining the impact of EPU on liquidity creation under moderating influence of BASEL regulations (capital and funding liquidity), we summarize the three models. The results of first models proves that under the moderation of capital, the negative effect of economic policy uncertainty on liquidity creation reduces with increasing level of capital. The results are same for large banks but for small banks the negative effect aggravates with increase in capital. Large and well-capitalized banks are less sensitive to changes in EPU and are in a better position to be deterrent against economic policy uncertainty because of increased sustainability and competitiveness. It concludes that Risk Absorption (Financial Fragility Crowding out) effect weakens (strengthens) the negative effect of economic policy uncertainty on liquidity creation of large(small) banks.

In second model, we evidence that the negative effect of economic policy uncertainty on liquidity creation aggravates as banks are to comply with BASEL regulation of 100% funding liquidity. In addition, the intensity of this adverse effect is more for small banks as compare to large banks. Large banks generally have more equity-based funds that are insensitive to changes in funding liquidity. moreover, large banks more integrated network, access to markets, competitiveness compared to small banks that make them more deterrent against adverse effect of economic policy uncertainty.

The third model presents the combined moderating role of both BASEL regulations (Capital and funding liquidity) on the relationship between EPU and liquidity creation. Significant negative role of combined moderation is observed for all types of banks. The results of marginal effects report that when both BASEL regulation are imposed, the impact of EPU is significant negative at all levels of capital and funding liquidity. The intensity of this adverse effect of economic policy uncertainty reduces as capital increases and aggravates when required funding liquidity increases. Larges banks are more deterrent to adverse effect of economic policy uncertainty when comply both BASEL regulations. However, for small banks BASEL regulations cause worsen the negative impact of economic policy uncertainty on liquidity creation of banks in emerging economies.

Third, in order to investigate the impact of bank competition on liquidity creation under influence of BASEL regulations (Capital and funding liquidity) we document results of three

models as follows. The first model proves that under moderation of BASEL regulation (capital) the negative effect of bank competition converts to positive impact on liquidity creation when equity capital of banks increases. In addition, the intensity of positive effect of bank competition increases (decreases) with rise in capital levels for large (small) banks. The reason for positive impact on bank liquidity of large banks being their greater capacity to create liquidity on account of their access to various markets, wider branch networks, prompt adoption of technology. In addition, the higher capability is superimposed by enhanced equity capital that works as shield to bank risks. This leads to improved liquidity creation by large banks even in times of increased competition in the banking sector. On contrary, small banks have certain segments to serve and limited capacity to create liquidity. Moreover, their product and services range are not as varied as large banks and these banks are not technology oriented. In face of competition, these banks rather intend to focus on improving existing customer relationships instead of capturing new ones and shift investment in short term and liquid assets that leads to decline in their liquidity creation.

The second model, documents that bank competition works in favor of liquidity creation of banks as long as banks are not required to maintain funding liquidity at 100% as imposed by BASEL. However, the implementation of minimum liquidity at 100% causes banks to reduce liquidity creation in more competitive banking market. As funding liquidity increases, the positive effect of competition diminishes for large banks and even converts to negative for small banks. The large banks have higher capability of creating liquidity and have wider branch network and diverse products available for customers that enable banks to be deterrent against adverse influence of competition. Instead, competition provides them more competitive edge over small banks and increased their opportunity on both liability and asset sides. The available funds of small banks, in addition, are more porn to limiting effect of funding liquidity. Thus, small banks are more effected by adverse effect of competition and increased funding liquidity as compare to large banks.

The third model includes both the BASEL regulations. The results documents that for banks in emerging economies, the bank competition exerts negative influence on liquidity. Its intensity decreases with increasing capital level and increases with increase in funding liquidity. However, large banks behave differently as compare to small banks. It can be argued that increase in equity

capital enables banks to increase liquidity creation due to their enhanced risk-taking capabilities (Risk Absorption effect). Therefore, banks with higher equity capital are motivated to create liquidity in times of more competition. On the other hand, BASEL liquidity requirement reduces available funds with banks and cause reduce their liquidity creation. The net effect of these opposite forces depends on the relative size of both opposite forces. For large banks, with progressing level of capital, the magnitude of adverse effect of bank competition is diminished and converted to positive at higher level of capital. For small banks, the effect of competition on liquidity changes from positive to negative with increasing levels of capital and it becomes more intensified when liquidity requirement is imposed on top of capital. In sum, the "Fragility Crowding out" effect is dominating for all banks which strengthens (diminishes) with increase in funding liquidity (capital level) of banks. The "Risk Absorption" effect increases for large banks and "Fragility Crowding out" effect enhances for small banks as capital and funding liquidity increases for banks in emerging economies.

5.3 Policy Recommendations and Implications

The results based on empirical analysis, provide consistent evidence that there is significant influence of our variables of interest (stock market liquidity, economic policy uncertainty and bank competition) along with BASEL regulations on bank liquidity creation in emerging economies. By this manner, there are a few crucial contributions to existing literature of bank liquidity creation in context of emerging economies. In addition, the outcomes of this study provide a few important policy implications as well as some recommendations for regulators, investors, academic researchers and particularly, for BASEL III regulations.

The results imply that both BASEL regulations are subject to a trade-off between improved stability of financial system and well-being of the economy achieved through liquidity creation. Although BASEL regulations aim at improving stability and liquidity position of banks by enhancing equity capital and required funding liquidity. Both of these regulations exert adverse impact on the liquidity creation capability of banks which is crucial for economic growth. Thus, BASEL regulations need to be reviewed and revised in order to align the prime objective of promoting positive role of banking for economic growth while enable and motivate them to

continue their productive role of liquidity creation in face of stock market deterioration, high economic pocky uncertainty and high competition.

The results reveal that BASEL regulation (Capital) enhances the effect of stock liquidity on liquidity creation. But in times of deteriorating stock liquidity, its adverse effect is to be worsen on liquidity creation with increase in capital. In this time, policy should be supportive for banks to continue liquidity creation. In this way, the capital requirement hinders banks' productive role in the economy and is not suggestive. Liquidity requirement aggravates the negative effect of stock liquidity on liquidity creation. It is acknowledged to liberalize market to facilitate more access for intermediaries, issuers, investors. Particularly, the economies that are based on banking system, must pay attention to devise such policies to motivate, facilitate and protect banking system, instead creating hindrance in their existing role.

Capital reduces the adverse effect of EPU on liquidity creation to some extent. Thus, it is consistent with the prime objective of BASEL to strengthen banking system to be deterrent in times of high uncertainty to continue creating liquidity in the economy. However, the funding liquidity requirement aggravates the negative impact of economic policy uncertainty on liquidity creation. In times of uncertainty, when there is a need of banks to perform their role to provide necessary funds to business on one hand, and offer savers the opportunity of generating risk free income by depositing in banks. The implementation of minimum funding liquidity requirement further deteriorates banks liquidity creation and causes hinderance to economic growth. Therefore, BASEL regulations should be reconsidered as to protect banking industry in times of economic uncertainty to continue playing their role to contribute in economic growth through liquidity creation.

The results indicate that under the BASEL capital requirement, banks competition favorably influence bank liquidity creation. Since capital enhances stability and risk-taking behavior of banks, the banks with higher capital are encouraged to create more liquidity. On contrary, funding liquidity increases the adverse effect of competition on liquidity creation by limiting available funds with banks to be transformed to loans. On one hand, government regulations promote bank competition so that depositors and business may have handsome rates on deposits and cheap credit, respectively. But, on the other hand, BASEL liquidity requirement evidences to

work in the opposite direction. It is imperative for policy makers to seek a balance between the advantages of BASEL regulations stabilizing financial system by improving their capital and liquidity positions, and the cost associated with reduced liquidity creation by banks, in consequence.

We question the "one size fit for all" strategy for both BASEL regulations. Since the management of assets and liabilities is different for large and small banks. The capacity of large banks to create liquidity is varied as compared to small banks on account of their characteristics. Large banks have greater access to markets, wider product ranges, and various funding sources, whereas small banks mostly engaged in certain small and medium enterprises and have narrow sources of funds. Their ability and management to adjust their assets and liabilities in complying capital and liquidity requirements is different. Thus, they behave differently to these regulations. The results clearly indicate that for large banks, capital has Risk Absorption effect that adds in the stability and risk-taking behavior of these banks. Whereas, Fragility Crowding out effect dominates for small banks as a result of increased capital. Similarly, the BASEL liquidity requirement, worsen the negative impact of external factors (stock liquidity, economic policy uncertainty and competition) for both types of banks. But our results evidence greater intensity of these adverse effects due to increased funding liquidity for small banks compare to large ones. Therefore, first BASEL regulations (Capital) influence favorably for large banks but negatively for small banks. There is need for revisit for this regulation in the context of large versus small banks. Moreover, it is profound that the second BASEL regulation (Funding Liquidity) adversely affect the liquidity creation of banks by limiting the available funds. However, the deterioration is more intensified for small banks. Both of these regulations provide competitive edge to large banks against small ones. Thus, imposition of BASEL requirements may be relevant to large banks as opposed to small banks. The findings of our study prompt question regarding the application of homogeneous requirements of both BASEL regulations across all categories of banks, given that significant banking institutions may exhibit distinct behavior due to their too-big-to-fail status or possess the ability to handle their capital and liquidity in a dissimilar manner.

Finally, our results of combined moderation of both of BASEL regulations (capital and liquidity) on bank liquidity creation prove that BASEL capital requirement enhances stability of banks that enable banks to safeguard themselves against adverse effect of external factors (stock market

liquidity, economic policy uncertainty and competition). But funding liquidity aggravates the adverse effects of these external factors and reduces the favorable effect of enhanced capital on liquidity creation. Thus, it is important to consider the role of liquidity requirement when implemented on top of capital, on the liquidity creation of banks. Our results endorse the implementation of capital requirement but cast doubt on the imposition of liquidity requirement on top of capital since it limits available funds and deteriorates liquidity creation that contradicts the prime objective of regulators to promote banks in contributing the economic growth of economy through liquidity creation.

In addition, this research study, offers several valuable outcomes with regard to academic and research students. The research study presents a comprehensive analysis and exploration of the subject matter pertaining to the bank liquidity creation in emerging economies where limited literature is available. Particularly, the study is pioneer one that analyzes the role of BASEL regulations in determining the bank liquidity creation. Furthermore, the study provides in depth understanding of the impact of three external factors (stock liquidity, economic policy uncertainty and competition) on bank liquidity creation under moderation of both BAEL regulations. A number of avenues may be explored for further studies in banking literature. A few research gaps are also mention at end of this section that gives guidelines for researchers and academies.

5.4 Limitations of the Study

The present study contributes in several ways in the existing literature regarding stock market liquidity, economic policy uncertainty, bank competition, BASEL regulations and bank liquidity creation. Yet the results of the study have a few limitations.

First and most crucial limitation is the available data on the variables of interest. The sample data for the study covers annual data from 2011 to 2019 obtained from Bankfocus database. The more comprehensive data set would produce generalizable results.

The study utilizes on-balance sheet items based on categories in order to calculate liquidity creation of banks on annual basis. The availability of off-balance sheet data and maturity

information of these items would certainly allow the calculations of liquidity creation with more accuracy.

The BASEL regulations introduced two indicators of liquidity namely, Liquidity Cover Ratio (LCR) and Net Stable Funding Ratio (NSFR). This study, however, uses NSFR and not LCR because data to calculate LCR is not available sufficiently that describes maturity of asset and liabilities and 30 days liabilities information is generally not reported in financial reports of banks.

The study relies on Amihud Index as indicator of stock market liquidity. This index is calculated on the basis of daily stock data of prices and trading volume of stocks. But the intraday trading data is not accessible like bid- ask price, quote size, trade size, commission charges, that are used to measure stock liquidity depth, transition cost, timing.

The economic policy uncertainty is gauged by world uncertainty index (WUI). The data for economic Policy Uncertainty (EPU) is not available for most of the emerging economies, the focus of this study.

5.5 Future Recommendations

The present study, after elaborating various aspects of external factors with relation to bank liquidity creation in context of BASEL regulations, open up various avenues for future research on the topic of banking industry.

Since this study analyses the bank liquidity creation, external factors and BASEL regulations in emerging economies of Asia. The future research can be conducted on advanced and developing economies. Moreover, this study uses sample data consisting of annual operations of banks from 2011 to 2019. A more comprehensive sample data set is recommended for the sack of generalization of the results.

Second, it is recommended to conduct a comparative study of advanced, emerging and developing economies. It will highlight distinct characteristics of banking institutions and their behavior towards external factors that may provide guidance for regulators to devise policy and regulations in accordance to these distinct features of financial institutions.

Third, this research relies on one indicator of the variables in study like stock market liquidity, economic policy uncertainty, bank competition and BASEL regulations (capital and NSFR). Other proxies may be used to measure the variables of interest such as Bid-ask price spread, distance to zero return are proxies that can be used as indicators of stock market liquidity. For economic policy uncertainty other proxies such as EPU index and VIX index, Geographical Political Risk (GPR), and political stability index be used for robust analysis. For bank competition, market share and Herfindal Index are alternate indicators used in literature to measure bank competition. And LCR be used as indicator of funding liquidity.

Fourth, although this study provides consistent results, particularly the moderation role of BASEL regulations, yet the question about the transmission channels for these interactions is still unexplored. Thus, future research may address possible mechanism in order to explain these influences of market factors to bank liquidity creation.

Fifth, the present study explores the moderating effect of BASEL regulations to influence the bank liquidity creation by interacting with external factors. It would be interesting to investigate the moderating role of other factors like asset/income diversity, stability, interest rate, economic growth, corporate governance. In addition, it is recommended to investigate the mediating role of BASEL regulations in determining bank liquidity creation.

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