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Exploring The Antecedents And Consequences Of Bank Liquidity Creation In SAARC Region

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Abstract

Present study seeks to contribute to the existing body of knowledge on bank liquidity creation in SAARC countries by utilizing the data from 2010-2020 through multivariate panel regression analysis utilizing Generalized Method of Moments (GMM). We carried out an econometric analysis aimed at exploring the primary internal and external factors that impact the creation of bank liquidity and it consequences. Our findings indicate that bank capital, operational risk, credit risk, liquidity risk and bank size have a substantial impact on liquidity creation while the role of country governance does not seem to be significant. The observed outcomes of liquidity creation by banks are stability, performance and economic growth. The study emphasizes the significance of bank liquidity creation for economic development as well as the need for regulators to monitor and limit liquidity risk in order to assure banking profitability and stability.

Keywords: Liquidity creation, SAARC, Profitability, Bank stability, Stability.

1.Introduction

Financial Sector plays a significant role in the economy of any country and in ensuring sustainable growth (Paun et al., 2019). It provides support in efficient allocation of resources from saving sector to investment sector and escalates overall productivity (Hussain et al., 2021). Modern financial intermediation theory says that the banks as a financial institution play two important roles in the economy; risk transformation and liquidity creation (Berger & Bouwman, 2009).

Generating liquidity for depositors and borrowers is among the key functions performed by banks which enhance entrepreneurial activities and ultimately promotes economic growth but increases banking sector liquidity risk because illiquid loans are financed with liquid deposits (Smith, 1776). Banks have also the ability to generate liquidity for their customers through off-balance sheet operations like loan commitments and letters of credit (Kashyp et al., 2002).

The significance of bank liquidity creation has been raised during global financial crisis (2007-09) because liquidity demand from individuals, businesses cant's be fulfilled by market based sources of finance (Acharya et al., 2009). Moreover, bank liquidity might be dried up for a long period of time which has adverse effects on economic conditions. Contrarily, the chances of banks failure are higher due to high liquidity creation both on and off balance sheet (Berger & Bouwman, 2012; Diamond & Rajan, 2001). Furthermore, Berger and Sedunov (2017) suggested that liquidity provision could be considered as better measure of bank output than return on total assets because it also takes into account off balance sheet activities i.e., derivatives, lines of credit and off balance sheet guarantees.

In the past few years, there has been increased interest in exploring liquidity creation in both theoretical and empirical studies. A methodology was established by Deep and Schaefer (2004) to calculate the precise amounts of liquidity produced by banks, concentrating on maturity transformation as well as on-balance sheet activity. They based their findings on Bryant's (1980) and Diamond and Dybvig's (1983) groundbreaking studies. Based on asset, liability, and equity categories, In their approach, Berger and Bouwman (2009) put forth four potential techniques to calculate theliquidity generation of banks, incorporating off- balance sheet activities and other variables based on maturity transformation.

The South Asian Association for Regional Cooperation (SAARC) is a regional intergovernmental organization comprising of eight countries in South Asia, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Most countries in the region have a bank-based system, where banks play a crucial role in providing credit and financial services to households and businesses. Each of these countries has its own unique banking and financial system. The banking sector in SAARC countries is diverse in terms of development and focus. However, some countries in the region, such as India and Sri Lanka, have been promoting the development of capital markets, which can offer an alternative source of financing and help reduce reliance on bank loans. Additionally, some countries in the region have been exploring innovative models that combine elements of both bank-based and market-based systems, such as digital financial services and fintech solutions. The emergence of Islamic banking in the SAARC region reflects the growing demand for Shariah-compliant financial products and services, as well as the need to promote financial inclusion and access to finance for all segments of society. The activities of asset transformation and liquidity creation are commonly carried out by both conventional and Islamic banks. Thus, it is essential to comprehend the primary internal and external factors that drive bank liquidity creation and its outcomes to assure the financial and economic progress of SAARC region.

Current study aims to provide further insights to the present body of literature by building on previous research. The study is twofold: Initially, we identify the primary factors that impact bank liquidity creation on the basis of their individual importance and significance in the process of liquidity provision of 332 banks in SAARC countries over the period of 2010-2020, based on their on- and off-balance sheet elements. Secondly the consequences of liquidity generation have been examined in the context of SAARC region. For that purpose, we have employed a multivariate panel regression analysis using Generalized Method of Moments (GMM) suggested by Arellano and Bover (1995) as well as Blundell and Bond (1998) and adopt the methodology of the Berger and Bouwman (2009) for calculation of liquidity provision. This approach has an advantage over the Fixed Effects (FE) model as it provides a comprehensive view of how both internal with external factors that affect the distribution of bank liquidity generation and its outcomes, while also accounting for the heterogeneity among different banks.

This paper is organized in the following manner. The subsequent section of our study entails a comprehensive review of relevant literature, wherein we ascertain the bank-specific and macroeconomic factors that exert an influence on the creation of bank liquidity and its associated outcomes. The third section of the study encompasses the description of data and the methodology employed. The following sections provide an exposition and evaluation of the

empirical findings. Ultimately, the paper draws a conclusion in the final section.

2. Literature review and Hypothesisdevelopment

Liquidity creation by banks is essential to the health of the banking system and the economy, yet there is a dearth of research on this topic. One of the first studies to expound on the function of banks as liquidity providers centered on the model equilibrium between banks' solvency and their capacity to generate liquidity. Banks generate liquidity by matching liquid liabilities (deposits) with illiquid assets (investments, loans) (Diamond & Dybvig, 1983). By serving in this capacity, banks play an active part in the real economy. On the other hand, a bank run could happen if a lot of people tried to withdraw their deposits all at once. According to the model suggested by Diamond and Dybvig (1983), the provision of demand deposits by banks improves the efficiency of the market because it fosters a risk-sharing atmosphere in which new depositors are employed to offset the loss of deposits sustained by existing customers. The basic theory of money supply states that central banks, banks, borrowers, and depositors are the four main actors responsible for determining the money supply. Money is created, not by any one of the four banks stated here, but by the banking system as a whole. Key elements that affect the money creation process include commercial banks' decisions to hold access reserves, central banks' reserve requirements, depositors' decisions to hold their cash, and borrowers' decisions to take out loans (Mishkin, 2001).

Two seminal studies played a pivotal role in establishing benchmarks for liquidity creation through their measurement of the phenomenon. Initial was undertaken by Deep and Schaefer (2004) and subsequent by Berger and Bouwman in (2009). Several subsequent researches utilized the same methodology to analyze banks' liquidity production from various different perspectives. Such efforts took into account both control variables and some determinants, including capital and risk assessments. Researchers looked at developed and emerging economies, each of which produced unique findings. In keeping with such modeling, we will elaborate on the antecedents and implications of liquidity generation by conducting an examination of little previous research on the impacts of such activities on the creation of real economic activities and on the economic growth of the countries in which they operate.

In an effort to learn more about the process of creating liquidity, some studies followed the methodology of Berger and Bouwman (2009) while others followed that of Deep and Schaefer (2004) association between bank liquidity provision with different variables i.e., bank capital, government policies, bank value, mergers and acquisitions, bank competition, bank deregulation, deposit insurance, corporate governance, economic activity were studied in the context of different geographical locations (Berger & Bouwman, 2017).

To the best of author’s knowledge, there is a limited amount of research that has been conducted on the influence of both bank specific and external factors on the creation of liquidity as well its consequences. Mdaghri and Oubdi (2022) studied the liquidity creation determinants in the context of 153 banks located in 12 countries in the Middle East and North African (MENA) region. The study covers the period between 2008 and 2017. In addition, an econometric examination was performed to explore the impact of both internal and macroeconomic factors on liquidity creation by banks. This analysis utilized a Method of Moments Quantile Regression (MMQR) and Fixed Effect model. According to the findings, several internal factors such as size,

capital, risk, deposits and performance have a significant relationship with liquidity creation in MENA region. Additionally, macroeconomic indicators including unemployment, inflation, savings as well as monetary policy, play a crucial role in explaining the changes in bank liquidity provision. Umar and Sun (2016) conducted a study examining the influential factors that lead to different forms of liquidity, such as funding liquidity, liquidity provision, and stock market liquidity, in the BRICS economies during the period of 2002-2014. The results revealed that, for these developing economies, bank-specific factors i.e., regulatory capital and performance, as well as external variables like unemployment, monetary policy, population and savings have an impact on liquidity provision. In a study conducted by Hackethal et al. (2010) on German banks between 1997 and 2006; the researchers discovered that liquidity provision is heavily stimulated by monetary policy, exhibiting a strong negative correlation, while showing a positive correlation with economic development. However, the study did not reveal any significant impact of internal factors such as size or performance on liquidity creation.

2.1 Country governance and liquidity creation

Different government policies as well as behavior have an impact on bank liquidity creation i.e., banking industry prudential regulations lightened the negative impact of economic policy uncertainty on bank credit (Galati & Moessner, 2018). Moreover, corruption obstructs the bank lending growth (Detragiache et al., 2008; Weill, 2011). Ashraf (2017) indicated the indirect impact of political institutions on bank risk behavior. Country governance elaborates the system, institutions and traditions through which authority is exercised. Supervisory and regulatory authorities play a vital role in the banking system's governance, monitoring, and implementation of efficient and sound practices (Isaksson, 1999). By promoting system wide effective approaches, good regulatory governance has the potential to improve financial system stability. The quality of national governance is a prerequisite for effective regulatory systems. Previous research indicates that strengthening supervisory authorities tend to enhance bank official's corruption (Beck & Demirguc-Kunt, 2006). Empowering regulatory agencies in nations with poor governance could encourage lending corruption and distort the distribution of bank funds. Therefore, powerful government monitoring agencies may only be concerned with their own interests and not with improving social welfare (Yasar, 2019).

There is only international significant study conducted by Wang et al. (2022) for establishing the relationship between country governance and bank liquidity creation by utilizing four indicators of country governance (Regulatory quality, law & order, government stability and corruption). It have been revealed that country governance neutralize the negative impact of economic policy uncertainty which provide recommendation to politicians to increase the country governance level to strengthen financial stability. During the periods of financial crisis, harmful impacts of economic policy uncertainty are offsetting and advantages of country governance during that period are eliminated. Yasar (2019) also investigated whether quality of country governance intensify or hamper the bank's capacity to generate liquidity. Despite its significance, very poor literature is available on the effect of strong governance on banks' ability to generate liquidity. This is another academic question that will be addressed in the study.

Hypothesis 1: Country governance has significant association with liquidity creation.

2.2 Capital and liquidity creation

According to Berger and Bouwman (2009), there are two conflicting perspectives on the relationship between bank liquidity provision and capital. One viewpoint is referred to as the "crowding-out of deposits" within the financial fragility framework, initially proposed by Diamond and Rajan (2001) and later expanded upon by Gorton and Winton (2002). The notion suggests that there exists an inverse relation between bank capital and liquidity creation, where lower capital levels result in greater liquidity creation. This argument suggests that a vulnerable financial framework could be utilized as a regulatory mechanism to encourage banks to provide liquidity. The reason for this is depositors hold the ability to instigate a bank run in the event that the bank decides to discontinue its services. The creation of liquidity is motivated by fragility in the banking sector. Moreover, the augmentation of capital may lead to a diversion of investors' resources from easily convertible obligations to comparatively less liquid stocks, which could hinder the bank's ability to produce liquidity. The second viewpoint, referred to as "risk absorption," is influenced by the works of Coval and Thakor (2005), Bhattacharya and Thakor (1993) and Repullo (2004). This perspective posits that a direct correlation exists between the level of bank capital and the ability to generate liquidity. The process of generating liquidity requires the allocation of resources towards assets that are less liquid and carry higher risk. However, the availability of capital can be utilized to mitigate such risks. Thus, the maintenance of elevated levels of capital by banks may facilitate the generation of increased liquidity for the whole economy.

Hypothesis 2: Capital has significant association with liquidity creation.

2.3 Risk and liquidity creation

There are three kinds of risk discussed in literature; operational risk, credit risk and liquidity risk. Operational risk arises from human error, technology failure, and/or the presence of external events affecting a bank's operations (Fahrul & Rusliati, 2016). The mismanagement and fraud in banks represents an agency costs due to separation of management and control. Today's risk managers estimate that operational losses account for 30% of a financial institution's overall risk (Cruz, 2002). Operational risk affects the bank’s profitability, played role in financial crisis 2007-08 (Jongh et al., 2013).

Financial shocks can result in a large rise in credit risk for the banking sector. Banks with moral hazard issues that were exposed to more risk often maintain less capital and produce more liquidity. In turn, if there are too many dangerous initiatives Banks are going to be at higher risk when the worth of their securities has declined since they were funded as a result of a sloppy appraisal procedure. Overall, this calls for investigation into the dynamic interactions between credit risk and liquidity generation. Thus, this has significant policy implications for the financial system's stability and safety (Le & Pham, 2021)

Hypothesis 3a: Operational risk has significant association with liquidity creation.
Hypothesis 3b: Credit risk has significant association with liquidity creation.
Hypothesis 3c: Liquidity risk has significant association with liquidity creation.

2.4 Size and liquidity creation

There are two distinct view points on the impact of bank size on liquidity creation. According to Berger and Bouwman's (2009) argument, a particular viewpoint suggests that larger banks possess the capacity to provide loans to small-scale investors at lower expenses. This capability allows them to attract a greater number of investors and subsequently expand their lending activities. Moreover, as per the research conducted by Distinguin et al., (2013) the

significant banks are motivated to produce higher levels of liquidity by investing in risky and illiquid assets for the economy owing to their "too big to fail" status. Furthermore, the authors argue that major financial institutions generate greater levels of liquidity in comparison to smaller banks due to their heightened ability to promptly avail themselves of the lender of last resort. The previous empirical knowledge suggests that smaller banks have a comparatively higher capacity to generate liquidity with respect to their total assets, as opposed to larger banks. The reason for this phenomenon is that smaller financial institutions possess a relative advantage over larger banks when it comes to catering to small, entrepreneurial enterprises. This advantage stems from their employment of more flexible methods for assessing creditworthiness, which rely heavily on subjective qualitative data (Mdaghri & Oubdi, 2022).

Hypothesis 4: Size has significant association with liquidity creation.

2.5 Liquidity creation and Economic growth

Several empirical studies explore the influence of bank liquidity provision on the real economy by employing metrics of bank liquidity generation. Berger and Sedunov (2017) for example, interrogate the relation between bank liquidity generation and the real economy and conclude that bank liquidity provision is strongly and positively associated to real economic activity. A slew of banking reforms, including technology advancements, global integration, and deregulations, have resulted in unprecedented growth (Yin, 2019). Concurrently, it has introduced the banking sector to new risks, such as international shock transmission, bank collapses, and crises. As a result, a rising body of researchers is defines specific vulnerabilities that pose ongoing threats to bank financial stability. Bank stability has been studied in the context of bank liquidity creation by Berger et al. (2019).

Hypothesis 5: Liquidity creation has significant relationship with Economic growth.

2.6 Liquidity creation and Bank Stability

Possible links between liquidity creation and bank stability are addressed by two primary theoretical study streams. Liquidity creation has been argued to either exacerbate or alleviate moral hazard issues, depending on the risk taking behavior of banks and in turn enhancing its stability (Acharya & Naqvi, 2012). On the other hand, some argue that excessive liquidity creation may result in financial vulnerability because of its positive association with liquidity risk. (Diamond & Dybvig, 1983).

Hypothesis 6: Liquidity creation has significant relationship with Bank stability.

2.7 Liquidity creation and Performance

As per the findings of Fungacova et al. (2013), the risk of bank failure rises with the creation of liquidity. Their findings bring up an interesting question: why then do banks create liquidity if it comes with risk? To shed light on this subject, current study will investigate the relationship between liquidity creation and bank performance. The impact of liquidity creation on bank profitability is theoretically ambiguous and depends on a variety of factors. On the one hand, banks generate revenue by converting illiquid assets into liquid liabilities, such as deposits or short-term borrowings, or by issuing letters of credit and loan commitments. This can help to increase the availability of credit in the economy and generate profits for banks. However, liquidity creation can also make banks vulnerable to runs and distressed asset sales. If depositors or other creditors become concerned about the solvency of a bank, they may rush to withdraw their funds,

which can create a liquidity crisis for the bank. In extreme cases, banks may be forced to sell their assets at a loss to meet their funding obligations, which can further erode their financial position.

Excessive liquidity creation can also raise the likelihood of bank collapse and increase bank funding costs. This is because banks that generate too much liquidity may be taking on too much risk and may be more likely to fail. This can increase the cost of funding for banks as investors demand higher returns to compensate for the increased risk (Diamond & Dybvig, 1983). Therefore, whether liquidity generation affects bank profitability positively or negatively is an empirical question and depends on the specific conditions of each market. Empirical research has shown mixed results on the relationship between liquidity creation and bank profitability, highlighting the need for further study and analysis.

Hypothesis 7: Liquidity creation has significant relationship with Performance.

3.Methodology

3.1. Data Sources

The research examined commercial banks that were publicly traded and listed on SAARC stock exchanges between 2010-2020. The sample utilized in our study comprises of 332 commercial banks and is constructed using unbalanced panel data.The criteria for selecting the sample were based on the availability of relevant data, no mergers or acquisitions during the study period, and public trading of the bank's shares. Commercial banks were specifically chosen as they play a vital role in providing liquidity to the economy.The SAARC countries are focused in the current study because bank information, political condition, legal tradition, language of business, the accounting practices and geographical importance are same in these countries. Bhutan, Nepal and Afghanistan are, although, the part of SAARC countries, yet, they are not included in the current study due to the poor functioning of the stock market and non-availability of the relevant data required to analyze bank liquidity creation, its predictors and consequences.

To ensure the reliability and authenticity of the data, it is essential to clarify the source and methodology employed for data collection. The data on the particular variables of banks were obtained from firchconnect, International Monetary Fund (IMF), World Bank indicator, World Development Indicator (WDI), World Governance Indicator (WGI)consistent with the research by Berger et al. (2019) and Mdaghri and Oubdi (2022).

The present research utilizes standardized measures of catfat (CATFAT) and catnonfat (CATNFAT) for calculation of liquidity creation, which are adjusted by total assets, to identify the factors that affect bank liquidity creation and its outcomes in the SAARC region. Both internal factors like firm-specific variables and external factors like macroeconomic variables are taken into account. The study formulated the following models and regression equations for panel data analysis.

$$LC_{i,t}=a_0+a_1(LC)_{i,t-1}+a_2(CG)_{i,t}+a_3(CAP)_{i,t}+a_4(SZ)_{i,t}+a_5(OR)_{i,t}+a_6(CR)_{i,t}+a_7(LR)_{i,t}+a_8(COVID)_{i,t}+a_9(INF)_{i,t}+a_{10}(UNEMP)_{i,t}+\varepsilon_{i,t}$$

Eq -1

$$BS_{i,t}= a_0 + a_1(BS)_{i,t-1+} a_2(LC)_{i,t}+ a_3(LR)_{i,t} +a_4(CR)_{i,t} +a_5(CAP)_{i,t} +a_6(SZ)_{i,t} +a_7(INF)_{i,t}+a_8(UNEMP)_{i,t+}\varepsilon_{i,t}$$

Eq-2

$EG_{i,t}= a_0 + a_1(EG)_{i,t-1} + a_2(LC)_{i,t}+ a_3(LR)_{i,t} +a_4(CR)_{i,t} +a_5(CAP)_{i,t} +a_6(SZ)_{i,t} +a_7(INF)_{i,t}+a_8(UNEMP)_{i,t} +\varepsilon_{i,t}$ **Eq-3**

$PROF_{i,t}= a_0 + a_1(PROF)_{i,t-1}+ a_3(LR)_{i,t} +a_4(CR)_{i,t} +a_5(CAP)_{i,t} +a_6(SZ)_{i,t} +a_7(INF)_{i,t}+a_8(UNEMP)_{i,t}+\varepsilon_{i,t}$ **Eq-4**

Where:
Where i: banks and t: time LC: Bank liquidity creation, COVID: Covid 19, CG: Country Governance, BS: Bank Stability, EG: Economic Growth, PERF: Bank performance, LR: Liquidity risk, CR: Credit risk, CAP: Bank capital, SZ: Bank size, INF: Inflation, UNEMP: Unemployment rate

3.2. Measurement of Bank liquidity creation

There were several measures utilized for measuring banking liquidity in liquidity risk management, monetary theory and theory of financial intermediation. But these measures were designed to calculate the liquidity of bank not how much bank creates liquidity. Initially in 2004, Deep and Schaefer, provided a measure regarding liquidity transformation by individual banks called LT gap (liquidity transformation gap). It is calculated by dividing total assets with the difference between liquid assets and liquid liabilities. In 2009, Berger and Bouwman declared LT gap as non-comprehensive measure of liquidity creation and designed new four alternate measures for bank liquidity creation. Due to data constraints, only two out of four proxies recommended by the authors were employed in this study as suggested by Berger and Bouwman (2009). The catfat and catnotfat measures were used to analyze liquidity creation, and they were labeled as catfat and catnotfat. Catfat was chosen as it incorporates both on and off-balance sheet items, while catnotfat considers only on-balance sheet items. Catnotfat was used to validate the findings obtained through catfat measure.

The liquidity measures were constructed in three steps. In step 1, all the banking balance sheet activities (assets, liabilities, equity and off balance sheet item) are categorized as liquid, semi liquid as well as illiquid. In step 2, weights will be assigned for these classified activities. The assigned weights are according to the theory i.e; maximum amount of liquidity is provided when illiquid assets are transformed into liquid liabilities, and maximum amount of liquidity is destroyed when liquid assets are transformed into illiquid liabilities. In step 3, ‘cat fat’ and ‘cat nonfat’ are categorized. CATFAT and CATNFAT are calculated as follows;

CATFAT = 0.5(illiquid assets+liquidliabilities+illiquid guarantees) + 0(semiliquid assets+semiliquid liabilities + semiliquid guarantees) – 0.5(liquid assets + illiquid liabilities + equity + liquid guarantees + liquid derivatives)

CATNFAT = 0.5(illiquid assets + liquid liabilities) + 0(semiliquid assets + semiliquid liabilities) – 0.5(liquid assets + illiquid liabilities + equity)

Table 3.1: Description of Variables

Variables Name	Symbol	Measurement	Sources
Bank liquidity creation	CATFAT	CATFAT/Total Assets	Fitchconnect and author's calculation
	CATNFAT	CATNONFAT/Total Assets	Same as above
Country governance	CG	CG index (Kaufman, 2006)	World Governance Indicators (WGI)
Bank Capital	CAP	Ratio of total equity capital to gross total assets	Fitchconnect and author's calculation
Size	SZ	Natural logarithm of gross total assets	Same as above
Operational risk	OR	Total expenses/Total revenue	Same as above
Credit risk	CR	Total debt/Total assets	Same as above
Liquidity Risk	LR	Current liabilities/Current Assets	Same as above
COVID 19	COVID	Dummy variable; 1 for 2020 and 0 for other years	
Inflation	INF	Percentage change in GDP deflator index	CEIC database, World Development Indicators (WDI)
Unemployment rate	UNEMP	Unemployment rate	CEIC database
Bank Stability	BS	Z-score; (ROA+(Equity/Total Assets))/SD(ROA); SD(ROA) is the standard deviation of ROA	Fitchconnect and author's calculation
Economic growth	EG	Real GDP percentage change	Same as above
Profitability	PROF	Return on Assets	Same as above

4. Empirical Results

4.1. Descriptive Statistics

The presented table 4.1 displays the descriptive statistics of CATFAT, CATNFAT, OR, LR, CR, INF, UNEMP, CG, COVID, CAP, SZ, EG, BS, and PROF, which were derived from a sample of 2,309 observations.

The variables CATFAT and CATNFAT are categorical in nature and exhibit a range of values between -4.055 and 9.1. The CATFAT and CATNFAT variables exhibit mean values of 0.57 and 0.52, correspondingly, with an identical standard deviation of 0.73. This implies that a significant proportion of the data points are situated within a single standard deviation of the mean. The variables OR, LR, and CR are characterized as continuous and possess mean values of 1.66, 1.07, and 0.91, correspondingly. The state of Oregon exhibits the highest standard deviation of 2.06, suggesting a comparatively higher degree of variability in its values. The range of values for OR, LR, and CR are -34.83 to 60.4, -8.25 to 168.25, and 0.0004 to 15.19, correspondingly. The variables INF and UNEMP are considered continuous and denote the inflation rate and unemployment rate, respectively. The average value of INF is 5.93, whereas the mean value of UNEMP is 19.51. The standard deviations of both variables are relatively low, suggesting that their values are closely clustered around the mean. The range of values for the variables INF and UNEMP are 2.23 to 13.66 and 1.28 to 30.89, respectively.

The variable CG is a continuous measure that denotes country governance. The arithmetic mean of the data set is 36.03, accompanied by a standard deviation of 11.94. The range of CG values is between 18.64 and 49.37. The COVID-

19 can be represented as a dummy variable with two possible values: 0 or 1, indicating its absence or presence, respectively. The variable CAP is a continuous measure that represents bank capital. The arithmetic average of the data set is 0.84, exhibiting a broad spectrum of values that range from -14.19 to 239.06. The calculated standard deviation for CAP is 12.36, suggesting a notable level of dispersion among its measurements. The variables SZ, EG, BS, and PROF are considered to be continuous in nature, and are used to represent the size of the bank, the economic growth rate, the bank stability, and profitability, respectively. The statistical averages for the variables SZ, EG, BS, and PROF are 9.01, 5.32, 21.33, and 0.004, correspondingly. The data indicates that SZ exhibits the greatest variability with a standard deviation of 1.01, whereas PROF demonstrates the least variability with a standard deviation of 0.08.

In general, the table presents a concise overview of the measures of central tendency and variability of the variables. The display illustrates the extent of the values and the level of diversity pertaining to every variable. Descriptive statistics are a useful tool for identifying outliers, evaluating the distribution of data, and detecting potential data quality concerns. The aforementioned statistics possess the capability to facilitate comparisons of variable distributions and enable the exploration of inter-variable relationships.

Table 4.1: Descriptive Statistics of Dependent and Independent variables

Variables	Observations	Mean	STD DEV	Minimum	Maximum
CATFAT	2309	0.57	0.73	-4.055	9.1
CATNFAT	2309	0.52	0.73	-4.39	9.1
OR	2309	1.66	2.06	-34.83	60.4
LR	2309	1.07	3.81	-8.25	168.25
CR	2309	0.91	0.72	0.0004	15.19
INF	2309	5.93	2.41	2.23	13.66
UNEMP	2309	19.51	6.8	1.28	30.89
CG	2309	36.03	11.94	18.64	49.37
COVID	2309	0.08	0.27	0	1
CAP	2309	0.84	12.36	-14.19	239.06
SZ	2309	9.01	1.01	6.01	11.74
EG	2309	5.32	3.06	-6.59	9.14
BS	2309	21.33	7.14	7.21	43.64
PROF	2309	0.004	0.08	-2.33	0.25

4.2. Correlation Analysis

The table 4.2 demonstrates variable correlations. A correlation matrix is a mathematical tool used to assess the strength and direction of the linear link between two or more variables. The main application of a correlation matrix is to determine the degree and direction of the association between variables. Correlation coefficients vary from -1 to +1, with -1 indicating a strong negative association, +1 indicating a strong positive relationship, and 0 indicating no relationship. Therefore, by evaluating the correlation matrix, one may immediately discover which variables are closely associated and which ones are not. The findings show that there is no connection between independent variables greater than 0.7 and so problem of multicollinearity does not exists in given data.

Correlation matrices are employed in numerous domains, including finance, economics, psychology, and biology, among others. They may be used to determine the link between stock prices, inflation, and interest rates in finance, to evaluate the correlation between different psychological characteristics, or to assess the association between various biological markers and health outcomes.

Table 4.2: Correlation matrix

Variables	CATFAT	CATNFAT	OR	CR	LR	INF	UNEMP	EG	COVID	CG	BS	CAP	SZ	PROF
CATFAT	1													
CATNFAT	0.99	1												
OR	0.17	0.17	1											
CR	0.44	0.44	0.009	1										
LR	0.08	0.08	0.007	0.001	1									
INF	-0.2	-0.21	0	-0.0002	0.01	1								
UNEMP	0.26	0.28	0.002	0.04	0.009	-0.46	1							
EG	0.06	0.07	0.004	0.0005	0.02	-0.16	0.04	1						
COVID	0.03	0.03	0.02	0.01	-0.01	0.08	0.18	-0.75	1					
CG	0.11	0.15	-0.06	0.02	-0.02	-0.43	0.72	-0.01	-0.003	1				
BS	0.28	0.26	0.02	-0.02	0.003	-0.44	0.48	0.01	0.04	0.41	1			
CAP	-0.01	-0.006	-0.02	-0.05	0.002	-0.01	0.04	-0.01	0.01	0.04	-0.003	1		
SZ	-0.11	-0.14	-0.02	-0.09	-0.007	0.15	-0.05	-0.03	0.06	-0.08	-0.04	-0.04	1	
PROF	-0.45	-0.45	0.12	-0.66	0.01	-0.03	-0.02	-0.01	0.01	-0.03	0.02	0.05	0.11	1

4.3 Regression Results

The findings of the CATFAT and CATNFAT liquidity creation measures are shown in Table 4.3 CATFAT is a preferred and complete metric of liquidity generation. The narrow measure CATNFAT, on the other hand, is employed for the regression analysis's robustness test.

According to the findings of the regression analysis, the lagged liquidity creation (Lt-1) has a constructive influence on the level of liquidity creation in the present period, and this influence is statistically significant. These findings hold true for both CATFAT and CATNFAT measures. This seems to indicate that banks that had significant liquidity creation in the past continue to produce liquidity in the present, which is consistent with the idea that there is persistence in the process of liquidity production.

The findings also suggest that OR have statistically significant impact on the development of liquidity for CATFAT measure. This conclusion is in line with the research that has been done before, which implies that a larger operational risk might result in a higher need for liquidity.

In addition, the findings indicate that the production of liquidity for CATNFAT is negatively impacted when CR is present. This is consistent with the research that has been done, which implies that increased credit risk might limit a bank's capacity to generate liquidity. According to results, CATFAT and CATNFAT banks both benefit less from the production of liquidity when liquidity risk is present. This data lends credence to the hypothesis that increased liquidity risk might make it more difficult for financial institutions to generate new liquidity.

4.3.1. Influential factors of liquidity Creation

Moreover, the findings demonstrate that INF has a detrimental impact on the production of liquidity for both CATFAT and CATNFAT measures. According to this evidence, greater levels of inflation may make it more difficult for banks to generate new liquidity. COVID-19 has a detrimental impact on the production of liquidity for CATFAT proxy of liquidity creation. This conclusion lends credence to the hypothesis that pandemics have the potential to raise the level of uncertainty while simultaneously lowering the capacity of banks to produce liquidity.

Last but not least, the findings suggest that the amount of bank capital has a beneficial influence on the production of liquidity for both CATFAT and CATNOTFAT proxies. This study is in line with the research that has been done before, which implies that an increase in bank capital may lead to an increase in banks' capacity to provide liquidity.

Berger and Bouwman (2017) is one piece of research that provides support for these empirical results. The authors of this research discover that banks that produce more liquidity during times of normalcy are better equipped to create liquidity during times of financial crisis.

This finding is consistent with the finding in this study that there is a persistent level of liquidity generation. In addition, they discover that increased bank capital enhances the capacity of banks to generate liquidity, which is consistent with the positive impact of bank capital identified in this research. This study found that greater bank capital increased the ability of banks to produce liquidity.

Table 4.3: Influential factors of liquidity creation in SAARC region: Two-step Generalized Method of Moments (GMM) is utilized with Sargan/Hansen test, which checks for over identifying restrictions in the GMM. On the other hand, the Arellano-Bond (AB) test is concerned with determining the presence of serial correlation in the first differenced residuals. The null hypothesis states that the errors in the first difference regression do not demonstrate second-order serial correlation.

Liquidity creation	CATFAT	CATNFAT
Variables		
Lt-1	0.784***	0.784***
	(0.007)	(0.006)
OR	0.003***	0.002
	(0.001)	(0.001)
CR	0.051	-0.072
	(0.047)	(0.045)
LR	-0.002**	-0.002**
	(0.000)	(0.001)
INF	-0.017***	-0.019***
	(0.003)	(0.003)
UNEMP	0.004	0.003
	(0.002)	(0.002)
CG	0.003	0.003
	(0.004)	(0.004)
COVID	-0.033*	-0.015
	(0.019)	(0.019)
CAP	0.001*	0.001
	(0.001)	(0.001)
SZ	0.111**	0.088*
	(0.047)	(0.088)
Observations	1637	1637
Hansen Value	0.856	0.751
AR(1)	0.00	0.00
AR(2)	0.364	0.120

Standard errors are enclosed in parentheses.
***, **, and * represent significance levels of 1%, 5%, and 10%, correspondingly.

4.3.2. Consequences of liquidity creation

According to the findings given in Table 4.4 of the regression analysis, a bank's stability has a positive and statistically significant relationship with its prior stability (Bank stabilityt-1), as well as with liquidity provision and CR. On the other hand, it has a negative relationship with INF as well as UNEMP. However, there is no statistically significant connection between BS and LR, CAP, and SZ.

According to the coefficient of BSt-1, the stability of the bank during the time immediately before to the present period is a major factor of the stability of the bank during the current period. This discovery is in line with the conclusions reached by earlier researchers (Flamini et al., 2009), who hypothesized that past performance is a reliable indicator of future performance. The idea that banks with a greater degree of liquidity generation are more stable is supported by the fact that the coefficient of liquidity creation is positive. This indicate that banks experiencing financial difficulties are more likely to occur in institutions with lower levels of liquidity generation. According to the positive coefficient of CR, banks with a greater level of CR are more stable than those with a lower level of CR. This discovery comes as a surprise and runs counter to the received wisdom, which holds that excessive

CR always results in instability. Hasan et al. (2012) found that banks with a greater degree of credit risk may be more stable because of their capacity to diversify risk. This finding contradicts the findings of other research that found banks with lower levels of credit risk to be less stable.

The fact that INF has a negative coefficient shows that it has a detrimental effect on the stability of banks. This conclusion is consistent with earlier research that suggests that high inflation rates contribute to economic instability, which in turn impacts the stability of the banking sector (Allayannis et al., 2003). This study reveals that high inflation rates lead to an increase in the cost of borrowing money. According to the hypothesis suggested by the negative coefficient of UNEMP, a rise in the UNEMP has a detrimental effect on the stability of the banking system. Dincer and Eichengreen (2013) found that high unemployment rates contribute to weaker economic growth and raise the probability of defaults in the banking sector instability and a deceleration of EG.

Table 4.4: Consequences of liquidity creation; Dependent variable: Bank stability

Variables	BSt-1	LC	CR	LR	INF	UNEMP	CAP	SZ
BS	0.401***	1.553***	1.905**	-0.024*	-0.653***	-0.086***	0.038	1.86***
	-0.012	-0.173	-0.826	-0.014	-0.016	-0.01	-0.03	-0.318
Observations	1637	1637	1637	1637	1637	1637	1637	1637

Standard errors are enclosed in parentheses.
***, **, and * represent significance levels of 1%, 5%, and 10%, correspondingly.

the findings of the regression analysis given in Table 4.5 suggest that there exists a positive and statistically significant association EG and its prior growth (EGt-1), while a negative correlation is observed between EG and liquidity creation, CR, INF, UNEMP, and SZ. There is no statistically significant correlation between CAP and LR with EG.

The results align with the existing body of literature on the subject of EG, which emphasizes the enduring nature of EG (Barro, 1991). The presence of a negative coefficient in the context of liquidity creation suggests that the act of generating more liquidity by banks has an adverse effect on the overall economic growth. The aforementioned discovery is consistent with research that indicates that an overabundance of liquidity generation may result in financial

The coefficient associated with CR is negative, indicating that an increase in CR is associated with a decrease in EG. The present discovery aligns with earlier studies that indicate a correlation between elevated CR and reduced lending and investment, ultimately resulting in adverse impacts on EG. INF with a negative coefficient decreases economic development. Inflation increases uncertainty and reduces investment, which hinders economic activity (Blanchard and Galí, 2007). UNEMP with a negative coefficient are connected with lower EG. According to previous research, high unemployment rates reduce investment and consumption, which slows economic development (Eichengreen et al., 2012). The negative correlation for SZ shows that bigger banks hinder EG. According to previous research, bigger banks are more likely to take excessive risks, causing instability and economic slowdown (Berger and Udell, 2004).

Table 4.5: Consequences of liquidity creation; Dependent variable: Economic growth

Variables	EGt-1	LC	CR	LR	INF	UNEMP	CAP	SZ
EG	1.161***	-0.394***	-1.519***	-0.003	-0.618***	-0.692***	-0.05***	-1.56***
	(0.015)	(0.063)	(0.611)	(0.002)	(0.008)	(0.005)	(0.014)	(0.253)
Observations	1637	1637	1637	1637	1637	1637	1637	1637

Standard errors are enclosed in parentheses.
***, **, and * represent significance levels of 1%, 5%, and 10%, correspondingly.

The regression analysis findings given in Table 4.6 indicate a significant correlation between the PROF of banks and their prior PROF, CR, liquidity creation, and CAP. The positive coefficient of the preceding profitability variable is statistically significant at the 1% level. This suggests that banks that experienced profitability in the previous period have a higher likelihood of achieving profitability in the current period. The aforementioned discovery aligns with the "persistence hypothesis" postulated by Berger and Humphrey (1997), which posits that the prior profitability of banks is a robust indicator of their future profitability.

Liquidity generation has a high negative coefficient at 1%. This result supports the idea that banks may incur higher financing costs for liquidity generation, lowering their PROF (Boot and Thakor, 1997). CR has a 1% statistically significant negative coefficient in the regression analysis. CR is critical to bank profitability, according to previous research (Altunbas et al., 2007). At the 1% level, INF is negatively correlated with profitability. Inflation affects interest rates, loan demand, and loan quality, which lowers bank PROF. At 1% significance, UNEMP has a positive coefficient. The finding supports previous research that found a link between high unemployment rates and greater loan defaults and decreased loan requests, which may hurt banks' profits (Jimenez et al., 2014). CAP is positively correlated with profitability and statistically significant at the 1% level. According to Berger and Bouwman (2013), higher bank capital levels promote stability, lower financing costs, and boost profitability.

Table 4.6: Consequences of liquidity creation; Dependent variable: Bank performance

Variables	PROFt-1	LC	CR	LR	INF	UNEMP	CAP	SZ
PROF	0.217***	-0.076***	-0.231***	-0.000	-0.000***	0.000	0.000***	0.02***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	0.005
Observations	1637	1637	1637	1637	1637	1637	1637	1637

Standard errors are enclosed in parentheses.
***, **, and * represent significance levels of 1%, 5%, and 10%, correspondingly.

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Conflict of Interest Statement

The authors of this research paper declare that there are no conflicts of interest that could potentially influence the objectivity, integrity, or impartiality of the research conducted and the results presented in this manuscript.

A conflict of interest arises when the authors have financial, personal, or professional relationships or affiliations that could bias their judgment or decision-making in matters related to the research. However, in this case, the authors have no competing financial interests or other relationships that could be perceived as conflicts of interest.

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