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Measuring Funding Liquidity and its Determinants within US Banks: An Empirical Investigation in Light of Subprime and Covid-19 Crises

Hamza Mouna[1*]
Boujelbene Younes[2]

[1,2]*Faculty of Economics Sciences and Management of Sfax, University of Sfax, Tunisia.*
[1]*Email:* manna.hamza15@gmail.com
[2]*Email:* younes.boujelbene@gmail.com

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(Corresponding Author)*

Abstract

This research aims to scrutinize the determinants of bank funding liquidity within American banks. It also endeavors to discern the difference between the impact of the subprime mortgage crisis and that of the covid-19 on bank funding liquidity. The sample used in this paper consists of 70 commercial banks operating in the United States, for the period spanning from 2000 to 2022. The authors utilize the fixed effects model, and the two-step generalized method of moments (GMM) estimator. The results evince that the credit risk and capital have a negative effect on bank funding liquidity. The findings also substantiate that the subprime mortgage crisis negatively affects bank funding liquidity. Nevertheless, the covid-19 pandemic has a positive impact. Then, this article adds to the limited body of research on the determinants of bank funding liquidity in the USA. As a matter of fact, this paper contributes to the literature since it aims to distinguish between two major widespread crises.

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1. Introduction

Liquidity is an economic term referring to a sum of money that can be accessed immediately, or to an asset that can be converted into cash easily. Diamond and Dybvig (1983) were the first to highlight the prominence of the role of the bank in creating liquidity. Moreover, liquidity is necessary for a properly-functioning banking system. In a similar sense, liquidity for the bank is like "blood" for the body (Talekar, 2005). In addition, the concept of liquidity lies at the core of commercial banking and financial management. Thus, liquidity is substantial for the survival and success of any bank (Vodova, 2013).

From a historical perspective, the literature has retained a narrow definition of liquidity, known as funding liquidity. This has been followed by a broader definition referring more to market liquidity. Brunnermeier and Pedersen (2009) differentiate market liquidity from funding liquidity, and explain how they correlate with each other. In fact, they are different in nature. They are not measured in the same terms, and are not regulated in the same way, either. Funding liquidity consists in the fact that the bank is able to meet funding demands from asset increases, and to discharge its debts because they fall due without incurring unbearable costs (Giannotti, Gibilaro, & Mattarocci, 2011). What is more, it enables the bank to fulfill its obligations to creditors and depositors, and to finance its investments (Moussa, 2015).

Liquidity is a fundamental condition for efficient markets. It is at the center of the financial stability issues addressed by the main central banks. Indeed, the paucity of liquidity has often been a factor during major crises. Hence, central banks have injected liquidity into the global financial system as part of the so-called unconventional monetary policy. This is known as quantitative easing (QE). These injections of liquidity have been made in order to stimulate the economy. In fact, some central banks have increased their balance sheets significantly by buying bonds.

Bank liquidity has been playing a pivotal role in the financial regulatory reform since the dangers of liquidity shortages became all too apparent in the course of the global financial crisis. There were a constant regulatory pressure and the introduction of the Dodd-Frank Wall Street Reform and Consumer Protection Act in July 2010. Accordingly, major US banks such as JP Morgan Chase increased the amount of liquid securities and cash as a means to reduce concerns about liquidity risks. Thus, they have placed great emphasis on funding liquidity requirements proposed in the new Basel III guidelines globally and in the Dodd-Frank Act in the US. Yet, it is ambiguous whether this emphasis will make banks less risky and the entire financial system more stable in the future. Consequently, a better understanding and investigation of the determinants of bank funding liquidity is crucial at a time when global banking regulatory reforms have aimed to make banks more liquid than they were in the past. More recently, the covid-19 has imposed further uncertainty on the banking system.

With the intention of looking into the funding liquidity determinants, we delve deeper into bank-specific and macroeconomic factors. We take a sample of 70 banks operating in the USA. We pay particular attention to the period running from 2000 to 2022 as a way to include the financial and covid-19 crises. Indeed, we can note the difference between crises in nature and their disastrous impact on the American economy (See Appendix). This impact is shown particularly on the macroeconomic aggregates (the growth rate and unemployment rate). Hence, we will try to find out the impact extent of these crises on the functioning of the US banking system, especially the bank funding liquidity.

We have chosen the United States owing to its particularity consisting in the presence of crises, and in the importance of the role played by banks in the American economy.

Bank funding liquidity and liquidity risk have been the subject of several academic studies in the US context (Distinguin, Roulet, & Tarazi, 2013; Dursun-de Neef & Schandlbauer, 2022; Imbierowicz & Rauch, 2014; Li, Strahan, & Zhang, 2020).

However, the studies mentioned above have only dealt with one crisis, and have not included both at the same time. As a result, we intend to bridge this gap. As a matter of fact, we identify, study and distinguish the impact of each crisis on the funding liquidity of American banks. Therefore, we perform modelling on simultaneous crises. In this context, our research question is 'how bank characteristics affect bank funding liquidity under subprime and covid-19 crises?

In the hope of meeting the objective of this research work, the remainder of our paper proceeds as follows. Section 2 reviews the related literature, and develops the research hypotheses. Section 3 sets forth the data and research methodology. Section 4 deals with the empirical results and interpretations. Section 5 presents the robustness test. Eventually, section 6 concludes the paper, and provides suggestions for future work.

2. Literature Review and Hypothesis Development

The previous literature divides the determinants of bank funding liquidity into two factors consisting in internal factors and external ones.

2.1. Internal Factors of Bank Funding Liquidity

In order to achieve better liquidity control, it is of great significance to examine internal factors. Some literature has investigated the impact of bank-specific factors (bank capital, bank credit risk, and bank size) on funding liquidity.

2.1.1. Bank Capital

The capital formation process is vital for the banking sector, whatever the nature of the bank. The bank capital can be linked to liquidity risk. That is to say, more capital indicates that the bank encounter fewer problems and/or risky situations. On the one hand, the risk absorption hypothesis states that the regulatory capital is positively related to the liquidity creation. It predicts that increased capital enhances the ability of banks to create liquidity because it allows them to absorb more risk (Repullo, 2004).

Moreover, some studies confirm the positive impact of capital on liquidity (e.g. (Distinguin et al., 2013)). Thus, adequate capital makes it possible to manage any shocks to the balance sheet, and it also offers some protection to depositors. Consequently, this variable may reduce liquidity risk (Ghenimi, Chaibi, & Omri, 2020).

On the other hand, the financial fragility theory denotes that the capital is negatively linked to the liquidity creation. That is to say, higher capital is associated with lower supervision, leading to lower liquidity creation (Diamond & Rajan, 2000). Several works have affirmed the negative impact of capital on bank liquidity (e.g. (Roman & Sargu, 2015)). More recently, Ünvan and Yakubu (2020) have corroborated that capital adequacy and bank deposits in Ghana are negatively linked.

Finally, several recent studies have provided evidence of a non-significant capital coefficient (Abdul-Rahman, Sulaiman, & Mohd Said, 2018; Effendi & Disman, 2017). The results drawn from these studies are mixed. Then, within this framework, we stipulate our first hypothesis as follows:

H_1: The bank capital positively affects bank funding liquidity.

2.1.2. Bank Credit Risk

Some recent studies have pointed out that the credit risk could be an advantage for the bank. In fact, Mohammad, Asutay, Dixon, and Platonova (2020) prove that the cautious behaviour of banks with a high credit risk can reduce their funding deficit. This occurs through reducing their lending activities, or via raising more funds by offering high rates for the purpose of attracting more deposits. Yet, the positive relationship between the liquidity risk and credit risk is supported by a body of literature. The classical theory of financial intermediation, represented mainly by Diamond and Dybvig (1983) suggests that there is an association between the liquidity risk and credit risk.

A growing number of publications, particularly after the subprime crisis, have brought to light the positive relationship between these two risks. As a matter of fact, Imbierowicz and Rauch (2014) explore the relationship between the liquidity risk and credit risk in the US commercial banks over the period ranging from 1998 to 2010. They outline that the credit risk positively affects liquidity risk. More recently, Ghenimi et al. (2020) have shown that the credit risk rises as a result of a myriad of uncollectible loans. That being so, the liquidity risk goes up as most depositors take their money out. Consequently, we set forth our second hypothesis as follows:

H_2: The credit risk negatively affects bank funding liquidity.

2.1.3. Bank Size

The results of empirical studies on the impact of bank size on the bank funding liquidity are mixed. On the one hand, the theory of economies of scale makes obvious that when a bank increases in size, it can achieve economies of scale (increasing returns to scale). This can happen through more efficient information systems, and also via better risk and resource management (Mohammad et al., 2020; Ünvan & Yakubu, 2020). On the other hand, large banks presume that they are 'too big to fail'. That being the case, they have an incentive to take on more risk, and hold more loans (Abdul-Rahman et al., 2018; Vodova, 2013).

Eventually, several studies report a non-significant size coefficient (Mahdi & Abbes, 2018; Moussa, 2015; Tran, Nguyen, Nguyen, & Long, 2019). Therefore, we posit our third hypothesis as follows:

H_3: The bank size positively affects bank funding liquidity.

2.2. External Factors of Bank Funding Liquidity

The external factors of bank funding liquidity (financial crisis, pandemic crisis, economic growth, inflation, and rule of law) have been examined in literature. This is due to their effect on bank liquidity.

2.2.1. Financial Crisis

With the aim of studying the determinants of funding liquidity, it is essential to consider the impact of the financial crisis. Depending on Diamond and Dybvig (who were awarded the Bernanke, Diamond, and Dybvig (2022)) model, banks are at risk of financial imbalance. However, a solvent bank promises its depositors to withdraw their money, and to lend borrowers long-run loans. Nonetheless, customers may feel that they will not be able to withdraw their deposits, particularly in times of financial crisis. Thus, a large group of depositors would like to withdraw their funds at the same time. This is known as the herd behaviour of depositors in bank runs (Diamond & Dybvig, 1983).

In this case, the bank will not be able to serve them all, and may run out of liquidity. Hence, the subprime crisis is a crisis of confidence that prompts the majority of depositors to withdraw their funds, leading to an inability to repay, and therefore to a reduction in bank funding liquidity. In this context, previous studies have found out a negative influence of subprime crisis on bank funding liquidity (Ghenimi et al., 2020; Vodova, 2013). For this reason, we postulate our fourth hypothesis as follows:

H_4: The financial crisis negatively affects bank funding liquidity.

2.2.2. Pandemic Crisis

Banks face serious threats from the effects of pandemic crisis. For instance, banks all over the world could face increased credit and default risk due to cash management problems and insolvency for debt services. This results from the many business closures, lock-ups, and reduced demands for goods and services during and after the pandemic (Beck & Keil, 2022).

On the other hand, many researches indicate that, in times of the pandemic, households have been unable to spend money on entertainment activities owing to some restrictions. Then, they have increased savings in their deposit accounts (Blickle, 2022; Dursun-de Neef & Schandlbauer, 2022; Levine, Lin, Tai, & Xie, 2021; Li et al., 2020; Lin, 2020). Those authors pay special attention to the forced saving theory postulating that the deposit accumulation is unintentional. This means that depositors consider that their deposit accounts increase because they have fewer opportunities to spend their money. Relying on recent literature on the impact of covid-19, we formulate our fifth hypothesis as follows:

H_5: The pandemic crisis positively affects bank funding liquidity.

2.2.3. Economic Growth

Studies have found a negative impact of the GDP (Gross Domestic Product) on bank liquidity, indicating that during periods of economic growth, banks hold less liquidity. This finding makes obvious that global liquidity shocks are less likely to break out in times of economic growth. Thus, periods of strong economic growth and long-term economic activity reduce bank deposits and raise loan demands.

In contrast, the GDP shows no relationship with bank liquidity (Abdul-Rahman et al., 2018; Hassan, Khan, & Paltrinieri, 2019; Mahdi & Abbes, 2018; Mohammad et al., 2020). Consequently, we posit the sixth hypothesis as follows:

H_6: The economic growth positively affects bank funding liquidity.

2.2.4. Inflation

Inflation has a direct impact on the growth of bank deposits. This confirms the motivation for precautionary saving. Yakubu and Abokor (2020) imply that during periods of high inflation, individuals save their money because of the rising prices of goods and services. They are careful to avoid being affected by rising prices, so they save in anticipation of lower prices in the future.

However, according to Ünvan and Yakubu (2020) higher inflation is expected to reduce the funding liquidity ratio. In fact, an inflationary environment makes people spend more on goods and services, leaving less money for savings. Yet, some studies do not find an impact of inflation on liquidity (Horvath, Seidler, & Weill, 2016; Mahdi & Abbes, 2018; Tran et al., 2019). By virtue of what is mentioned above, we formulate our seventh hypothesis.

H_7: The inflation negatively affects bank funding liquidity.

2.2.5. Rule of Law

Establishing a high-performance atmosphere guaranteed by the "rule of law" enhances the confidence of customers and deposit accounts. This moderates and mitigates the exposure to liquidity risk, and leads to a successful political economy for the overall functioning of the banking system (Mohammad et al., 2020). In the same vein, Shleifer and Vishny (2010) propose a theory of financial instability, evincing that banks are influenced by investor sentiment. Indeed, political instability provokes negative feelings among investors who become increasingly concerned about losing their money. This spurs them on to reorganize their portfolios by shifting their investments from riskier to safer assets, thereby reducing funding liquidity, particularly in banks. Thus, we postulate our eighth hypothesis as follows.

H_8: The rule of law positively affects bank funding liquidity.

3. Data and Research methodology

3.1. Data Description

Our study focuses on a sample of 70 commercial banks in the USA. The period considered for this study runs from 2000 to 2022. Bank data have been extracted from the datastream database. Macroeconomic variables have been collected from the World Bank website, and governance variables have been extracted from Worldwide Governance Indicators (WGI).

3.1.1. Description of Variables

3.1.1.1. Dependent Variable

Bank deposit flows are obviously prominent since their fluctuations can disrupt both aggregate investment and consumption, leading to substantial negative effects on the macroeconomic environment (Demirgüç-Kunt & Detragiache, 1998). In our research, we take the ratio of deposits to total assets as our dependent variable in order to measure the funding liquidity. Several previous studies have used this measure as the inverse of funding liquidity risk (Acharya & Naqvi, 2012; Dahir, Mahat, & Ali, 2018; Khan, Scheule, & Wu, 2017; O'Connell, 2022; Phan, Tran, & Iyke, 2022; Smaoui, Mimouni, Miniaoui, & Temimi, 2020). Deposits protect banks against funding shortages and mass withdrawals of funds. Higher deposits imply a lower funding liquidity risk.

3.1.1.2. Independent Variables

The literature suggests that bank funding liquidity is a function of both internal and external factors. Internal factors include bank-specific determinants of funding liquidity. Yet, external factors affect funding liquidity, but they are not under the control of bank management.

The inflation rate is measured through the consumer price index growth. Economic growth is represented by the natural logarithm of the real GDP growth rate. The financial crisis is a dummy variable indicating 1 for the period ranging from 2006 to 2009, and the pandemic crisis is a dummy variable indicating 1 for the 2020-2022 period. The rule of law is a governance indicator, among others (Kaufmann, Kraay, & Mastruzzi, 2011).

The capital adequacy variable is essential to ensure that banks have a sufficient buffer to absorb a reasonable amount of loss, and compile with statutory capital requirements before they become insolvent. It is used by regulators to determine the capital adequacy of banks, and to carry out stress tests. The capital adequacy also measures the financial strength of a bank. It is computed by dividing a bank's capital by its risk-weighted assets (RWA) (Imbierowicz & Rauch, 2014; Riahi, 2019; Yaacob, Rahman, & Karim, 2016).

We measure the differences in loan quality through loan loss provisions as a proportion of total loans. This ratio is used by banks to measure the credit risk and the quality of the bank's assets. It indicates that banks may face more future losses. This proxy has previously been used in some studies (Klomp & de Haan, 2009; Rashid, Ramachandran, & Bin Tunku Mahmood Fawzy, 2017).

The bank size is the natural logarithm of total bank assets in millions of constant US dollars. This variable is widely used as a determinant of liquidity (Abdul-Rahman et al., 2018; Alzoubi, 2017; Dinger, 2009; Effendi & Disman, 2017; Ghenimi et al., 2020; Moussa, 2015; Riahi, 2019; Vodova, 2013). Table 1 shows all of these variables.

Table 1. Definitions of variables.

Variables	Definitions	Abbreviations	Expected signs	References
Funding liquidity	Ratio of total deposits to total assets	DA		Dahir et al. (2018); Smaoui et al. (2020); Phan et al. (2022) and O'Connell (2022).
Capital	Ratio of capital (Tier 1) to total assets	CAR	+	Riahi (2019); Yaacob et al. (2016) and Imbierowicz and Rauch (2014).
Credit risk	Ratio of loan loss provisions to total loans.	LLP	-	Riahi (2019); Effendi and Disman (2017); Ghenimi et al. (2020) and Incekara and Çetinkaya (2019).
Bank size	Logarithm of the book value of the bank's total assets at the end of the accounting period.	SIZE	+	Riahi (2019); Abdul-Rahman et al. (2018); Effendi and Disman (2017); Ghenimi et al. (2020) and Alzoubi (2017).
Financial crisis	The binary variable taking the value 1 for 2006-2009 years.	SUB-CRISIS	-	Ghenimi et al. (2020); Vodova (2013); Imbierowicz and Rauch (2014) and Mahdi and Abbes (2018).
Pandemic crisis	The binary variable taking the value 1 for 2020-2022 years.	COV-CRISIS	+	Dursun-de Neef and Schandlbauer (2022); Li et al. (2020) and Levine et al. (2021).
GDP growth	Real GDP growth rate	GDP	+	Moussa (2015); Riahi (2019); Abdul-Rahman et al. (2018); Effendi and Disman (2017); Ghenimi et al. (2020) and Mahdi and Abbes (2018).
Inflation	Consumer price index	INF	-	Riahi (2019); Abdul-Rahman et al. (2018); Effendi and Disman (2017); Ghenimi et al. (2020) and Mahdi and Abbes (2018).
Rule of law	Governance indicator	RL	+	Mohammad et al. (2020).

3.2. Research Methodology

We study the determinants of bank funding liquidity, using the static panel (fixed-effects).

The subsequent model is applied with a view to measuring the funding liquidity of our sample.

$$DA_{i,t} = C + \alpha_1 CAR_{i,t} + \alpha_2 LLP_{i,t} + \alpha_3 SIZE_{i,t} + \beta_1 INF_t + \beta_2 GDP_t + \beta_3 RL_t + \lambda_1 SUB\_CRISIS_t + \lambda_2 COV\_CRISIS_t + \varepsilon_{i,t} \quad (1)$$

Where i represents the bank; t indicates the time (our time frame is 2000–2022), and $DA_{i,t}$ sets forth the funding liquidity. $\varepsilon_{i,t}$ points out an idiosyncratic error term, and δ, α, β *and* λ are coefficients for estimation, using the Fixed effects. We use the static panel since it can control the individual and temporal variation in observable behavior or aggregate cross-sectional time series. It can also monitor the observed or unobserved individual heterogeneity, and hierarchical structure.

4. Empirical Results and Interpretations

4.1. Descriptive Statistics of the Model Variables

Descriptive statistics are compiled for funding liquidity and for each factor. They include the capital, credit risk and size of commercial banks in the USA on the one hand.

Table 2. Descriptive statistics.

Variables	Mean	Standard-deviation	Minimum	Maximum
DA	76.756	8.951	41.84	92.44
CAR	12.91	3.79	6	38.4
LLP	0.335	0.498	-1.48	6.11
SIZE	14.984	1.266	12.212	18.51
SUB-CRISIS	0.174	0.379	0	1
COV-CRISIS	0.13	0.337	0	1
INF	2.493	1.628	-0.356	8.003
GDP	2.042	1.841	-2.768	5.945
RL	1.544	0.08	1.361	1.639

Note: The mean corresponds to the average value of the variables; The standard deviation or variation corresponds to the distribution of data dispersed in relation to the mean value; LLP is the ratio of loan loss provisions; CAR is the capital adequacy ratio; and SIZE is the bank size.
Source: Research findings.

They also represent the financial crisis, covid crisis, inflation rate, economic growth and rule of law of the US economy, on the other hand. Thus, we present descriptive statistics for all our variables, providing heightened awareness of the funding liquidity position of the banks in the sample, and establishing a good basis for testing the hypotheses.

The mean, standard deviation, minimum and maximum of these different variables are presented in Table 2.

Over the 2000-2022 period, on average, deposits represented 76.75% of total assets, proving a strong capacity to attract depositors. Indeed, deposits are overriding in the banking sector. However, there is a wide variation in deposits between banks (standard deviation = 8.95). This result is congruent with that of Phan et al. (2022) in the American context and for the same sample period, with a proportion of 78% of deposits to total assets. Similarly, Khan et al. (2017) have found an average DA of 82.15 for US banks. In addition, the capital adequacy ratio (tier 1 to risk-weighted assets) has averaged 12.91. Moreover, the loan loss reserve ratio has averaged 0.335. We note that the average size of the banks in our sample is $15 million.

4.2. Correlation

The multicollinearity test aims at studying the correlation between independent variables. There are two types of multicollinearity: Bivariate and multivariate. On the one hand, the bivariate multicollinearity occurs when two independent variables are closely correlated. Detecting this problem is based on the Pearson correlation matrix. In fact, according to Kennedy (1985) when the correlation coefficient exceeds 0.8, he confirms the existence of a serious multicollinearity problem. On the other hand, the multivariate multicollinearity happens when several independent variables are correlated. The multivariate multicollinearity can be detected by two indicators:

- The tolerance of variables: This corresponds to the expression of ($1-R^2$), where R^2 represents the determination coefficient of the variable regression against other independent variables. A multicollinearity problem is more paramount when the value gets closer to 0. Depending on the VIF (Variable Influence Factor) limit, the tolerance of a variable can be set at a lower limit of 0.1, 0.2 or 0.25.
- Variable influence factor (VIF): It is calculated from the inverse of the variable tolerance ($1/(1-R^2)$). For Fox (1991) the limit is 4 or 5, meaning that there is a multicollinearity problem when this factor is equal to 4 or 5. Kennedy (1985) considers that this limit to be tolerated up to 10.

Based on Table 3, the correlation coefficients between the independent variables do not exceed 0.8. Thus, the problem of bivariate multicollinearity is completely absent. Similarly, the results indicate that none of the values of the multivariate multicollinearity indicators exceed the limits aforementioned.

Table 3. Correlation.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	VIF	1/vif	Mean VIF
(1) CAR	1.000								1.04	0.962	
(2) LLP	-0.069*	1.000							1.12	0.895	
	(0.006)										
(3) SIZE	-0.146*	0.024	1.000						1.12	0.896	
	(0.000)	(0.345)									1.72
(4) SUB-CRISIS	-0.074*	0.134*	-0.079*	1.000					1.51	0.661	
	(0.003)	(0.000)	(0.002)								
(5) COV-CRISIS	-0.074*	-0.208*	0.263*	-0.178*	1.000				2.91	0.343	
	(0.003)	(0.000)	(0.000)	(0.000)							
(6) INF	-0.064*	-0.200*	0.071*	-0.029	0.512*	1.000			2.01	0.497	
	(0.010)	(0.000)	(0.005)	(0.246)	(0.000)						
(7) GDP	0.027	-0.193*	-0.030	-0.365*	-0.060*	0.391*	1.000		1.77	0.565	
	(0.284)	(0.000)	(0.224)	(0.000)	(0.017)	(0.000)					
(8) RL	0.040	0.228*	-0.140*	0.360*	-0.7*	-0.342*	-0.026	1.000	2.31	0.433	
	(0.113)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.305)				

Note: Pearson correlations between paired explanatory variables, VIF and tolerance values are all shown in this table ; These correlations relate to data extracted from 70 banks over the 2000-2022 period ; LLP is the ratio of loan loss provisions ; CAR is the capital adequacy ratio ; and SIZE is the bank size ; * p<0.05.

Source: Research findings

4.3. Empirical Results

Table 4 shows the empirical results of estimating model (1), using the static panel fixed effects model.

The findings of Hausman test evince that the P-value is below 5%. The fixed-effects panel model is the most appropriate. The probabilities of the Modified-Wald test and the BP-LM (Breush Pagan-Lagrange multiplier) tests are below 5%. Hence, there is a heteroscedasticity problem between individuals, and autocorrelation between residuals.

The outcomes of the fixed-effects panel model are reported in Table 4, considering the DA as a measure of bank funding liquidity.

Table 4. The fixed effects estimation.

	Dependent variable: DA	
	Coefficient	**P-value**
CAR	-0.336*	(0.069)
LLP	-2.927***	(0.000)
SIZE	1.057	(0.151)
SUB_CRISIS	-4.168***	(0.000)
COV_CRISIS	7.374***	(0.000)
INF	-0.294***	(0.000)
GDP	-0.098**	(0.032)
RL	14.524***	(0.000)
R^2	34.3%	
Fisher (p-value)	30.53***	
Hausman	0.0004	
Modified-Wald test	0.0000	
BP-LM test	0.0000	
Observation	1610	

Note: DA (Funding liquidity) is the dependent variable ; Values in parentheses indicate probabilities that are robust to problems of heteroskedasticity and error autocorrelation ; (*), (**) and (***) indicate significance at the 10%, 5% and 1% thresholds, respectively ; Both tests (for heteroscedasticity and autocorrelation) have been carried out ; and the correction of our estimators (the fixed-effects estimator) has been made by adding the "Vce robust" option in order to obtain an estimate robust to these two problems.

Source: Research findings

The bank capital shows a negative impact, with a significant coefficient at the 10% level. Whenever a bank's capital increases, it will tend to record transactions, which can have a negative effect on its daily liquidity. This requires clearing from other banks. In fact, at the end of the day, a clearing session is organized by the central bank through an intra-bank network. If transfers exceed payments, the bank will have excess liquidity. In the opposite case, there is a liquidity shortage. This result confirms the financial fragility hypothesis explained by Diamond and Rajan (2000) stating that the capital reduces the bank fragility. Indeed, a bank is considered fragile if it has no deposit insurance, and a low level of capital. A high level of capital counteracts fragility, since it is a sign of a considerable bargaining power and negligible oversight. As a result, deposits are crowded out and less funding liquidity is created.

Our result is in consonance with the study of Roman and Sargu (2015). In fact, due to the substantial capital invested by shareholders in banks, there will be strong influence on management.

Similarly, our research is in the same line of thought with that of Ünvan and Yakubu (2020) corroborating that the capital adequacy and bank deposits are negatively related. This implies that highly capitalized banks are less dependent on bank deposits for their operations, and may be less willing to make efforts to attract deposits. However, this outcome is not in agreement with our first hypothesis. It also contradicts Repullo (2004) theoretical predictions stating that higher capital strengthens banks' ability to create liquidity. This is because it enables them to absorb more risk.

The credit risk, measured by the ratio of loss provisions to loans, displays a negative and significant coefficient at the 1% level. This result is in line with the theory of financial intermediation. This theory points out that the credit risk and liquidity risk are positively related.

On account of the Monti-Klein model of banking industry and relying on the financial intermediation, we can account for the positive relationship between these two risks. Our results confirm our second hypothesis, and align with several previous studies (Diamond & Rajan, 2005; Effendi & Disman, 2017; Ghenimi, Chaibi, & Omri, 2017; Ghenimi et al., 2020; Imbierowicz & Rauch, 2014; Riahi, 2019).

With regard to the bank size, the findings give proof of a non-significant coefficient. The size has no impact on the bank funding liquidity in the USA. This outcome is congruent with some previous studies (Akhtar, Ali, & Sadaqat, 2011; Effendi & Disman, 2017; Ghenimi et al., 2020; Mahdi & Abbes, 2018; Moussa, 2015; Tran et al., 2019).

Respecting the financial crisis, the results show a negative link between the financial crisis and funding liquidity, with a significant coefficient at the 1% level. Conforming to our fourth hypothesis, this finding proves that subprime crisis has led to a rise in toxic loan in banks, pushing a majority of depositors into withdrawing their funds. This leads to an insolvency, and brings about a scarcity of liquidity. This outcome is in line with some previous studies (Ghenimi et al., 2020; Mahdi & Abbes, 2018; Vodova, 2013).

Touching the covid crisis, the effect of the Covid-19 turbulence is different from the global financial crisis. The positive sign of the coefficient attached to this crisis, with a significant coefficient at the 1% level, confirms our fifth hypothesis. This result has been proven by Li et al. (2020); Levine et al. (2021) and Dursun-de Neef and Schandlbauer (2022). It is explained by the forced saving theory suggesting that depositors view their deposit accounts increase because they have fewer opportunities to spend their money on unnecessary or secondary activities (leisure, travel). This is due to restrictions on their mobility. For instance, the Silicon Valley Bank (SVB) in the USA has enjoyed a rise in deposits during the flexible monetary policy of the pandemic era. It has also relished the boom in investment in private technology companies. Indeed, in 2021, SVB deposits rose from $102 billion to $189 billion. They also tripled between 2019 and 2021 (Choi, Goldsmith-Pinkham, & Yorulmazer, 2023).

Regarding macroeconomic variables, we find a negative impact of the GDP on funding liquidity, with a significant coefficient at the 5% level. This is not in consonance with our sixth hypothesis. This result connotes that the economic growth is a key variable, and bank funding liquidity is negatively affected by the wealth newly created by the productive system. It corroborates those of Dinger (2009) revealing a negative impact of the GDP on bank liquidity in emerging economies. It is also in accordance with those of Yaacob et al. (2016)denoting that both liquidity measures proposed by Basel III are related to macroeconomic factors such as the GDP. Their results indicate a positive relationship with liquidity risk exposure as well.

A rising GDP increases liquidity risk for banks. This means that banks are not maintaining their liquidity ratio despite the economic growth. This indicates that banks may hold less liquidity, and increase their financing and investments to boost profitability in a stable economic situation. These results also confirm those of Yakubu and Abokor (2020) implying that long-run economic activities reduce bank deposits. Thus, in times of economic recession, banks may hoard cash in order to reduce the amount of external debt. However, in times of economic expansion, the investment level is likely to increase, facilitating economic growth. Banks are more likely to lend money since they are aware that companies are in a position to pay off their debts. This makes them reduce their cash reserves. In this case, banks try to reduce their funding liquidity via increasing the supply of financing and promoting investment to enhance their profits.

Concerning inflation, there is a negative impact of INF on funding liquidity, with a significant coefficient at the 1% level. This outcome is consistent with our seventh hypothesis, and also with the studies of De Haas and Van Lelyveld (2006), Nkusu (2011); Moussa (2015) and Riahi (2019). We infer that inflation could affect the monetary value, purchasing power and real interest rate charged and received by banks. It can have an impact on the banks' profit margin as well. That being so, the inflation rate has a detrimental effect on US banks. In fact, it may worsen the overall macroeconomic environment, and therefore reduces banks' liquidity. This is since higher inflation will bring about a lower profitability and deterioration in the value of collateral, as well as an increase in bank charges. Thus, the bank funding liquidity is highly sensitive to sudden fluctuations in inflation. This is due to the fact that higher inflation can deteriorate borrowers' ability to pay off their debts through reducing their real income (Nkusu, 2011).

Eventually, we provide evidence of a positive impact of the rule of law on funding liquidity, with a significance of 1%. Our result is congruent with the theory of Shleifer and Vishny (2010) and in consonance with those of Mohammad et al. (2020). These authors come to the inference that the rule of law helps reduce exposure to liquidity risk, which is considered a positive effect in terms of creating an efficient and favorable political economy environment. Indeed, the rule of law is linked to enhancing confidence in the functioning of a society's entire political economy. That being the case, it is essential to the smooth operation of banking, and financial instruments and institutions.

On this account, establishing a high-performance atmosphere guaranteed by the rule of law builds the customer trust and enhances deposit accounts. Thus, it moderates and mitigates exposure to liquidity risk, and it facilitates a successful political economy for the overall functioning of the banking system. On the contrary, any form of political instability, such as the absence of the rule of law, could create a feeling of mistrust amongst investors and depositors.

5. Robustness Check

We use the GMM-system estimator to verify the effect of explanatory variables on the US bank funding liquidity. In fact, fixed and random effects provides biased estimates owing to the lagged dependent variable, the endogeneity problem, and the omitted variable bias. Hence, systemic GMM estimator, proposed by Arellano and Bover (1995) and Blundell and Bond (1998) serves to solve these problems. On this account, our study differs from other works since it delivers more reliable results compared to prior research restricted to static panel (Rashid et al., 2017; Riahi, 2019; Vodova, 2013).

Then, our model is the following.

$$DA_{i,t} = C + \delta DA_{i,t-1} + \alpha_1 CAR_{i,t} + \alpha_2 LLP_{i,t} + \alpha_3 SIZE_{i,t} + \beta_1 INF_t + \beta_2 GDP_t + \beta_3 RL_t + \lambda_1 SUB\_CRISIS_t + \lambda_2 COV\_CRISIS_t + \varepsilon_{i,t} \quad (2)$$

Where i represents the bank; t indicates the time (our time frame is 2000–2022), and $DA_{i,t}$ sets forth the funding liquidity (i.e. the inverse of funding liquidity risk). $DA_{i,t-1}$ is the first lagged dependent variable capturing the persistence in funding liquidity over time, and $\varepsilon_{i,t}$ points out an idiosyncratic error term. δ, α, β and λ are coefficients for estimation, using the GMM-system.

5.1. Estimation of GMM Dynamic Panel Data Model

Referring to Table 5, Hansen's tests show that the p-value is not statistically significant, with a value higher than 0.1. This means that the null hypothesis H0 of the validity of the identification restrictions (instrument validity) cannot be rejected. Thus, we come to the inference that the instruments used for these regressions are valid, implying the validity of the results.

Table 5. The GMM results.

	Dependent variable: DA	
	Coefficient	**P-value**
Lag DA	0.36***	(0.000)
CAR	-0.456***	(0.002)
LLP	-0.815*	(0.08)
SIZE	0.913*	(0.085)
SUB_CRISIS	-5.351***	(0.000)
COV_CRISIS	6.499***	(0.000)
INF	-0.0379***	(0.000)
GDP	-0.122***	(0.001)
RL	13.348***	(0.000)
AR (2)	-0.76	(0.448)
Hansen test	3.01	(0.556)
Number of observations	1540	

Note: Lag DA is the lagged dependent variable ; Values in brackets represent probabilities ; (*) and (***) indicate significance at the 10% and 1% thresholds, respectively.

Source: Research findings

What is more, the p-value of AR (2) is not statistically significant. This connotes that we cannot reject the hypothesis stating that there is no second-order autocorrelation. Hence, the empirical model has been properly identified. Consequently, we come to the conclusion that the model estimated satisfies the diagnostic tests.

It is worth noting that the coefficient of the lagged dependent variable is significant, proving the dynamic nature of the model specification (Daher, Masih, & Ibrahim, 2015). Hence, the dynamic nature of our model is approved.

Touching the explanatory variables, and regarding the bank-specific ones, the negative sign of the coefficient attached to capital in the dynamic panel model, with significance at the 1% level, confirms the static panel result. The GMM method shows the same results of fixed effects. They denote that the credit risk is negatively related to bank liquidity, with significance at the 10% level. This finding is in accord with the study carried out by Diamond and Rajan (2005). These authors evince that if a myriad of troubled economic projects is financed by loans, the bank cannot meet depositors' demands. In consequence, if the value of these assets deteriorates, more and more depositors will demand their money back. That being so, the higher credit risk is accompanied by a higher liquidity risk through depositor demand.

Respecting the bank size, unlike the static panel model, the dynamic panel model reveals a positive effect with a low significance of 10%. Therefore, the GMM reveals a size impact which has not previously been highlighted by fixed effects. This outcome corroborates that of Ünvan and Yakubu (2020) substantiating that the bank size has a positive influence on bank deposits. This indicates that larger banks, which benefit from economies of scale and a more extensive branch network, are more effective in mobilizing deposits than smaller banks. Furthermore, our study confirms that of Alzoubi (2017). This author accounts for the positive impact by the fact that large banks tend to be more stable, and customers feel more secure when dealing with large banks.

With regard to the crises, in line with our hypotheses, the coefficients of the financial crisis (the pandemic crisis) are always negative (positive) and statistically significant, confirming our basic results. Finally, we note a negative influence of the GDP and inflation, on the one hand, and a positive effect of the rule of law, on the other hand, with high significance for each of them. This impact is shown not only by the estimation of the fixed-effects panel regression but also by the GMM method. Hence, we confirm that our findings are robust to different econometric methodologies.

6. Conclusion

This research work aims to test empirically the impact of internal factors on the one hand and the external factors on the other hand on the funding liquidity of the American banks. Our sample comprises 70 banks operating in the USA, for the period running from 2000 to 2022. In addition, we use the static and dynamic data models.

This paper reports that the majority of bank-specific and macroeconomic variables affect the funding liquidity of American banks, measured by bank deposits. Moreover, it shows that the credit risk and capital have a negative impact on bank funding liquidity. Furthermore, it provides evidence of a negative influence of the subprime crisis on bank funding liquidity. Nonetheless, it gives proof of a positive effect of the covid-19 crisis. Depending on these results, we notice that these crises affect not only the economic activity but also the bank functioning.

6.1. Implications

Our findings have several interesting implications. To begin with, they provide guidelines for academic researchers on the internal factors of bank funding liquidity essentially reflected by credit risk and capital, and on the external factors mainly the financial and pandemic crises.

Secondly, they offer practical guidance for practitioners after the recent pandemic crisis. Indeed, they allow distinguishing the different sources of economic disruption affecting funding liquidity levels in banks. This paper contributes to the literature since it is the pioneer in studying the financial and pandemic crises simultaneously within the US banking systems against the backdrop of funding liquidity. It also focuses on the increasing differentiation in funding liquidity between two major widespread and global crises. This occurs through modeling over a long period and simultaneous crises. That being so, the result of our study may differ from previous researches. In fact, the factors used may be different. Additionally, other factors, such as global crises, may also affect the final result.

6.2. Limitations

Like any other research, our study has some shortcomings. Firstly, it is difficult to make generalization from our results because of our limited sample size. It deals only with some American banks. Secondly, it examines only two crises, while the world is characterized by a more recent wave of dramatic events. Finally, other pertinent variables could play an important role in further research were not included in our study.

6.3. Futures Research Suggestions

Future researchers can look into other crises such as energetic, inflation, and Russia-Ukraine crises. Furthermore, they can add other bank-specific variables like leverage, and macroeconomic factors such as unemployment rate, to have an overall impact on the bank's funding liquidity. Eventually, they can broaden the sample size. On this account, future researches may contribute to a better assessment and appreciation of the field.

References

Abdul-Rahman, A., Sulaiman, A. A., & Mohd Said, N. L. H. (2018). Does financing structure affects bank liquidity risk? *Pacific-Basin Finance Journal*, *52*, 26-39. https://doi.org/10.1016/j.pacfin.2017.04.004

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. https://doi.org/10.1016/j.jfineco.2012.05.014

Akhtar, M. F., Ali, K., & Sadaqat, S. (2011). Factors influencing the profitability of Islamic banks of Pakistan. *International Research Journal of Finance and Economics*, *66*(66), 1-8.

Alzoubi, T. (2017). Determinants of liquidity risk in Islamic banks. *Banks & Bank Systems*(12,№ 3), 142-148. https://doi.org/10.21511/bbs.12(3).2017.10

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

Beck, T., & Keil, J. (2022). Have banks caught corona? Effects of COVID on lending in the U.S. *Journal of Corporate Finance*, *72*, 102160. https://doi.org/10.1016/j.jcorpfin.2022.102160

Bernanke, B. S., Diamond, D. W., & Dybvig, P. H. (2022). *The sveriges riksbank prize in economic sciences in memory of alfred nobel 2022 – awarded for research on banks and financial crises*. Retrieved from Announcement by the Royal Swedish Academy of Sciences: https://www.nobelprize.org/prizes/economic-sciences/2022/summary/

Blickle, K. (2022). Local banks, credit supply, and house prices. *Journal of Financial Economics*, *143*(2), 876-896. https://doi.org/10.1016/j.jfineco.2021.07.003

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115-143. https://doi.org/10.1016/S0304-4076(98)00009-8

Brunnermeier, M. K., & Pedersen, L. H. (2009). Market liquidity and funding liquidity. *The review of Financial Studies*, *22*(6), 2201-2238. https://doi.org/10.1093/rfs/hhn098

Choi, D. B., Goldsmith-Pinkham, P., & Yorulmazer, T. (2023). *Contagion effects of the silicon valley bank run*. Retrieved from National Bureau of Economic: https://www.nber.org/papers/w31772

Daher, H., Masih, M., & Ibrahim, M. (2015). The unique risk exposures of Islamic banks' capital buffers: A dynamic panel data analysis. *Journal of International Financial Markets, Institutions and Money*, *36*, 36-52. https://doi.org/10.1016/j.intfin.2015.02.012

Dahir, A. M., Mahat, F. B., & Ali, N. A. B. (2018). Funding liquidity risk and bank risk-taking in BRICS countries: An application of system GMM approach. *International Journal of Emerging Markets*, *13*(1), 231-248. https://doi.org/10.1108/IJoEM-03-2017-0086

De Haas, R., & Van Lelyveld, I. (2006). Foreign banks and credit stability in Central and Eastern Europe. A panel data analysis. *Journal of Banking & Finance*, *30*(7), 1927-1952. https://doi.org/10.1016/j.jbankfin.2005.07.007

Demirgüç-Kunt, A., & Detragiache, E. (1998). The determinants of banking crises in developing and developed countries. *Staff Papers*, *45*(1), 81-109. https://doi.org/10.2307/3867330

Diamond, D. W., & Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*, *91*(3), 401-419. https://doi.org/10.1086/261155

Diamond, D. W., & Rajan, R. G. (2000). A theory of bank capital. *The Journal of Finance*, *55*(6), 2431-2465. https://doi.org/10.1111/0022-1082.00296

Diamond, D. W., & Rajan, R. G. (2005). Liquidity shortages and banking crises. *The Journal of Finance*, *60*(2), 615-647. https://doi.org/10.1111/j.1540-6261.2005.00741.x

Dinger, V. (2009). Do foreign-owned banks affect banking system liquidity risk? *Journal of Comparative Economics*, *37*(4), 647-657. https://doi.org/10.1016/j.jce.2009.04.003

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

Dursun-de Neef, H. Ö., & Schandlbauer, A. (2022). COVID-19, bank deposits, and lending. *Journal of Empirical Finance*, *68*, 20-33. https://doi.org/10.1016/j.jempfin.2022.05.003

Effendi, K. A., & Disman, D. (2017). Liquidity risk: Comparison between Islamic and conventional banking. *European Research Studies Journal*, *20*(2), 308–318.

Fox, N. A. (1991). If it's not left, it's right: Electroencephalograph asymmetry and the development of emotion. *American Psychologist*, *46*(8), 863.

Ghenimi, A., Chaibi, H., & Omri, M. A. B. (2017). The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region. *Borsa Istanbul Review*, *17*(4), 238-248. https://doi.org/10.1016/j.bir.2017.05.002

Ghenimi, A., Chaibi, H., & Omri, M. A. B. (2020). Liquidity risk determinants: Islamic vs conventional banks. *International Journal of Law and Management*, *63*(1), 65-95. https://doi.org/10.1108/IJLMA-03-2018-0060

Giannotti, C., Gibilaro, L., & Mattarocci, G. (2011). Liquidity risk exposure for specialised and unspecialised real estate banks: Evidence from the Italian market. *Journal of Property Investment & Finance*, *29*(2), 98-114. https://doi.org/10.1108/14635781111112756

Hassan, M. K., Khan, A., & Paltrinieri, A. (2019). Liquidity risk, credit risk and stability in Islamic and conventional banks. *Research in International Business and Finance*, *48*, 17-31. https://doi.org/10.1016/j.ribaf.2018.10.006

Horvath, R., Seidler, J., & Weill, L. (2016). How bank competition influences liquidity creation. *Economic Modelling*, *52*, 155-161. https://doi.org/10.1016/j.econmod.2014.11.032

Imbierowicz, B., & Rauch, C. (2014). The relationship between liquidity risk and credit risk in banks. *Journal of Banking & Finance*, *40*, 242-256. https://doi.org/10.1016/j.jbankfin.2013.11.030

Incekara, A., & Çetinkaya, H. (2019). Credit risk management: A panel data analysis on the Islamic banks in Turkey. *Procedia Computer Science*, *158*, 947-954.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues1. *Hague Journal on the Rule of Law*, *3*(2), 220-246.

Kennedy, P. (1985). *A guide to econometrics*. Cambridge: MA: MITPress.

Khan, M. S., Scheule, H., & Wu, E. (2017). Funding liquidity and bank risk taking. *Journal of Banking & Finance*, *82*, 203-216.

Klomp, J., & de Haan, J. (2009). Central bank independence and financial instability. *Journal of Financial Stability*, *5*(4), 321-338. https://doi.org/10.1016/j.jfs.2008.10.001

Levine, R., Lin, C., Tai, M., & Xie, W. (2021). How did depositors respond to COVID-19? *The Review of Financial Studies*, *34*(11), 5438-5473. https://doi.org/10.1093/rfs/hhab062

Li, L., Strahan, P. E., & Zhang, S. (2020). Banks as lenders of first resort: Evidence from the COVID-19 crisis. *The Review of Corporate Finance Studies*, *9*(3), 472-500. https://doi.org/10.1093/rcfs/cfaa009

Lin, L. (2020). Bank deposits and the stock market. *The Review of Financial Studies*, *33*(6), 2622-2658. https://doi.org/10.1093/rfs/hhz078

Mahdi, I. B. S., & Abbes, M. B. (2018). Relationship between capital, risk and liquidity: A comparative study between Islamic and conventional banks in MENA region. *Research in International Business and Finance*, *45*, 588-596.

Mohammad, S., Asutay, M., Dixon, R., & Platonova, E. (2020). Liquidity risk exposure and its determinants in the banking sector: A comparative analysis between Islamic, conventional and hybrid banks. *Journal of International Financial Markets, Institutions and Money*, *66*, 101196. https://doi.org/10.1016/j.intfin.2020.101196

Moussa, M. A. B. (2015). The determinants of bank liquidity: Case of Tunisia. *International Journal of Economics and Financial Issues*, *5*(1), 249-259.

Nkusu, M. M. (2011). *Nonperforming loans and macrofinancial vulnerabilities in advanced economies*. Washington, D.C: International Monetary Fund.

O'Connell, M. (2022). Bank-specific, industry-specific and macroeconomic determinants of bank profitability: Evidence from the UK. *Studies in Economics and Finance*, *40*(1), 155-174. https://doi.org/10.1108/SEF-10-2021-0413

Phan, D. H. B., Tran, V. T., & Iyke, B. N. (2022). Geopolitical risk and bank stability. *Finance Research Letters*, *46*, 102453. https://doi.org/10.1016/j.frl.2021.102453

Rashid, M., Ramachandran, J., & Bin Tunku Mahmood Fawzy, T. S. (2017). Cross-country panel data evidence of the determinants of liquidity risk in islamic banks: A contingency theory approach. *International Journal of Business & Society*, *18*, 3-22.

Repullo, R. (2004). Capital requirements, market power, and risk-taking in banking. *Journal of Financial Intermediation*, *13*(2), 156-182. https://doi.org/10.1016/j.jfi.2003.08.005

Riahi, Y. M. (2019). How to explain the liquidity risk by the dynamics of discretionary loan loss provisions and non-performing loans? The impact of the global crisis. *Managerial Finance, 45*(2), 244-262. https://doi.org/10.1108/MF-12-2017-0520

Roman, A., & Sargu, A. C. (2015). The impact of bank-specific factors on the commercial banks liquidity: Empirical evidence from CEE Countries. *Procedia Economics and Finance, 20*, 571-579. https://doi.org/10.1016/S2212-5671(15)00110-0

Shleifer, A., & Vishny, R. W. (2010). Unstable banking. *Journal of Financial Economics, 97*(3), 306-318. https://doi.org/10.1016/j.jfineco.2009.10.007

Smaoui, H., Mimouni, K., Miniaoui, H., & Temimi, A. (2020). Funding liquidity risk and banks' risk-taking: Evidence from Islamic and conventional banks. *Pacific-Basin Finance Journal, 64*, 101436. https://doi.org/10.1016/j.pacfin.2020.101436

Talekar, S. D. (2005). *Management of working capital*. New Delhi, India: Discovery Publishing House.

Tran, T. T., Nguyen, Y. T., Nguyen, T. T., & Long, T. (2019). The determinants of liquidity risk of commercial banks in Vietnam. *Banks and Bank Systems, 14*(1), 94.

Ünvan, Y. A., & Yakubu, I. N. (2020). Do bank-specific factors drive bank deposits in Ghana? *Journal of Computational and Applied Mathematics, 376*, 112827. https://doi.org/10.1016/j.cam.2020.112827

Vodova, P. (2013). Determinants of commercial bank liquidity in Hungary. *Finansowy Kwartalnik Internetowy e-Finanse, 9*(4), 64-71.

Yaacob, S. F., Rahman, A. A., & Karim, Z. A. (2016). The determinants of liquidity risk: A panel study of Islamic banks in Malaysia. *Journal of Contemporary Issues and Thought, 6*, 73-82.

Yakubu, I. N., & Abokor, A. H. (2020). Factors determining bank deposit growth in Turkey: an empirical analysis. *Rajagiri Management Journal, 14*(2), 121-132. https://doi.org/10.1108/RAMJ-05-2020-0017

Appendix. Difference between crises.

Characteristics \ Crises	**Subprime crisis**	**Covid-19 crisis**
Type of crisis	Financial crisis Economic crisis Origin of banking problems	Public health crisis Becoming economic when the economy comes to a standstill to limit the spread of the virus. Not becoming a banking crisis
Nature of recession	The longest recession	The shortest recession
Recovery process and economic activity situation	Slow recovery process **Annual growth rate** Year of crisis (2008) 0% One year later (2009) -3% **Annual unemployment rate** Year of crisis (2008) 6% Two years later (2010) 10%	Rapid recovery process **Annual growth rate** Year of crisis (2020) -3% One year later (2021) 6% **Annual unemployment rate** Year of crisis (2020) 8% Two years later (2022) 4%

Source: The Authors.