Nexus between Economic Policy Uncertainty and Bank Liquidity Creation: Moderating Role of Bank Regulations and Credit Risk

Sabuj Saha[1*] Kanon Kumar Sen[2] & Prodip Chandra Bishwas[3]

[1]Department of Finance, Oklahoma State University, Oklahoma, USA
[2]Departmenr of Accounting& Information Systems, Jahangirnagar University, Dhaka, Bangladesh
[3]Departmenr of Finance & Banking, Jahangirnagar University, Dhaka, Bangladesh
**Corresponding author: sabuj.saha@oktstate.edu*

Citation: Saha, S., Sen, K.K. & Bishwas, P.C. (2024). Nexus between Economic Policy Uncertainty and Bank Liquidity Creation: Moderating Role of Bank Regulations and Credit Risk. *Finance & Economics Review 6(1),* 45-60. https://doi.org/10.38157/fer.v6i1.621.

Research Article

Abstract

Purpose: *This paper analyzes the effects of economic policy uncertainty (EPU), bank regulations, and credit risk on the asset and liability sides of liquidity creation in developed and developing countries.*

Methods: *The sample comprises 100 companies in developed and developing countries from 2015 to 2021. We used a dynamic Generalized Method of Moments (GMM) estimator to test the hypothesis. We also performed the Sargan test of over-identification or J-statistics to check the validity of instruments in the GMM model. Additionally, we conducted a robustness test on our analysis based on average assets and average capital.*

Results*: We find that Economic Policy Uncertainty (EPU) significantly negatively impacts asset-side liquidity creation in developed and developing countries. However, EPU significantly positively impacts liability-side liquidity creation only in developed countries. Interestingly, higher credit risk can effectively counteract the adverse effects of EPU on asset-side liquidity creation and encourage a positive impact on liability-side liquidity creation in developed and developing countries. Moreover, stricter bank regulations, including activity restriction and capital stringency, can weaken the negative effects of EPU on asset-side liquidity creation in developed and developing countries. However, we do not find any significant effect of higher bank regulations on the relationship between liability-side liquidity creation and EPU.*

Implications: *Since financial institutions can make riskier decisions to keep their businesses going in an uncertain economy, regulators need to act in advance to restore confidence in credit growth and financial resilience. The government should assess the short-term and long-term consequences of any policy implications.*

Originality: *While most studies concentrate on total liquidity creation from a cross-country perspective, our study provides new evidence by breaking down liquidity creation into asset-side and liability-side liquidity creation and examining the research separately in developed and developing countries.*

Keywords: Economic Policy Uncertainty, Liquidity Creation, Bank Regulation, Activity Restrictions, Capital Stringency, and Credit Risk.

1. Introduction

We explore the relationship between bank liquidity creation and economic policy uncertainty (EPU) with the moderating effect of bank regulations and credit risk. For this purpose, we use the EPU index, developed

Published by *Research & Innovation Initiative Inc.,* registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

by Baker et al. (2016), to estimate the national-level policy uncertainties. Next, Berger & Bouwman (2009) introduce a three-step metric for measuring the liquidity creation of banks: (i) count both on- and off-balance sheet operations of banks, (ii) assign weight to different forms of liquidity, and (iii) define asset side liquidity creation and liabilities side liquidity creation. Berger and Sedunov (2017) find that on-balance-sheet liquidity creation is more significant for smaller banks. In contrast, off-balance sheet liquidity creation is more significant for larger banks. Prior research (Berger & Sedunoy, 2017; Gong et al., 2018; Nguyen et al., 2020; Berger et al., 2022; Dang, 2022; Wang et al., 2022; Saha et al., 2024) find a relationship between economic policy uncertainty and bank liquidity creation. However, how this relationship deviates across different economies remains unexplored.

Economic policy uncertainty can adversely affect the economy and financial institutions through various channels. (Bloom, 2014; Baker et al., 2016; Gulen & Ion, 2016). Uncertainties surrounding government policies, such as fiscal reforms, trade agreements, or regulatory changes, can lead businesses to delay investment decisions and reduce hiring, dampening economic growth (Lee & Wang, 2021; Bordo et al., 2016). Moreover, uncertain economic conditions may prompt consumers to postpone large purchases, affecting overall consumer spending(Giavazzi & McMahon,2012). Additionally, uncertainty in economic decision-making can disrupt financial markets by causing volatility in asset prices and reducing market liquidity, which can undermine investor confidence and further exacerbate economic instability (Krishnan et al., 2015). However, fewer studies have investigated the impact of EPU on bank liquidity creation (Berger et al.,2022; Diamond &Rajan, 2011; Wang et al., 2022). Uncertainty can also increase the cost of capital as investors demand higher returns to compensate for risk, which can discourage borrowing and investment activities for banking liquidity creation (Bonaime et al., 2018). In addition, EPU hurts the banks' ability to create liquidity regarding their assets and off-balance sheet activities (Berger et al., 2017). They also argue that EPU will likely impede banks' capacity to carry on their original role (i.e., channeling capital from depositors to productive undertakings). Moreover, the growing EPU hurts the relationship between bank liquidity creation from deposits and bank performance (Khalfaoui & Derbali, 2021). Similarly, Wang et al. (2022) find that EPU makes it harder to produce liquidity on the asset side. Conversely, EPU contributes to liability-side liquidity production, declining the total liquidity creation (Berger et al., 2017).

During economic policy uncertainty, there is a limited understanding of the most effective bank policies to implement (Nguyen, 2021). As a result, it is not uncommon for bank regulators to respond in unprecedented ways when faced with elevated policy uncertainty, as evidenced by their actions following events such as the recession and COVID-19 (Hu & Gong, 2019). Country-specific bank regulations (such as capital stringency and activity restriction) and credit risk can contribute to the relationship between EPU and bank liquidity creation. Pasiouras et al. (2009) argued that capital stringency enhances cost efficiency but decreases profit efficiency. In addition, when ill-formed banks and inadequate oversights exist in the banking industry, capital stringency is a control mechanism to maintain minimum capital requirements (Anginer et al., 2014; AIS, 2018). Prior literature (Barth et al., 2004; Djalilov & Piesse, 2019) found that activity restrictions increase bank efficiency. This circumstance limits the flexibility of a bank to invest in risky projects and reduces the adverse consequences of economic policy uncertainty on bank liquidity creation. Thus, strict regulations on capital requirements and activities can reduce the adverse effect of economic policy uncertainty on bank liquidity creation. Along with the bank regulations, our study uses credit risk as a moderating variable. Chi & Li (2017) describe a positive relationship between EPU and credit risk. Thus, firms tend to hold cash in hand and decrease investment during high EPU. This behavior creates operational risk and has a spillover effect on bank credit risk. On the other hand, prior literature (Acharya & Viswanathan, 2011; Diamond & Rajan, 2001) finds a positive connection between liquidity creation and credit risk, whereas Le & Pham (2021) finds a negative relation between credit risk and liquidity creation. Hence, EPU can create disturbances when evaluating loan applications for future projects. Moreover, increased EPU leads to greater credit risk due to investing in economically distraught projects. The banking sector of developing countries is more complex than developed countries because corruption

Published by *Research & Innovation Initiative Inc.*, registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

and contract enforcement impede the smooth operation of business for banks in emerging nations (Djalilov & Piesse, 2019). In addition, developing countries lack financial transaction transparency, poor information systems, political instability, and weak policy implementation systems. Moreover, developing countries need stable capital markets and robust legal systems. Consequently, the banking industry of developing countries becomes more volatile due to economic policy uncertainty. This paper has a significant impact as it explores the intricate interplay between economic policy uncertainty, asset and liquidity side liquidity creation, credit risk, and bank regulation. Our study considers the unique perspectives of both developing and developed countries and aims to compare the differential impact of these factors on developed and developing economies.

Our study contributes to the extant literature in the following ways. Firstly, we explored the relationship between EPU and bank liquidity creation across developed and developing economies. The previous study used Berger and Bouwman's (2009) measurement to establish liquidity creation but ignored the heterogeneity in financial infrastructure development. We used sophisticated econometric techniques to investigate the relationship between economic policy uncertainty and liquidity creation in developed and developing economic contexts. Additionally, it is one of the first studies to show the breakdown of liquidity creation into assets and liabilities separately, considering different economic versions. Secondly, we showed that country-specific bank regulations can contribute to liquidity creation due to economic policy uncertainties. It suggests that regulatory bodies should establish the appropriate bank regulations (for example, capital stringency and activity restriction) to mitigate the adverse effects of policy uncertainties. Lastly, we investigated the impact of credit risk on the relationship between EPU and bank liquidity creation.

2. Literature Review

2.1 Theoretical Framework

The literature shows two opposing schools of thought on the link between economic policy uncertainty and liquidity creation, as discussed by Berger and Bouwman (2009). One is the financial fragility-crowding out theory, and the other is the risk absorption theory.

During periods of high economic policy uncertainty, banks perceive a higher level of risk. This perception arises from the unpredictability of regulatory changes, fiscal policies, and broader economic conditions. Consequently, banks become more cautious in their lending practices to avoid potential losses, reducing the creation of new loans and other liquid assets (Distinguin et al., 2013). EPU can lead to volatility in financial markets, increasing banks' capital costs. When the cost of raising funds (through equity or debt) rises, banks may find extending loans and creating other liquid assets less attractive, preferring to hold onto their capital or invest in safer, more liquid securities (Diamond & Rajan, 2000, 2001). During high EPU, regulators might impose stricter capital and liquidity requirements on banks to safeguard the financial system. While stabilizing in the long run, these measures can restrict banks' ability to create liquidity in the short term by limiting the proportion of assets they can allocate to riskier but potentially more liquid loans (Gorton & Winton (2000). Kim & Sohn (2017), Sabuj et al. (2019), and Levine (2005) concluded that banks may shift their asset allocation towards more liquid and higher-quality assets such as government bonds and away from loans to businesses and consumers. This preference for safer assets is a defensive strategy to ensure liquidity and minimize potential losses during uncertain times, further curtailing liquidity creation.

In risk absorption theory, banks act as risk transformers. During economic uncertainty, banks employ various risk management techniques, such as diversification, hedging, and capital buffers, to absorb and mitigate risk, resulting in higher capital, improving their ability to absorb risk and, hence, their ability to create liquidity. Financial institutions might play safe with risky moves and lending because they are unsure about future economic policies. Thus, a positive relationship is expected since banks transform and

Published by *Research & Innovation Initiative Inc.,* registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

redistribute risk by converting risky assets into more liquid and less risky liabilities (Allen & Gale, 2004; Bhattacharya & Thakor, 1993). Repullo (2004) argued that high levels of EPU can influence financial institutions' risk appetite and willingness to absorb risk. Financial institutions may become more cautious in their approach to risk-taking and lending activities during economic uncertainty because of uncertainty about future economic policies. This heightened level of caution can lead regulators to implement measures aimed at bolstering banks' financial stability, such as requiring higher capital buffers to ensure greater liquidity within the banking system (Acharya & Naqvi, 2012)

2.2 Hypothesis Development

2.2.1 Bank Liquidity Creation and EPU

Economic Policy Uncertainty (EPU) has emerged as a prominent indicator for assessing the levels of uncertainty following its inception by Baker et al. (2016). The EPU index quantifies the occurrence of terms associated with economy, policy, and uncertainty in newspaper articles across different countries. Chi & Li (2017) found that EPU increases banks' credit risks and limits how much they can lend, especially for banks that a group of people own. In addition, Nguyen (2021) explored how the EPU affects bank stability and concluded that uncertainty about economic policy hurts bank stability. Moving forward, Shabir et al. (2021) showed that the effect of EPU varies across banks and market structures, and it becomes more vital where a financial crisis exists.

The idea of bank liquidity creation on the balance sheet suggests that banks generate liquidity by financing comparatively illiquid assets with comparatively liquid liabilities (Berger & Bouwman, 2009). Banks generate liquidity by purchasing illiquid items and giving liquid items to the public. However, when high EPU prevails, banks tend to reduce loans and financial services to firms and households to minimize the risk aroused by high EPU. For example, Dang (2022) found that EPU prevents banks from expanding their liquidity creation activities. Wang et al. (2022) stated that EPU makes it harder to produce liquidity on the asset side. Conversely, EPU contributes to liability-side liquidity production, declining the total liquidity creation (Berger et al., 2017). Besides, EPU facilitates the liquidity creation on the liability side (Wang et al., 2022). Moreover, the EPU poses challenges in getting bank credit, whereas it stimulates individuals to deposit money to get financial security. Therefore, based on the above discussion, we propose that:

H1a: *Economic policy uncertainty has a significant negative impact on asset-side liquidity creation both in developed and developing countries.*

H1b: *Economic policy uncertainty has a significant positive impact on liability-side liquidity creation both in developed and developing countries.*

2.2.2. Moderating Effect of Credit Risk

There is a strong, positive link between EPU, the number of default loans concentrated in one place, and the average rate of loan migration. This relationship hurts commercial bank loan sizes because of the sudden demand for credit resources and the banks' ability to allocate those (Chi & Li, 2017). The study also found that when EPU increases in Chinese commercial banks, terrible loans, loan concentration, and migration rates of regular loans are raised, resulting in higher credit risks that negatively affect the loan-to-deposit ratio and growth rate. Similarly, when EPU rises, banks experience more credit risk due to a decline in asset quality. Next, Ashraf and Shen (2019) stated that EPU raises loan prices because it makes borrowers more unlikely to repay their loans. Consequently, credit risk has a harmful influence on liquidity generation (Le & Pham, 2021).

H2a: *Credit risk moderates the relationship between economic policy uncertainty and asset-side liquidity creation in developed and developing countries.*

H2b: *Credit risk moderates the relationship between economic policy uncertainty and liability-side liquidity creation in developed and developing countries.*

Published by *Research & Innovation Initiative Inc.,* registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

2.2.3. Moderating Effect of Bank Regulations

In the post-global financial crisis period, developed nations have explored the explanatory factors to reduce the financial crisis's impact on the financial system and economy (Nguyen, 2021). For example, prior literature has identified several bank-specific and macroeconomic factors such as bank capital (Anginer et al., 2021; Valencia, 2016), funding strategies (Dell'Ariccia et al., 2014), bank regulation and supervision (Le et al., 2020) to mitigate the impact of the financial crisis Next, we use bank regulations (activity restrictions and capital stringency) as moderating variables for the relationship between EPU and liquidity creation. Firstly, activity restriction measures how far a regulatory body restricts banks from engaging in real estate, insurance, and securities transactions. It mitigates the adverse effect of EPU on bank stability by lessening risky investments (Nguyen, 2021). Moreover, restrictions on bank activities are an essential regulation that contributes to banking efficiency (Djalilov & Piesse, 2019). Secondly, capital stringency measures the level of the law's strictness to govern the source and category of regulatory capital. It has a significant impact on bank liquidity creation. For example, large capital negatively affects liquidity creation (Wang et al., 2022; Distinguin et al., 2013). Moreover, capital requirements reduce the adverse effects of EPU on the banks' stability (Nguyen, 2021).

H3a: *Bank Regulations moderate the relationship between economic policy uncertainty and asset-side liquidity creation in developed and developing countries.*

H3b: *Bank Regulations moderate the relationship between economic policy uncertainty and liability-side liquidity creation in developed and developing countries.*

3. Research Design

3.1. Sample and Data

For our study, we selected commercial banks from each country's central bank website that met two criteria: trade shares publicly and belong to the top 10th percentile regarding bank capitalization (Ashraf & Shen, 2019; Anginer et al., 2014). Initially, our sample consisted of 165 commercial bank data from 17 countries. However, we discarded 87 banks due to the unavailability of financial statements in the English language and the poor reporting practices of notes and disclosures. Finally, we ended up with 100 banks from 17 countries. Next, we divide our sample using IMF criteria into developed and developing countries (IMF, 2023). We have collected bank-specific financial data from Capital IQ for 100 banks across 17 countries (Capital IQ, 2023). We consider the study period from 2015 to 2021 to build balanced panel data. Next, the World Development Indicators collect country-specific bank regulations and macroeconomic data. The economic policy uncertainty index is collected from the seminal study of Baker et al. (2016). Lastly, we collect detailed bank-level supplementary off-balance sheet data from each bank's annual reports to calculate the bank's liquidity creation.

3.2. Variable Measurements

Economic Policy Uncertainty: EPU is the primary explanatory variable in our study. We obtained the EPU index of each country from Baker et al. (2016), who developed a text-mining approach to analyze policy uncertainty through newspaper articles and other sources that track government spending, inflation risk, and tax code expirations. This index considers short-term and long-term uncertainty concerns rather than pinpointing specific economic uncertainty events. To ensure accuracy in our analysis, we will take an average of 12 months to calculate each country's yearly Economic Policy Uncertainty (EPU) index. Since the EPU index value is highly skewed, we took the natural logarithm(lnEPU) approach.

Bank Liquidity Creation: Berger & Bouwman (2009) outline a three-step framework for constructing any bank liquidity creation variable. Step 1: All on-balance and off-balance sheet activities were classified as

Published by *Research & Innovation Initiative Inc.,* registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

liquid, semiliquid, and illiquid. Step 2: Assigning weight to different forms of liquidity (½ is given to liquid assets and illiquid assets plus equity, 0 is given to semiliquid assets and liabilities, -½ is given to illiquid assets and liquid liabilities). Step 3 involves classifying any activity into respective classes, multiplying with the weight, and adjusting the off-balance sheet item to define asset- and liabilities-side liquidity creation. We apply this process to banks in both developed and developing countries for asset-side liquidity creation (ASLC) and liability-side asset creation (LSLC).

Country-specific Bank Regulations: We have used two indices to define bank regulation's regulatory and supervision outcomes: capital stringency and activity restriction. Firstly, capital stringency (CS) measures the capital requirements of banks and the strictness of laws regulating the nature and source of regulatory capital. Barth et al. (1998) stated that banks need adequate capital to support their operations and act as a buffer against unexpected losses or asset value declines that could lead to a bank's failure. Secondly, activity restriction (AR) quantifies the degree to which a country regulates banks' securities (underwriting, brokerage, and dealing), insurance (underwriting and selling insurance), and real estate businesses (real estate investment, development, and management). Kladakis et al. (2022) stated that the score ranges from 3 to 12. The higher the index, the greater the restriction on the bank's nature of business.

Credit Risk: Credit risk indicates potential loss from a borrower failing to meet their contractual obligations. It tends to be higher in cases where the borrower lacks adequate cash flows to pay back the creditor or does not have enough assets to liquidate and make a payment (AIS, 2018). Ahammed and Saha (2018) stated that credit risk is measured by the ratio of non-performing loans (NPLs) to total gross loans.

Control Variables: We used two control variables: company-specific (e.g., size, ROE, revenue growth, and loan-deposit ratio) and country-specific (e.g., GDP and inflation). Cornett et al. (2011) suggested including bank-specific fixed effects to control for omitted time-invariant bank characteristics and account for seasonality.

Capital Ratio (CPR) determines their economic capability to meet their obligations using their assets and capital. Capital ratio is measured as the total equity capital as a proportion of TA for each bank (Wang et al., 2022; Saha et al., 2024). Next, we measured size (lnTA) as the natural logarithm of total assets to measure the company size. Bordo et al. (2016) stated that total assets as size could drive the relationship between EPU and LC. Besides, we take a return on equity or ROE as a proxy of management efficiency, which maximizes shareholder value. Revenue growth (RG) reflects the change in revenue from the previous year. An increase in revenue over time can signal that the bank is expanding and reaching new markets, leading to increased profits and opportunities for liquidity creation (Almeshari et al., 2023). Again, the loan deposit ratio (LDR) indicates whether the bank is at risk of insufficient liquidity to cover unexpected fund requirements to survive the operation. Diamond and Rajan (2001) examined the external factors that influence how government policies influence banks' behavior in terms of liquidity creation. lnGDP as the natural logarithm of Gross Domestic Product measures the total economic output of a country. Higher GDP ensures better capital flow in the economy and favorable business prospects. Finally, inflation (INF) measures the rate at which prices increase over time. When inflation is high, it reduces consumers' ability to purchase goods and services, which can hurt a country's business growth.

To determine the effect of EPU on bank liquidity creation, we use the following base model both for developed and developing countries.

$$\ln ASLC_{ijt} = \alpha_{ijt} + \beta_1 \ln EPU_{jt} + \beta_2 TA_{ijt} + \beta_3 ROE_{ijt} + \beta_4 RG_{ijt} + \beta_5 LDR_{ijt} + \beta_6 CPR_{ijt} + \beta_7 GDP_{jt} + \beta_8 INF_{jt} + \varepsilon_{ijt} \quad (1)$$

$$\ln LSLC_{ijt} = \alpha_{ijt} + \beta_1 \ln EPU_{jt} + \beta_2 TA_{ijt} + \beta_3 ROE_{ijt} + \beta_4 RG_{ijt} + \beta_5 LDR_{ijt} + \beta_6 CPR_{ijt} + \beta_7 GDP_{jt} + \beta_8 INF_{jt} + \varepsilon_{ijt} \quad (2)$$

Here, i represents the $i-th$ bank, j represents the $j-th$ country, and t (2015,….., 2021) represents the time period for each company. $\ln ASLC$ and $\ln LSLC$ represent the natural logarithm of two sides of bank

Published by *Research & Innovation Initiative Inc.*, registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

liquidity creation: asset side and liability side liquidity creation, respectively. The beta coefficients (β_1 to β_7) reflect the impact of independent and control variables of asset- and liability-side liquidity creation. ε_{ijt} Refers to the error term.

We further examined our baseline model by introducing the interaction effect of bank regulations (BR) and credit risk (CR) on the relationship between EPU and asset (ASLC) and liability (LSLC) side liquidity creation across developed and developing countries.

$$\ln ASLC_{ijt} = \alpha_{ijt} + \beta_1 \ln EPU_{jt} + \beta_2 CR_{jt} + \beta_3 \ln EPU * CR_{jt} + \beta_4 TA_{ijt} + \beta_5 ROE_{ijt} + \beta_6 RG_{ijt} + \beta_7 LDR_{ijt} + \beta_8 CPR_{ijt} + \beta_9 GDP_{jt} + \beta_{10} INF_{jt} + \varepsilon_{ijt} \quad (3)$$

$$\ln LSLC_{ijt} = \alpha_{ijt} + \beta_1 \ln EPU_{jt} + \beta_2 CR_{jt} + \beta_3 \ln EPU * CR_{jt} + \beta_4 TA_{ijt} + \beta_5 ROE_{ijt} + \beta_6 RG_{ijt} + \beta_7 LDR_{ijt} + \beta_8 CPR_{ijt} + \beta_9 GDP_{jt} + \beta_{10} INF_{jt} + \varepsilon_{ijt} \quad (4)$$

$$\ln ASLC_{ijt} = \alpha_{ijt} + \beta_1 \ln EPU_{jt} + \beta_2 BR_{jt} + \beta_3 \ln EPU * BR_{jt} + \beta_4 TA_{ijt} + \beta_5 ROE_{ijt} + \beta_6 RG_{ijt} + \beta_7 LDR_{ijt} + \beta_8 CPR_{ijt} + \beta_9 GDP_{jt} + \beta_{10} INF_{jt} + \varepsilon_{ijt} \quad (5)$$

$$\ln LSLC_{ijt} = \alpha_{ijt} + \beta_1 \ln EPU_{jt} + \beta_2 BR_{jt} + \beta_3 \ln EPU * BR_{jt} + \beta_4 TA_{ijt} + \beta_5 ROE_{ijt} + \beta_6 RG_{ijt} + \beta_7 LDR_{ijt} + \beta_8 CPR_{ijt} + \beta_9 GDP_{jt} + \beta_{10} INF_{jt} + \varepsilon_{ijt} \quad (6)$$

3.3. Regression Analysis

In the presence of a lagged dependent variable, simple panel OLS is not a good choice. The OLS does not control the problem of endogeneity, autocorrelations, and heteroscedasticity. Therefore, the equation mentioned above is estimated by using a dynamic GMM estimator. It accounts for the missing variables and possible endogeneity problems in the data, as argued by (Arellano & Bover, 1995). This GMM estimator will capture the variability of cross-sectional data and control heterogeneity by introducing firm-specific random effects to avoid multicollinearity. We lagged the independent and control variables by one year as instrumental variables to mitigate the potential endogeneity. We also did the Sargan test of over-identification or J-statistics to check the validity of instruments in the GMM model.

4. Results and Interpretation

4.1. Summary Statistics

Table 1 presents the summary statistics of EPU, asset, and liability side liquidity creation, as well as bank and country-specific variables. Developing countries have a higher average and standard deviation of EPU than developed countries. Next, the average assets and liability side liquidity creation in developed countries is higher than in developing countries. For moderating variables, developing countries have a higher mean value of credit risk than developed countries, indicating developing countries have significant lending risk compared to developed countries. Next, the higher mean value of activity restrictions and capital stringency in developing countries than in developed countries indicates more regulated banking supervision in developing countries.

Table 2 represents the result of the multicollinearity problem. Our study uses pairwise correlation coefficients to explore the multicollinearity between explanatory variables. It finds that all correlation coefficients are below 90 percent ($\leq 90\%$). Thus, no multicollinearity problem exists.

Table 1: Summary Statistics

Variables	Obs.	Developed Countries				Developing Countries			
		Average	SD	Minimum	Maximum	Average	SD	Minimum	Maximum
EPU	350	178.04	76.93	81.00	464.00	185.16	162.22	33.00	792.00
ASLC	350	0.36	0.24	-0.29	0.82	0.21	0.13	-0.15	0.45
LSLC	350	0.19	0.13	-0.41	0.60	0.17	0.10	0.01	0.52
CR	350	0.01	0.01	0.00	0.08	0.05	0.04	0.00	0.18
AR	350	6.03	1.86	3.00	9.00	8.45	1.16	4.00	10.00
CS	350	6.29	2.06	2.00	9.00	7.02	1.63	3.00	10.00
lnTA	350	12.16	1.93	2.89	16.14	10.63	1.98	2.00	14
LDR	350	4.82	31.88	0.18	337.41	1.10	0.68	0.31	5.19
CPR	350	0.17	0.04	0.10	0.32	0.16	0.10	0.09	1.47
RG	350	0.17	2.05	-0.91	38.14	0.14	0.51	-0.91	4.03
ROE	350	0.08	0.07	-0.37	0.21	0.12	0.08	-0.68	0.30
lnGDP	350	9.63	1.31	1.32	12.36	6.96	1.35	1.37	9.78
INF	350	1.40	0.98	-0.23	4.70	4.21	2.18	0.98	10.58

Source: Authors' Analysis

Table 2: Multicollinearity Test

Variables	lnEPU	CR	CS	AR	LDR	lnTA	CPR	INF	lnGDP	RG	ROE
lnEPU	1.00										
CR	-0.180	1.00									
CS	0.209	0.071	1.00								
AR	0.118	0.224	0.476	1.00							
LDR	0.003	-0.233	0.094	-0.029	1.00						
lnTA	0.409	-0.376	0.296	-0.018	0.365	1.00					
CPR	-0.034	0.009	-0.079	-0.099	0.037	-0.125	1.00				
INF	-0.141	0.441	-0.049	0.162	-0.215	-0.383	0.002	1.00			
lnGDP	0.268	-0.524	0.151	-0.215	0.539	0.762	-0.014	-0.546	1.00		
RG	-0.007	0.013	0.019	0.025	0.011	-0.027	0.014	-0.001	-0.027	1.00	
ROE	-0.007	-0.142	0.057	0.145	-0.113	-0.016	-0.112	0.235	-0.016	-0.214	1.00

Source: Authors' Analysis

4.2. Baseline Model Analysis

Table 3 displays the baseline model results regarding the impact of EPU on bank liquidity creation in developed and developing countries in the GMM analysis. At the 1% significance level, the coefficient of EPU on asset-side liquidity creation is negative and statistically significant in developed countries (coefficient = -.0001) in column 1 and developing countries (coefficient = -.0001) in column 3. So, the results accept hypothesis H1a. Since default probability is high, commercial banks are more unlikely to find profitable investment opportunities in a higher economic uncertainty environment in developing and developed contexts. Baker et al. (2016) stated that a higher level of policy uncertainty and an unstable economic condition might drive the bank to engage in more risk-taking initiatives. During uncertain times, borrowers are more likely to default on their loans. As a result, economic policy uncertainty curtails asset-side bank liquidity creation in developed and developing countries. The co-efficient of EPU on liability side liquidity creation is positive and statistically significant for developed countries (coefficient = -.0002) in column 2 at a 1% significance level. However, the coefficient of EPU on liability side liquidity creation is negative and statistically significant for developing countries at a 1% significance level (coefficient = -.0001) in column 4. So, hypothesis H1b is inconclusive and only valid for developed countries. In times of

Published by *Research & Innovation Initiative Inc.*, registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

more significant uncertainty, depositors' perception of the financial system drives the liability side of liquidity creation. Saha et al. (2024) concluded that since developed countries have depositor insurance programs and banks tend to increase the interest rate in economic downturns to reserve the additional cash for adverse shocks, banks can finance liquid assets with illiquid liabilities more easily. However, this phenomenon does not apply to developing countries. Depositors often rush to the banks to withdraw money since governments in developing countries might not guarantee the deposit if banks fail during uncertain times.

Table 3: Baseline Model

Variables	**Developed Countries**		**Developing Countries**	
	ASLC (1)	LSLC (2)	ASLC (3)	LSLC (4)
lnEPU	-0.0001*** (0.00)	0.0002*** (0.00)	-0.0001*** (0.01)	-0.0001** (0.05)
lnTA	0.044 (0.13)	-0.012* (0.05)	-0.058*** (0.00)	0.004 (0.13)
LDR	0.001*** (0.00)	0.0003*** (0.00)	-0.007*** (0.00)	0.018*** (0.00)
CPR	-1.46*** (0.00)	-0.004 (0.29)	-0.161*** (0.00)	0.025*** (0.00)
RG	0.027*** (0.00)	0.064*** (0.00)	-0.005*** (0.18)	0.007*** (0.00)
ROE	0.208*** (0.00)	0.393*** (0.00)	-0.022 (0.30)	-0.088*** (0.00)
lnGDP	0.113** (0.02)	0.2382 (0.30)	0.090*** (0.00)	-0.0001** (0.03)
INF	-0.003 (0.50)	0.001 (0.67)	0.003*** (0.00)	0.0002 (0.52)
Constant	-1.009* (0.07)	0.142* (0.08)	0.117 (0.06)	-0.003 (0.92)
AR (2)	-0.039 (0.96)	-0.211 (0.89)	-0.578 (0.56)	1.349 (0.18)
J-statistics	26.66 (0.15)	33.76 (0.39)	34.51 (0.54)	35.93 (0.47)

Note: ***P<0.01 denotes significant at 1 percent level, **P<0.05 denotes significant at 5 percent level, *P<0.10 denotes significant at 10 percent level.

4.3. Moderating Effect of Credit Risk

Table 4 shows the moderating effect of credit risk on liquidation by introducing the interaction terms between EPU and credit risk. While the coefficient of EPU on asset side liquidity creation is negative for developed countries (coefficient = -.0001) in column 1 and developing countries (coefficient = -.0001) in column 3 at a 1% significance level, the interaction term between EPU and credit risk coefficient is positive for developed countries at 10% significance level (coefficient = 0.004) in column 1 and developing countries at a 1% significance level (coefficient = 0.001) in column 3. These interactions between EPU and credit risk positively mediate the negative relation between asset-side liquidity creation and EPU for developed and developing countries. So, these findings accept the hypothesis H2a. Banks with high credit risk create more liquidity by issuing more loans when economic uncertainty is prevalent. Borio & Zhu (2012) justified that managers tend to hold or increase their risky portfolio during uncertain periods to meet their target

return and appease shareholders. To keep the supply of credit and liquidity consistent, managers may take innovative schemes that could jeopardize their business. Moreover, banks mimic the lending behavior of their peer group instead of information asymmetry to neutralize during hard times and tap into more homogenous lending practices. This herding strategy leads the bank to create more liquidity at the expense of high credit risk. Bordo et al. (2016) found that high credit risk activities during uncertainty would be possible in a capitalized banking system, strong market power, and a less regulated system. These banking systems align more with developed countries' banks and can draw depositors' money with more assurance and create liquidity even in dire times.

Table 4: Moderating Effect of Credit Risk

Variables	**Developed Countries**		**Developing Countries**	
	ASLC (1)	LSLC (2)	ASLC (3)	LSLC (4)
lnEPU	-0.0001*** (0.00)	0.0001*** (0.00)	-0.0001*** (0.00)	-0.0001** (0.05)
CR	-1.967*** (0.00)	2.142*** (0.00)	-0.513*** (0.00)	0.036 (0.37)
lnEPU*CR	0.004* (0.09)	-0.018*** (0.00)	0.001*** (0.01)	-0.001*** (0.00)
lnTA	-0.122*** (0.00)	0.081*** (0.00)	-0.073*** (0.00)	0.004 (0.13)
LDR	0.001*** (0.00)	0.0001*** (0.00)	-0.017*** (0.00)	0.018*** (0.00)
CPR	-0.796*** (0.00)	-0.155*** (0.00)	-0.213*** (0.00)	0.025*** (0.00)
RG	0.035*** (0.00)	0.002 (0.23)	-0.002 (0.24)	0.007*** (0.00)
ROE	0.155*** (0.00)	0.002 (0.23)	-0.095*** (0.00)	-0.088*** (0.00)
lnGDP	0.327*** (0.00)	-0.098*** (0.00)	0.154*** (0.00)	-0.0001** (0.03)
INF	-0.013*** (0.00)	-0.004*** (0.00)	0.003*** (0.00)	0.0002 (0.52)
Constant	-1.141*** (0.00)	0.216 (0.21)	-0.132 (0.13)	-0.003 (0.92)
AR (2)	-1.081 (0.28)	1.174 (0.24)	-0.652 (0.51)	1.349 (0.18)
J-statistics	44.45 (0.41)	39.79 (0.13)	39.68 (0.27)	35.93 (0.47)

Note: ***P<0.01 denotes significant at 1 percent level, **P<0.05 denotes significant at 5 percent level, *P<0.10 denotes significant at 10 percent level

However, EPU has a significant positive relationship with liability-side liquidity creation in developed countries (coefficient = .0001) in column 2 at a 1% significance level and a significant negative relationship with liability-side liquidity creation in developing countries (coefficient = -.0001) in column 4 at 5% significance level. For only developed countries' liability side asset creation, the interaction coefficient between EPU and credit risk is statistically negative at a 1% significance level and moderates the relationship between liability side asset creation and EPU (coefficient = -0.018) in column 2. So, hypothesis H2b is not conclusive. Banks with higher credit risk tend to avoid a more liquid position during uncertain times. As bank managers have more risk lovers for a long time, they want to avoid piling cash or cash equivalent to forgo any opportunities. Moreover, developed countries' governments could inject bailouts to save the economy if banks ran out of cash; this might work as a safety net for banks. However, at times of high credit risk, banks might face bank runs that can withdraw the deposit money and decrease the liability side liquidity creation.

Published by *Research & Innovation Initiative Inc.*, registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

4.4. Moderating Effect of Bank Regulations

Table 5 reports the interaction between economic policy uncertainty and bank regulatory variables on bank liquidity creation for developed and developing countries. The interaction term coefficient between activity restriction and EPU has a positive sign at a 1% significance level in developed countries (coefficient = 0.0002) in column 1 and developing countries (coefficient = 0.0001) in column 5. Since the interaction term coefficient between activity restrictions and EPU positively moderates the negative relationship between EPU and asset-side liquidity creation for developed countries (coefficient= -.0001) in column 1 and developing countries (coefficient= -.0001) in column 5, hypothesis H3a is accepted when activity restrictions exist in bank regulation.

Table 5: Moderating Effect of Bank Regulations

Variables	Developed Countries				Developing Countries			
	Activity Restrictions		Capital Stringency		Activity Restrictions		Capital Stringency	
	ASLC (1)	LSLC (2)	ASLC (1)	LSLC (2)	ASLC (1)	LSLC (2)	ASLC (1)	LSLC (2)
lnEPU	-0.0001*** (0.00)	0.0003*** (0.00)	-0.0001*** (0.00)	0.0002*** (0.00)	-0.0001*** (0.00)	-0.0001*** (0.00)	-0.0005*** (0.00)	-0.0004*** (0.00)
AR	-0.049*** (0.00)	0.007 (0.10)			-0.014*** (0.00)	-0.013*** (0.00)		
lnEPU*AR	0.0002*** (0.00)	-0.0001*** (0.00)			0.0001*** (0.00)	0.0001*** (0.00)		
CS			0.002 (0.80)	0.001 (0.69)			-0.008*** (0.00)	-0.003* (0.07)
lnEPU*CS			0.0001*** (0.01)	-0.0001*** (0.00)			0.0001*** (0.00)	0.0001*** (0.00)
lnTA	0.074*** (0.01)	0.078*** (0.00)	-0.011 (0.65)	0.071*** (0.00)	-0.057*** (0.00)	-0.004 (0.41)	-0.057*** (0.00)	-0.002 (0.74)
LDR	0.001*** (0.00)	0.0001*** (0.00)	0.0012*** (0.00)	0.0001*** (0.00)	0.008*** (0.01)	0.017*** (0.00)	0.003 (0.22)	0.016*** (0.00)
CPR	-1.628*** (0.00)	-0.104*** (0.00)	-1.481*** (0.00)	0.104*** (0.00)	-0.185*** (0.00)	0.019 (0.156)	-0.154*** (0.00)	0.027* (0.08)
RG	0.029*** (0.00)	-0.016*** (0.00)	0.037*** (0.00)	-0.018*** (0.00)	0.002 (0.19)	0.005*** (0.00)	0.001 (0.62)	0.005*** (0.00)
ROE	0.289*** (0.00)	0.119*** (0.00)	0.006 (0.94)	0.173*** (0.00)	-0.033 (0.19)	-0.092*** (0.000)	-0.023 (0.45)	-0.096*** (0.00)
lnGDP	-0.022 (0.65)	-0.048* (0.09)	0.249*** (0.00)	-0.074*** (0.00)	0.079*** (0.00)	0.0001 (0.56)	0.089*** (0.00)	-0.0001 (0.75)
INF	-0.001 (0.90)	-0.008*** (0.00)	-0.009*** (0.00)	-0.005*** (0.01)	0.002*** (0.00)	0.002*** (0.00)	0.001 (0.03)	0.001*** (0.00)
Constant	0.250 (0.63)	-0.303 (0.30)	-1.672*** (0.00)	0.039 (0.85)	0.294 (0.00)	0.190*** (0.01)	0.155 (0.06)	0.069 (0.26)
AR (2)	-0.273 (0.78)	-1.114 (0.27)	0.118 (0.91)	-1.144 (0.25)	-0.911 (0.36)	1.21 (0.23)	-0.630 (0.53)	1.26 (0.21)
J-statistics	35.54 (0.19)	30.91 (0.47)	34.68 (0.22)	34.22 (0.32)	39.87 (0.26)	34.16 (0.16)	36.92 (0.38)	35.10 (0.14)

Note: ***P<0.01 denotes significant at 1 percent level, **P<0.05 denotes significant at 5 percent level, *P<0.10 denotes significant at 10 percent level

This indicates that the negative effect of EPU on bank asset liquidity creation is less severe if countries impose more substantial activity restrictions. While economic uncertainties might push the bank into a more volatile position and hurt the bank's safety net to generate liquidity for the economy, having a stricter activity

Published by *Research & Innovation Initiative Inc.,* registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

restriction prevents the bank from stepping into a riskier investment portfolio and stabilizes the bank lending system.

The coefficient of interaction between the capital stringency and EPU is positive and statistically significant at a 1% significance level both in developed countries (coefficient = 0.0001) in column 3 and developing countries (coefficient = 0.0001) in column 7. Since the interaction term coefficient between capital stringency and EPU positively moderates the negative relationship between EPU and asset side liquidity creation for developed countries (coefficient= -.0001) in column 3 and developing countries (coefficient= -.0005) in column 9, So, hypothesis H3a is accepted when capital stringency exists in bank regulation. This result indicates that the adverse effect of EPU on liquidity creation is weakened in the presence of capital stringency. Banks tend to follow a cautionary approach by adding more capital to the balance sheet to absorb economic shock. Banks follow high-risk, high-return policies in a highly regulated capital structure to cover up any forecasted loss from a highly profitable venture rather than depending on capital. Laeven et al. (2016) find that during the great depression, large financial firms, what we see as banks from developed countries, fell short of maintaining high-quality capital to mitigate loan loss and subsequently needed government bailouts. This would have interpreted the liquidity creation process. Anginer et al. (2021) and Islam et al. (2024) also show that maintaining more capital helps the bank create the loss-bearing capacity in dire economic uncertainty to operate its standard liquidity hoarding.

The coefficients of interaction terms between EPU and activity restrictions (coefficient = -.0001) and capital stringency (coefficient = -.0001) are negative and statistically significant on liability side liquidity creation for developed countries at a 1% significance level and moderate the positive relation between EPU and liability side asset creation activity restrictions (coefficient = -.0003), capital stringency (coefficient = -.0002), columns 2 and 4, respectively. However, the coefficients of interaction terms between EPU and activity restrictions (coefficient = .0001) and capital stringency (coefficient = 0.0001 are positive and statistically significant on liability side liquidity creation for developing countries at 1% significance level columns 8 and 10respectively; however, does not moderate the relationship between EPU and liability side liquidity creation. So, hypothesis H3b is inconclusive. However, these findings are expected from a developing economics point of view. As banks from developing countries are unlikely to bail out from the government, as we can see in developed countries, this uncertainty forces the banks to hold more capital to absorb the loss and to save the bank from any moral hazard. Valencia (2016) concluded that since capital buffers might reward depositors by offering more interest, depositors do not withdraw money.

4.5. Robustness Check- Size Effects

We conducted robustness tests to confirm the relationship between EPU and liquidity creation by average total assets and average capital on the overall sample (see Table 6). We divided the total sample into two groups: large bank (i.e., greater than and equal to the average value of total assets and capital, and third quartile) and small bank (i.e., lower than the average value of total assets and capital, and first quartile). The coefficient of EPU is statistically significant and negative on asset-side liquidity creation, which supports the hypothesis for developing and developed banks on asset and capital classification. This indicates asset-side liquidation creation, though lending depositors' funds do not affect asset size or capital. However, the influence of EPU on liability-side liquidity creation is negative for small banks and statistically significant, which contradicts hypothesis H1b. This indicates that bank liquidity creation through deposit withdrawal or cash position is significantly affected by the bank's size.

Published by *Research & Innovation Initiative Inc.*, registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

Table 7: Robustness Check- Size Effects Size Effects

Variables	Average Total Assets				Average Capital			
	Large Bank		Small Bank		Large Bank		Small Bank	
	ASLC	LSLC	ASLC	LSLC	ASLC	LSLC	ASLC	LSLC
lnEPU	-0.0001*** (0.00)	0.0002*** (0.00)	-0.0001*** (0.00)	-0.0001*** (0.00)	-0.0002*** (0.00)	0.0002*** (0.00)	-0.0001*** (0.01)	-0.0001*** (0.02)
lnTA	-0.042 (0.25)	0.160*** (0.00)	-0.022*** (0.00)	-0.015*** (0.00)	0.022 (0.19)	0.068*** (0.00)	-0.063*** (0.00)	0.010** (0.03)
LDR	0.173*** (0.00)	0.057*** (0.01)	0.001*** (0.00)	-0.0001*** (0.00)	-0.0004*** (0.00)	0.0001** (0.04)	0.005 (0.42)	0.002 (0.15)
CPR	-0.203 (0.30)	-0.109 (0.71)	-0.166*** (0.00)	-0.065*** (0.00)	-0.110*** (0.00)	0.031 (0.19)	-0.037 (0.71)	-0.463*** (0.00)
RG	0.153*** (0.00)	-0.064*** (0.00)	0.007*** (0.00)	-0.009*** (0.00)	0.007*** (0.00)	-0.011*** (0.00)	0.009*** (0.00)	-0.001 (0.14)
ROE	-0.989*** (0.00)	-0.109* (0.09)	-0.023 (0.20)	-0.061*** (0.00)	0.085*** (0.00)	-0.086*** (0.00)	-0.024 (0.41)	-0.043*** (0.00)
lnGDP	-0.059*** (0.01)	-0.007 (0.83)	0.070*** (0.00)	0.039*** (0.00)	0.059 (0.14)	-0.043*** (0.00)	0.090*** (0.00)	0.046*** (0.00)
INF	0.011*** (0.00)	0.010*** (0.00)	0.001* (0.09)	0.0003 (0.47)	0.010*** (0.00)	0.002*** (0.00)	0.003*** (0.00)	0.003*** (0.00)
Constant	1.298*** (0.00)	-1.945*** (0.00)	-0.022 (0.69)	-0.091** (0.03)	-0.476 (0.13)	-0.184 (0.15)	0.142 (0.36)	-0.406*** (0.00)
AR (2)	0.850 (0.39)	-1.053 (0.29)	-0.136 (0.89)	-0.475 (0.63)	-0.337 (0.74)	-1.104 (0.27)	0.360 (0.72)	0.040 (0.97)
J-statistics	15.832 (0.54)	20.435 (0.43)	52.185 (0.28)	50.670 (0.33)	25.006 (0.53)	28.72 (0.53)	36.086 (0.33)	49.804 (0.12)

Note: ***P<0.01 denotes significant at 1 percent level, **P<0.05 denotes significant at 5 percent level, *P<0.10 denotes significant at 10 percent level

6. Policy Implications and Conclusion

Our study explores the relationship between EPU, bank liquidity creation, bank regulation, and credit risk behavior from 2015 to 2021, both from a developed and developing economic perspective. While most studies concentrated on total liquidity creation from a cross-country perspective, our study brings new evidence by breaking down liquidity creation into asset-side and liability-side liquidity creation and looking at the research separately in developed and developing countries. Our baseline model investigated the relationship between EPU and asset and liability side liquidity creation, controlling the bank-specific characteristics and macro variables. Then, we analyzed whether the impact of bank regulation can mitigate the negative impact of EPU on liquidity creation. In addition, we also investigate how credit risk appetite can influence the EPU effect on liquidity creation. We constructed GMM models to remove the endogenous concerns at 1%,5%, and 10% significance levels.

Our study finds that EPU has a significantly negative impact on asset-side liquidity creation in developed and developing countries; however, EPU has a significantly positive impact on liability-side liquidity creation only in developed countries. Our results show that higher credit risk significantly eliminates the negative impact of EPU on asset-side liquidity creation and spurs a positive effect on liability-side liquidity creation in developed and developing countries. We observe that higher bank regulation (activity restriction and capital stringency) has a statistically significant effect on weakening the negative impact of EPU on liquidity creation in developed and developing countries. However, higher bank regulations have not

Published by *Research & Innovation Initiative Inc.,* registered with the Michigan Department of Licensing & Regulatory Affairs, United States (Reg. No. 802790777).

statistically affected the relationship between liability-side liquidity creation and EPU. We also did a robustness test on our analysis based on bank size and amount of capital. The findings are the same.

Our in-depth analysis has several policy implications. First, EPU significantly negatively impacts bank liquidity creation; the government should consider the credit supply and demand mechanism. In addition, the government should clarify the underlying reasons for any policy implementation and present the short-term and long-term consequences to its stakeholders. Second, bank regulators should continuously develop and implement supervisory mechanisms to alleviate the EPU effect cautionary. Since financial institutions can make riskier decisions to keep the business going irrespective of the uncertain economy, regulators need to act in advance to bring back confidence in credit growth for financial resilience. Third, the risk department should regularly do the stress testing of policy uncertainty shocks to keep a balance on credit growth. During uncertain times, banks should rely on professional opinion to closely monitor macroeconomic indicators to balance risk exposure and liquidity creation.

7. Limitations and Directions for Future Research

The limitation of our study is that the EPU index is only available for a specific number of countries and considers newspaper text-based events. Another limitation is that this paper focuses on the most recent bank data rather than the long horizon. Future studies may include showing the impact of monetary policy on bank liquidity creation, the effect between small and large banks, bank competition on liquidity hoarding, and the recessionary impact on bank liquidity.

Authors' Contribution: Sabuj Saha conceived the idea, Sabuj Saha and Prodip Chandra Bishwas collected data, Kanon Kumar Sen analyzed the data. Sabuj Saha and Prodip Chandra Bishwas wrote the paper.

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

Acharya, V., & Naqvi, H. (2012). The seeds of a crisis: A theory of bank liquidity and risk-taking over the business cycle. *Journal of financial economics*, *106*(2), 349-366.

Acharya, V. V., & Viswanathan, S. (2011). Leverage, moral hazard, and liquidity. *The Journal of Finance*, *66*(1), 99-138. https://doi.org/10.1111/j.1540-6261.2010.01627.x

Ahammed, A., & Saha, S. (2018$_a$). Firm-specific Financial Determinants of Non-Performing Loan in the Banking Sector of Developing Countries: Evidence from the Listed Commercial Banks in Bangladesh. *Journal of Economics and Business*, 1(4), 555-563. https://doi.org/10.31014/aior.1992.01.04.49

Ahammed, A. & Saha, S. (2018$_b$). Firm-specific Financial Determinants of Non-Performing Loan in the Banking Sector of Developing Countries: Evidence from the Listed Commercial Banks in Bangladesh. *Journal of Economics and Business*, 1(4), 555-563.

Allen, F., & Gale, D. (2004). Financial intermediaries and markets. *Econometrica*, *72*(4), 1023-1061.

Almeshari, A., Bin Dato Haji Yahya, M. H., Bin Kamarudin, F., & Abd Hamid, S. A. (2023). Liquidity Creation and Economic Growth: Are They Monotonically Related? Evidence from MENA Countries. *Economies*, *11*(1), 24. https://doi.org/10.3390/economies11010024

Anginer, D., Bertay, A. C., Cull, R., Demirgüç-Kunt, A., & Mare, D. S. (2021). Bank capital regulation and risk after the Global Financial Crisis. *Journal of Financial Stability*, 100891. https://doi.org/10.1016/j.jfs.2021.100891

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29-51. https://doi.org/10.1016/0304-4076(94)01642-D

Ashraf, B. N., & Shen, Y. (2019). Economic policy uncertainty and banks' loan pricing. *Journal of Financial Stability*, *44*, 100695. https://doi.org/10.1016/j.jfs.2019.100695

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The quarterly journal of economics*, *131*(4), 1593-1636. https://doi.org/10.1093/qje/qjw024

Barth, J. R., Caprio, G., & Levine, R. (1998). *Financial regulation and performance: cross-country evidence.* World Bank Policy Research Working Paper 2037. *Available at SSRN: https://ssrn.com/abstract=569208*

Barth, J. R., Lin, C., Ma, Y., Seade, J., & Song, F. M. (2013). Do bank regulation, supervision, and monitoring enhance or impede bank efficiency? *Journal of Banking & Finance*, *37*(8), 2879-2892. https://doi.org/10.1016/j.jbankfin.2013.04.030

Berger, A. N., & Bouwman, C. H. (2009). Bank liquidity creation. *The review of financial studies*, *22*(9), 3779-3837. https://doi.org/10.1093/rfs/hhn104

Berger, A. N., & Sedunov, J. (2017). Bank liquidity creation and real economic output. *Journal of Banking & Finance*, *81*, 1-19. https://doi.org/10.1016/j.jbankfin.2017.04.005

Berger, A. N., Guedhami, O., Kim, H. H., & Li, X. (2017). Economic policy uncertainty and bank liquidity creation. *SSRN Scholarly Paper. Social Science Research Network, Rochester, NY.*

Berger, A. N., Guedhami, O., Kim, H. H., & Li, X. (2022). Economic policy uncertainty and bank liquidity hoarding. *Journal of Financial Intermediation*, *49*, 100893. https://doi.org/10.1016/j.jfi.2020.100893

Bhattacharya, S., & Thakor, A. V. (1993). Contemporary banking theory. *Journal of Financial Intermediation*, *3*(1), 2-50.

Bloom, N. (2014). Fluctuations in uncertainty. *Journal of Economic Perspectives*, *28*(2), 153-176.

Bordo, M. D., Duca, J. V., & Koch, C. (2016). Economic policy uncertainty and the credit channel: Aggregate and bank-level US evidence over several decades. *Journal of Financial Stability*, *26*, 90-106. https://doi.org/10.1016/j.jfs.2016.07.002

Borio, C., & Zhu, H. (2012). Capital regulation, risk-taking, and monetary policy: a missing link in the transmission mechanism. *Journal of Financial Stability*, *8*(4), 236-251. https://doi.org/10.1016/j.jfs.2011.12.003

Chi, Q., & Li, W. (2017). Economic policy uncertainty, credit risks and banks' lending decisions: Evidence from Chinese commercial banks. *China journal of accounting research*, *10*(1), 33-50. https://doi.org/10.1016/j.cjar.2016.12.001

Cornett, M. M., McNutt, J. J., Strahan, P. E., & Tehranian, H. (2011). Liquidity risk management and credit supply in the financial crisis. *Journal of financial economics*, *101*(2), 297-312. https://doi.org/10.1016/j.jfineco.2011.03.001

Dang, V. D. (2022). Bank liquidity creation under micro uncertainty: The conditioning role of income structure. *Economic Modelling*, *112*, 105852. https://doi.org/10.1016/j.econmod.2022.105852

Dell'Ariccia, G., Laeven, L., & Marquez, R. (2014). Real interest rates, leverage, and bank risk-taking. *Journal of Economic Theory*, *149*, 65-99. https://doi.org/10.1016/j.jet.2013.06.002

Diamond, D. W., & Dybvig, P. H. (2000). Bank runs, deposit insurance, and liquidity. *Federal Reserve Bank of Minneapolis Quarterly Review*, *24*(1), 14-23.

Diamond, D. W., & Rajan, R. G. (2001). Liquidity risk, liquidity creation, and financial fragility: A theory of banking. *Journal of Political Economy*, *109*(2), 287-327.

Distinguin, I., Roulet, C., & Tarazi, A. (2013). Bank regulatory capital and liquidity: Evidence from US and European publicly traded banks. *Journal of Banking & Finance*, *37*(9), 3295-3317.

Distinguin, I., Roulet, C., & Tarazi, A. (2013). Bank regulatory capital and liquidity: Evidence from US and European publicly traded banks. *Journal of Banking & Finance*, *37*(9), 3295-3317. https://doi.org/10.1016/j.jbankfin.2013.04.027

Djalilov, K., & Piesse, J. (2019). Bank regulation and efficiency: Evidence from transition countries. *International Review of Economics & Finance*, *64*, 308-322. https://doi.org/10.1016/j.iref.2019.07.003.

Giavazzi, F., & McMahon, M. (2012). Policy uncertainty and household savings. *Review of Economics and Statistics*, *94*(2), 517-531.

Gong, D., Jiang, T., Li, Z., & Wu, W. (2018). Bank lending under policy uncertainty: Theory and cross-country evidence. *Available at SSRN 3272065*.

Gorton, G., & Winton, A. (2017). Liquidity provision, bank capital, and the macroeconomy. *Journal of Money, Credit and Banking*, *49*(1), 5-37.

Gulen, H., & Ion, M. (2016). Policy uncertainty and corporate investment. *The Review of Financial Studies*, *29*(3), 523-564.

Hu, S., & Gong, D. (2019). Economic policy uncertainty, prudential regulation, and bank lending. *Finance Research Letters*, *29*, 373-378.

Islam, J., Saha, S., Hasan, M., Mahmud, A., & Jannat, M. (2024, April). Cognitive Modelling of Bankruptcy Risk: A Comparative Analysis of Machine Learning Models to Predict the Bankruptcy. *In 2024 12th International Symposium on Digital Forensics and Security (ISDFS)* (pp. 1-6). IEEE. https://doi.org/10.1109/ISDFS60797.2024.10527269

Khalfaoui, H., & Derbali, A. (2021). Money creation process, banking performance, and economic policy uncertainty: Evidence from Tunisian listed banks. *International Journal of Social Economics*, *48*(8), 1175-1190. https://doi.org/10.1108/IJSE-12-2020-0784

Kim, D., & Sohn, W. (2017). The effect of bank capital on lending: Does liquidity matter? *Journal of Banking & Finance*, *77*, 95-107.

Kladakis, G., Chen, L., & Bellos, S. K. (2022). Bank regulation, supervision, and liquidity creation. *Journal of International Money and Finance*, *124*, 102629. https://doi.org/10.1016/j.jimonfin.2022.102629

Krishnan, K., Nandy, D. K., & Puri, M. (2015). Does financing spur small business productivity? Evidence from a natural experiment. *The Review of Financial Studies*, *28*(6), 1768-1809.

Laeven, L., Ratnovski, L., & Tong, H. (2016). Bank size, capital, and systemic risk: Some international evidence. *Journal of Banking & Finance*, *69*, S25-S34. https://doi.org/10.1016/j.jbankfin.2015.06.022

Lee, C. C., & Wang, C. W. (2021). Firms' cash reserve, financial constraint, and geopolitical risk. *Pacific-Basin Finance Journal*, *65*, 101480.

Le, T. D., & Pham, X. T. (2021). The inter-relationships among liquidity creation, bank capital, and credit risk: evidence from emerging Asia–Pacific economies. *Managerial Finance*, *47*(8), 1149-1167. https://doi.org/10.1108/MF-04-2020-0189

Le, T. N. L., Nasir, M. A., & Huynh, T. L. D. (2020). Capital requirements and banks performance under Basel-III: A comparative analysis of Australian and British banks. *The Quarterly Review of Economics and Finance*. https://doi.org/10.1016/j.qref.2020.06.001

Levine, R. (2005). Chapter 12 finance and growth: theory and evidence. *Handbook of Economic Growth*, 865–934. Elsevier, Amsterdam, Netherlands.

Nguyen, C. P., Le, T. H., & Su, T. D. (2020). Economic policy uncertainty and credit growth: Evidence from a global sample. *Research in International Business and Finance*, *51*, 101118. https://doi.org/10.1016/j.ribaf.2019.101118

Nguyen, T. C. (2021). Economic policy uncertainty and bank stability: Does bank regulation and supervision matter in major European economies? *Journal of International Financial Markets, Institutions, and Money*, *74*, 101387. https://doi.org/10.1016/j.intfin.2021.101387

Pasiouras, F., Tanna, S., & Zopounidis, C. (2009). The impact of banking regulations on banks' cost and profit efficiency: Cross-country evidence. *International review of financial analysis*, *18*(5), 294-302. https://doi.org/10.1016/j.irfa.2009.07.003

Repullo, R. (2004). Capital requirements, market power, and risk-taking in banking. *Journal of Financial Intermediation*, *13*(2), 156-182.

S&P Global Market Intelligence. (2023). *S&P Capital IQ*. https://www.capitaliq.com/

Sabuj, S., Arif, A., & Momotaz, B. (2019). Audit Expectation Gap: Empirical Evidence from Bangladesh, SSRG. *International Journal of Economics and Management Studies*, *6*(5), 32-36. https://doi.org/10.14445/23939125/IJEMS-V6I5P106

Saha, S., Bishwas, P. C., Das, U., & Arshi, A. S. (2024). Is Fintech Just an Innovation? Impact, Current Practices, and Policy Implications of Fintech Disruptions. *International Journal of Economics, Business and Management Research*, 8(4),174-193. doi.org/10.51505/IJEBMR.2024.8412

Saha, S., Bishwas, P. C., Das, U., & Arshi, A. S. Is Fintech Just an Innovation? Impact, Current Practices, and Policy Implications of Fintech Disruptions.

Saha, S., Hasan, A. R., Islam, K. R., & Priom, M. A. I. (2024). Sustainable Development Goals (SDGs) practices and firms' financial performance: Moderating role of country governance. *Green Finance*, *6*(1), 162-198. https://doi.org/10.3934/GF.2024007

Saha, S., Hasan, A. R., Mahmud, A., Ahmed, N., Parvin, N., & Karmakar, H. (2024). Cryptocurrency and financial crimes: A bibliometric analysis and future research agenda. *Multidisciplinary Reviews*, *7*(8), 2024168-2024168. https://doi.org/10.31893/multirev.2024168

Shabir, M., Jiang, P., Bakhsh, S., & Zhao, Z. (2021). Economic policy uncertainty and bank stability: Threshold effect of institutional quality and competition. *Pacific-Basin Finance Journal*, *68*, 101610. https://doi.org/10.1016/j.pacfin.2021.101610

Valencia, F. (2016). Bank capital and uncertainty. *Journal of Banking & Finance*, *69*, S1-S9. https://doi.org/10.1016/j.jbankfin.2015.06.010

Wang, C. W., Lee, C. C., & Chen, M. C. (2022). The effects of economic policy uncertainty and country governance on banks' liquidity creation: International evidence. *Pacific-Basin Finance Journal*, *71*, 101708. https://doi.org/10.1016/j.pacfin.2022.101708.