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From risk to resilience: Ownership moderation in the geopolitical risk–cash holdings nexus of Indonesian banks

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Abstract

Purpose — This study examines the effect of geopolitical risk on bank cash holdings in Indonesia and investigates whether institutional, foreign, and government ownership moderate this relationship.
Method — The empirical analysis employs System Generalized Method of Moments (System GMM) to address endogeneity inherent in dynamic panel models with lagged dependent variables. Serial correlation is diagnosed via the Arellano–Bond test, and instrument validity is confirmed through Hansen and Sargan tests.
Findings — Geopolitical risk, including both perceived threats and realized geopolitical events, has a significant negative effect on bank cash holdings. The results also indicate persistence in banks' cash policies. Institutional ownership positively affects cash reserves; however, its interaction with geopolitical risk is negative, suggesting that geopolitical pressures weaken the prudential role of institutional investors. Foreign and government ownership shows no significant direct or moderate effects.
Implications — Bank managers and regulators should incorporate geopolitical exposure and ownership characteristics into liquidity risk assessment and cash management policies. Adaptive liquidity frameworks are necessary to balance financial resilience and intermediation efficiency during periods of heightened global uncertainty.
Originality — This study provides new evidence on the joint influence of external geopolitical shocks and internal ownership structures on bank liquidity decisions in an emerging economy.
Keywords: Cash Holdings, Geopolitical Risk, Ownership Structure.
JEL Classification: G21; G32; G34

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Introduction

Geopolitical risk (GPR) denotes political and security uncertainties arising from interstate conflicts, terrorism, and diplomatic tensions that destabilize economic conditions across advanced and emerging markets (Caldara and Iacoviello, 2022). Empirical evidence consistently links GPR to higher sovereign borrowing costs, tighter credit supply, and cross-border capital flow reversals (Subramaniam, 2021;

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Lu et al., 2020; NguyenHuu and Örsal, 2023). At the firm level, GPR constrains foreign direct investment and disrupts global supply chains, prompting operational risk adjustments (Yu and Wang, 2023; Liu, 2024; Barman and Mahakud, 2024).

GPR is increasingly seen as an important variable affecting the banking sector, particularly in relation to bank liquidity and cash holdings. Instability triggered by political, economic, and social tensions has prompted financial institutions to adopt a more conservative approach to their financial strategies, which in turn affects their cash management and liquidity positions. The direct relationship between GPR and bank liquidity stems from the increased uncertainty caused by geopolitical escalation. In such conditions, banks tend to increase cash reserves as a precautionary measure against potential liquidity crises. Behera and Mahakud (2024) show that companies, including banks, significantly adjust their cash reserves in response to geopolitical risks, with the aim of reducing external funding frictions that are exacerbated by global uncertainty.

In line with this, research by Guizani, Talbi and Abdalkrim (2023) confirms that banks facing high geopolitical uncertainty tend to adopt stricter cash management practices to withstand cash flow fluctuations. The implications of GPR do not stop at short-term cash decisions, but extend to the overall stability and performance of banks. Adel and Naili (2024) emphasize the importance of banks designing more careful risk management strategies to deal with geopolitical volatility, as this factor can increase capital and funding costs due to increased risk perception. This confirms that banks exposed to high geopolitical risk not only need to increase liquidity but also adjust liquidity pricing in their funding operations.

From a historical perspective, dependence on liquidity during periods of crisis has also been shown to increase when GPR peaks. Carlson and Jaremski (2018) show that dependence on cash can exacerbate liquidity pressures, especially when banks are heavily reliant on external sources of liquidity that are vulnerable to disruption from geopolitical instability. This condition is in line with the findings of Dhifaoui *et al.* (2023), which reveal that GPR has the potential to hamper economic activity and indirectly disrupt banks' ability to generate cash flow, although their study focused more on environmental aspects than banking conditions. In the long term, the relationship between GPR and bank liquidity shows adaptive dynamics.

Banks are increasingly adopting a diversified approach to cash management, where larger cash reserves can signal strong risk management in the face of geopolitical uncertainty (d'Udekem, 2014). In addition, Andriani, Ashsifa and Kuncoro (2024) emphasize that geopolitical conditions also force banks to adjust their credit policies, which indirectly affects their liquidity position. The purpose of this study is to investigate the relationship between geopolitical risk (GPR) and cash holdings in the banking sector by placing ownership structure as a moderating variable. This study is important because GPR is increasingly recognized as a significant external factor influencing the financial strategies of banking institutions, especially in terms of cash and liquidity management.

In this context, the study aims to explain how geopolitical uncertainty encourages banks to adjust their cash reserves as a precautionary measure against liquidity risk. Previous literature confirms that geopolitical uncertainty and economic policy are the main factors driving companies and banks to increase their cash holdings. Duong *et al.* (2017) found a strong positive correlation between policy uncertainty and corporate cash holdings in the United States, indicating that the higher the uncertainty, the greater the tendency for companies to hold cash as a protective measure.

Guizani, Talbi and Abdalkrim (2023) also prove that geopolitical and economic uncertainty in emerging markets, such as Saudi Arabia, encourages companies to increase cash reserves as a risk mitigation measure against economic volatility. Similarly, Priya and Sharma (2023) emphasize that companies with limited access to external financing tend to hold larger cash reserves in order to survive in an uncertain environment.

The mechanism underlying corporate cash ownership decisions is also an important part of the explanation. Chen *et al.* (2023) state that companies implement cash hoarding strategies during periods of economic policy uncertainty as a buffer against potential financial shocks. Su *et al.* (2020) add that this precautionary motive becomes even more dominant when uncertainty has a direct impact on cash flow. Roring and Juliana (2022) show that volatility arising from economic uncertainty has a negative impact on cash holding strategies, requiring companies to maintain higher liquidity. The implications of geopolitical uncertainty apply not only to companies, but also have a significant impact on bank operations. Davydov, King and Weill (2024) assert that economic policy uncertainty encourages banks to hoard liquidity, which directly affects their cash management strategies.

Research by Dang and Nguyen (2022) also shows that uncertainty exacerbates the liquidity risk faced by banks while affecting corporate cash reserves. Chen *et al.* (2023) highlight that companies with larger cash reserves have the opportunity to capture new investment opportunities when stability returns. Phan *et al.* (2017) support this view by explaining that adaptive strategies allow companies to maintain flexibility in uncertain conditions. Trần (2020) also asserts that in unavoidable situations, companies choose to prioritize cash holdings, reflecting financial conservatism.

Furthermore, this study adds an important dimension by including ownership structure as a moderating variable. Ownership structure has been shown to have a significant effect on cash holdings decisions in financial institutions. Yeddou and Pourroy (2020) reveal that banks with concentrated ownership tend to hold larger amounts of cash as a mechanism to reduce agency problems, thereby ensuring the availability of liquidity for operational needs. Saxena and Sahoo (2022) support these findings by showing that ownership concentration encourages companies to hold more cash reserves, confirming the relevance of ownership structure in liquidity strategies. The literature also shows that ownership structure can shape different risk aversion behaviors related to cash holdings. Al-Shaikhli *et al.* (2024) found that banks with concentrated ownership tend to be more cautious in dealing with risk.

The research gap this study addresses is threefold. Prior literature on GPR focuses predominantly on macro-level effects, leaving bank-level cash responses understudied. Studies on ownership structure apply agency theory to cash behavior under normal conditions, but not under geopolitical stress. Critically, the distinction between domestic and foreign government ownership has been analytically neglected: banks majority-owned by foreign sovereign wealth funds, operate under fundamentally different political incentives than domestically state-controlled institutions, with divergent expectations regarding soft financing, emergency liquidity support, and political risk exposure. This study fills these three gaps by integrating GPR, disaggregated ownership types, and their interactions within a unified dynamic panel framework. Most of the previous literature emphasizes the impact of GPR and economic policy uncertainty on corporate cash behavior (Duong *et al.*, 2017; Guizani, Talbi and Abdalkrim, 2023; Priya and Sharma, 2023), but not many studies have focused on banking as a central actor in financial system stability.

On the other hand, studies on ownership structure generally relate it to agency theory, where conflicts of interest between principals and agents influence managerial decisions regarding cash (Abdioğlu, 2016; Hasan, Habib and Zhao, 2021). However, the integration between GPR, cash holdings, and ownership structure is still rarely described simultaneously, so this study presents a novelty by filling this theoretical gap.

The novelty of this study lies in its multidimensional approach, which combines GPR as an external factor with ownership structure as an internal factor to explain variations in bank liquidity decisions. This context is important because cash in the perspective of agency theory is ambivalent: it can be an instrument of protection against uncertainty, but it also has the potential to increase agency costs if not effectively monitored (Yeddou and Pourroy, 2020; Gao and Li, 2021). By placing ownership structure as a moderator, this study seeks to prove whether ownership concentration can strengthen managerial oversight in managing cash reserves or instead create inefficiencies in cash usage.

The academic contribution of this research is to broaden the understanding of GPR and cash holdings dynamics within the framework of agency theory, by providing more specific empirical evidence in the banking sector. This study also enriches the corporate governance literature by showing how ownership configurations influence liquidity strategies in unstable geopolitical conditions. Meanwhile, the practical contribution of this study is to provide insights for regulators, bank managers, and investors regarding the importance of integrating external and internal factors in the design of liquidity strategies.

For regulators, these findings can serve as a basis for strengthening the framework for banking liquidity risk management policies. For bank managers, the results of this study can be used as a guideline for calibrating cash reserves by taking into account geopolitical pressures and ownership dynamics. For investors, this study provides a better understanding of how geopolitical risks and governance can affect the financial stability of banks, thereby supporting more rational investment decisions.

Geopolitical risk (GPR) exerts documented pressure on financial system stability through multiple transmission channels. Subramaniam (2021) demonstrates that rising GPR steepens the yield curve in BRICS sovereign bond markets, increasing government borrowing costs. Lu et al. (2020) confirms that GPR suppresses credit availability in emerging market financial systems, with consequent drag on real economic growth. NguyenHuu and Örsal (2023) establish Granger-causal links from geopolitical instability to financial stress indices across developing economies, validating GPR as a systemic shock variable. At the firm level, Yu and Wang (2023) show that GPR depresses inward foreign direct investment, while Liu (2024) documents supply-chain fragmentation as a channel through which geopolitical tensions reshape corporate operational risk exposure.

Precautionary motive theory predicts that firms accumulate liquid assets when access to external finance becomes uncertain or costly. Duong et al. (2017) provide evidence that policy uncertainty correlates positively with corporate cash accumulation in the United States, a pattern extended to emerging markets by Guizani, Talbi and Abdalkrim (2023) for Saudi Arabia. Chen et al. (2023) document cash-hoarding behavior among Chinese firms during elevated policy uncertainty episodes, while Su et al. (2020) confirm that the precautionary motive intensifies when uncertainty directly affects operating cash flow.

Within banking specifically, Davydov, King and Weill (2024) establish that policy uncertainty prompts liquidity hoarding, and Behera and Mahakud (2024) confirm that geopolitical escalation significantly adjusts bank cash reserves in emerging economies, consistent with the precautionary motive under external uncertainty.

Ownership structure modulates corporate cash policy through agency-theoretic mechanisms. Yeddou and Pourroy (2020) demonstrate that concentrated ownership reduces liquidity creation risk in banks, as large shareholders impose monitoring that curtails managerial discretion over idle cash. Saxena and Sahoo (2022) confirm that firms with concentrated ownership maintain larger precautionary buffers, consistent with principal-agent alignment reducing the cost of holding liquid assets. Government ownership introduces a distinct dimension: domestically state-owned banks benefit from implicit sovereign guarantees and emergency liquidity support, potentially reducing their precautionary cash imperative.

Foreign-government-owned banks, by contrast, such as those controlled by sovereign wealth funds of other nations, cannot rely on host-country backstops and operate under different political incentive structures, suggesting their cash response to GPR may follow a systematically different path (Barry, Lepetit and Tarazi, 2011). This ownership-type distinction has not been empirically tested in the GPR-cash nexus literature, constituting the primary theoretical gap this study addresses.

Methodology

This study used a sample of 46 banks in Indonesia, consisting of 4 state-owned banks and 42 non-state-owned banks. The selection of this number was based on considerations of the representativeness of the national banking industry, which includes institutions with different ownership characteristics. The research period covers the time span from the first quarter of 2009 (Q1 2009) to the fourth quarter of 2024 (Q4 2024), allowing for observation of both long-term dynamics and short-term fluctuations. The data used was sourced from company financial reports, official publications from the Indonesia Stock Exchange, and annual reports available on each bank's website.

This company-level data was selected because it is able to describe the fundamental financial condition of banks in detail, such as cash, assets, and other relevant liquidity indicators. In addition, the geopolitical risk variable was obtained from an index developed by Caldara and Iacoviello (2022), which measures global geopolitical uncertainty through an analysis of the frequency of international news related to conflicts, wars, and political tensions.

The dependent variable, cash holdings, is measured using two proxies, namely CASHTA, which represents the ratio of cash and cash equivalents to total assets, and LNCASHTA, which is the natural logarithm of this ratio. The main independent variable, geopolitical risk (GPR), is measured through a news-based index that calculates the proportion of international media articles covering issues of war, terrorism, and global crises, which is then adjusted from daily or monthly frequencies to quarterly data using arithmetic averages. In addition, GPRA is also used as a component of GPR that only records the realization of geopolitical escalation events, such as the outbreak of war or terrorist attacks, thus reflecting the intensity of actual events.

This study uses panel data, which is a combination of cross-section and time series. The econometric approach used is a dynamic panel data model with the System Generalized Method of Moments (SysGMM) method, both one-step and two-step. This method was chosen based on SysGMM's ability to overcome problems of endogeneity, heteroscedasticity, and autocorrelation that often arise in dynamic panel data, especially when the model includes lagged dependent variables. The one-step SysGMM method was used because it is efficient under conditions of homogeneous error variance, while the two-step SysGMM was chosen to produce more consistent estimates with standard error corrections through Windmeijer finite-sample correction.

To ensure the consistency and reliability of the estimation, the study applied several diagnostic tests. The Arellano–Bond test was used to detect first- and second-order serial correlation, while the Hansen and Sargan tests were employed to assess the validity of the instruments. These tests indicate whether the SysGMM models are appropriately specified and capable of producing consistent estimates of the relationship between geopolitical risk, ownership structure, and bank cash holdings.

Table 1. *Variable Operationalization*

Variable	Operationalization
Dependent Variables:	
First Proxy Cash Holdings (CASHTA)	"The proportion of cash and cash equivalents to total assets (Hu, Li and Luo, 2019)."
Second Proxy Cash Holdings (LNCASHTA)	"The natural logarithm of the ratio of cash and cash equivalents to total assets (Hu, Li and Luo, 2019)."
Independent Variables:	
Geopolitical Risk (GPR)	"The GPR variable is operationalized as a news-based index that measures the proportion of articles in leading newspapers that mention threats or the realization of geopolitical events war, terrorism, and international crises (Caldara and Iacoviello, 2022). The index value is obtained as the ratio of the number of articles that meet the thematic search query (e.g., the combination of the words "war" with "threat/risk/crisis") to the total number of articles and is normalized over the sample period (Caldara and Iacoviello, 2022). In this study, monthly/daily GPRs are adjusted to quarterly frequencies through arithmetic averaging; higher values indicate greater geopolitical pressure that could potentially influence bank risk decisions (Caldara and Iacoviello, 2022)."
Geopolitical Risk Acts (GPRA)	"The GPRA (geopolitical acts) variable is operationalized as a component of GPR that only counts the realization/escalation of events the start of war, escalation of war, and acts of terrorism based on acts category queries (Caldara and Iacoviello, 2022). In terms of construction, this index captures the intensity of actual event-driven incidents, not merely threats (Caldara and Iacoviello, 2022). GPRA values are aggregated quarterly through averaging to align with bank data; higher numbers indicate increased intensity of geopolitical incidents (Caldara and Iacoviello, 2022)."
Geopolitical Risk Threats (GPRT)	"The GPRT (geopolitical threats) variable is operationalized as a component of GPR that calculates media coverage of threats including threats of war, disruption of peace, military buildup, and nuclear and terrorist threats without requiring action to occur

Variable	Operationalization
	(Caldara and Iacoviello, 2022). The index construction uses a two-word proximity search between topic words (e.g., war, military, terrorism) and threat words (e.g., threat, risk, crisis), then normalized against the total number of articles (Caldara and Iacoviello, 2022). The GPRT is then aligned to quarterly frequencies with an average, so that higher values reflect increased perceptions of geopolitical threats that could potentially drive changes in banks' risk-taking behavior (Caldara and Iacoviello, 2022)."
Moderating Variable	
Institutional Ownership (INSTOWN)	Measured as the percentage of share ownership by institutional investors (Bose *et al.*, 2018).
Foreign Ownership (FOREIGN)	Measured as the percentage of shares owned by foreign investors (Bose *et al.*, 2018).
Government Ownership (GOVOWN)	Measured as the percentage of shareholding by the government (Bose *et al.*, 2018).
Control Variable	
Accounts Receivable (AR)	"Accounts receivable divided by total assets (DeFond *et al.*, 2024)."
Firm Size (SIZE)	"Measured as the natural logarithm of the company's total assets (Amin et al., 2023)."
Inflation (INFL)	"Inflation is measured based on the percentage change in the annual consumer price index (CPI) published by Bank Indonesia in each quarter of observation (Petria, Capraru and Ihnatov, 2015; Le and Ngo, 2020)."

Source: Processed by Author

To ensure the validity of the model, this study uses the Arellano-Bond test to detect first- and second-order autocorrelation, as well as the Hansen and Sargan tests to examine the validity of the instruments and the accuracy of the model specification. The following is the econometric model used in the study.

$$Cash\ Holdings_{i,d} = f\begin{pmatrix} Geopolitical\ Risk_{i,d} \\ Ownership\ Structure_{i,d} \\ Geopolitical\ Risk_{i,d} \times Ownership\ Structure_{i,d} \end{pmatrix} + \varphi_{i,d} \quad (1)$$

The Cash Variable consists of the CASHTA and LNCASHTA variables. The Ownership Structure variable consists of the Institutional Ownership (INSTOWN), Foreign Ownership (FOREIGN), and Government Ownership (GOVOWN) variables. Meanwhile, the Geopolitical Risk variable consists of Geopolitical Risk (GPR), Geopolitical Risk Action (GPRA), and Geopolitical Risk Threat (GPRT).In addition, this model also includes a control variable (φ_(i,d)), which represents other factors that can influence investment decisions, such as Accounts Receivable (AR), Firm Size (SIZE), and Inflation (INFL).

Results and Discussion

Descriptive statistics provide an overview of the characteristics of the research variables used. The dependent variable of cash holdings, proxied by CASHTA, shows an average value of 0.129 with a minimum value of 0.023 and a maximum value of 0.227, indicating a wide variation in the proportion of cash to total interbank assets. The second proxy, LNCASHTA, has an average of 0.12 with a minimum value of 0.022 and a maximum of 0.205, reflecting a relatively consistent distribution with the logarithmic measure of the cash-to-assets ratio.

In terms of moderating variables, institutional ownership (INSTOWN) shows an average of 0.758 with a minimum value of 0.038 and a maximum of 0.987, which means that most banks in the sample are dominated by institutional ownership. Meanwhile, foreign ownership (FOREIGN) averaged 0.336 with a range of 0 to 0.987, indicating that there are banks with no foreign ownership as well as banks with significant foreign ownership.

The government ownership variable (GOVOWN) has an average of 0.091 with a minimum value of 0 and a maximum of 0.795, confirming that most banks have a relatively low portion of government ownership, except for certain banks that are majority-owned by the state. For the control variable, accounts receivable (AR) has an average of 0.006 with little variation, reflecting the relatively low contribution of accounts receivable to total bank assets. Company size (SIZE) shows a natural logarithm average value of 30.886 with a minimum of 28.3 and a maximum of 33.429, indicating considerable heterogeneity in bank size within the sample.

Inflation (INFL) during the study period had an average of 3.914 percent with a range of 1.533 to 7.466 percent, illustrating fluctuations in macroeconomic stability that also influenced bank liquidity decisions.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
CASHTA	2367	.129	.061	.023	.227
LNCASHTA	2367	.12	.054	.022	.205
INSTOWN	2367	.758	.175	.038	.987
FOREIGN	2367	.336	.398	0	.987
GOVOWN	2367	.091	.225	0	.795
AR	2367	.006	.006	0	.019
SIZE	2367	30.886	1.693	28.3	33.429
INFL	2367	3.914	1.983	1.533	7.466

Source: Processed by Author

The correlation matrix in Table 3 shows the relationship between relevant research variables for further analysis. The dependent variable of cash holdings, proxied by CASHTA, has a positive and significant correlation with inflation (0.076; $p<0.01$), indicating that an increase in inflation tends to encourage banks to increase their cash reserves as a form of prudence.

Table 3. Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) CASHTA	1.000							
(2) LNCASHTA	1.000***	1.000						
	(0.000)							
(3) INSTOWN	-0.022	-0.022	1.000					
	(0.290)	(0.288)						
(4) FOREIGN	-0.023	-0.023	0.623***	1.000				
	(0.262)	(0.260)	(0.000)					
(5) GOVOWN	0.025	0.026	-0.229***	-0.341***	1.000			
	(0.221)	(0.212)	(0.000)	(0.000)				
(6) AR	-0.017	-0.017	-0.034*	0.043**	0.311***	1.000		
	(0.404)	(0.422)	(0.094)	(0.035)	(0.000)			
(7) Size	0.008	0.009	-0.072***	0.055***	0.397***	0.400***	1.000	
	(0.697)	(0.654)	(0.000)	(0.008)	(0.000)	(0.000)		
(8) INFL	0.076***	0.074***	-0.009	0.004	0.037*	0.018	-0.090***	1.000
	(0.000)	(0.000)	(0.647)	(0.848)	(0.068)	(0.379)	(0.000)	

**** p<0.01, ** p<0.05, * p<0.1*

Source: Processed by Author

Similar results are seen in the second proxy, LNCASHTA, which also correlates positively with inflation (0.074; p<0.01), thus reinforcing the consistency of the relationship between macroeconomic pressures and bank liquidity decisions. Meanwhile, CASHTA and LNCASHTA have a very high correlation (1.000; p<0.01) because they are different measures of the same variable, which is methodologically reasonable.

On the moderating variable side, institutional ownership (INSTOWN) did not show a significant correlation with both cash holdings proxy, indicating that variations in institutional ownership did not directly affect bank cash policy in the sample. Similarly, foreign ownership (FOREIGN) shows a negative but insignificant correlation with CASHTA and LNCASHTA, suggesting that the role of foreign ownership in cash decisions is more complex and may be influenced by other factors. Conversely, government ownership (GOVOWN) shows a positive but insignificant correlation with cash holdings, indicating that banks with a larger share of state ownership tend to have slightly higher cash reserves, although this relationship is not statistically significant.

The regression results show that the dependent variable of cash holdings, whether proxied by CASHTA or LNCASHTA, is consistently influenced by the independent variable representing geopolitical risk. The lagged cash holdings coefficients (L.CASHTA and L.LNCASHTA) are always positive and significant, confirming the existence of a persistence effect, whereby cash decisions in the previous period play an important role in determining cash policy in the following period. The GPR variable shows a significant negative effect on cash holdings in all models, meaning that increased geopolitical uncertainty leads to a decline in the proportion of cash to total bank assets.

Similar results are shown by GPRT, which also has a significant negative coefficient, indicating that the perception of geopolitical threats, even if not yet realized in the form of actual conflict, still pressures banks' decisions to hold cash.

Table 4. Regression Results for GPR as an Independent Variable

	(1) CASHTA One-Step SysGMM	(2) CASHTA Two-Step SysGMM	(3) LNCASHTA One-Step SysGMM	(4) LNCASHTA Two-Step SysGMM
L.CASHTA	0.0712***	0.0768***		
	(0.0228)	(0.0253)		
L.LNCASHTA			0.0685***	0.0740***
			(0.0230)	(0.0253)
GPR	-0.0004***	-0.0004***	-0.0003***	-0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
SIZE	0.0048***	0.0049***	0.0045***	0.0046***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
AR	-0.4133**	-0.4079**	-0.3807**	-0.3910**
	(0.1744)	(0.1954)	(0.1543)	(0.1726)
INFL	0.0026***	0.0031***	0.0024***	0.0028***
	(0.0007)	(0.0007)	(0.0006)	(0.0007)
Observations	2316	2316	2316	2316
Number of Groups	46	46	46	46
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.494	0.551	0.412	0.472
Hansen p-value	0.053	0.053	0.062	0.062
Sargan p-value	0.142	0.142	0.155	0.155

Source: Processed by Author

Tabel 5. Regression Results for GPRT as an Independent Variable

	(1) CASHTA One-Step SysGMM	(2) CASHTA Two-Step SysGMM	(3) LNCASHTA One-Step SysGMM	(4) LNCASHTA Two-Step SysGMM
L.CASHTA	0.0678***	0.0695***		
	(0.0224)	(0.0268)		
L.LNCASHTA			0.0650***	0.0672**
			(0.0227)	(0.0270)
GPRT	-0.0002*	-0.0002**	-0.0001**	-0.0002**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
SIZE	0.0042***	0.0044***	0.0039***	0.0041***
	(0.0003)	(0.0003)	(0.0002)	(0.0003)
AR	-0.3505**	-0.3457*	-0.3249**	-0.3342*
	(0.1698)	(0.2026)	(0.1496)	(0.1783)
INFL	0.0024***	0.0027***	0.0021***	0.0025***
	(0.0007)	(0.0008)	(0.0006)	(0.0007)
Observations	2316	2316	2316	2316
Number of Groups	46	46	46	46
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.516	0.509	0.425	0.434
Hansen p-value	0.051	0.052	0.052	0.052
Sargan p-value	0.051	0.051	0.056	0.056

Source: Processed by Author

Tabel 6. Regression Results for GPRA as an Independent Variable

	(1) CASHTA One-Step SysGMM	(2) CASHTA Two-Step SysGMM	(3) LNCASHTA One-Step SysGMM	(4) LNCASHTA Two-Step SysGMM
L.CASHTA	0.0698***	0.0748***		
	(0.0230)	(0.0264)		
L.LNCASHTA			0.0670***	0.0723***
			(0.0232)	(0.0265)
GPRA	-0.0002**	-0.0002**	-0.0002**	-0.0002**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
SIZE	0.0042***	0.0042***	0.0039***	0.0039***
	(0.0002)	(0.0003)	(0.0002)	(0.0002)
AR	-0.3333*	-0.3589*	-0.3059*	-0.3408*
	(0.1806)	(0.2135)	(0.1592)	(0.1875)
INFL	0.0025***	0.0027***	0.0023***	0.0024***
	(0.0007)	(0.0008)	(0.0006)	(0.0007)
Observations	2316	2316	2316	2316
Number of Groups	46	46	46	46
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.862	0.945	0.773	0.866
Hansen p-value	0.059	0.059	0.054	0.054
Sargan p-value	0.073	0.073	0.082	0.082

Source: Processed by Author

Similarly, GPRA, as a measure of the intensity of actual geopolitical events, shows a significant negative coefficient in all estimates, meaning that the escalation of conflict or acts of terrorism has a direct implication on the decline in bank cash reserves.

The consistent negative influence of GPR, GPRT, and GPRA on cash holdings proves that both the threat and realization of geopolitical events play a significant role in reducing bank cash reserves, making exposure to external uncertainty a key determinant in banking liquidity management.Cash holdings proxied by CASHTA and LNCASHTA are influenced by geopolitical risk dynamics with ownership structure as a moderating variable. In institutional ownership has a significant positive effect on cash reserves, indicating that institutional ownership can strengthen market discipline in bank liquidity management.

However, the interaction between GPR and institutional ownership is significantly negative, meaning that even though institutional investors encourage prudence, geopolitical pressures reduce banks' tendency to increase cash holdings. Meanwhile, foreign ownership does not have a significant effect on cash holdings, nor does its interaction with GPR, GPRA, and GPRT, which are also insignificant.

This indicates that foreign ownership does not play a significant moderating role in the relationship between geopolitical risk and bank cash policy. Furthermore, Table 9 shows that government ownership is also insignificant in influencing cash holdings, and its interaction with GPR, GPRA, and GPRT does not have a significant effect. This condition indicates that government ownership is not strong enough to withstand the impact of geopolitical risks on bank cash reserves.

Table 7. Regression Results with Institutional Ownership as a Moderating Variable (Two-Step SysGMM)

	(1) CASHTA	(2) LNCASHTA	(3) CASHTA	(4) LNCASHTA	(5) CASHTA	(6) LNCASHTA
L.CASHTA	0.0594**		0.0578**		0.0523**	
	(0.0249)		(0.0242)		(0.0247)	
L.LNCASHTA		0.0560**		0.0547**		0.0496**
		(0.0253)		(0.0244)		(0.0251)
INSTOWN	0.4491***	0.3952***	0.4286**	0.3831***	0.4216***	0.3688***
	(0.1599)	(0.1407)	(0.1679)	(0.1459)	(0.1507)	(0.1323)
GPR	-0.0013**	-0.0012**				
	(0.0007)	(0.0006)				
GPR*INSTOWN	-0.0021***	-0.0019***				
	(0.0008)	(0.0007)				
GPRA			-0.0009**	-0.0008**		
			(0.0005)	(0.0004)		
GPRA*INSTOWN			-0.0013**	-0.0012**		
			(0.0006)	(0.0005)		
GPRT					-0.0010**	-0.0009**
					(0.0005)	(0.0004)
GPRT*INSTOWN					-0.0015**	-0.0013**
					(0.0006)	(0.0005)
SIZE	-0.0066	-0.0055	-0.0067	-0.0059	-0.0063	-0.0052
	(0.0041)	(0.0036)	(0.0043)	(0.0038)	(0.0039)	(0.0034)
AR	0.5422	0.4487	0.4146	0.3482	0.5647	0.4594
	(0.5560)	(0.4938)	(0.6488)	(0.5743)	(0.6227)	(0.5469)
INFL	0.0015	0.0014*	0.0017*	0.0015*	0.0016**	0.0015**
	(0.0009)	(0.0008)	(0.0009)	(0.0008)	(0.0008)	(0.0007)
Observations	2316	2316	2316	2316	2316	2316
AR(1)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2)	0.4246	0.3461	0.6149	0.5346	0.3973	0.3196
Hansen J	0.3161	0.2847	0.2738	0.2822	0.2750	0.2611
Sargan	0.2684	0.2478	0.3654	0.3669	0.2442	0.2339

Source: Output from STATA

Table 8. *Regression Results with Foreign Ownership as a Moderating Variable (Two-Step SysGMM)*

	(1) CASHTA	(2) LNCASHTA	(3) CASHTA	(4) LNCASHTA	(5) CASHTA	(6) LNCASHTA
L.CASHTA	0.0782***		0.0765***		0.0699***	
	(0.0245)		(0.0257)		(0.0261)	
L.LNCASHTA		0.0751***		0.0738***		0.0674**
		(0.0246)		(0.0258)		(0.0263)
FOREIGN	0.0478	0.0447	0.0329	0.0325	0.0407	0.0367
	(0.0518)	(0.0456)	(0.0579)	(0.0509)	(0.0490)	(0.0432)
GPR	-0.0003*	-0.0003*				
	(0.0002)	(0.0001)				
GPR*FOREIGN	-0.0004	-0.0003				
	(0.0003)	(0.0003)				
GPRA			-0.0001	-0.0001		
			(0.0001)	(0.0001)		
GPRA*FOREIGN			-0.0001	-0.0001		
			(0.0002)	(0.0002)		
GPRT					-0.0001	-0.0001
					(0.0001)	(0.0001)
GPRT*FOREIGN					-0.0003	-0.0003
					(0.0002)	(0.0002)
SIZE	0.0043***	0.0040***	0.0037***	0.0035***	0.0039***	0.0036***
	(0.0007)	(0.0006)	(0.0008)	(0.0007)	(0.0006)	(0.0006)
AR	-0.3769	-0.3637*	-0.3326	-0.3185	-0.2999	-0.2938
	(0.2336)	(0.2087)	(0.3120)	(0.2807)	(0.2368)	(0.2089)
INFL	0.0030***	0.0027***	0.0028***	0.0025***	0.0027***	0.0024***
	(0.0007)	(0.0006)	(0.0008)	(0.0007)	(0.0008)	(0.0007)
Observations	2316	2316	2316	2316	2316	2316
AR(1)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2)	0.6013	0.5147	0.9627	0.8811	0.5535	0.4679
Hansen J	0.1172	0.1352	0.0522	0.0605	0.0571	0.0507
Sargan	0.2443	0.2626	0.1596	0.1773	0.1054	0.1146

Source: Output from STATA

Table 9. Regression Results with Government Ownership as a Moderating Variable (Two-Step SysGMM)

	(1) CASHTA	(2) LNCASHTA	(3) CASHTA	(4) LNCASHTA	(5) CASHTA	(6) LNCASHTA
L.CASHTA	0.0756***		0.0736***		0.0681**	
	(0.0254)		(0.0264)		(0.0271)	
L.LNCASHTA		0.0727***		0.0710***		0.0657**
		(0.0255)		(0.0265)		(0.0272)
GOVOWN	0.0281	0.0262	0.0450	0.0406	0.0506	0.0463
	(0.0367)	(0.0334)	(0.0597)	(0.0540)	(0.0342)	(0.0305)
GPR	-0.0005***	-0.0004***				
	(0.0001)	(0.0001)				
GPR*GOVOWN	0.0002	0.0002				
	(0.0004)	(0.0004)				
GPRA			-0.0002**	-0.0002***		
			(0.0001)	(0.0001)		
GPRA*GOVOWN			0.0002	0.0001		
			(0.0004)	(0.0004)		
GPRT					-0.0002*	-0.0002**
					(0.0001)	(0.0001)
GPRT*GOVOWN					-0.0001	-0.0001
					(0.0004)	(0.0003)
Size	0.0049***	0.0046***	0.0041***	0.0038***	0.0043***	0.0040***
	(0.0004)	(0.0003)	(0.0003)	(0.0002)	(0.0004)	(0.0003

	(1) CASHTA	(2) LNCASHTA	(3) CASHTA	(4) LNCASHTA	(5) CASHTA	(6) LNCASHTA
AR	-0.7648**	-0.7094**	-0.7737*	-0.7066**	-0.6720**	-0.6226**
	(0.3329)	(0.2936)	(0.4006)	(0.3559)	(0.3414)	(0.2973)
INFL	0.0031***	0.0028***	0.0027***	0.0024***	0.0027***	0.0025***
	(0.0007)	(0.0006)	(0.0007)	(0.0006)	(0.0008)	(0.0007)
Observations	2316	2316	2316	2316	2316	2316
AR(1)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2)	0.5107	0.4340	0.8833	0.8048	0.4616	0.3895
Hansen J	0.0930	0.1066	0.0528	0.0621	0.0591	0.0516
Sargan	0.2245	0.2429	0.1313	0.1459	0.0809	0.0898

Source: Output from STATA

This study aims to examine the relationship between geopolitical risk and cash holdings in the banking sector by including ownership structure as a moderating variable. The results of the analysis show that cash holdings are consistently influenced by geopolitical risk, where the lagged cash holdings coefficient is significantly positive, confirming the existence of a persistence effect in cash policy. All geopolitical risk variables have a significant negative effect on bank cash reserves, which means that increased geopolitical uncertainty, whether in the form of threats or actual conflict escalation, encourages banks to reduce the proportion of cash to total assets.

These findings prove that external risks arising from geopolitical dynamics are an important determinant in banking liquidity management. Furthermore, the estimation results also show that institutional ownership has a positive effect on cash reserves, but its interaction with GPR is significantly negative, indicating that although institutional investors encourage prudence, geopolitical escalation weakens this supervisory role. Meanwhile, foreign ownership and government ownership do not show a significant influence, either directly or in interaction with the geopolitical risk variable, so it can be concluded that both are not strong enough to moderate the relationship between geopolitical risk and bank cash holdings.

The policy recommendations from this study emphasize the importance of integrating external factors, such as geopolitical risk, and internal factors, such as ownership structure, into the design of bank liquidity management. Theoretically, these findings enrich the literature on the relationship between geopolitical risk and cash holdings by providing empirical evidence that ownership structure, particularly institutional ownership, can strengthen market discipline but is not always effective in dealing with geopolitical escalation, thereby broadening the understanding of the role of governance in the agency theory framework. In practical terms, this research encourages regulators to design liquidity policies that are more adaptive to global uncertainty by considering the ownership configuration of banks, while also providing guidance for bank management to balance the need for intermediation efficiency with defensive strategies in maintaining cash reserves. For investors, the results of this study signal that geopolitical dynamics can affect the financial stability of banks, making it important to assess governance and ownership structure when making investment decisions.

This study has limitations in its use of news-based geopolitical risk indices, which, although credible, do not fully capture local or regional nuances that may be relevant to Indonesian banking conditions. In addition, the study's focus on institutional, foreign, and government ownership does not cover other forms of ownership, such as family or management ownership, which also have the potential to influence cash policy.

Going forward, further research should include more comprehensive monetary policy controls, such as the Minimum Reserve Requirement (GWM) and Bank Indonesia's policy interest rate (BI 7-Day Reverse Repo Rate/BI7DRR), so that cash sensitivity to reserve requirements and monetary stance can be quantified more accurately. Future research could explore other intermediary mechanisms, such as governance quality or dividend policy, as well as cross-country comparisons to gain a broader understanding of how geopolitical factors influence liquidity strategies in the global financial system.

AI declaration

The authors declare that artificial intelligence (AI) tools were used solely to assist in language refinement, grammar checking, and improving the clarity of writing. The use of AI did not influence the research design, data collection, data analysis, interpretation of results, or the development of conclusions. All intellectual contributions, including conceptualization, methodology, analysis, and final content, remain the full responsibility of the authors.

Conflict Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper. The research was conducted independently without any financial, commercial, or personal relationships that could be construed as a potential conflict of interest.

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