

Liquidity and Bank Size: Ownership Dynamics across Developed and Emerging Economies

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Abstract. This study examines the relationship between liquidity and bank size across different ownership types; public, private, and foreign in developed and emerging economies. Using data from 2002 to 2017, the study employs two-step dynamic panel estimation to address endogeneity and heteroskedasticity. The analysis is based on a sample of 81 banks, with data sourced from Compustat and World Development Indicators (WDI). The results reveal a significant relationship between liquidity risk and bank size in public, private, and foreign banks within developed economies, while the relationship is insignificant in emerging economies. This study contributes to the understanding of liquidity dynamics across diverse economic contexts, offering fresh insights into how ownership structures influence the interplay between bank size and liquidity risk.

Keyword: liquidity; bank size; ownership; emerging economies; developed economies

1. Introduction

Achieving economic stability is a complex process, with banks serving as the backbone of a country's economy. Bank liquidity is a crucial component of economic viability and stability, ensuring that financial institutions maintain an optimal level of cash to meet business demands and support daily operations (Bibi & Amjad, 2017). Scholarly research identifies several key factors influencing bank liquidity, with bank size and ownership structure being two of the most prominent.

The influence of bank size on liquidity has been extensively explored. For example, Mogwambo (2020) found that credit liquidity is linked to both bank size and liquidity risk management. Similarly, Singh and Sharma (2016) argued that larger banks enhance liquidity by increasing economies of scale through demand deposits, which, in turn, can reduce the collateral premium associated with loans. Anbar and Alper (2011) also highlighted a negative relationship between bank size and liquidity, suggesting that as banks grow, their liquidity may decrease. Roman and Sargu (2015) further emphasized that liquid asset holdings increase with a rise in deposit demand. Additionally, Karavelic and Gojkovic (2013) examined the link between liquidity and economic growth, underscoring that optimal liquidity is essential for economic success. Davydov et al. (2018) noted similar investment strategies among public and private banks, reinforcing the role of liquidity as a critical factor in bank stability and growth. In addition, Niu (2021) investigated the relation between bank size and liquidity creation using panel data on US

banks between 2001:Q1 and 2016:Q4, and revealed that the relation is negative before and during the financial crisis of 2007–2009, but positive after the crisis.

Bank liquidity becomes especially significant during periods of financial crisis, where poor liquidity management often leads to bank failures. Researchers have shown that inadequate liquidity disrupts economic flow, while excess liquidity can drive inflation and, over time, lead to inefficiencies and misuse of surplus cash (Baumeister et al., 2008). Effective liquidity management, therefore, is vital for financial stability (Salas, 2019). In examining factors that impact liquidity, Hajivassiliou and Ioannides (2007) found a negative relationship between inflation, GDP, and unemployment, while Samhan and Al-Khatib (2015) identified a positive correlation between return on assets (ROA) and GDP. Hattori (2019) introduced shiftability theory, which emphasizes a bank's ability to maintain reserves for unexpected liquidity needs, such as large deposit withdrawals. The theory also highlights the role of government securities in maintaining liquidity (Mitchell, 1923).

Liquidity in banks also depends on their ability to convert assets into cash at predictable prices. Individual and systemic risks both rise with bank size, demonstrating a positive relationship with equity vitality but a negative association with equity returns (Berger et al., 2008). Singh and Sharma (2016) found that bank-specific factors and macroeconomic conditions significantly impact liquidity, with a strong relationship between bank size and liquidity in developed countries across public, private, and foreign ownership structures. However, this relationship is weaker in emerging economies. In addition, recently Majumdar, Agarwal Ghosh (2024) using data on domestic Indian commercial banks investigated the impact of sudden and unannounced policy changes by the government and reviled a decline in risk and an increase in returns of state-owned banks, consistent with a flight-to-safety. Further, Patra and Hiremath (2024) intended to measure the degree of volatility co-movement between stock market liquidity and informational efficiency across Asia, Europe, North-South America, Africa, and the Pacific Ocean over three decades and revealed the presence of stronger volatility co-movement between inefficiency and illiquidity due to the price impact characteristics of the stock markets.

Ownership structure is another significant factor in bank liquidity, with notable differences across public, private, and foreign ownership arrangements. Liquidity management strategies vary according to ownership. For example, foreign banks generally produce lower liquidity compared to public and private banks (Rhee & Wang, 2009), yet they encounter fewer liquidity issues than local banks. Liquidity challenges remain a major barrier to economic growth (How et al., 2005). Studies suggest that bank ownership is crucial when examining bank liquidity, with substantial differences observed across public, private, domestic, and foreign banks. Marois (2022) argued that public banks, often viewed as static entities, are actually dynamic institutions shaped by their social and political environments. Public ownership does not predetermine the bank's function; instead, it opens a unique space for adaptation to financial and climate-related challenges. In contrast, privately owned banks frequently demonstrate higher institutional quality, with lending growth often surpassing that of public banks (Michael & Alfredo, 2015). However, state policies can disproportionately impact privately owned banks, increasing their risk of failure during economic downturns (Michael & Alfredo, 2015).

Given the diverse factors influencing bank liquidity, the present study examines the relationship between liquidity and bank size across different ownership types in both developed and emerging economies, using data from 2002 to 2017. Liquidity is measured as the ratio of liquid assets to total assets, while bank size is represented by the logarithm of total assets. Public, private, and foreign ownership structures are included as dummy variables, with GDP, unemployment rate, and inflation rate as control variables. To assess the relationship, the study employs two-step dynamic panel estimation, addressing lagged dependent variables, endogeneity, Heteroskedasticity, and the limited time span with a large cross-sectional dataset.

The paper is structured as follows: Section 2 presents a literature review on bank determinants of liquidity; Section 3 describes the research methodology and data collection; Section 4 discusses the analysis results; Section 5 provides a discussion of the findings; and Section 6 concludes with managerial implications.

2. Literature review

The relationship between bank size and liquidity has been a significant focus in academic research, with findings that vary across regions and contexts. Studies indicate that bank-specific characteristics, such as size, play a key role in determining liquidity levels. For example, Dinger (2009) and Delechat et al. (2012) found that in emerging economies, larger banks tend to maintain higher liquidity levels. This suggests that bank size can positively influence liquidity in certain contexts. Conversely, Kashyap et al. (2002) and Massah et al. (2019) reported a negative relationship between bank size and liquidity within similar settings, where larger banks may prioritize alternative investment strategies over holding liquid assets.

Some scholars argue that smaller banks focus more on traditional intermediation activities, maintaining lower liquidity ratios due to their limited access to capital markets (Chagwiza, 2014; Khoury, 2015; Moussa, 2015; Laximikantham & Melese, 2015). Other studies suggest a negative impact of bank size on liquidity, especially in large banks that tend to employ borrowed liquidity management strategies (El Khoury, 2015; Moussa, 2015; El-Chaarani, 2019; Choon et al., 2013). In the case of U.S. banks, Kashyap and Stein (1997) and Kashyap et al. (2002) found that smaller banks, due to limited access to capital markets, hold higher liquidity levels as a buffer against financial instability.

Further, Dinger (2009) showed that smaller Eastern European banks hold higher liquidity levels compared to their larger counterparts, though foreign banks in this region tend to hold less liquidity. However, Aspachs et al. (2005) found that in the UK, bank size has an insignificant effect on liquidity, illustrating potential regional differences in this relationship. From the extant literature, the following hypothesis is formulated:

H1. There is a negative relationship between bank size and liquidity.

The literature on bank liquidity explores a range of factors that influence liquidity levels, including financial architecture transformations across both developed and developing countries (Mattana & Panetti, 2014). Bank ownership is particularly significant in understanding liquidity challenges, as public, private, and foreign banks exhibit varying liquidity behaviors (Mattana & Panetti, 2014). State policy also impacts liquidity risk, with ownership playing a distinct role in countries like China, where government policy influences liquidity management practices (Hussain et al., 2021). In addition, a recent study by Panizza (2024) who uses a dataset on bank ownership that covers more than 6,500 banks in 181 countries, documents that until 2010, there was a reduction in state-ownership of banks and an increase in foreign ownership, and the Global Financial Crisis interrupted or reversed these trends.

Ownership structure is frequently examined in relation to liquidity. For example, Dinger (2009) emphasizes the importance of ownership in shaping banks' liquidity strategies, noting that the separation of ownership and control can affect liquidity management. Bank-specific factors, including ownership type, impact liquidity differently. Studies indicate that foreign banks, for instance, often hold lower liquidity buffers than other financial institutions (Zhou, 2019). Aspachs et al. (2005) found that in the UK, local banks' liquidity holdings are influenced by the availability of a domestic lender of last resort, whereas foreign banks do not rely on this support. In their analysis, foreign banks' liquidity levels were less sensitive to changes in domestic policy rates and GDP growth, indicating that foreign-owned banks may operate under different constraints than domestic banks. Similar findings are noted by Dinger (2009) and Delechat et al.

(2012), who observed that foreign banks generally maintain lower liquidity buffers than local banks.

Publicly owned banks, where government entities own and manage the institution, tend to have a positive association with liquidity. Sidhu et al. (2022) found that public banks maintain higher liquidity, partly due to the government's backing and oversight, which mitigates liquidity risk. Private ownership, in which banks are owned by private entities, typically correlates with lower liquidity as these banks prioritize profitability. Studies suggest that foreign ownership affects liquidity as well, with Dinger (2009) observing that foreign banks often maintain lower liquidity, given that liquidity can be managed centrally by their parent institutions, a finding supported by Delechat et al. (2002).

Calomiris, Heider, and Hoerova (2014) argue that banks should maintain cash reserves as a prudential strategy against liquidity risk, a practice more feasible in publicly owned banks than private ones (Yeddou & Pourroy, 2020). Contemporary Banking Theory also supports the idea that ownership type matters when central banks manage bank liquidity (Bhattacharya & Thakor, 1993). Liquidity preference theories, such as Modigliani's (1944), highlight the importance of currency demand and supply in influencing liquidity. According to this theory, economic indicators like unemployment, inflation, and GDP fluctuations impact the demand and supply of deposits, prompting all ownership types to closely monitor these factors when crafting their liquidity policies. Additionally, market liquidity theory reinforces the relationship between bank size and liquidity management (Markus et al., 2009), suggesting that bank size is integral to determining liquidity levels in public, private, and foreign banks. Therefore, we aim to test the following hypotheses:

H2. The nature of bank ownership is associated with liquidity, with public ownership positively related to liquidity, while private and foreign ownership are negatively related.

3. Data and methodology

3.1. Data and Sample

The primary purpose of the research is to explore the relationship between bank size and liquidity across different types of ownership in both developed and emerging economies. In order to test the relationship between bank size and liquidity. The dynamic panel system estimation is used for the period from 2006 to 2017.

The sample population consists of 81 banks from developed and emerging countries and includes banks from New Zealand, Hong Kong, and Singapore. Pakistan, India, Sri-Lanka, and Bangladesh, which are listed in their stock exchanges. Data is collected from the financial reports and other different databases.

Table 1 reflects data from the eight countries, four from developing regions and four from the developed region. From the total number of banks, we selected 81 banks in Sri Lanka, Bangladesh, India, Pakistan, New Zealand, Hongkong and Singapore.

Table 1. Data description

Country name	No of banks	Selected banks
Sri Lanka	26	10
Bangladesh	33	10
India	57	19
Pakistan	20	18

New Zealand	20	11
Hong-Kong	21	7
Singapore	12	6

Autocorrelation is checked using Durbin Watson H test. Multicollinearity is checked with the correlation matrix. We checked heteroskedasticity using the Breusch Pagan test and Multicollinearity was verified through a correlation matrix. The issue of endogeneity is also checked in research, which occurs when explanatory variables are correlated with the error term. We deal with unobserved heterogeneity applying either fixed-effects or by taking the first or second-order differences. The Ramsey RESET parameter is used to check for model misspecification. The results indicated there is no omitted variables problem in our regressions.

To evaluate the defined relationship, the study used the Generalized Method of the Moment (GMM). A GMM produces a consistent parameter (Ozili, 2023). The first reason to use dynamic panel estimation is because the dependent variable is represented by annual data. The second reason is the possibility of unobserved heterogeneity with regressors, GMM controlling such effects and the lagged dependent variable. The study applies the two-step GMM estimator to evaluate the results across developed and developing countries throughout 2006-2017. The dependent variable is Liquidity, which is measured as a ratio of liquid over total assets. Liquid assets include accounts receivable, demands which are easily converted into cash. Total assets include the sum of current and noncurrent assets. Bank size is an independent variable measured by the log of total assets, which includes cash, marketable securities, account receivable, prepaid expenses, inventory fixed assets, tangible assets, goodwill, and other assets. Profitability (Return on asset), Inflation, GDP, and unemployment are used as the control variables.

3.2. Analysis model

The equations where bank liquidity is a dependent variable market feature, where an individual or institution can quickly purchase or sell an asset and bank size is represented as ownership of assets by banks. A public bank, private, and foreign bank is used as a dummy variable, which tells if ownership is public, private or foreign-owned, and control variables are ROA inflation, GDP, and unemployment.

To evaluate the impact of bank size on liquidity, academics will estimate a series of panel data to investigate the impact of of bank size on liquidity across different types of ownership and sets of control variables. The equations can be written as follows:

$$BLIQ_{it} = \alpha_{it} + BLIQ_{it-1} + \beta_1 BS_{it} + \beta_2 PB_{it} + \beta_3 ROA_{it} + \beta_4 UNEM_{it} + \beta_5 GDP_{it} + \beta_6 INFLA_{it} + \varepsilon_{it} \quad (i)$$

$$BLIQ_{it} = \alpha_{it} + BLIQ_{it-1} + \beta_1 BS_{it} + \beta_2 PB_{it} + \beta_3 ROA_{it} + \beta_4 UNEM_{it} + \beta_5 GDP_{it} + \beta_6 INFLA_{it} + \varepsilon_{it} \quad (ii)$$

$$BLIQ_{it} = \alpha_{it} + BLIQ_{it-1} + \beta_1 BS_{it} + \beta_2 PVB_{it} + \beta_3 ROA_{it} + \beta_4 UNEM_{it} + \beta_5 GDP_{it} + \beta_6 INFLA_{it} + \varepsilon_{it} \quad (iii)$$

Where,

- LIQ is the liquidity variable,
- BS presents the bank size,
- ROA measure the bank profitability,
- UNEM is annual unemployment,
- GDP presents annual Gross Domestic Product,
- INF shows inflation,

PVB is a dummy variable for private ownership group, and
 PB is a dummy variable for public ownership group,

Table 2 reflects summary of variable. The study examines several variables to understand their effects on bank liquidity. Liquidity (LIQ), the dependent variable, is measured as the ratio of liquid assets to total assets, as suggested by Moussa (2015). Among the independent variables, Bank Size (BS), proxied by the logarithm of total assets, is expected to have a negative effect on liquidity, aligning with the findings of Singh & Sharma (2016). Control variables include Profitability (ROA), measured by return on total assets, which is anticipated to negatively influence liquidity based on Abdullah & Khan (2012). GDP, representing annual GDP, and Inflation (INF), indicated by the consumer price index, are both expected to have negative effects on liquidity, as supported by Trenca, Petria, & Corovei (2015) and Singh & Sharma (2016), respectively. Additionally, Unemployment (UNEM), measured by annual unemployment rates, is expected to negatively impact liquidity, in line with Trenca, Petria, & Corovei (2015).

The study also incorporates dummy variables for ownership types. Public Ownership (PB), identified through financial reports, is anticipated to positively impact liquidity, as suggested by Givoly, Hayn, & Katz (2010). Private Ownership (PVB) and Foreign Ownership (FB), also measured via financial reports, are expected to have negative and positive relationships with liquidity, respectively, according to Naes (2004a) and Yeddou & Pourroy (2020).

Table 2. Summary of Variable

Variable	Proxy	Measurement	Expected effect
Liquidity	LIQ	Liquid asset over total assets	
Bank size	BS	Log of total asset	Negative
Profitability	ROA	Return on total assets	Negative
GDP	GDP	Annual GDP	Negative
Inflation	INF	Consumer price	Negative
Unemployment	UNEM	Annual unemployment	Negative
Public Ownership	PB	Financial Report	Positive
Private Ownership	PVB	Financial Report	Negative
Foreing ownerhsip	FB	Financial Report	Positive

4. Results

The descriptive statistics are shown in Table 3 and the normality of data being analyzed. The highest mean for bank size is 24.699, its maximum value is 31.561, and the minimum value is zero. The mean value of Return on Assets is 0.269 and this in turns means that, on average, banks

were profitable. On average, the selected countries experienced a positive economic growth as indicated by the mean value of GDP (5.301), but also with considerable rate of the inflation (5.983). Whilst, unemployment varies from 0.832 to 12.885.

Table 3. Descriptive Statistics

Variable	Std.	Mean	Median	Maximum	Minimum
FB	0.262	0.074	0	1.000	0.000
GDP	2.357	5.301	5.456	14.525	-2.459
INFLA	4.621	5.983	4.350	22.564	0.292
LIQ	4.958	2.093	1.084	74.618	0.000
PVB	0.498	0.464	0	1.000	0.000
PB	0.498	0.461	0	1.000	0.000
ROA	0.680	0.269	0.014	14.3748	-2.719
BS	3.812	24.69	25.86	31.5614	0.000
UNEM	2.888	7.705	8.528	12.885	0.832
Obs	1045	1045	1045	1045	1045

Note: The LIQ is the Liquidity ratio of the liquid assets over total assets (%), GDP is the Gross Domestic Product Growth Rate (%), INFL is the Annual Inflation Rate, PVB is the private banks, PB is public banks, FB is the foreign banks, ROA is the return on assets, BS is the firm size, i.e., natural log of total assets, UNEM is the Annual unemployment Rate.

As it can be seen in Table 4, foreign ownership is negatively correlated with GDP, inflation rate, liquidity ratio, private ownership, public ownership, and bank size, but positively correlated with ROA. The relationship between GDP and inflation, liquidity ratio, public ownership, and ROA is negative, and with private ownership, bank size, and unemployment, is positive, which means that if GDP decreases, it also affects the profitability of the firm, inflation rate is reduced, and the liquid position of the firm is also affected by the reduction in GDP. GDP increases the private ownership when GDP increases, bank size and unemployment also increase.

The inflation rate is positively correlated with liquidity ratio, private ownership, and bank size, but negatively correlated with public ownership, ROA, and unemployment, which means with the increase in the inflation rate liquidity position of the institution also increases. The value of private ownership also increases, and with the increase in the inflation rate, bank size is also impacted positively. The decreased inflation rate affected the unemployment rate profitability, public ownership being also affected. The relationship of public ownership with ROA and unemployment is positive, but negative with bank size. Bank size was also negatively impacted due to negative public ownership. The relationship of a private bank with the size is positive but negatively correlated with public ownership, ROA, and bank size. The relationship of ROA with size is negative but positive with unemployment. A negative correlation exists between bank size and unemployment, which means bank size negatively impacted unemployment rate.

Table 4. Correlation Analysis

	FB	GDP	INF	LIQ	PRI	PUB	ROA	SIZE	UNEM
FB	1								
GDP	-0.063*	1							
INFLA	-0.151*	-0.072**	1						
LIQ	-0.084*	-0.046*	0.080*	1					
PVB	-0.264*	0.102*	0.116*	0.106	1				
PB	-0.262*	-0.068***	0.036**	-0.062*	0.861*	1			
ROA	0.029*	-0.205*	-0.117	0.281**	0.134*	0.119*	1		
BS	-0.067*	0.376*	0.207*	-0.092*	0.252*	0.217*	0.397*	1	
UNEM	-0.024	0.164	-0.399	0.125	-0.196	0.209	0.214	-0.381	1

Note: The LIQ is the Liquidity ratio of the liquid assets over total assets(%), GDP is the Gross Domestic Product Growth Rate (%), INFLA is the Annual Inflation Rate, PVB is the private banks, PB is public banks, FB is the Foreign banks, ROA is the return on assets, BS is the firm size, i.e., natural log of total assets, UNEM is the annual unemployment rate.

Table 5 shows that bank size has a significant and a negative effect on liquidity. This is in line with Singh and Sharma (2016) and Choon et al. (2013) who reported the same results. In addition, results show that there is a positive and significant relationship between liquidity and ROA. Similar results were reported by Choon et al. (2013); Vodová (2017); Lartey et al. (2020). The inflation rate registers a significant and positive association with liquidity ratio. The significant relationship between them is aligned with Tseganesh (Moussa, 2015). Further, there is a significant but negative relationship between the control variable GDP and liquidity, when GDP increases, the liquidity ratio also increases. A significant negative relationship exists between them and the results are aligned with Aspach et al. (2005); Dinger (2009); and Vodova (2011).

However, the unemployment rate has an insignificant relationship with liquidity ratio. Public ownership has a significant association, but a negative association with liquidity ratio and the results are aligned with Acharya and Kulkarni (Vodova, 2011). The dummy variable for foreign ownership shows a significant and positive association with liquidity ratio, which means in the presence of foreign ownership, the liquidity ratio also increases. Our results are aligned with Lee (2019), and Sitenel (2005). Thus, the results conclude that there is a relationship between bank size and liquidity across public, private, and foreign ownership of banks. The overall result shows that the objective of the study to evaluate the relationship between bank size and liquidity across public ownership was achieved. There is a significant relationship that exists between private ownership and liquidity. The results are aligned with Naes (Næs, 2004).

Table 5. Two-Step Dynamic Panel Estimation across Developed and Developing Countries

LIQ	Coef	Std. err	p>z
L1.	1.237	0.031	0.000
ROA	0.784	0.301	0.009

BS	-0.025	0.049	0.008
INFLA	0.039	0.020	0.051
GDP	-0.333	0.032	0.000
UNEM	-0.062	0.062	0.321
PB	-3.271	0.947	0.001
PVB	3.140	0.930	0.001
FB	12.426	4.779	0.009
C	0.967	1.623	0.551
AR(1) P-Value		0.000	
AR(2) P-Value		0.1121	
Sargan Value		30.051	
Sargan (P-Value)		0.321	

Note: ROA is the return on assets; it is the ratio of earnings before interest and tax to total assets, the proxy used for the profitability, which is the control variable. BS is Bank size, which is measured through, liquidity ratio is the ratio of a liquid asset over the total asset. Infl is the inflation rate. GDP is the gross domestic product. Unem is the unemployment rate. The PB is the public ownership, PVB is private, FB is the foreign ownership.

Table 6 shows that a significant relationship exists between liquidity ratio and bank size and the results are aligned with aligned with Kashyap et al. (Aspachs et al., 2005). ROA registers a significant and positive relation with liquidity ratio, which shows the significant nature of the control variable, and results are aligned with Singh and Sharma (2016), and Lartey et al. (2013). The inflation rate has a significant and positive association with the liquidity ratio, indicating that higher inflation rates increased the liquidity ratio, the results are aligned with Horváth et al. (2014), and Tseganesh (2012). GDP has a significant but negative association with liquidity ratio, which indicates that GDP significantly impacted and affects the liquidity ratio. It means the increase of GDP generates a decrease in liquidity position of the institution (Dinger, 2009; Mahmood et al., 2019; Acharya & Kulkarni, 2012).

The control variable of unemployment has a significant and negative association with the liquidity ratio. Horváth et al. (2014) reported the same result, which shows that by increasing the unemployment rate, the liquidity ratio decreases. Private ownership and liquidity ratio has a significant but negative association with liquidity ratio, so the results show that in the presence of private ownership, the liquidity ratio decreases. Results are aligned with (Næs, 2004). There is a significant and negative relationship between public ownership and liquidity, which means in the presence of public ownership, liquidity decreases. A meaningful relationship exists between liquidity and foreign ownership, which indicates that in the presence of public, private, and foreign ownership, the liquidity ratio is impacted.

Table 6. *Two-Step Dynamic Panel Estimation across Developed Countries*

LIQ	Coef.	StErr.	P>z
L1.	1.318	0.054	0.000
ROA	1.660	0.511	0.001

BS	0.121	0.137	0.04
INF	0.199	0.054	0.000
GDP	-0.586	0.065	0.000
UNEM	-0.365	0.164	0.026
PB	-16.712	4.426	0.000
PVB	-18.519	4.185	0.000
FB	9.695	3.475	0.005
C	12.923	4.099	0.002
AR(1) P-Value		0.000	
AR(2) P-Value		0.3541	
Sargan Value		28.521	
Sargan (P-Value)		0.328	

Note: ROA is the return on assets; it is the ratio of earnings before interest and tax to total assets, the proxy used for the profitability, which is the control variable. BS is Bank size, measured through liquidity ratio is the ratio of a liquid asset over the total asset. INF is the inflation rate. GDP is the gross domestic product. Unem is the unemployment rate. The PB is the public ownership, PVB is private ownership, FB is the foreign ownership.

Table 7 shows that bank size and liquidity ratio have an insignificant negative association between them (Choon et al., 2013). The Return on Asset and liquidity ratio has an insignificant association, the results are aligned with Aspachs et al. (Aspachs et al., 2005). There is an insignificant relationship between the inflation rate and liquidity ratio, which is similar to the results in the literature (Bunda & Desquilbet, 2003, May). GDP has an insignificant association with liquidity ratio, and this result is aligned with Dinger (Dinger, 2009). The unemployment rate and liquidity ratio have an insignificant relation between them which aligns with the findings of Munteanu (Valla et al., 2006). There is an insignificant relationship between public ownership and liquidity, the results are in keeping with those of Næs (Næs, 2004). The relationship between private banks and liquidity is also insignificant in emerging countries, which means that in the presence of private ownership, the liquidity ratio is insignificant. The relationship between liquidity and foreign ownership is insignificant, which means foreign ownership has an insignificant relationship with liquidity; this result is aligned with the finding of Ding et al. (2017). The resultant conclusion is that in emerging countries there is an insignificant relationship that exists between liquidity and public, private, and foreign ownership.

Table 7. Two-Step Dynamic panel Estimation (Developing Region)

LIQ	Coef.	SE	P>z
L1.	1.125	0.047	0.00
ROA	1.760	2.981	0.555
BS	-0.092	0.0208	0.37
INF	0.0001	0.009	0.99

GDP	0.009	0.0195	0.623
UNEM	0.021	0.025	0.405
PB	-0.119	0.371	0.749
PVB	0.232	0.375	0.537
FB	1.104	0.846	0.192
C	1.828	0.698	0.009
AR(1) P-Value		0.000	
AR(2) P-Value		0.2154	
Sargan Value		20.081	
Sargan (P-Value)		0.211	

Note: BS is bank size, measured through liquidity ratio is the ratio of a liquid asset over the total asset. ROA is the return on assets; it is the ratio of earnings before interest and tax to total assets, the proxy used for the profitability, which is the control variable. Infla is the inflation rate. GDP is the gross domestic product. UNEM is the unemployment rate. The PB is the public ownership, PVB is private ownership, FB is the foreign ownership.

5. Discussion

This study examined the impact of bank liquidity on bank size in both developing and developed countries from 2006 to 2017, and additionally explored the relationship between bank ownership and liquidity. The results show a significant relationship between liquidity ratio and bank size in developed countries, with this association holding across various ownership types. A notable relationship is also observed between liquidity and Return on Assets (ROA). Among macroeconomic variables, inflation, unemployment, and bank size exhibit a largely negative association with liquidity, particularly in developed countries. Across public, private, and foreign ownership, a relationship exists between bank size and liquidity, with bank size and GDP generally demonstrating a negative relationship with liquidity.

The analysis indicates that, in emerging countries, the overall findings are mostly insignificant, suggesting that while a relationship between bank size and liquidity may exist, it does not significantly vary across different ownership types in these regions.

At the 5% significance level, empirical results show that bank size, inflation rate, GDP, and both private and public ownership have a negative relationship with liquidity. In contrast, foreign ownership, unemployment, and ROA show a positive relationship with liquidity. Specifically, the negative relationship between bank size and liquidity suggests that as banks grow in size, their liquidity decreases. ROA, on the other hand, has a significant positive effect on liquidity, indicating that higher profitability aligns with increased liquidity ratios. These findings are consistent with previous research, such as Lartey et al. and Vodová (2011).

In summary, during periods of inflation and recession, larger banks whether privately or publicly owned tend to be less liquid than their smaller counterparts. Conversely, foreign-owned banks tend to maintain higher liquidity and profitability during periods of high unemployment. While inflation appears to have an insignificant effect on bank liquidity, GDP has a significant impact. This aligns with the findings of Bunda and Desquilbet (2003), who noted a positive impact of GDP on bank liquidity, though Aspachs et al. (2005) report a contrasting negative impact of GDP on liquidity.

6. Conclusion

In today's economic landscape, liquidity plays a crucial role in sustaining business activities and is considered the backbone of the economy. During times of crisis, banks that maintain a healthy level of liquidity help build customer trust, ensuring that clients feel secure in their choice of banks for future investments and deposits.

A key finding of this study is the relationship between bank size and liquidity, with results indicating that larger banks tend to have lower liquidity, while smaller banks hold higher liquidity levels. This finding highlights the importance of maintaining sufficient funds, especially in periods of uncertainty. Additionally, liquidity was found to be significantly influenced by GDP, which shows a positive relationship with liquidity, aligning with the findings of Aspachs et al. (2005).

In summary, this study examined the relationship between bank liquidity and factors such as profitability, GDP, unemployment, inflation, and ownership type (public, private, and foreign) across developed and developing countries from 2002 to 2017. Results show that in developed countries, liquidity ratios tend to increase significantly, suggesting that GDP, inflation, ROA, and unemployment rates play a crucial role in enhancing the liquidity position of banks, regardless of ownership type. These findings align with the research of Moussa (2015). However, in emerging countries, results indicate a decrease in the liquidity ratio, which may impact the liquidity position of institutions in these regions.

To our knowledge, there are no cross-country studies examining liquidity ratios in relation to ownership type (public, private, and foreign) with a specific focus on bank size and other variables. This study, therefore, makes a valuable contribution to the existing literature by filling this gap and providing insights into the influence of bank size and ownership type on liquidity across different economic environments.

The study has significant implications for investors, policymakers, and bankers. For investors, liquidity trends offer a valuable metric for evaluating investment opportunities and assessing an organization's financial health. Policymakers can use insights on liquidity trends to support investment decisions and promote economic development within their jurisdictions. For bankers, understanding liquidity dynamics is essential to ensuring the proper functioning of financial markets and maintaining stability.

This study acknowledges certain limitations. First, it relies solely on banking data and uses only the liquidity ratio as a measure of liquidity. Alternative liquidity measures, such as the cash ratio, current ratio, and quick ratio, could be incorporated in future research for a more comprehensive analysis. Future studies could also explore the impact of bank size on liquidity in developed countries following crises, such as COVID-19, and examine the effect of inflation on bank liquidity across different countries.

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