

Beyond Geopolitical Shocks: How Institutional Quality and Ownership Structure Heterogeneity Shape Nonlinear Banking Resilience in MENA

Aya Abdelbaky

Beijing University of Technology

Esraa Fathi

Cairo University

Mohamed Lotfy

Imam Mohammad ibn Saud Islamic University

Yazeed Alkhrijah

Imam Mohammad ibn Saud Islamic University

Ahmed Rashed

`ahmed_rashed@foc.cu.edu.eg`

Cairo University

Aya Samir Barakat

Kafrelsheikh University

Article

Keywords: Geopolitical tensions, Financial resilience, Institutional quality, Ownership structure, MENA, GMM, DID

Posted Date: September 7th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10543670/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations:

No competing interests reported.

Tables are available in the Supplementary Files section.

Figures are available in the Supplementary Files section.

Beyond Geopolitical Shocks: How Institutional Quality and Ownership Structure Heterogeneity Shape Nonlinear Banking Resilience in MENA

Aya Abdelbaky^{1,2}, Esraa Fathi³, Mohamed Lotfy⁴, Yazeed Alkhrijah⁵, Ahmed Rashed^{6*}, Aya Samir Barakat⁷

¹ School of Economics and Management, Beijing University of Technology, Beijing 100124, China

² Department of Accounting, Faculty of Commerce, Damietta University, New Damietta 34511, Egypt ayarizk@du.edu.eg

³ Department of Accounting, Faculty of Commerce, Cairo University, Egypt, esraa.fathil@foc.cu.edu.eg

⁴ College of Business, Imam Mohammad Ibn Saud Islamic University (IMSIU), Riyadh 11432, Riyadh, Saudi Arabia, e-mail: MABOUELENEIN@imamu.edu.sa

⁵ Department of Electrical Engineering, Imam Mohammad ibn Saud Islamic University (IMSIU), e-mail: Ymalkhrijah@imamu.edu.sa

⁶ Faculty of Commerce, Cairo University, e-mail: ahmed_rashed@foc.cu.edu.eg

⁷ Faculty of Commerce, Kafrelsheikh University, Egypt, e-mail: aya_barakat@com.kfs.edu.eg

Correspondence: ahmed_rashed@foc.cu.edu.eg

Abstract

Geopolitical tensions have become an increasingly important source of uncertainty affecting financial resilience, particularly in regions characterized by persistent political instability and institutional heterogeneity. We develop a comprehensive framework by exploring the nonlinear effect of geopolitical tensions and examining how institutional quality and ownership structure condition banks' resilience to geopolitical shocks across 112 banks across MENA countries during 2007–2024 using dynamic system GMM estimations. Our findings show that geopolitical tensions exhibit a nonlinear relationship with financial resilience. Initial increases in geopolitical tensions significantly reduce resilience by increasing uncertainty, market instability, and default risk; however, at higher levels of geopolitical exposure, banks gradually adapt through stronger risk management and resilience-building strategies. Institutional quality significantly moderates the geopolitical tensions–financial resilience nexus. Stronger regulatory quality, government effectiveness, corruption control, rule of law, voice and accountability, and political stability mitigate the adverse consequences of geopolitical shocks. Ownership structure plays an important governance role, with state ownership, foreign ownership, domestic private ownership, and ownership concentration enhancing banks' ability to absorb geopolitical disruptions. Difference in differences confirm the causal negative impact of geopolitical instability on financial resilience. Furthermore, propensity score matching,

and entropy balancing approaches demonstrate that the findings remain robust after addressing potential selection bias. This paper contributes to geopolitical risk and financial resilience literature by showing that the consequences of geopolitical tensions depend not only on shock intensity but also on institutional capacity and ownership governance mechanisms. The findings provide important implications for policymakers and bank managers seeking to strengthen financial resilience in geopolitically vulnerable economies. **Keywords:** Geopolitical tensions; Financial resilience; Institutional quality; Ownership structure; MENA; GMM; DID.

1. Introduction

Financial resilience has become a central concern for banking systems facing increasing geopolitical uncertainty, economic disruptions, and global instability. Recent geopolitical events, including regional conflicts, diplomatic tensions, and military disruptions, have demonstrated that external shocks can rapidly transmit into financial markets through uncertainty channels, capital flows, asset prices, and borrower risk. Unlike conventional economic shocks, geopolitical tensions are difficult to predict and may generate persistent uncertainty that influences banks' lending decisions, liquidity management, risk-taking behavior, and solvency conditions (Caldara & Iacoviello, 2022). This issue is particularly relevant for the Middle East and North Africa (MENA) region, where banking systems operate under continuous geopolitical pressures arising from conflicts, political instability, and economic dependence on external markets. Existing literature has extensively examined the relationship between geopolitical risks and financial stability. Previous studies generally conclude that geopolitical tensions weaken banking resilience by increasing uncertainty, deteriorating asset quality, increasing non-performing loans, and reducing investor confidence (Phan et al., 2022; Trinh & Tran, 2024).

However, this literature has several important limitations. First, most studies assume a linear relationship between geopolitical risks and financial stability, implicitly suggesting that each additional increase in geopolitical tension produces a proportional deterioration in resilience. This assumption may overlook the adaptive behavior of banks and regulators, as financial institutions may gradually adjust their strategies through stronger capital buffers, improved risk management, and enhanced contingency planning after experiencing repeated geopolitical shocks. Second, previous studies mainly focus on the

direct consequences of geopolitical risks while paying limited attention to the institutional conditions that determine banks' ability to absorb geopolitical shocks. Institutional theory suggests that governance quality influences how external uncertainty is transmitted into financial markets. Strong institutions enhance regulatory effectiveness, improve transparency, reduce information asymmetry, and provide credible policy responses, potentially reducing the negative consequences of geopolitical instability. However, whether institutional quality acts as a buffering mechanism in the geopolitical tensions–financial resilience relationship remains insufficiently explored. Third, existing research pays limited attention to the role of ownership governance mechanisms in shaping banks' responses to geopolitical uncertainty. Ownership structure determines monitoring intensity, access to resources, risk-taking incentives, and strategic flexibility. State-owned banks may benefit from government support during crises, whereas foreign banks may rely on international expertise and risk diversification. Similarly, concentrated ownership may improve monitoring efficiency. Nevertheless, empirical evidence regarding whether ownership heterogeneity strengthens or weakens banking resilience under geopolitical shocks remains inconclusive.

To address these gaps, this study develops an integrated framework examining how geopolitical tensions influence financial resilience and how institutional and ownership mechanisms shape this relationship. Specifically, we address three research questions: First, does geopolitical tension affect financial resilience linearly or nonlinearly? Unlike previous studies that mainly identify negative linear effects, we argue that geopolitical tensions may initially damage resilience but eventually stimulate adaptive responses when shocks become persistent. Second, can institutional quality reduce the adverse impact of geopolitical tensions? Building on institutional theory, we investigate whether stronger governance environments allow banks to better absorb geopolitical uncertainty. Third, does ownership structure determine banks' ability to withstand geopolitical shocks? We examine whether different ownership forms provide governance advantages that enhance resilience.

Using a comprehensive sample of 112 MENA banks from 2007 to 2024, this study employs dynamic system GMM estimation to address endogeneity concerns and control for persistence in financial resilience. Empirical analysis is further strengthened through DID analysis as well as PSM and entropy balancing approaches. The results provide several

important findings. First, geopolitical tensions significantly reduce financial resilience; however, the relationship is nonlinear. The baseline GMM results show that geopolitical tensions initially decrease ZR and DD while increasing earnings volatility, but the positive quadratic effects indicate that banks gradually adapt after geopolitical tensions exceed certain thresholds. This finding extends previous literature by demonstrating that geopolitical shocks generate both vulnerability and adaptation effects. Second, institutional quality significantly weakens the negative effect of geopolitical tensions. All institutional dimensions, including rule of law, government effectiveness, corruption control, regulatory quality, voice and accountability, and political stability, reduce the transmission of geopolitical shocks into financial instability. This finding highlights the importance of governance capacity in transforming external uncertainty into manageable risks. Third, ownership structure significantly moderates the geopolitical tensions–financial resilience relationship. State ownership, foreign ownership, domestic private ownership, and ownership concentration enhance resilience by providing government support, international expertise, operational flexibility, and stronger monitoring mechanisms.

This study makes three main contributions. First, it extends the geopolitical risk literature by moving beyond the conventional linear perspective and demonstrating a nonlinear relationship between geopolitical tensions and banking resilience. Second, it contributes to institutional theory by showing that governance quality serves as a resilience-enhancing mechanism during geopolitical uncertainty. Third, it advances banking governance literature by demonstrating that ownership heterogeneity determines banks' capacity to withstand geopolitical disruptions.

The remainder of the paper is organized as follows. Section 2 develops the theoretical framework. Section 3 debates literature and hypotheses development. Section 4 describes the data, variables, and methodology. Section 5 presents empirical results and robustness analyses. Section 6 concludes the study and discusses theoretical and policy implications.

2. Theoretical Background

The relationship between geopolitical tensions and financial resilience is particularly important in the Middle East and North Africa (MENA) region because banks operate within an environment characterized by persistent political uncertainty, conflicts, economic dependence on external markets, and institutional heterogeneity. Unlike temporary

economic shocks, geopolitical tensions in the MENA region often represent long-lasting structural challenges arising from regional conflicts, diplomatic disputes, security threats, and political instability. These conditions create continuous uncertainty that can influence banks' strategic decisions, risk-taking behavior, and ability to maintain financial stability. From the perspective of financial fragility theory, uncertainty shocks weaken financial resilience by increasing information asymmetry, reducing market confidence, and deteriorating asset quality. Geopolitical tensions can negatively affect banks through several channels. First, increased uncertainty may reduce investment and economic activity, weaken borrowers' repayment capacity and increase non-performing loans. Second, geopolitical instability may trigger capital outflows, exchange rate volatility, and liquidity pressures, limiting banks' ability to provide credit. Third, uncertainty can increase precautionary behavior among investors and financial institutions, reducing lending activities and weakening financial intermediation. Therefore, geopolitical tensions represent an external source of financial fragility that can undermine banking stability (Nagel, 2012; Phan et al., 2022)

The MENA region provides an appropriate context for examining this relationship because geopolitical risks are deeply embedded in its economic and financial environment. Countries in the region have experienced repeated geopolitical disruptions, including conflicts, political instability, and regional tensions, which directly influence investor confidence and financial market conditions. Previous evidence shows that geopolitical risks negatively affect bank stability by increasing credit risk and systemic vulnerabilities (Phan et al., 2022; Trinh & Tran, 2024). However, the consequences of geopolitical tensions may differ across MENA countries because banks possess different levels of institutional support, governance quality, capitalization, and ownership structures. Beyond the conventional negative perspective, adaptive resilience theory suggests that the effect of geopolitical tensions on financial resilience may not be linear. Financial institutions are not passive recipients of external shocks; they continuously adjust their strategies in response to changing environments. At relatively low levels of geopolitical tensions, uncertainty may increase rapidly because banks and investors have limited information about future developments. This can lead to higher risk perception, weaker credit conditions, and declining financial stability. However, when geopolitical tensions become persistent, banks

and regulators may develop adaptive mechanisms, including stronger capital buffers, improved liquidity management, enhanced risk assessment systems, and greater regulatory coordination. Consequently, the marginal negative effect of geopolitical tensions may decrease as financial institutions become more experienced in managing repeated shocks.

This nonlinear argument is particularly relevant for MENA banks because many financial institutions have operated under prolonged geopolitical uncertainty. Continuous exposure to geopolitical risks may encourage banks to develop stronger internal risk-management capabilities and strategic flexibility. Therefore, although geopolitical tensions initially weaken financial resilience, extremely high and persistent levels of geopolitical uncertainty may stimulate institutional adaptation and defensive strategies that partially offset their adverse consequences. This perspective extends previous literature, which mainly assumes a direct and linear negative relationship between geopolitical risks and financial stability.

Furthermore, the transmission of geopolitical tensions into financial instability depends strongly on the institutional environment. According to institutional theory, effective institutions reduce uncertainty by establishing credible rules, improving regulatory enforcement, protecting property rights, and strengthening market confidence. In the MENA region, institutional quality varies considerably across countries, influencing banks' ability to absorb external shocks. Strong institutions enhance financial resilience by improving supervision, reducing information asymmetry, limiting excessive risk-taking, and enabling effective policy responses during periods of uncertainty. Conversely, weak institutions may amplify geopolitical shocks by increasing governance problems, reducing regulatory effectiveness, and encouraging inefficient resource allocation. Therefore, institutional quality can be viewed as a shock-absorption mechanism that determines whether geopolitical tensions translate into financial instability or are effectively managed by the banking system. In countries with stronger institutions, banks are more capable of maintaining lending activities, managing liquidity pressures, and preserving stability during geopolitical disruptions. In contrast, weaker institutional environments may intensify the negative consequences of geopolitical tensions because limited regulatory capacity and governance weaknesses reduce banks' adaptive capabilities.

Ownership structure provides another important governance mechanism influencing how MENA banks respond to geopolitical uncertainty. Drawing on agency theory and ownership governance perspectives, different ownership types create different incentives, monitoring mechanisms, and risk-taking behaviors. State-owned banks may benefit from government support, implicit guarantees, and policy protection, allowing them to maintain stability during geopolitical crises. However, political interference, soft budget constraints, and inefficient lending decisions may increase vulnerability during periods of uncertainty. Thus, state ownership may either strengthen resilience through government support or weaken it through governance inefficiencies. Similarly, foreign ownership may influence banks' responses to geopolitical tensions through competing mechanisms. The global advantage hypothesis suggests that foreign banks possess superior technology, international diversification, advanced risk-management systems, and stronger governance practices, enabling them to better absorb geopolitical shocks. Conversely, the home-field advantage hypothesis argues that foreign banks may face information disadvantages, higher operating costs, and difficulties adapting to local political and institutional conditions. These competing mechanisms suggest that ownership structure may determine whether geopolitical tensions have stronger or weaker effects on financial resilience.

The theoretical framework suggests that geopolitical tensions do not have a uniform effect on banking resilience. Instead, their impact depends on banks' ability to adapt and the governance environment in which they operate. By integrating financial fragility theory, adaptive resilience theory, institutional theory, and ownership governance perspectives, this study develops a comprehensive framework explaining how geopolitical tensions influence financial resilience in MENA banks. Specifically, it argues that geopolitical tensions may have nonlinear effects, while institutional quality and ownership structure serve as critical mechanisms that shape banks' capacity to absorb geopolitical shocks. Accordingly, this study contributes to the literature by moving beyond the conventional view that geopolitical tensions simply weaken financial stability and by explaining the conditions under which banks can transform geopolitical uncertainty into resilience through institutional strength and governance adaptation.

3. Literature Review

3.1. Geopolitical Tensions and Financial Resilience

Financial resilience has become a central concern in the banking literature, particularly following repeated geopolitical conflicts, economic disruptions, and global uncertainty shocks. Geopolitical tensions represent a multidimensional source of uncertainty arising from conflicts, diplomatic disputes, military confrontations, and policy instability, which can disrupt financial markets, weaken investor confidence, and increase economic vulnerability (Caldara & Iacoviello, 2022). Unlike conventional economic shocks, geopolitical tensions are difficult to predict and may generate persistent uncertainty that influences banks' risk-taking behavior, asset quality, liquidity management, and solvency conditions (Phan et al., 2022). Therefore, understanding how geopolitical tensions affect financial resilience is essential, particularly in regions such as the MENA area, where geopolitical instability is structurally embedded in the economic environment.

The existing literature generally documents a negative relationship between geopolitical risks and financial stability. Geopolitical tensions increase uncertainty, reduce market confidence, and create unfavorable conditions for financial intermediation. Higher geopolitical uncertainty may lead to asset price volatility, capital outflows, exchange rate pressures, and deterioration in borrowers' repayment capacity, thereby increasing credit risk and weakening bank stability (Phan et al., 2022). From the perspective of financial fragility theory, uncertainty shocks increase information asymmetry between lenders and borrowers, making banks less able to accurately evaluate credit quality and encouraging more conservative lending behavior (Nagel, 2012). Consequently, declining credit growth, increasing non-performing loans, and higher default probabilities can undermine financial resilience.

Empirical evidence supports the adverse consequences of geopolitical tensions on banking stability. Phan et al. (2022) showed that geopolitical risk reduces bank stability in the United States, although stronger capitalization and larger bank size partially mitigate these negative effects. Using international evidence from 179 countries, Trinh and Tran (2024) found that geopolitical risk increases non-performing loans and reduces banking stability. Similarly, recent studies indicate that geopolitical shocks increase systemic risk, weaken banking resilience, and increase solvency risks over longer horizons (Behn et al.,

2025; Gabbiadini et al., 2025; Topcu & Can, 2025). In emerging markets, geopolitical instability may be particularly harmful because weaker institutional environments and higher economic dependence on external markets amplify the transmission of geopolitical shocks.

However, the relationship between geopolitical tensions and financial resilience may not necessarily be linear. While moderate geopolitical tensions can generate uncertainty and reduce stability, extremely high levels of geopolitical tensions may produce different responses from banks, regulators, and market participants. This argument is consistent with the adaptive resilience perspective, which suggests that financial institutions gradually adjust their strategies when exposed to persistent external pressures. When geopolitical tensions initially increase, banks may experience greater uncertainty, deteriorating asset quality, and reduced profitability because they are unable to immediately adjust their risk management practices. However, prolonged exposure to geopolitical threats may encourage banks to strengthen capital buffers, improve liquidity management, diversify portfolios, and adopt more conservative risk-control mechanisms, thereby enhancing resilience. Furthermore, the relationship can be explained through the risk-taking channel and institutional adaptation theory. At lower levels of geopolitical tensions, uncertainty increases precautionary behavior, reduces investment opportunities, and weakens financial stability. However, when geopolitical risks become persistent and widely recognized, banks and regulators may develop stronger monitoring systems, improve contingency planning, and implement stricter prudential regulations. Such adaptive responses may partially offset the negative consequences of geopolitical shocks. Therefore, the marginal impact of geopolitical tensions on financial resilience may decline at higher levels of geopolitical exposure.

The nonlinear perspective is also supported by evidence from related uncertainty literature. Previous studies show that uncertainty does not always produce proportional economic effects because firms and financial institutions adjust their behavior depending on the intensity and persistence of uncertainty (Rashed & Wu, 2025; Rashed et al., 2026). Similarly, geopolitical uncertainty influences investment, lending, and financial decisions through nonlinear mechanisms because moderate uncertainty may stimulate precautionary adjustment, whereas extreme uncertainty can trigger defensive responses and institutional

adaptation. In banking markets, uncertainty affects liquidity provision, credit allocation, and risk-taking behavior, suggesting that the relationship between geopolitical tensions and stability may depend on the level of geopolitical exposure.

Existing empirical studies have mainly examined the direct negative effect of geopolitical risk on bank stability, profitability, lending, and asset prices (Alsagr & Hemmen, 2020; Demir & Danisman, 2021; Yildirim & Berkman, 2022; Wang et al., 2023). However, limited attention has been given to whether the effect changes at different levels of geopolitical tensions. This gap is particularly important for MENA economies, where banks operate under persistent geopolitical pressures but may simultaneously develop stronger risk-management capabilities and adaptation mechanisms. Therefore, investigating the nonlinear relationship between geopolitical tensions and financial resilience provides a more comprehensive understanding of how banks respond to geopolitical uncertainty. Accordingly, this paper argues that geopolitical tensions may initially weaken financial resilience by increasing uncertainty, credit risk, and market instability; however, beyond a certain threshold, banks may adapt through improved risk management, regulatory responses, and strategic adjustments. Thus, we propose the following hypothesis:

H₁: Geopolitical tensions have a nonlinear relationship with financial resilience.

3.2. The Moderating Role of Institutional Quality

The importance of institutional quality becomes particularly evident during periods of heightened uncertainty and systemic stress. Strong institutions enhance economic resilience by improving policy credibility, strengthening regulatory effectiveness, and enabling governments and financial authorities to implement timely responses to adverse shocks (Klomp & De Haan, 2014). Previous research confirms that institutional development is a key determinant of financial development and long-term economic performance because effective institutions facilitate investment, innovation, and sustainable growth (Bayraktar et al., 2023; Doré & Teixeira, 2023). Moreover, the positive contribution of financial development to economic growth is significantly stronger in countries characterized by superior institutional frameworks, suggesting that institutional quality acts as an enabling mechanism that transforms financial resources into productive economic outcomes (Fengju & Wubishet, 2024).

Institutional quality is a multidimensional concept encompassing government effectiveness, regulatory quality, political stability, control of corruption, voice and accountability, and the rule of law. These institutional dimensions influence the ability of economies and financial systems to manage uncertainty, maintain market confidence, and achieve sustainable development (Apergis et al., 2021; Azam et al., 2021; Boulanouar et al., 2021). Countries with stronger institutions possess greater capacity to formulate effective policies, enforce financial regulations, and absorb external disruptions. In contrast, weak institutional environments increase exposure to economic shocks because inadequate governance, corruption, and ineffective regulation undermine financial supervision and weaken market confidence (Rashed et al., 2026). From a banking perspective, institutional quality is considered a fundamental determinant of financial stability. Poor institutional environments contribute to financial fragility by weakening regulatory oversight, increasing information asymmetry, and encouraging excessive risk-taking among financial institutions (Wu et al., 2026). In contrast, stronger institutions improve supervisory effectiveness, enhance transparency, and strengthen market discipline, thereby reducing moral hazard and improving banks' ability to withstand financial disruptions (Anginer et al., 2014; Hoque et al., 2015).

Recent empirical evidence further supports this argument, showing that institutional quality positively influences bank stability across emerging and developing economies by improving governance mechanisms and reducing systemic vulnerabilities (Elfeituri, 2022; Tran et al., 2023). Beyond its direct effect, institutional quality may also influence how external shocks affect financial resilience. Geopolitical tensions represent a major source of uncertainty that can disrupt financial markets through capital outflows, exchange rate volatility, trade restrictions, and declining investor confidence. However, the magnitude of these adverse effects is unlikely to be uniform across countries because institutional arrangements determine the capacity of financial systems to absorb and respond to geopolitical disruptions. Strong institutions can moderate the negative consequences of geopolitical tensions by providing credible regulatory frameworks, enhancing policy coordination, improving information transparency, and supporting effective crisis-management mechanisms. The moderating role of institutional quality is consistent with institutional theory, which argues that effective governance structures reduce uncertainty

and constrain opportunistic behavior by establishing reliable rules and enforcement mechanisms. In financial markets, stronger institutions improve creditor protection, strengthen supervision, reduce agency conflicts, and enhance risk management practices. Consequently, banks operating in countries with high institutional quality are better positioned to maintain lending activities, manage liquidity pressures, and preserve financial stability during periods of geopolitical uncertainty.

Empirical studies provide evidence supporting the buffering role of institutional quality in financial stability relationships. Hou and Wang (2016) found that stronger institutional governance reduces the negative consequences of financial market liberalization on bank stability in China. Similarly, Bermpei et al. (2018) demonstrated that political stability strengthens the effectiveness of regulatory policies in improving bank resilience across emerging economies. Uddin et al. (2020) showed that government effectiveness, corruption control, institutional trust, and legal enforcement contribute to lower banking risks and greater stability among emerging-market banks. Furthermore, Tran and Nguyen (2024) found that institutional quality modifies the relationship between market concentration and bank stability by strengthening the beneficial effects of concentration on resilience. Recent evidence further highlights the importance of institutions in shaping financial resilience. Nguyen (2023) demonstrated that institutional quality improves bank stability by mitigating the adverse consequences of excessive market concentration among ASEAN banks. Setianto et al. (2025) found that stronger institutions enhance the stability benefits associated with financial inclusion across a large international sample of banks. Similarly, Ofoeda et al. (2024) reported that institutional quality strengthens financial stability by reducing transaction costs and mitigating information asymmetry in African financial systems. These findings suggest that institutions serve as a critical transmission mechanism through which economies and financial systems respond to uncertainty.

We argue that institutional quality can determine whether geopolitical shocks translate into financial instability or are effectively absorbed by the banking system. In countries with weak institutions, geopolitical tensions may intensify uncertainty, weaken regulatory responses, increase credit risks, and undermine financial confidence. Conversely, strong institutions provide governance capacity, regulatory credibility, and policy flexibility that

allow banks to better manage geopolitical disruptions and maintain financial resilience. Therefore, institutional quality is expected to weaken the adverse impact of geopolitical tensions on financial stability. Based on these theoretical arguments and empirical evidence, we propose the following hypothesis:

H₂: Institutional quality moderates the relationship between geopolitical tensions and financial resilience.

3.3. The Moderating Role of Ownership Structure

Ownership structure represents an important governance mechanism that influences banks' risk-taking behavior, strategic decisions, and ability to absorb external shocks. Different ownership types create different incentive structures and governance systems, which may determine how geopolitical tensions affect financial resilience. The impact of state ownership on bank stability remains theoretically debated. From the public interest perspective, state ownership can enhance financial resilience by providing government support, improving access to capital, and maintaining lending activities during periods of uncertainty (Lassoued et al., 2016; Boulanouar et al., 2021). State-owned banks may be less likely to engage in excessive risk-taking because they pursue broader economic and social objectives and benefit from implicit government guarantees. Therefore, during geopolitical tensions, government backing may reduce liquidity pressures and strengthen bank stability (Rashed & Wu, 2025).

However, the political economy perspective argues that state ownership may weaken financial resilience because of agency problems, political intervention, inefficient resource allocation, and soft budget constraints (Shleifer & Vishny, 1997). Government-controlled banks may prioritize political objectives over financial efficiency, resulting in excessive lending and higher risk exposure. Consequently, geopolitical tensions may intensify these weaknesses by increasing uncertainty and encouraging politically motivated decisions. Empirical studies provide mixed evidence, showing that state ownership can either reduce risk-taking and improve stability (Boubakri et al., 2020; Boulanouar et al., 2021) and increase insolvency risk due to governance inefficiencies (Hunjra et al., 2020). Therefore, state ownership may have a dual moderating effect on the relationship between geopolitical tensions and financial resilience. Government support can protect banks from external shocks, whereas political interference may amplify risk exposure.

The role of foreign ownership in bank stability is explained by two competing perspectives: the global advantage hypothesis and the home-field advantage hypothesis. The global advantage hypothesis suggests that foreign banks improve resilience through superior technology, advanced risk-management systems, international expertise, and stronger governance practices (Léon & Zins, 2020; Mateev et al., 2023). Foreign banks may better withstand geopolitical shocks because they benefit from international diversification, stronger monitoring, and access to external financial resources. Conversely, the home-field advantage hypothesis argues that foreign banks may face disadvantages due to limited knowledge of local markets, higher operating costs, regulatory challenges, and difficulties adapting to host-country conditions (Kallel & Triki, 2024). During geopolitical uncertainty, these disadvantages may increase vulnerability because foreign banks may reduce lending or withdraw resources from risky markets. Thus, foreign ownership may either mitigate or amplify the effect of geopolitical tensions on financial resilience. On one hand, international expertise and risk diversification can strengthen banks' ability to absorb shocks; on the other hand, foreign banks may experience greater exposure due to information disadvantages and adjustment costs. Based on this debate, we propose:

H₃: Ownership structure moderates the relationship between geopolitical tensions and financial resilience.

Figure (1) shows the research model as follows:

Insert Figure [1]

4. Research Methodology

4.1. Sample

The sample involved 112 commercial banks from 15 MENA countries over the period of 2007-2024. Islamic banks are excluded from the main sample because they operate under different principles, risk-sharing mechanisms, and strategic objectives compared with conventional banks, which may affect their risk-taking behavior and resilience responses to geopolitical shocks. Several countries were excluded due to severe political instability, institutional disruption, or insufficient data availability during the study period. Specifically, Syria, Yemen, and Libya were excluded because prolonged conflicts and institutional paralysis limited the availability and reliability of banking data. Iran was

excluded because of both data constraints and the distinct characteristics of its Islamic banking system, which differs substantially from conventional banking models. In addition, banks with missing financial information, merger and acquisition activities, or inconsistent reporting during the sample period were removed to maintain data reliability and consistency.

The sample period begins in 2007 for several reasons. First, this period corresponds with the gradual adoption of IFRS accounting standards and Basel II regulatory frameworks across many MENA banks, improving financial reporting comparability and risk measurement consistency. Second, the period captures important structural transformations in MENA banking markets, including financial liberalization, increased competition, regulatory reforms, and changes in ownership structures. Third, starting from 2007 provides an appropriate pre-crisis benchmark to examine how banks responded to major external shocks, including the Global Financial Crisis (2007–2009), the Arab Spring (2011–2013), the COVID-19 pandemic (2020–2022), and geopolitical conflicts such as the Russia–Ukraine war. The final sample consists of 2016 bank-year observations after excluding all banks with missing financial data, mergers, and acquisition operations during the sample period. Data was obtained from Bankscope, the global economy database, and the World Bank.

Table 1 presents the distribution of the sample across MENA countries. The sample demonstrates substantial geographical diversity, covering Gulf Cooperation Council (GCC), North African, and Levant economies with different institutional environments, economic structures, and exposure to geopolitical risks (see Panel A). The largest representation comes from the United Arab Emirates (10.71%), followed by Tunisia and Algeria (9.82%), and Saudi Arabia and Jordan (8.93%). North African and Levant countries represent a significant proportion of the sample, allowing the analysis to capture heterogeneous institutional and geopolitical conditions across the region. Panel B indicates that state-owned banks dominate the MENA banking sample (49%), followed by foreign-owned banks (34%) and domestic private banks (17%), highlighting substantial ownership heterogeneity for examining the moderating role of ownership structure in the geopolitical tensions–financial resilience nexus. The final dataset of 112 commercial banks and 2,016 bank-year observations provide a comprehensive representation of conventional banking

systems in the MENA region and offers an appropriate setting for examining how geopolitical tensions influence financial resilience under different institutional and ownership environments.

Insert Table [1]

4.2. Model specification

We examine the nonlinear relationship between geopolitical tensions (GT) and financial resilience (FR) in addition to explore the moderating role of institutional quality (IQ) and ownership structure (OS) on the association between geopolitical tensions (GT) and financial resilience (FR). We employed GMM to address potential endogeneity, dynamic panel bias, and simultaneity between geopolitical tensions, institutional quality, ownership structure, and financial resilience. GMM validates causal and dynamic effects, ensuring results are robust to omit variable and simultaneity concerns. We used the lagged dependent variables in the GMM approach as instrument variables in our models. The two-step GMM ameliorates the endogeneity problem by employing the lagged differences of the regressors as instruments, since some of the explanatory variables may be weakly or strictly endogenous (Ullah et al., 2018; Ullah et al., 2021). The Arellano and Bond (AR) test is used to test for second-order autocorrelation in order to more accurately gauge its intended purpose in the dynamic panel GMM specifications. The over-identifying restrictions have been examined using the Hansen test, and the difference in Hansen to evaluate the instruments. The Sargan over-identifying test has been utilized to test for the endogenous nature of variables.

We explore the nonlinear relationship between geopolitical tensions and financial resilience via GMM via the following equation:

$$FR_{i,t} = \alpha_0 + \alpha_1 FR_{i,t-1} + \alpha_2 GT_{it} + \alpha_3 GT^2 + \alpha_4 \sum_{j=1}^n \lambda_j Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

We investigate the moderate effect of institutional quality on the relationship between geopolitical tensions and financial resilience as the second following equation:

$$FR_{i,t} = \alpha_0 + \alpha_1 FR_{i,t-1} + \alpha_2 GT_{it} + \alpha_3 IQ_{it} + \alpha_4 GT_{it} * IQ_{it} + \alpha_5 \sum_{j=1}^n \lambda_j Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (2)$$

We examine the moderate effect of ownership structure on the relationship between geopolitical tensions and financial resilience as the third following equation:

$$FR_{i,t} = \alpha_0 + \alpha_1 FR_{i,t-1} + \alpha_2 GT_{it} + \alpha_3 OS_{it} + \alpha_4 GT_{it} * OS_{it} + \alpha_5 \sum_{j=1}^n \lambda_j Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (3)$$

Where: FR represents financial resilience of bank i in year t , measured by ZR, SDR, and DD. $FR_{i,t-1}$ is the lagged dependent variable included to capture persistence in financial resilience and address dynamic effects. $GT_{i,t}$ represents geopolitical tensions measured by the Geopolitical Risk Index. $GT_{i,t}^2$ captures the nonlinear effect of geopolitical tensions. $Controls_{i,t}$ is a vector of bank-specific and macroeconomic control variables, including bank size (BS), capital adequacy (CA), asset growth (AG), loan growth (LG), inflation (IN), and GDP growth (GD). μ_i represents bank fixed effects controlling for unobserved time-invariant bank characteristics. λ_t represents year fixed effects capturing common macroeconomic shocks. $\varepsilon_{i,t}$ is the error term.

Table (2) describe the main variables with the measurements.

Insert Table [2]

5. Empirical analysis

5.1. Descriptive statistics and Correlation matrix

Table 3 reports descriptive statistics for all variables based on a balanced panel of 112 commercial banks across 15 MENA countries, resulting in 2,016 bank-year observations. The mean value of ZR is 3.91, suggesting that MENA banks maintain a relatively stable solvency position, with substantial buffers against potential losses. The average DD value of 3.78 confirms that banks operate with considerable distance from default thresholds. However, the mean value of SD (0.135) indicates noticeable variation in earnings stability, reflecting heterogeneous exposure to operational and macroeconomic risks across countries. The average geopolitical tension index (GT) is 0.190, while its growth rate (GG) averages 0.04, indicating that although geopolitical pressure remains persistent in the region, its intensity fluctuates considerably over time. The standard deviation of GG (0.234) highlights substantial variation in geopolitical shocks, supporting the importance of examining their implications for banking resilience. Ownership concentration (OC) averages 35.1%, indicating moderate shareholder concentration among MENA banks. The

average capital adequacy ratio (CA) is 16.81%, exceeding international regulatory requirements and suggesting relatively strong capitalization levels. Bank size averages 6.98, while asset and loan growth rates are 15.6% and 10.1%, respectively, indicating continued expansion of banking activities across the region.

Regarding institutional quality, all governance indicators (RL, GE, CC, RQ, VE, PV) display negative average values, reflecting institutional weaknesses commonly observed in emerging markets. Among these dimensions, voice and accountability exhibits the lowest average value (−0.845), followed by political stability (−0.721), highlighting persistent governance challenges in several MENA economies. Nevertheless, substantial variation across countries is evident, allowing empirical analysis of how institutional heterogeneity moderates the geopolitical tensions–financial resilience relationship. The descriptive statistics demonstrate considerable cross-country and temporal heterogeneity in geopolitical exposure, institutional development, ownership characteristics, and banking resilience, providing an appropriate empirical setting for examining how governance mechanisms shape banks’ ability to withstand geopolitical shocks.

Insert Table [3]

Table 4 presents the Pearson correlation matrix among the variables. ZR is negatively correlated with SDR (−0.506, $p < 0.05$) and positively correlated with DD (0.556, $p < 0.05$), confirming that stronger financial resilience is associated with lower earnings volatility and greater distance from default. Similarly, SDR is negatively related to DD (−0.141, $p < 0.05$), indicating that unstable earnings reduce banks’ capacity to withstand financial distress. GT exhibit a significant negative relationship with ZR (−0.148, $p < 0.05$) and a positive association with SDR (0.051, $p < 0.05$), suggesting that geopolitical uncertainty weakens bank resilience by increasing earnings instability and reducing stability buffers. Although GI has a weak negative correlation with DD (−0.015, $p < 0.05$), this relationship indicates that geopolitical shocks may also affect banks’ default risk. The institutional quality variables (RL, GE, CC, RQ, VE, and PV) are positively and significantly correlated with each other, with coefficients ranging between 0.333 and 0.570, reflecting the complementary nature of governance dimensions. These findings suggest that stronger institutions enhance banks’ ability to absorb shocks and reduce earnings instability. Among

bank-specific variables, CA demonstrates a strong positive correlation with resilience measures, particularly DD (0.476, $p < 0.05$) and ZR (0.269, $p < 0.05$), highlighting the importance of sufficient capital buffers in improving financial stability. Bank size (BS) is positively related to ZR (0.136, $p < 0.05$) and DD (0.305, $p < 0.05$), indicating that larger banks may benefit from diversification and stronger risk-management capabilities. AG and LG also show positive associations with resilience, although excessive expansion may increase risk exposure, which is controlled by the regression models. For macroeconomic variables, inflation (INF) has a negative correlation with ZR (-0.177 , $p < 0.05$), suggesting that macroeconomic instability reduces banking resilience. In contrast, GDP is positively associated with ZR (0.120, $p < 0.05$) and DD (0.243, $p < 0.05$), indicating that stronger economic conditions support banking stability. The correlation results are consistent with theoretical expectations that geopolitical tensions weaken financial resilience, whereas stronger institutional quality and sound bank fundamentals enhance resilience. The correlation coefficients are below 0.70 and all VIF values are below 5, indicating the absence of severe multicollinearity among the explanatory variables.

Insert Table [4]

5.2. Baseline Results

Table 5 shows that geopolitical tensions generate both adverse and adaptive effects depending on their intensity, confirming that the relationship is not purely linear. For ZR, the coefficient of geopolitical tensions is negative and significant ($\beta = -0.472$, $p < 0.01$), while the squared term is positive and significant ($\beta = 0.756$, $p < 0.01$), confirming a U-shaped relationship. This indicates that geopolitical tensions initially weaken financial resilience by increasing uncertainty, reducing market confidence, deteriorating asset quality, and increasing credit risk. However, the positive quadratic effect indicates that the negative impact diminishes after the turning point (0.31). This finding extends previous linear studies by demonstrating that prolonged geopolitical tensions may encourage banks to adopt adaptive responses, including stronger capital positions, improved risk management practices, liquidity adjustments, and portfolio diversification. This result supports the adaptive resilience perspective, which argues that repeated exposure to external shocks can stimulate organizational learning and

strengthen institutional capacity. Therefore, while the initial negative effect supports the financial fragility literature, the nonlinear reversal provides new evidence beyond previous studies that mainly emphasize the damaging consequences of geopolitical risks.

The economic significance further confirms the importance of this relationship. A one-standard-deviation increase in geopolitical tensions (0.132) reduces ZR by approximately 0.062 points, equivalent to 1.59% of the average ZR level. Although the percentage impact appears moderate, it represents a meaningful decline in banks' solvency buffers, particularly in the MENA region where geopolitical shocks are frequent and persistent. The results using SDR provide additional support for H₁. The positive coefficient of GT ($\beta = 0.154$, $p < 0.01$) and negative coefficient of GT² ($\beta = -0.390$, $p < 0.01$) indicate an inverted U-shaped relationship, suggesting that geopolitical tensions initially increase earnings volatility but eventually encourage stabilization mechanisms. The economic impact is substantial: a one-standard-deviation increase in geopolitical tensions increases SDR by approximately 15.04% relative to its mean value, indicating that geopolitical shocks significantly affect banks' operational stability. The findings using geopolitical tension growth (GG) are consistent with these results. The negative linear effect and positive quadratic effect for ZR (GG = -0.076 ; GG² = 0.162 , $p < 0.01$) confirm that sudden geopolitical escalations initially weaken resilience but generate adaptive responses after the threshold (0.23). Similarly, the inverted U-shaped relationship with SDR confirms that banks gradually adjust to persistent geopolitical pressure.

Based on control variables, BS has a positive and significant effect on ZR ($\beta = 0.815$, $p < 0.01$), suggesting that larger banks benefit from diversification advantages, stronger market access, and better risk-management capabilities. However, BS has a negative relationship with SDR, indicating that larger banks experience lower earnings volatility due to greater operational stability. CA positively affects ZR ($\beta \approx 0.013$ – 0.016 , $p < 0.05$) and negatively affects SD, confirming the importance of capital buffers in absorbing unexpected losses and improving financial stability. This finding is consistent with the regulatory capital literature, which emphasizes capitalization as a key mechanism for strengthening bank resilience. Both AG and LG show positive effects on ZR, indicating

that controlled expansion can enhance resilience through increased profitability and business diversification. However, their negative relationship with SD suggests that growth strategies may reduce earnings volatility when supported by effective risk management.

These findings highlight the importance of balancing growth opportunities with prudent risk controls. INF negatively affects ZR ($\beta = -0.001$ to -0.021 , $p < 0.05$) and increases SDR, indicating that macroeconomic instability weakens banking resilience by reducing borrowers' repayment capacity and increasing operating uncertainty. Conversely, GD positively influences ZR and reduces SD, confirming that favorable economic conditions support banking stability through improved credit quality and profitability. The validity of the dynamic GMM estimations is confirmed by the diagnostic tests. The significant AR(1) statistics indicate expected first-order autocorrelation, while insignificant AR(2) statistics confirm the absence of second-order serial correlation. The Hansen and Sargan tests are insignificant across all models, supporting the validity of the instruments, while the Difference-in-Hansen tests confirm instrument exogeneity. Moreover, the number of instruments remains below the number of banks, reducing concerns regarding instrument proliferation.

These findings partially support and extend previous literature. The negative initial effect is consistent with previous studies (Alsagr & Hemmen, 2020; Demir & Danisman, 2021; Phan et al., 2022; Yildirim & Berkman, 2022; Tran et al., 2023; Wang et al., 2023; Trinh & Tran, 2024; Behn et al., 2025; Wu et al., 2026), which demonstrate that geopolitical tensions increase financial vulnerability and undermine financial resilience. However, the evidence of a nonlinear reversal extends existing literature by showing that geopolitical tensions may also generate resilience-enhancing effects when banks have sufficient time to adapt. Thus, the study rejects the assumption of a uniformly negative relationship between geopolitical tensions and financial resilience and provides evidence that the impact depends on the intensity and persistence of geopolitical shocks. This contribution is particularly important for MENA banking systems, where repeated geopolitical shocks require continuous strategic adaptation and institutional strengthening. The results support H_1 , demonstrating that geopolitical tensions have a nonlinear effect on financial resilience. The findings contribute to the

literature by integrating financial fragility and adaptive resilience perspectives, showing that geopolitical uncertainty represents both a source of financial vulnerability and a driver of strategic adaptation in MENA banking systems.

Insert Table [5]

Table 6 shows that geopolitical tensions (GT) maintain a negative and significant effect on ZR ($\beta = -0.234; -0.411, p < 0.01; 0.05$), confirming that geopolitical uncertainty reduces banking resilience by increasing market uncertainty, credit risks, and financial vulnerability. However, the interaction terms between geopolitical tensions and institutional quality indicators are negative and significant in all models. Specifically, the interaction coefficients are significant for GT*RL ($\beta = -0.211, p < 0.05$), GT*GE ($\beta = -0.255, p < 0.05$), GT*CC ($\beta = -0.265, p < 0.05$), GT*RQ ($\beta = -0.190, p < 0.05$), GT*VE ($\beta = -0.290, p < 0.05$), and GT*PV ($\beta = -0.278, p < 0.05$). These results indicate that institutional quality strengthens the resilience of banks when facing geopolitical pressures. In other words, stronger institutional environments reduce the negative transmission of geopolitical tensions into financial instability. This finding supports institutional theory, which suggests that effective governance structures reduce uncertainty, improve regulatory credibility, and constrain opportunistic behavior through stronger enforcement mechanisms. In countries with stronger institutions, banks benefit from more effective supervision, better transparency, stronger creditor protection, and improved crisis-management capacity, allowing them to absorb geopolitical shocks more effectively.

Among the institutional dimensions, voice and accountability (VE) and political stability (PV) demonstrate relatively stronger moderating effects, with interaction coefficients of -0.290 and -0.278 , respectively. This highlights the importance of political governance and institutional credibility in reducing uncertainty during geopolitical disruptions. Similarly, control of corruption (CC) and government effectiveness (GE) significantly mitigate the negative effect of geopolitical tensions by improving policy implementation and reducing governance-related risks. The direct effects of institutional quality are also positive and significant. For example, RL ($\beta = 0.043, p < 0.05$), GE ($\beta = 0.037, p < 0.05$), CC ($\beta = 0.032, p < 0.05$), RQ ($\beta = 0.028, p < 0.05$), VE ($\beta = 0.022, p < 0.05$), and PV ($\beta = 0.036, p < 0.05$) all enhance financial resilience. These results confirm

that stronger institutions directly improve banks' stability by strengthening governance quality, regulatory effectiveness, and market confidence.

These findings support previous studies showing that institutional quality improves financial stability by strengthening regulatory effectiveness and reducing systemic vulnerabilities (Anginer et al., 2014; Hoque et al., 2015; Uddin et al., 2020). Moreover, the findings extend recent literature on the role of institutions in financial resilience. Prior studies demonstrate that institutional quality strengthens the stability benefits of financial development, market structures, and financial inclusion (Nguyen, 2023; Tran et al., 2023; Setianto et al., 2025). The control variables also provide consistent evidence. CA has a positive and highly significant effect across all models ($\beta = 0.012\text{--}0.021$, $p < 0.01$), confirming that stronger capital buffers enhance banks' ability to absorb shocks. BS, AG, and LG generally contribute positively to resilience, indicating that well-managed expansion and diversification support financial stability. GDP growth (GD) also has a positive effect, suggesting that positive macroeconomic conditions strengthen banks' resilience. The validity of the dynamic GMM estimations is confirmed by the diagnostic tests. AR (2) statistics are insignificant in all specifications, indicating no second-order serial correlation. The Hansen and Sargan tests are insignificant, supporting instrument validity, while the Difference-in-Hansen tests confirm the exogeneity of the instruments. The findings demonstrate that institutional quality acts as an effective buffering mechanism that reduces the negative consequences of geopolitical tensions on financial resilience. These results extend previous literature by showing that the impact of geopolitical uncertainty depends not only on the intensity of external shocks but also on the institutional capacity of countries to absorb and manage these shocks. Therefore, H₂ is accepted, confirming that institutional quality significantly moderates the geopolitical tensions–financial resilience relationship.

Insert Table [6]

Table 7 provides strong support for H3b, indicating that ownership characteristics significantly influence how banks respond to geopolitical shocks. The baseline results show that geopolitical tensions negatively affect financial resilience. Specifically, GT and GG have negative and significant coefficients across all models (GT = -0.127 to -0.328 ; GG

= -0.052 to -0.071 , $p < 0.05/0.01$), confirming that geopolitical uncertainty reduces banks' resilience. However, the interaction effects demonstrate that ownership structure plays an important moderating role. For state-owned banks, the interaction terms GT*ST ($\beta = 0.163$, $p < 0.01$) and GG*ST ($\beta = 0.012$, $p < 0.01$) are positive and significant, indicating that state ownership reduces the negative impact of geopolitical tensions on resilience. This supports the public interest perspective, suggesting that government ownership provides implicit guarantees, easier access to resources, and stronger crisis support during periods of uncertainty. These findings are consistent with previous studies that state ownership can enhance bank stability through government backing and risk-sharing mechanisms (Lassoued et al., 2016; Boulanouar et al., 2021; Rashed & Wu, 2025).

Foreign ownership also strengthens resilience during geopolitical shocks. The interaction coefficients GT*FR ($\beta = 0.022$, $p < 0.01$) and GG*FR ($\beta = 0.009$, $p < 0.01$) are positive and significant, supporting the global advantage hypothesis. This indicates that foreign banks benefit from superior risk-management systems, international expertise, technological advantages, and diversification opportunities, enabling them to better absorb geopolitical disruptions. These findings are consistent with previous work that emphasize the stabilizing role of foreign ownership through improved governance and international resources (Léon & Zins, 2020; Mateev et al., 2023; Rashed et al., 2026).

Similarly, domestic private ownership shows a positive moderating effect. The interaction terms GT*DF ($\beta = 0.105$, $p < 0.01$) and GG*DF ($\beta = 0.006$, $p < 0.01$) indicate that domestic private banks are also able to mitigate geopolitical shocks, possibly through greater operational flexibility, market knowledge, and faster strategic adjustment compared with more rigid ownership structures. Ownership concentration also strengthens resilience. The coefficients of GT*OC ($\beta = 0.673$, $p < 0.01$) and GG*OC ($\beta = 0.111$, $p < 0.01$) are positive and significant, suggesting that concentrated ownership improves monitoring efficiency and reduces managerial opportunism during periods of geopolitical uncertainty. This supports the agency theory perspective, which argues that stronger shareholder monitoring can improve governance quality and risk-control effectiveness.

The economic interpretation of these findings indicates that ownership mechanisms substantially offset the negative effect of geopolitical tensions. Among the ownership dimensions, ownership concentration exhibits the strongest moderating effect, followed by

state ownership and domestic private ownership, suggesting that effective monitoring and resource support are particularly important for maintaining resilience during geopolitical shocks. Based on control variables, CA has a consistently positive and significant effect on resilience ($\beta = 0.008\text{--}0.013$, $p < 0.01$), confirming that stronger capital buffers enhance banks' ability to absorb shocks. BS, AG, and LG generally contribute positively to resilience, while IN negatively affects stability. GDP has a positive effect, indicating that favorable economic conditions improve banks' capacity to withstand uncertainty.

The validity of the dynamic GMM models is confirmed by the diagnostic tests. The AR(2) statistics are insignificant, indicating no second-order serial correlation. The Hansen and Sargan tests confirm instrument validity, while the Difference-in-Hansen tests support instrument exogeneity. The findings demonstrate that ownership structure serves as an important governance mechanism that shapes banks' responses to geopolitical shocks. State ownership, foreign ownership, domestic private ownership, and ownership concentration all reduce the adverse consequences of geopolitical tensions and enhance financial resilience. These results extend previous studies by showing that ownership heterogeneity determines the extent to which banks can absorb geopolitical disruptions. Therefore, H_3 is accepted, confirming that ownership structure significantly moderates the relationship between geopolitical tensions and financial resilience.

Insert Table [7]

5.3. Robustness analysis

Table 8 examines the robustness of the nonlinear relationship between geopolitical tensions and financial resilience using distance-to-default (DD) as an alternative measure. The results are consistent with the baseline findings based on ZR and SDR, providing further support for H_1 . Geopolitical tensions have a significant negative linear effect on DD ($\beta = -0.116$, $p < 0.01$) and a positive quadratic effect ($GT^2 = 0.107$, $p < 0.01$), confirming a U-shaped relationship. This indicates that geopolitical tensions initially reduce banks' distance from default by increasing uncertainty, market instability, and risk exposure. However, after the turning point (0.54), the effect becomes positive, suggesting that persistent geopolitical pressure encourages banks to strengthen capital buffers, improve risk management, and enhance resilience strategies. The economic significance

analysis indicates that a one-standard-deviation increase in geopolitical tensions ($SD = 0.132$) reduces DD by approximately 0.015 points, representing around 0.41% of the mean DD value (3.78). The results confirm the same nonlinear pattern when using the growth rate of geopolitical tensions (GG).

The negative coefficient of GG ($\beta = -0.033, p < 0.01$) and positive coefficient of GG^2 ($\beta = 0.102, p < 0.01$) indicate that rapid geopolitical escalation initially weakens market-based resilience but encourages adaptation after the threshold (0.16). The control variables provide additional evidence. Bank size and capital adequacy positively affect DD, indicating that larger and better-capitalized banks possess stronger shock-absorption capacity. Asset growth and loan growth also improve DD, suggesting that well-managed expansion supports resilience. Conversely, inflation reduces DD, while GDP growth enhances banks' ability to withstand financial shocks. The validity of the dynamic GMM estimations is confirmed by the diagnostic tests. The AR(2) tests show no second-order serial correlation, while the insignificant Hansen and Sargan tests confirm instrument validity. The Difference-in-Hansen tests further support instrument exogeneity. The DD robustness results confirm that geopolitical tensions have a threshold-dependent effect on financial resilience. Initial geopolitical shocks weaken banks' solvency capacity, but prolonged exposure promotes strategic adaptation and resilience-building. Therefore, H1 is supported, and the nonlinear relationship remains robust across different measures of financial resilience.

Insert Table [8]

Table 9 presents the robustness analysis of the moderating role of institutional quality using distance-to-default (DD) as an alternative measure of financial resilience and the growth rate of geopolitical tensions (GG) as an alternative geopolitical risk indicator. The results are consistent with the baseline findings and provide further support for H₂. The results show that GG has a negative and significant effect on DD across all specifications ($\beta = -0.010; -0.040, p < 0.05; 0.01$), confirming that increases in geopolitical tensions reduce banks' market-based resilience by increasing uncertainty and default risk. Importantly, all interaction terms between geopolitical tension growth and institutional quality are negative and significant, confirming the moderating role of institutions (e.g.

RL*GG ($\beta = -0.076$, $p < 0.05$). These results indicate that stronger institutional environments reduce the adverse impact of rising geopolitical tensions on banks' distance-to-default. The moderating effects are economically meaningful. Among the institutional dimensions, RQ and CC show relatively stronger buffering effects, with coefficients of -0.089 and -0.078 , respectively. This suggests that effective regulation and transparent governance mechanisms play a critical role in protecting banks from geopolitical shocks by improving supervision, reducing information asymmetry, and strengthening market confidence. Similarly, political stability and government effectiveness help banks maintain resilience by improving policy credibility and crisis-response capacity.

Institutional quality measures remain positive and significant with DD (e.g., RL ($\beta = 0.033$), confirming that stronger institutions independently enhance financial resilience. These findings are consistent with institutional theory, showing that governance quality strengthens financial stability by improving regulation, reducing corruption, and enhancing risk management effectiveness. The robustness results using DD and GG confirm that institutional quality acts as an effective buffer against geopolitical shocks. Stronger institutions reduce the negative consequences of geopolitical tensions and enhance banks' ability to maintain financial resilience. Therefore, H₂ is further supported, demonstrating that institutional quality significantly moderates the geopolitical tensions–financial resilience relationship.

Insert Table [9]

Table 10 presents the robustness analysis of the moderating role of ownership structure using distance-to-default (DD) as an alternative measure of financial resilience. The results confirm the baseline findings reported in Table 6 and provide further support for H₃, demonstrating that ownership characteristics significantly influence how banks respond to geopolitical shocks. The results show that geopolitical tensions continue to negatively affect DD across all specifications. Specifically, GT and GG exhibit negative and significant coefficients (GT = -0.157 ; -0.656 ; GG = -0.013 ; -0.319 , $p < 0.05$; 0.01), indicating that geopolitical uncertainty reduces banks' market-based resilience by increasing default risk and weakening financial buffers. The interaction effects confirm the buffering role of ownership structure. For state ownership, the interaction terms are positive

and significant ($GT*ST = 0.228, p < 0.01$; $GG*ST = 0.020, p < 0.05$), indicating that state-owned banks are better able to withstand geopolitical shocks. This supports the public interest perspective, suggesting that government support, implicit guarantees, and easier access to resources enhance resilience during periods of uncertainty.

For foreign ownership, the interaction effects remain significant ($GT*FR = 0.018, p < 0.01$), although the GG interaction is negative ($GG*FR = -0.016, p < 0.05$), suggesting that foreign banks benefit from international expertise and advanced risk-management systems when facing persistent geopolitical risks but may experience short-term adjustment pressures following rapid geopolitical escalations. The results reflect the competing global advantage and home-field advantage perspectives. The evidence indicates that foreign ownership generally strengthens resilience through better governance, technology, and international diversification. Domestic private ownership also moderates the geopolitical resilience relationship. The interaction coefficient $GT*DF$ is positive and significant ($\beta = 0.148, p < 0.01$), suggesting that domestic private banks can absorb geopolitical shocks through greater operational flexibility and local market knowledge. However, the negative effect of $GG*DF$ ($\beta = -0.023, p < 0.05$) indicates that rapid geopolitical deterioration may create short-term challenges for private banks due to limited external support compared with state or internationally connected banks. Ownership concentration demonstrates the strongest moderating effect. The interaction terms $GT*OC$ ($\beta = 0.904, p < 0.01$) and $GG*OC$ ($\beta = 0.248, p < 0.01$) are positive and significant, indicating that concentrated ownership substantially reduces the negative impact of geopolitical shocks. This finding supports agency theory, suggesting that concentrated shareholders enhance monitoring efficiency, reduce managerial opportunism, and improve strategic responses during periods of uncertainty.

Economic interpretation confirms the importance of ownership mechanisms. The strongest buffering effect comes from ownership concentration, followed by state ownership and domestic private ownership, indicating that effective monitoring and access to institutional support are critical channels through which banks maintain resilience under geopolitical pressure. The validity of the dynamic GMM estimations is confirmed by the diagnostic tests. The robustness results confirm that ownership structure is an important governance mechanism shaping banks' responses to geopolitical uncertainty. State

ownership, foreign ownership, domestic private ownership, and ownership concentration generally reduce the adverse effects of geopolitical tensions and strengthen financial resilience.

Insert Table [10]

5.4. Additional Tests

We provide additional robustness analyses using Difference-in-Differences (DID), Propensity Score Matching (PSM), and Entropy Balancing (EB). The DID results show that the Arab Spring significantly reduced bank financial resilience, with ZR declining by 0.078–0.090 points ($p < 0.01$) and SDR increasing by 0.045–0.067 points ($p < 0.01$) among affected banks relative to the control group. The findings remain robust after addressing potential selection bias using PSM and EB: geopolitical tension growth (GG) significantly reduces ZR ($\beta = -0.045$ and -0.062 , $p < 0.05$) and increases SDR ($\beta = 0.025$ and 0.033 , $p < 0.05$), respectively. These consistent results provide strong additional evidence that geopolitical shocks causally weaken banking resilience and increase earnings volatility, supporting H1 and reinforcing the robustness of the baseline findings (See Suppmenatry materials (A)).

Additionally, we provide additional heterogeneity analyses that extend the main findings by examining differences in the geopolitical tensions–financial resilience relationship across country income levels and oil dependence. The results consistently show that geopolitical tensions negatively affect banking resilience across all groups, while the magnitude of the effect varies substantially. The strongest adverse effects are observed in high-income and oil-dependent economies, reflecting their greater financial integration and exposure to energy-market and geopolitical shocks. However, the positive interaction effects across income groups indicate stronger adaptive and recovery capacity in economies with greater institutional and financial capacity. Similarly, lower oil-dependent economies exhibit relatively weaker adverse effects, suggesting that economic diversification reduces vulnerability to geopolitical shocks. These additional results confirm significant structural heterogeneity and reinforce the robustness of the study’s main conclusions (See Suppmenatry materials (B)).

6. Conclusion

This paper investigates the impact of geopolitical tensions on financial resilience in MENA banks and examines whether institutional quality and ownership structure influence banks' ability to absorb geopolitical shocks. Using dynamic system GMM estimations, supported by DID, PSM, entropy balancing, and alternative resilience measures, the findings provide robust evidence that geopolitical tensions significantly affect banking resilience. The results show that geopolitical tensions initially weaken financial resilience by increasing uncertainty, financial risk, and default exposure; however, the relationship is nonlinear, suggesting that banks gradually adapt through improved risk management, capital strengthening, and strategic adjustments. Furthermore, the findings demonstrate that institutional quality plays a critical buffering role. Stronger rule of law, regulatory quality, government effectiveness, corruption control, political stability, and accountability reduce the negative transmission of geopolitical shocks into banking instability. These results confirm that effective institutions enhance policy credibility, improve supervision, and strengthen banks' capacity to manage uncertainty. The study also highlights the importance of ownership governance. State ownership, foreign ownership, domestic private ownership, and ownership concentration generally strengthen financial resilience by providing government support, improving governance mechanisms, enhancing monitoring efficiency, and facilitating strategic adaptation during periods of geopolitical uncertainty.

The findings provide several policy implications for MENA economies. First, policymakers should prioritize institutional reforms by strengthening regulatory independence, improving legal enforcement, reducing corruption, and enhancing transparency, as institutional capacity represents a key defense mechanism against geopolitical shocks. Second, central banks and financial regulators should encourage proactive resilience frameworks, including stronger capital buffers, liquidity risk management, stress testing, and contingency planning for geopolitical scenarios. Third, ownership policies should balance the advantages of state support with the need to prevent political interference, while promoting effective governance practices in both domestic and foreign-owned banks. Finally, MENA economies should reduce excessive dependence on

oil revenues by promoting economic diversification, as oil-dependent economies remain particularly vulnerable to geopolitical disruptions.

Despite these contributions, this study has some limitations that provide directions for future research. Future studies could examine other regions with different institutional and geopolitical characteristics to test the generalizability of the findings. Additionally, future research could explore specific channels through which geopolitical tensions affect banks, such as cybersecurity risks, energy shocks, trade disruptions, or sovereign risk. Further studies may also investigate whether digital transformation, ESG practices, financial innovation, and climate-risk management enhance banks' resilience under geopolitical uncertainty. This paper demonstrates that geopolitical tensions are not only a source of financial vulnerability but also a catalyst for institutional and strategic adaptation. The resilience of MENA banking systems depends not only on managing external shocks but also on strengthening institutional capacity and governance mechanisms that enable banks to withstand future uncertainty.

Author Contributions: Conceptualization, A.A. and A.R.; methodology, A.S. and A.R.; software, M.L. and Y.A.; validation, A.A. and M.L.; formal analysis, E.F. and A.S.; investigation, A.R. and A.S.; resources, A.A. and T.L.; data curation, E.F. and A.A.; writing—original draft preparation, A.R. and T.L.; writing—review and editing, E.F. and Y.A.; visualization, M.L. and Y.A.; supervision, E.F. and A.S.; project administration, M.L. and Y.A.; funding acquisition, M.L. and Y.A.; All authors have read and agreed to the published version of the manuscript.

Data Availability: The data is available on request from the authors.

Funding : This work was supported and funded by the Deanship of Scientific Research at Imam Mohammad Ibn Saud Islamic University (IMSIU) (grant number IMSIU-DDRSP2604).

Conflicts of Interest: The authors declare no conflicts of interest.

References

Alsagr, N., & Hemmen, S. v. (2020). Oil rent, geopolitical risk and banking sector performance. *International Journal of Energy Economics Policy*, 10(5), 305-314. <https://doi.org/10.32479/ijeep.9668>.

- Anginer, D., Demircug-Kunt, A., & Zhu, M. (2014). How does competition affect bank systemic risk? *Journal of Financial Intermediation*, 23(1), 1-26. <https://doi.org/10.1016/j.jfi.2013.11.001>
- Apergis, N., Aysan, A. F., & Bakkar, Y. (2021). How do institutional settings condition the effect of macroprudential policies on bank systemic risk? *Economics Letters*, 209, 110123. <https://doi.org/10.1016/j.econlet.2021.110123>
- Azam, M., Hunjra, A. I., Bouri, E., Tan, Y., & Al-Faryan, M. A. S. (2021). Impact of institutional quality on sustainable development: Evidence from developing countries. *Journal of Environmental Management*, 298, 113465. <https://doi.org/10.1016/j.jenvman.2021.113465>
- Bayraktar, Y., Ozyilmaz, A., Toprak, M., Olgun, M. F., & Isik, E. (2023). The role of institutional quality in the relationship between financial development and economic growth: Emerging markets and middle-income economies. *Borsa Istanbul Review*, 23(6), 1303-1321. <https://doi.org/10.1016/j.bir.2023.10.002>
- Behn, M., Lang, J. H., & Reghezza, A. (2025). 120 years of insight: Geopolitical risk and bank solvency. *Economics Letters*, 247, 112168.
- Bermpei, T., Kalyvas, A., & Nguyen, T. C. (2018). Does institutional quality condition the effect of bank regulations and supervision on bank stability? Evidence from emerging and developing economies. *International Review of Financial Analysis*, 59, 255-275. <https://doi.org/10.1016/j.irfa.2018.06.002>
- Boubakri, N., El Ghoul, S., Guedhami, O., & Hossain, M. (2020). Post-privatization state ownership and bank risk-taking: Cross-country evidence. *Journal of Corporate Finance*, 64, 101625. <https://doi.org/10.1016/j.jcorpfin.2020.101625>
- Boulanouar, Z., Alqahtani, F., & Hamdi, B. (2021). Bank ownership, institutional quality and financial stability: evidence from the GCC region. *Pacific-Basin Finance Journal*, 66, 101510. <https://doi.org/10.1016/j.pacfin.2021.101510>
- Caldara, D., & Iacoviello, M. (2022). Measuring geopolitical risk. *American Economic Review*, 112(4), 1194-1225. <https://doi.org/10.1257/aer.20191823>
- Demir, E., & Danisman, G. O. (2021). Banking sector reactions to COVID-19: The role of bank-specific factors and government policy responses. *Research in International Business and Finance*, 58, 101508. <https://doi.org/10.1016/j.ribaf.2021.101508>
- Doré, N. I., & Teixeira, A. A. (2023). The role of human capital, structural change, and institutional quality on Brazil's economic growth over the last two hundred years (1822–2019). *Structural Change and Economic Dynamics*, 66, 1-12. <https://doi.org/10.1016/j.strueco.2023.04.003>
- Elfeituri, H. (2022). Banking stability, institutional quality, market concentration, competition and political conflict in MENA. *Journal of International Financial Markets, Institutions and Money*, 76, 101476. <https://doi.org/10.1016/j.intfin.2021.101476>
- Fengju, X., & Wubishet, A. (2024). Analysis of the impacts of financial development on economic growth in East Africa: How do the institutional qualities matter? *Economic Analysis Policy*, 82, 1177-1189. <https://doi.org/10.1016/j.eap.2024.04.002>
- Gabbiadini, M., Meoli, M., & Vismara, S. (2025). Geopolitical risk and systemic risk in the European banking system. *Finance Research Letters*, 108796.

- Hoque, H., Andriosopoulos, D., Andriosopoulos, K., & Douady, R. (2015). Bank regulation, risk and return: Evidence from the credit and sovereign debt crises. *Journal of Banking and Finance*, 50, 455-474. <https://doi.org/10.1016/j.jbankfin.2014.06.003>.
- Hou, X., & Wang, Q. (2016). Institutional quality, banking marketization, and bank stability: Evidence from China. *Economic Systems*, 40(4), 539-551. <https://doi.org/10.1016/j.ecosys.2016.01.003>.
- Hunjra, A. I., Tayachi, T., & Mehmood, R. (2020). Impact of ownership structure on risk-taking behavior of South Asian banks. *Corporate Ownership and Control*, 17(3), 108-120. <https://doi.org/10.22495/cocv17i3art8>.
- Kallel, H., & Triki, M. (2024). Foreign ownership, bank efficiency and stability: Whether the institutional quality of countries is important? *International Journal of Finance & Economics*, 29(1), 632-653. <https://doi.org/10.1002/ijfe.2701>.
- Klomp, J., & De Haan, J. (2014). Bank regulation, the quality of institutions, and banking risk in emerging and developing countries: an empirical analysis. *merging Markets Finance and Trade*, 50(6), 19-40. <https://doi.org/10.1080/1540496X.2014.1013874>.
- Lassoued, N., Sassi, H., & Attia, M. B. R. (2016). The impact of state and foreign ownership on banking risk: Evidence from the MENA countries. *Research in International Business and Finance*, 36, 167-178. <https://doi.org/10.1016/j.ribaf.2015.09.014>.
- Léon, F., & Zins, A. (2020). Regional foreign banks and financial inclusion: Evidence from Africa. *Economic Modelling*, 84, 102-116. <https://doi.org/10.1016/j.econmod.2019.03.012>.
- Mateev, M., Sahyouni, A., & Tariq, M. U. (2023). Bank regulation, ownership and risk taking behavior in the MENA region: policy implications for banks in emerging economies. *Review of Managerial Science*, 17(1), 287-338. <https://doi.org/10.1007/s11846-022-00529-5>.
- Nagel, S. (2012). Evaporating liquidity. *The Review of Financial Studies*, 25(7), 2005-2039. <https://doi.org/10.1093/rfs/hhs066>.
- Nguyen, H.-T. (2023). Does institutional quality reduce the impact of market concentration on bank stability? Evidence of developing countries. *Cogent Economics & Finance*, 11(2), 2244769. <https://doi.org/10.1080/23322039.2023.2244769>.
- Ofoeda, I., Mawutor, J. K. M., & Ohenebeng, D. N. F.-H. (2024). Financial inclusion, institutional quality and bank stability: Evidence from sub-Saharan Africa. *International Economics and Economic Policy*, 21(1), 27-64. <https://doi.org/10.1007/s10368-023-00578-5>.
- Phan, D. H. B., Tran, V. T., & Iyke, B. N. (2022). Geopolitical risk and bank stability. *Finance Research Letters*, 46, 102453. <https://doi.org/10.1016/j.frl.2021.102453>.
- Rashed, A., & Wu, D. (2025). Bank Risks, and Bank Stability: The Moderating Role of State Ownership in the MENA Region. Proceedings of the 7th International Conference on Finance, Economics, Management and IT Business, Portugal.
- Rashed, A., Wu, D., Abdelbaky, A., Elamer, A. A., & Mohsen, D. (2026). How ESG Shapes the Competition–Stability Nexus in Banking: Nonlinear Evidence From MENA. *Business Strategy and the Environment*. <https://doi.org/10.1002/bse.70831>

- Rashed, A., Wu, D., Hussein, A., Mohsen, D., Abdelbaky, A., & Omar, M. (2026). How institutional quality shapes the impact of competition on financial stability: evidence from the MENA region. *International Journal of Disclosure and Governance*, 1-31. <https://doi.org/10.1057/s41310-026-00381-z>
- Setianto, R. H., Azman-Saini, W., & Law, S. H. (2025). Threshold effects of institutional quality on the financial inclusion and stability nexus: International evidence. *Borsa Istanbul Review*, 25(2), 388-399. <https://doi.org/10.1016/j.bir.2025.01.015>
- Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52(2), 737-783. <https://doi.org/10.1111/j.1540-6261.1997.tb04820.x>.
- Topcu, M., & Can, U. (2025). Political stability, geopolitical risks, and bank stability. *Finance Research Letters*, 86, 108889.
- Tran, H. S., Nguyen, T. D., & Nguyen, T. L. (2023). Market structure, institutional quality and bank stability: evidence from emerging and developing countries. *Competitiveness Review: An International Business Journal*, 33(6), 1046-1068. <https://doi.org/10.1108/CR-02-2022-0016>
- Tran, V. T., & Nguyen, H. (2024). Competition, liquidity creation and bank stability. *Accounting and Finance*, 64(2), 2111-2146.
- Trinh, H. H., & Tran, T. P. (2024). Global banking systems, financial stability, and uncertainty: How have countries coped with geopolitical risks? *International Review of Economics & Finance*, 96, 103647. <https://doi.org/10.1016/j.iref.2024.103647>.
- Uddin, A., Chowdhury, M. A. F., Sajib, S. D., & Masih, M. (2020). Revisiting the impact of institutional quality on post-GFC bank risk-taking: Evidence from emerging countries. *Emerging Markets Review*, 42, 100659. <https://doi.org/10.1016/j.ememar.2019.100659>
- Ullah, S., Akhtar, P., & Zaefarian, G. (2018). Dealing with endogeneity bias: The generalized method of moments (GMM) for panel data. *Industrial Marketing Management*, 71, 69-78. <https://doi.org/10.1016/j.indmarman.2017.11.010>
- Ullah, S., Zaefarian, G., & Ullah, F. (2021). How to use instrumental variables in addressing endogeneity? A step-by-step procedure for non-specialists. *Industrial Marketing Management*, 96, 1-6. <https://doi.org/10.1016/j.indmarman.2020.03.006>
- Wang, X., Wu, Y., & Xu, W. (2023). Geopolitical risk and investment. *Journal of Money, Credit and Banking*, 56(8), 2023 - 2059. <https://doi.org/10.1111/jmcb.13110>.
- Wu, D., Rashed, A., & Elamer, A. A. (2026). Geopolitical Risk and Bank Stability in the MENA Region: The Moderating Role of Diversification and Financial Flexibility. *International Journal of Finance and Economics*, 1-32. <https://doi.org/10.1002/ijfe.70165>
- Yildirim, F., & Berkman, A. N. (2022). The impact of geopolitical risk index on the profitability performance of the banking sector. *Journal of Turkish Social Sciences Research*, 7(2), 89-100.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Tables.docx](#)
- [SupplementaryMaterials.docx](#)
- [Figures.docx](#)