Banking and Management Review

Competition Plays A Moderating Role in The Impact of Liquidity Creation on Bank Capital

Ahmad Fuad[1*], Joko Hartono[2]

[1] Faculty of Economi, Sekolah Tinggi Ilmu Ekonomi Ekuitas, Bandung, Indonesia
[2] Faculty of Economi, Sekolah Tinggi Ilmu Ekonomi Ekuitas, Bandung, Indonesia

ABSTRACT

Introduction/Main Objectives: This study examines the moderating influence of bank competition, proxied by the Lerner index, on the impact of liquidity creation, measured using the Catfat method, on bank capital, proxied by the equity-to-total-assets ratio. **Background Problems:** Limited academic literature explores how competition moderates the relationship between liquidity creation and bank capital, which is essential for maintaining stability and risk absorption in the banking sector. **Novelty:** This study fills the gap by demonstrating that the effect of liquidity creation on bank capital depends on the level of bank competition. **Research Methods:** The study uses purposive sampling, covering 96 banks from 2013 to 2023, and applies panel data regression analysis with Hayes' method. Control variables include ROA, LDR, NPL, GDP, inflation, and Bank Indonesia interest rates. **Findings/Results:** The results indicate that competition moderates the negative effect of liquidity creation on bank capital, weakening this impact. This suggests that competition enables banks to maintain higher capital levels. **Conclusion:** The study highlights the importance of competition in moderating the liquidity creation-capital relationship, with implications for bank management and regulatory policies.

ARTICLE INFO

Keywords:
Bank Capital_1,
Liquidity Creation_2,
Bank Competition_3,
Moderation_4,
Hayes Method_5

Submitted: 15th October 2024
Reviewed: 29th October 2024
Accepted: 29th October 2024
Published: 30th October 2024

* Ahmad Fuad at Faculty of Economi, Sekolah Tinggi Ilmu Ekonomi Ekuitas, Bandung, Indonesia
E-mail address: elfuadys@gmail.com, djokoaudit@yahoo.com

1. Introduction

The role of the banking sector in the economy can be likened to the function of the circulatory system in the human body. The flow of funds from savers or investors to borrowers, facilitated by banks as intermediaries, is a crucial aspect of economic activity. The intermediation function of the banking sector can stimulate economic growth through investment and the provision of credit. This role of banking in intermediating financial flows has been a topic of significant discussion in modern financial theory.

The role of banking in the economy is of significant consequence, particularly in light of the systemic or contagion effects that may result from a banking crisis. This is evidenced by the costs incurred by the government in saving banks affected by the banking crisis. The data indicates that the global average cost incurred by countries in order to address the banking crisis is approximately 20–25% of GDP (Dell'Ariccia et al., 2008; Laeven & Valencia, 2012). In Indonesia, this phenomenon occurred in 1997, when an economic crisis resulted in the liquidation of 16 banks at a cost of Rp 48.8 trillion through the Indonesian Deposit Insurance Corporation (IDIC) bailout program (Apriadi et al., 2017). In addition to the high costs of recovery banking, the relatively long recovery period for the banking sector following a banking crisis must also be considered. The mean recovery period for the banking sector following a systemic banking crisis is approximately 6.2 years, with an associated cost of 7.2% of GDP (Frydl, 1999). Furthermore, the economic downturn has resulted in a disruption to the capital base, which has in turn led to job losses and a decline in real wages (Colombo et al., 2016).

Bank capital represents a crucial bank-specific factor in maintaining the stability of the banking sector in the context of a financial crisis. The model of bank instability resulting from a bank run was initially presented in previous studies (Diamond & Dybvig, 1983; Waldo, 1985). The stability of banks can be supported by maintaining the level of capital, as capital is used as a buffer to absorb shocks (Repullo, 2004;von Thadden, 2004). This is in line with the theory of capital as a risk-absorbing mechanism. Theoretical models have been developed to examine a range of variables that are believed to influence the level of bank capital. For instance, research in Southeast Asian countries has indicated that bank capital is shaped by factors such as management quality, liquidity, leverage, bank size, and government regulations (Rubi & Albaity, 2019). Similarly, findings in African countries suggest that bank capital is influenced by liquidity, return on assets (ROA), net interest margin (NIM), inflation rate, and foreign and private ownership.

In developing countries, a significant correlation was also identified between managerial risk-taking behavior in capital decisions and the level of minimum capital provisions set by the government. This resulted in a capital ratio that exceeded the minimum capital provisions set by the regulator (Ahmad et al., 2008). Similar results have been observed in developed countries, including Europe and the United States. The behavior of capital ratio decisions is significantly influenced by the minimum capital provisions set by regulators (Barth et al., 2004; Flannery & Rangan, 2008; Alfon et al., 2004; Brewer et al., 2008).

Likewise, in the theory of modern financial intermediation, liquidity management through liquidity creation has a very important role for banks (Berger & Bouwman, 2009; Zheng et al., 2019). This liquidity management is also related to the bank's liquidity risk. This higher liquidity creation is

risky because it can make the bank less liquid (for example, the bank holds illiquid assets, which, on the other hand, must also provide liquidity to external parties), increase the bank's risk exposure, and increase the possibility of losses associated with having to release liquid assets to meet customer liquidity demands (Allen & Santomero, 1998; Allen & Gale, 2004). The potential loss due to this liquidity risk needs to be covered by capital. Capital is used as a buffer that absorbs bank losses (Repullo, 2004; von Thadden, 2004). Capital also plays a role in hedging against risk exposure (Berger et al., 2008; Distinguin et al., 2012).

Horváth et al., (2014) found that bank capital and liquidity provision negatively influenced each other through the granger-cause method on a sample of banks in the Czech Republic during the period 2000-2010. This is because the increase in liquidity creation was obtained by releasing liquid assets to finance illiquid assets so that the bank's capital level decreased. In addition to the creation of liquidity, the level of competition also affects the level of bank capital. Empirical evidence indicates that bank capital ratios are consistently maintained at levels exceeding the minimum regulatory requirements. Some literature posits a link between this phenomenon and competitive factors. Tighter competition encourages bank management behavior that results in the increase and maintenance of capital ratios above the minimum regulatory requirements (Allen et al., 2011; Schaeck & Cihák, 2012). Furthermore, heightened competition prompts banks to curtail liquidity creation by constraining both credit and deposit volumes, thereby mitigating the risk of bank runs (Horvath & Seidler, 2013).

A synthesis of the literature reveals a negative correlation between liquidity creation and capital level. Consequently, banking institutions implement measures to enhance their capital base in order to safeguard against potential liquidity risks. Conversely, intense competition within the banking sector motivates financial institutions to maintain and, where possible, enhance their capital reserves. It is therefore the intention of the author to investigate whether the variable of bank competition level can serve to either reinforce or attenuate the influence of liquidity creation on the level of bank capital.

The present study makes a significant contribution to the existing literature on the subject of liquidity creation and its impact on bank capital by providing compelling evidence that the effect of liquidity creation on bank capital is highly dependent on the level of bank competition. To the best of our knowledge, no previous study has empirically investigated the role of bank competition in moderating the effect of liquidity creation on bank capital. Furthermore, our findings have significant implications for current policy.

2. Literature Review

A number of studies have demonstrated the significance of bank capital in the context of banking operations. The findings of Berger & Bouwman, (2013) indicate that an increase in capital is

associated with an enhanced probability of survival and market share for small banks in the context of banking crises, market crises, and normal market conditions. Secondly, capital improves the performance of medium and large banks, particularly during periods of financial crisis. In this paper, the capital ratio employed is derived from the regulatory provisions for the assessment of banking CAMEL (Schaeck et al., 2009; Zheng et al., 2019). The use of CAMEL calculations because apart from having been used by previous authors, the data components are also available in the bank's financial reports. The formula is as follows: The capital ratio (CA) is calculated by dividing the equity by the total assets (TA), where CA represents the capital ratio and TA and equity are defined as previously stated.

The term 'liquidity creation' is used to describe the process of generating liquidity through the collection and placement of funds, with the aim of optimizing risk and income in a bank's on- and off-balance sheet financial statements (Berger & Bouwman, 2009; Berger et al., 2014). The greater the liquidity creation, the greater the possibility and level of risk or loss associated with the release of illiquid assets to meet customer liquidity demands (Diamond & Dybvig, 1983; Allen & Santomero, 1998). A higher liquidity creation value indicates a lower level of bank liquidity, as the bank invests a significant proportion of its liquid liabilities in illiquid assets. The Catfat method is employed for the calculation of liquidity creation, whereby bank assets and liabilities are classified into three categories of liquidity levels. In the catfat method, all assets are classified as liquid, semi-liquid, or illiquid based on the ease, cost, and time for the bank to obtain liquid funds to meet customer demand. Bank liabilities and equity are also classified to obtain liquid funds from the bank. Collateral and derivatives in the off-balance sheet financial statements are also classified consistently with the treatment of items in the on-balance sheet financial statements.

In the field of competition analysis, various methodologies exist for quantifying the level of competition. One such approach is the structure-conduct-performance (SCP) framework, which assesses the level of competition based on market concentration. As concentration levels increase, market power also rises (Bikker & Haaf, 2000). The competition approach that measures market power is based on the Lerner index (Casu & Girardone, 2009). The Lerner index is a method of calculating market power by determining the discrepancy between the price of a product and the marginal costs associated with its production (Demirguc-Kunt & Martinez Peria, 2010).

In the extant literature, two distinct theories have been proposed to elucidate the relationship between liquidity creation and bank capital. The first theory, that of financial fragility-crowding out, posits that capital has a negative effect on liquidity creation. This is because a higher capital ratio makes the bank less fragile, which in turn leads to a reduction in depositor monitoring activities. This, in turn, hinders the bank's ability to create liquidity (Diamond & Rajan, 2000; Diamond & Rajan, 2002). Secondly, the risk absorption hypothesis posits that capital has a positive effect on liquidity creation.

This is because capital helps to absorb liquidity risks associated with the provision of liquidity and liquidity creation (Repullo, 2004).

A further series of studies was conducted to investigate the two-way relationship between capital and liquidity provision, given the potential for these two variables to influence each other. Horváth et al., (2014) employed the Granger Causality Method to demonstrate that bank capital and liquidity provision exerted a negative influence on each other on a sample of banks in the Czech Republic during the period 2000-2010. Similarly, Fu et al., (2016) found a significant negative two-way relationship between capital and liquidity provision in a sample of banks in the Asia-Pacific region during the period 2005-2012. In contrast, the results of the study by Tran et al., (2016) indicated a positive two-way relationship between regulatory capital and liquidity provision in a sample of United States banks over the period 1996-2016.

Several authors report that banks in both the US and the UK tend to maintain capital levels above regulatory standards (Barth et al., 2004; Flannery & Rangan, 2008). Allen et al., (2011) explain that maintaining capital ratios above or above regulatory requirements is caused by market discipline arising from the bank's asset side. According to their model, competition motivates banks to maintain higher capital levels because it shows a commitment to monitoring loans and attracting creditworthy borrowers. Consistent results from a study of 2,600 banks from 10 European countries show that competition keeps banks maintaining higher capital ratios (Allen et al., 2009; Schaeck & Cihák, 2012).

The level of bank capital is influenced by various determinant factors, one of which is liquidity creation. Liquidity creation can increase liquidity risk, which has an impact on increasing capital in anticipation of losses due to liquidity risk. The role of capital that absorbs losses encourages banks to maintain capital at a certain level. Despite the differences in the role of liquidity creation in relation to bank capital, these researchers agree that both influence each other. Increased liquidity creation can increase the possibility of losses that are responded to by increasing capital.

In practice, banks are subject to external influences on their operations, including those pertaining to the maintenance of capital levels. These external factors may include competition. Furthermore, the level of capital is also subject to influence from competitive factors. As demonstrated by Allen et al. (2011), banks maintain capital above the standard provisions due to the competitive pressures they face. Similarly, the impact of competition on the risk of bank failure merits consideration. It is therefore proposed that competition serves to moderate the influence of liquidity creation on bank capital. Therefore, the hypothesis of this study is that competition plays a moderating role in the relationship between liquidity creation and bank capital.

3. Method, Data, and Analysis

The method employed to ascertain the causal relationships between variables is causal explanation (Zikmund et al., 2013). By employing this methodology, the author can procure empirical evidence substantiating the causal relationship between liquidity creation and bank capital. Furthermore, the author employs competition as a moderator of the intended causal relationship through the interaction effect of two independent variables (Hayes, 2013), namely liquidity creation and competition on bank capital.

The selection of samples is based on the purposive random sampling method, which is combined with the judgmental sampling type. This method involves the selection of samples based on the application of specific criteria or features in alignment with the research objectives (Hadi, 2007). A data sample of 96 banks, which meet the established criteria, namely the required data is consistently available in the financial reports, and the banks have been operating during the period 2013-2023, were selected from a total population of 114 banks.

The data analysis employs the regression model method, utilizing panel data (cross-sectional and time series) over the period spanning 2013 to 2023. In order to ascertain the role of moderation, the author employs the initial model presented in the book by Hayes, (2013). To ensure the integrity of the study and prevent the influence of external factors on the independent and dependent variables, the author incorporates control variables into the research model, including Return on Assets (ROA), Loans to Deposits Ratio (LDR), Non-Performing Loans (NPL) and Gross Domestic Products (GDP), inflation, and Bank Indonesia interest rate. The moderation effect, also known as the conditional effect, represents the statistical interaction between two independent variables and the dependent variable. The objective of this analysis is to identify the strengthening or weakening effects of the Competition Level (TP) variable on the influence of liquidity creation (KL) on bank capital (MB). This is expressed mathematically as follows, $Y = b_1 + b_3M$, where M is the moderation of bank competition.

4. Result and Discussion

4.1 Result

The mean ratio of MB to total assets over the course of the study period was 15.14%. The mean MB value is greater than its standard deviation value, which indicates that the data set is adequately represented. This average capital value exceeds the minimum capital requirement set by the Financial Services Authority. This indicates that the average capital of the Indonesian banking sector can be considered to be in a healthy state. However, the mean MB value of the foreign bank group is the lowest in comparison to the other bank groups. The mean ratio of KL capital to total assets is 16.9%. As illustrated in Table 2, the majority of bank groups exhibit an average KL value that exceeds the mean of 0.1604. It is notable that the BPD (Regional Bank) and non-Devisa BUSN (National Private

Commercial Bank) exhibits an average KL value that is below the overall mean. Consequently, banks with a higher average KL value indicate a lower level of bank liquidity, as a considerable proportion of liquid liabilities are invested in illiquid assets. Consequently, these banks will become increasingly vulnerable to the risk of mismatched maturities. In addition, the liquidity ratio standards of regulators in Indonesia do not formally use the catfat method.

Table 2 Descriptive Statistics

Bank Types	KL		TP		MB	
	Mean	SD	Mean	SD	Mean	SD
Bank Persero	0,27	0,09	0,44	0,06	11,33	1,71
BPD	0,09	0,10	0,17	0,04	12,61	1,24
BUSN Devisa	0,23	0,13	0,43	0,06	13,98	2,37
BUSN Non Devisa	0,04	0,44	0,36	0,05	22,20	2,53
Foreign Banks	0,35	0,22	0,24	0,08	6,99	0,51
Mixed Banks	0,26	0,20	0,36	0,07	16,69	1,56
All Banks	0,16	0,26	0,33	0,03	15,14	1,09

The mean TP, as proxied by the Lerner index, was 0.3265 over the course of the study period. This result is comparable to that reported by Wibowo (2016), which was 0.306. The mean TP value is greater than its standard deviation, which means that the mean data also represents good data. The group of state-owned banks and BUSN devisa (National Private Commercial Bank) has the highest Lerner index value compared to other bank groups. This shows that they have greater market power. Such banks are able to set higher prices above their marginal costs. Based on the descriptive statistics of the Lerner index, it can be said that the Indonesian banking market tends to be oligopolistic or monopolistic.

The analysis yielded a t-value of 14.1967 for the interaction of KL and TP, with a p-value of 0.000, indicating a significance level below 0.05 0r 0.01. This indicates that the interaction between KL and TP exerts an influence on MB. The mathematical equation for MB is as follows:

$$MB = -1{,}0109 - 25{,}9769X_{KL} + 3{,}8029X_{TP} + 20{,}2287X_{KL}W_{TP}$$

In this equation, M represents the TP variable (see Table 3). The R^2 value is 60.30% after the interaction. The R^2 change value is 0.1226, indicating that the interaction effect contributes 12.26% to the increase in variation in MB. (see table 4).

Table 3 Statistical Analysis

Variables	Coeff	SE	t	p	LLCI	ULCI
Constan	-1,0109	2,7999	-0,3611	0,7181	-6,505	4,4832
KL	-25,9769	1,1893	-21,8429	0,0000	-28,3105	-23,6433
TP	3,8029	1,1826	3,2157	0,0013	1,4823	6,1234
Int_1	20,2287	1,4249	14,1967	0,0000	17,4237	23,0247
ROA	0,2109	0,0656	3,2138	0,0014	0,0821	0,3396
NPL	-0,0368	0,0913	-0,4230	0,6724	-0,2178	0,1406
LDR	0,046	0,0047	9,7623	0,0000	0,0367	0,0552
BI Interest rate	-0,2746	0,2947	-0,9318	0,3517	-0,8529	0,3037
Inflation	-0,1412	0,1978	0,7142	0,4753	-0,2468	0,5293
PDB	-0,5327	0,5085	-1,0475	0,2951	-1,5304	0,4651

MB : dependent variable

Int_1 : KL x TP

Table 4 Unconditional Interaction

	R2	R2-chng	F	df1	df2	p
KL x TP	0,6030	0,1226	201,5454	1,0000	1046,0000	0,0000

Test (s) Highest order uncoditional interaction(s)

In order to gain a more profound understanding of the interaction effects, it is necessary to examine the conditional effects as presented in Table 5 below.

Table 5 Conditional Effects

TP	Effect	se	t	p	LLCI	ULCI
-2,391	-30,8131	1,4117	-21,8269	0,0000	-33,5832	-28,0430
0,000	-25,9769	1,1893	-21,8429	0,0000	-28,3105	-23,6433
2,391	-21,1407	1,0334	-20,4579	0,0000	-23,1684	-19,1130

Focal predict : KL

Moderation var : TP

Conditional effect of the focal predictor at value of the moderator(s) :

At a low level of competition (SD = -1; TP = -0.2391), the positive moderation effect is statistically significant (b = -30.8131; p = 0.000), and the 95% confidence intervals do not include zero. At the medium competition level (SD=0; TP=0.000), the positive moderation effect is statistically significant (b=-25.9769; p=0.000), and the 95% confidence intervals do not include zero. At the elevated competition level (SD=1; TP=0.2391), the positive moderation effect is statistically significant (b=-21.1407; p=0.000), and the confidence intervals for the lower and upper limits do not include zero.

4.2 Discussion

The analysis results indicate that competition at various levels serves to mitigate the adverse impact of liquidity creation on bank capital. This is in line with the research hypothesis that competition moderates the influence of liquidity creation on bank capital. The subsequent question pertains to the manner in which competition can serve to mitigate the adverse impact of liquidity creation on bank capital. This theoretical argument concerns the relationship between three variables: liquidity creation, the level of competition, and bank capital. It is based on an analysis of previous literature. Primarily, the bank increases liquidity creation by increasing loans on the asset side and deposits on the liability

side. This increase on the liability side has an effect on the composition of capital and liabilities to assets, which declines. Consequently, this augmentation in liquidity creation exerts an influence on the decline in the capital ratio. The increase in liquidity creation through increased activity on the productive asset side, such as loans, can reduce the capital ratio. However, the rate of expansion of productive assets can be restrained or slowed down by competition so that it does not have too much impact on the decline in the capital ratio. Thus, in this condition, competition plays a role in weakening the inverse effect of liquidity creation on bank capital.

Secondly, the level of bank competition can increase liquidity creation (Love & Peria, 2012; Beck et al., 2004) and increase bank capital (Allen et al., 2009). Increased bank competition affects the decline in loan and deposit interest rates. As a result, the demand for deposits and loans increases. The results of the study provide empirical support that there is a relationship between the level of competition and low deposit interest rates (Santiago et al., 2009; Love & Peria, 2012). Increased competition stimulates loan demand by reducing financing barriers (Beck et al., 2004). Therefore, increased competition can increase credit (illiquid assets) and deposits (liquid liabilities), thereby increasing bank liquidity creation.

The argument is based on the direction of influence of the variables. Liquidity creation has a negative effect on bank capital (Horváth et al., 2014; Fu et al., 2016). The level of bank competition can increase liquidity creation (Love & Peria, 2012; Beck et al., 2004) and increase bank capital (Allen et al., 2009). From a mathematical perspective, the influence of liquidity creation on bank capital is inversely proportional to the influence of competition on capital, indicating a potential trade-off. To illustrate, in the absence of competition, an increase of 2% in liquidity creation can result in a reduction of capital by 4%. Subsequently, competition emerges, resulting in an increase of 2% in capital. Following the introduction of competition, the impact of enhancing liquidity creation by 2% can only diminish capital by 2% (4%-2%).

The findings of this study have significant implications for bank management, underscoring the necessity for a comprehensive evaluation of cost efficiency to ensure competitive pricing in the market. This efficiency can be achieved through the development of information technology, networks, and others in order to increase economic scale. In addition, improving services and maintaining bank capital levels needs to be a concern.

Regulators also need to maintain a healthy level of competition in the domestic banking industry through their authority and regulations. Transparency in determining credit interest rates through the Basic Credit Interest Rate (SBDK) is one of the right steps. The concentration level of large banks needs to be reduced periodically by encouraging small and medium banks to merge or acquire.

This study is limited to conventional banking in Indonesia. The results are not necessarily the same for Islamic banking in Indonesia or conventional banking in other emerging countries.

5. Conclusion and Suggestion

This study was conducted on 96 conventional commercial banks out of 114 banks in Indonesia during the period 2013–2023. This moderation effect study resulted in findings that competition at various levels (low, medium, and high) significantly moderates the negative (weakens) effect of liquidity creation on bank capital. This result takes into account control variables from bank-specific and macroeconomic factors. The implications of this study are for banking to improve cost and service efficiency in facing competition. Risk appetite management in managing risks arising from competition must also receive special attention. Regulators also need to continue to increase banking competition in Indonesia through their authority and regulations.

This research model is yet to be tested in emerging countries, and further research is required to ascertain its efficacy in these contexts. Furthermore, it would be beneficial to investigate whether the same outcomes are observed in banking institutions that adhere to Sharia principles in Indonesia and other emerging countries.

6. References

Ahmad, R., Ariff, M., & Skully, M. J. (2008). The Determinant of Bank Capital Ratios in a Developing Economy". *Asia-Pasific Financial Markets, 15*, 255–272.

Alfon, I., Argimon, I., & Bascunana-Ambros, P. (2004). What determines how much capital is held by UK banks and building societies? *FSA Occasional Paper Series*, 22.

Allen, F., Carlett, E., & Marquez, R. (2009). Credit Market Competition and Capital Regulation. *EUI Working Papers*. http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Eui+working+papers#4

Allen, F., Carletti, E., & Marquez, R. (2011). Credit Market Competition and Capital Regulation. *The Review of Financial Studies*, *24*(4), 983–1018. https://doi.org/https://doi.org/10.1093/rfs/hhp089

Allen, F., & Gale, D. (2004). Financial intermediaries and markets. *Econometrica*, *72*(4), 1023–1061. https://doi.org/10.1111/j.1468-0262.2004.00525.x

Allen, F., & Santomero, A. M. (1998). The theory of financial intermediation. *Journal of Banking & Finance*, *21*, 1461–1485. https://doi.org/10.1007/BF01388162

Barth, R., J., Jr., C., Gerard, Levine, & Ross. (2004). Bank supervision and regulation: What works best? *Journal of Financial Intermediation*, *13*(2), 205–248.

Beck, A., D.-K., & V. Maksimovic. (2004). Bank Competition and Access to Finance: International Evidence. *Journal of Money, Credit and Banking*, *36*(3), 627–654.

Berger, A. N., & Bouwman, C. H. S. (2009). Bank liquidity creation. *Review of Financial Studies*, *22*(9), 3779–3837. https://doi.org/10.1093/rfs/hhn104

Berger, A. N., & Bouwman, C. H. S. (2013). How does capital affect bank performance during financial crisesα. *Journal of Financial Economics*, *109*(1), 146–176. https://doi.org/10.1016/j.jfineco.2013.02.008

Berger, A. N., Bouwman, C. H. S., & Berger, A. N. (2014). *Bank Liquidity Creation Bank Liquidity Creation*. *22*(9), 3779–3837.

Berger, A. N., DeYoung, R., Flannery, M. J., Lee, D., & Öztekin, Ö. (2008). How do large banking organizations manage their capital ratios? *Journal of Financial Services Research*, *34*(2–3), 123–149. https://doi.org/10.1007/s10693-008-0044-5

Bikker, J. A., & Haaf, K. (2000). Competition, Concentration And Their Relationship: An Empirical Analysis Of The Banking Industry. *Research Series Supervision*, *30*.

Brewer, E., Kaufman, G. G., & Wall, L. D. (2008). Bank capital ratios across countries: why do they vary? *Journal of Financial Services Research*, *34*, 177–201.

Casu, B., & Girardone, C. (2009). Does Competition Lead to Efficiency? The Case of EU Commercial Banks. *WORKING PAPER SERIES*, *WP 01/09*, 1–35. https://doi.org/10.2139/ssrn.1200362

Colombo, E., Onnis, L., & Tirelli, P. (2016). Shadow economies at times of banking crises: Empirics and theory. *Journal of Banking and Finance*, *62*(September), 180–190. https://doi.org/10.1016/j.jbankfin.2014.09.017

Dell'Ariccia, G., Detragiache, E., & Rajan, R. (2008). The real effect of banking crises. *Journal of Financial Intermediation*, *17*(1), 89–112. https://doi.org/10.1016/j.jfi.2007.06.001

Demirguc-Kunt, A., & Martinez Peria. (2010). A framework for analyzing competition in the banking sector: an application to the case of Jordan. *World Bank Policy Research Working Paper Series, Vol*, *December*. https://doi.org/10.1596/1813-9450-5499

Diamond, D. W., & Dybvig, P. H. (1983). Liquidity - Diamond and Dybvig. *Journal of Political Economy*, *24*(1), 14–23. https://doi.org/10.1086/261155

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

Diamond, D. W., & Rajan, R. G. (2002). Bank Bailouts and Aggregate Liquidity. *American Economic Review*, *92*(2), 38–41. https://doi.org/10.1257/000282802320188961

Distinguin, I., Roulet, C., & Tarazi, A. (2012). Bank Regulatory Capital Buffer and Liquidity: Evidence from US and European Publicly Traded Banks. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1884811

Flannery, M. J., & Rangan, K. P. (2008). How Bank Capital Buffers Vary Across Countries: The Influence of Cost of Deposits, Market Power and Bank Regulation. *Journal of Banking and Finance*, *34*, 892–902.

Frydl, E. J. (1999). The Length and Cost of Banking Crises. In *IMF Working Papers* (Vol. 99, Issue 30, p. 1). https://doi.org/10.5089/9781451844894.001

Hadi, A. (2007). Metodologi Penelitian Pendidikan. In *Pustaka Setia*. Pustaka Setia.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis*. The Guilford Press.

Horvath, R., & Seidler, J. (2013). How bank competition influence liquidity creation Institute for Economies in Transition. *BOFIT Discussion Papers*, *16*.

Horváth, R., Seidler, J., & Weill, L. (2014). Bank Capital and Liquidity Creation: Granger-Causality Evidence. *Journal of Financial Services Research*, *45*(3), 341–361. https://doi.org/10.1007/s10693-013-0164-4

Laeven, L. A., & Valencia, F. V. (2012). Systemic Banking Crises Database: An Update. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2096234

Love, I., & Peria, M. S. M. (2012). How Bank Competition Affects Firms' Access to Finance. *The World Bank Economic Review*, *29*(3).

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

Rubi, A., & Albaity, M. (2019). The Determinants of Bank Capital for East Asian Countries. *Global Business Review*, *20*(1).

Santiago, C.-V., Francisco, Rodríguez-Fernández, & Udell, G. (2009). Bank Market Power and SME Financing Constraints. *Review of Finance*, *13*(2), 309–340.

Schaeck, K., & Cihák, M. (2012). Banking Competition and Capital Ratios. *European Financial Management*, *18*(5), 836–866. https://doi.org/10.1111/j.1468-036X.2010.00551.x

Schaeck, K., Cihak, M., & Wolfe, S. (2009). Are competitive banking systems more stable? *Journal of Money, Credit and Banking*, *41*(4), 711–734. https://doi.org/10.1111/j.1538-4616.2009.00228.x

Tran, V. T., Lin, C. T., & Nguyen, H. (2016). Liquidity creation, regulatory capital, and bank profitability. *International Review of Financial Analysis*, *48*, 98–109. https://doi.org/10.1016/j.irfa.2016.09.010

von Thadden, E. L. (2004). Bank capital adequacy regulation under the new Basel accord. *Journal of Financial Intermediation*, *13*(2), 90–95. https://doi.org/10.1016/j.jfi.2003.04.002

Waldo, D. G. (1985). Bank runs, the deposit-currency ratio and the interest rate. *Journal of Monetary Economics*, *15*(3), 269–277. https://doi.org/10.1016/0304-3932(85)90015-7

Zheng, C., (Wai Kong) Cheung, A., & Cronje, T. (2019). The moderating role of capital on the relationship between bank liquidity creation and failure risk. *Journal of Banking and Finance*, *108*, 105651. https://doi.org/10.1016/j.jbankfin.2019.105651

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods* (9th ed.). Cengage Learning.