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Research paper

Resilience of Islamic and Conventional Banks in The GCC During Systemic Crises: Evidence from A Dynamic Panel GMM Framework

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Abstract

The current study investigates the Islamic and conventional banks' resilience in the GCC across four systemic crises, the GFC, Arab Spring, oil price crash, and COVID-19, through a dynamic panel GMM framework that incorporates an inflation threshold. The findings confirm that resilience is a multidimensional and crisis-specific concept. Market valuations (Tobin's Q) deteriorated sharply during the GFC and COVID-19, while the Arab Spring and oil price crash elicited more adaptive responses. In contrast, credit risk (NPL/TA) rose significantly during the Arab Spring, with weaker direct effects from other crises. The role of inflation is pivotal: when inflation exceeded 3%, Islamic banks exhibited greater vulnerability during oil shocks but enhanced resilience during the Arab Spring and the COVID-19 pandemic, reflecting differences in policy responses, structural features, and funding models. Across indicators, a duality emerges, Islamic banks often outperformed in market valuation terms but showed heightened sensitivity in asset quality under adverse inflation dynamics. Country-level effects further highlight heterogeneity, with Oman appearing more resilient, while Saudi Arabia and the UAE faced stronger valuation pressures. The study demonstrates that resilience in dual-banking systems is heterogeneous, inflation-sensitive, and shaped by both market- and balance-sheet dimensions, underscoring the need for inflation-aware macroprudential policies, countercyclical buffers, and targeted credit monitoring to safeguard GCC financial stability.

Keywords: *Dynamic Panel Model; GCC; Inflation Threshold; Resilience; Tobin's Q.*

1. Introduction

The banking systems' ability to withstand systemic crises has been a persistent concern for regulators, policymakers, and market players. Since there are both conventional and Islamic banks operating in the Gulf Cooperation Council (GCC), the region has been subjected to frequent macroeconomic shocks over the past 20 years, making it an ideal place to examine the relative resilience of the various banking regimes (Al-Wesabi et al. 2020; Ghenimi et al. 2024). The global financial crisis (GFC) (2007–2009), the Arab Spring (2011), the oil price crash (2014–2016), and the COVID-19 pandemic (2020–2021) exposed banks to several stressors, such as exogenous economic shutdowns, commodity volatility, credit market disruption, and geopolitical instability (Al-Aradi & AlBalooshi 2023, Al-Wesabi et al. 2020, Ghenimi et al. 2024).

The GFC, as evidence, indicates that Islamic banks, compared to conventional banks, may have performed better in terms of credit and asset growth (Beck et al. 2013, Hasan & Dridi 2010), due to the asset-based nature of Islamic banks and risk-sharing contracts. Other sources, however, show insignificant differences (Bourkhis & Nabi, 2013) or even lower performance in the real economy (Alqahtani et al., 2017). These variances in results imply that resilience is very contextual and is determined by the character of the shock, the macroeconomic situations, in addition to the institutional backdrop. The GCC landscape is also highly susceptible to oil price trends, as member states are greatly dependent on hydrocarbon earnings to maintain their fiscal balance (Alsharif 2024). The Oil Price Crash of 2014-2016 had considerably overstressed the liquidity and solvency of the banks, and the Arab Spring created political and market uncertainty, distorting flows in the credit. In more recent history, the COVID-19 pandemic was a shock of an entirely different kind, being medically based but having profound economic and far-reaching impacts, due to which production, trade, and consumption were disrupted in unprecedented ways (Ghulam 2022). Another aspect that has been underrepresented in the study of crisis effects is the significant but unexplored connection between inflation thresholds and financial instability. An inflation beyond a specified critical limit may affect real values of assets, increase the cost of funding, and increase the likelihood of default. The impacts of these may be more pronounced on Islamic banks, as they operate on fixed-nominal-return contracts (e.g., Murabaha) for their assets and liabilities. This nonlinear relationship cannot be captured in traditional linear specifications and may obscure regime-specific vulnerabilities.

A dynamic panel threshold model via System GMM is employed to investigate the resilience of conventional and Islamic banks in the GCC during the four systemic crises. The model incorporates crisis-specific time dummies and an empirically determined inflation

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threshold, allowing us to examine whether the resilience gap between the two banking models widens under high-inflation regimes. Bank resilience is assessed using Tobin's Q, a forward-looking market valuation metric, and non-performing loans (NPLs), a backward-looking indicator of asset quality deterioration. This dual approach bridges market-based expectations and realized credit risk, providing a comprehensive picture of stability under stress.

By integrating multiple crisis contexts, an inflation-threshold framework, and both market- and balance-sheet-based resilience indicators, the study offers novel insights into the dynamics of bank stability in oil-dependent, dual-banking economies. The findings have direct implications for GCC central banks and regulators in designing macroprudential policies that mitigate systemic risk and enhance financial system robustness.

The study addresses the following research questions:

1) Do conventional and Islamic banks in the GCC differ in their resilience during the GFC, Arab Spring, Oil Price Crash, and COVID-19 crises?
2) Does inflation above a critical threshold amplify the adverse effects of systemic crises on bank resilience, and does this effect differ between conventional and Islamic banks?
3) How do systemic crises and high-inflation regimes affect forward-looking (Tobin's Q) versus backward-looking (NPL) resilience indicators for each banking model?
4) Are certain crises more detrimental to Islamic banks relative to conventional banks, or vice versa, when controlling for macroeconomic and bank-specific factors?
5) What macroprudential measures can GCC policymakers adopt for enhancing the resilience of both banking models in future systemic crises?

2. Literature Review

During systemic crises, the resilience of banking systems has emerged as a significant research area, especially in the GCC region, where, within dual banking frameworks, conventional and Islamic banks operate. Previous research focused on banking resilience during crises has revealed varying levels of performance differentiation between the two types of banking systems, while giving specific attention to the ability of the banks to withstand systemic shocks (El-Chaarani et al. 2024, Abdulla & Ebrahim 2022, Alhaddab et al. 2025). The following review of literature explores and discusses the empirical evidence on the resilience of the banking system during systemic crises with a specific focus on the GCC.

The stability of banking systems has been an important topic of discussion in financial research, given their central role in ensuring economic resilience and supporting sustainable growth. A growing strand of literature emphasizes that, along with macroeconomic conditions, stability is determined and shaped by institutional factors, including governance quality, market structure, efficiency, and systemic linkages between different types of financial institutions. This is particularly relevant in economies with dual-banking systems, where both conventional and Islamic banks operate, often subject to differing regulatory frameworks, business models, and governance structures.

The relative resilience of conventional and Islamic banks has become a significant issue in banking literature, especially after the events of the GFC between 2007 and 2008 that revealed flaws in conventional banking models. Many studies around the world have analyzed the sensitivity of the Islamic banks (IBs), which are regulated by Shariah law (like risk sharing, interest prohibition (riba)), to the financial shocks compared to traditional institutions (CBs). Through panel data at a bank level of eight countries, which comprises GCC nations, previous research has analyzed Islamic banks' performance compared to conventional banks during the GFC with a fixed-effects regression model. It focused on the impact on asset growth, credit expansion, profitability, and external ratings and found that IBs enjoyed an increase in lending and asset growth in the GFC and were largely unaffected in profitability and capital reserve levels (Hasan & Dridi, 2010). On the same note, Bourkhis and Nabi (2013) used a Z-score-based stability model with study-specific variables (profitability, capitalization, and liquidity) as they inputted and determined that IBs are less volatile and more financially stable during the crisis because of less exposure to risky assets and greater trust of depositors. These findings, however, are not unanimous. While Bourkhis and Nabi (2013) concluded that Islamic banks were less volatile and more stable, Alqahtani et al. (2017) reported that conventional banks often displayed stronger performance post-crisis on capital adequacy and efficiency indicators. The divergence stems largely from differences in sample periods, indicator choice, and methodology: Z-scores capture insolvency risk but do not reflect dynamic adjustments, whereas GMM approaches can incorporate persistence and macroeconomic controls. This suggests that resilience assessments are highly sensitive to methodological design and data horizons.Čihák and Hesse (2010) used a cross-country dataset with Z-scores as the outcome and size, capitalization, and asset quality as explanatory variables in a dynamic panel framework, concluding that small IBs are more stable than both small CBs and large IBs.

The Arab Spring, which erupted in late 2010 and intensified in 2011, caused significant economic and political disruptions in various MENA countries, as well as indirect consequences on Gulf Cooperation Council (GCC) member states. Bongini, Claessens, and Ferri (2013) used bank-level data with variables such as non-performing loans, credit growth, and liquidity ratios, applying a panel regression to examine political shocks' impact on financial distress. Empirical studies demonstrated that Islamic banks across the GCC had superior credit quality and fewer NPLs during this era, most likely due to their cautious risk management and limited exposure to high-risk international markets.

Another significant shock that affected GCC oil-based economies after the events of 2008 was the drop in oil prices experienced in 2014. Espinoza and Prasad (2012) applied both macroeconomic and bank-level panel data and estimated the effects of oil shocks and monetary policy on money changes, growth of bank credit, liquidity ratio, and spreads in GCC nations by utilizing a vector autoregressive (VAR) model. Ghosh (2016) also applied a panel ARDL model to determine the impact of oil price shocks and macroeconomic and regional political factors on the GCC countries' bank profitability. The research incorporated the variables ROA, ROE, and NIM/NPM, estimating the short-term effects and the long-term effects. It was observed that both price shocks in oil and the Arab Spring had a strong impact on both conventional and Islamic banks, though effects were stronger on CBs because the IBs showed more sustainable profits due to quicker convergence to the equilibrium.

Connecting the threshold literature with Islamic-banking mechanisms is crucial but understudied. Several recent empirical papers and working studies examine how inflation and interest-rate dynamics influence Shariah-compliant contracts (e.g., Murabaha, Ijarah, Musharakah). Murabaha's fixed-markup and deferred payment structure, for example, can lead to an erosion of real margins under high inflation unless contract terms are fully index-linked; conversely, profit-and-loss-sharing contracts (Musharakah/Mudarabah) distribute macroeconomic shocks between bank and counterparty and may mitigate NPL growth in some regimes but increase profit volatility. Empirical case studies and time-series analyses find that Murabaha margins and Murabaha-dominant portfolios display measurable sensitivity

to inflation and exchange-rate shocks, especially in countries where adjustments or indexation are limited. These contract-level channels provide a plausible mechanism for the pattern reported in several GCC studies—market valuation resilience on some indicators but heightened asset-quality sensitivity in high-inflation regimes (Akib et al. 2024).

Ftiti et al. (2013) used the Data Envelopment Analysis (DEA) in conjunction with the panel regression method to assess the Islamic bank and conventional bank performances in the subprime crisis in the GCC context. They utilized the inputs like total deposits, labor, and capital, and the outputs like loans and other earning assets to find that the Islamic banks, including the ones in Saudi Arabia, had maintained higher levels of efficiency and were not adversely affected by the crisis. Alqahtani et al. (2017) considered the GCC concerning the financial stability of IBs and CBs from 2003 to 2014, using indicators (based on CAMELS) on earnings, management efficiency, asset quality, capital adequacy, and stability indicators (also including Z-scores) in the framework of a dynamic panel GMM. It is observed that Islamic banks were more likely to have a better capital standing and a more sustainable performance, especially during and after the financial crisis of the world. These mixed results reinforce the importance of methodology in shaping conclusions about resilience.

These contract-level vulnerabilities and mixed institutional findings highlight the importance of methodologies that can capture both forward-looking (market) and backward-looking (asset-quality) indicators of resilience. While the literature is growing rapidly, it has several methodological limitations that help explain conflicting results and motivate our approach. First, many studies rely on single-indicator outcomes (e.g., profitability, ROA) or cross-sectional DEA efficiency scores—measures that do not capture combined forward-looking and backward-looking dimensions of resilience. Second, studies that do compare Islamic and conventional banks rarely incorporate endogenous regime shifts (e.g., inflation thresholds) and often overlook interaction effects between crisis dummies and macro thresholds. Third, sample selection (country coverage, bank size, and balance-sheet composition) and time-period choice (short COVID-only panels vs. long multi-crisis panels) substantially alter inferences. These methodological gaps explain why earlier findings about Islamic resilience are mixed and justify our use of a dynamic panel threshold (System GMM) approach that jointly models persistence, endogenous threshold regimes, and triple interactions (Bank type × Crisis × High-inflation).

Recent empirical work (2023–2025) broadens and complicates this view. Studies focusing on the COVID-19 episode and post-pandemic macroeconomic environment provide mixed evidence. Some large-sample comparative studies report that Islamic banks maintained stronger liquidity and lower systemic interconnectedness during COVID-19. At the same time, other analyses document weaker profitability and more volatile asset-quality outcomes for Islamic banks once country regulation and support measures are considered. For example, a comparative study of bank performance during COVID-19 finds that Islamic banks showed resilience on liquidity indicators but not uniformly on profitability measures, indicating indicator-dependence of any 'Islamic resilience' claim (Butt & Chamberlain, 2025). The COVID-19 pandemic presented a unique real-sector shock. Lassoued et al. (2025) employed DEA to measure efficiency scores for IBs and CBs in the MENA region during COVID-19, followed by Tobit regression using bank-level variables such as operating expenses, deposits, and income, though the study is not yet widely available in indexed databases. Elamer et al. (2020) applied content analysis of operational risk disclosures and panel regressions to assess the role of Shariah supervisory boards, with variables including governance structures, operational risk reporting, and bank size. Mansour et al. (2021) used panel regressions with dependent variables such as ROA, ROE, and net interest margins, along with control variables including capitalization, liquidity, and GDP growth, finding that IBs faced profitability pressures due to repayment delays in contracts, which were profit-and-loss sharing. The Islamic Financial Services Board (IFSB 2020) reported aggregated industry-level indicators—including total assets, financing volumes, and NPL ratios—to highlight liquidity challenges faced by the sector. Rizwan et al. (2022) applied a dynamic conditional correlation (DCC-GARCH) model using bank returns and market indices to measure systemic risk, finding that Islamic banks exhibited lower interconnectedness during the pandemic.

Studies have employed a range of bank performance indicators to assess resilience during crises. Ulussever (2018) conducted an analysis that compared IBs and CBs on financial performance and corporate governance. The study calculates Tobin's Q (market valuation measure), which is a ratio between market value and replacement cost of assets. It reports a significantly higher mean Tobin's Q for Islamic banks (0.21) versus conventional banks (0.03), indicating stronger market valuation under the former.

Beck et al. (2010) conducted an extensive cross-country empirical analysis comparing IBs and CBs in terms of business model, efficiency, and stability. Using bank-level panel data, their specification included dependent variables such as the fee income ratio, overhead costs, cost-to-income ratio, Z-score, and liquidity growth during the crisis period. Control variables included bank size, funding mix, country fixed effects, and time fixed effects. Results indicated that, during the GFC, Islamic banks experienced faster liquidity growth, lower reliance on non-interest income, and comparable or higher stability (measured by Z-scores) relative to conventional banks, even after controlling for country- and time-specific effects.

Previous research has shown that the link between banking performance and inflation is non-linear. Moreover, it is observed that a substantial role is played by informational frictions when the inflation rate reaches a certain threshold. In this regard, Azariadas and Smith (1996) and Choi et al. (1996) show that inflation does not interfere with resource allocation or distort the information flow in the case of economies at very low inflation because of non-binding credit market frictions. However, credit market friction emerges when inflation exceeds a certain level, which hurts the performance of the financial sector. The existence of inflation thresholds is also discussed by Huybens and Smith (1999) in the context of the link between real activity. It is observed that inflation negatively influences financial sector performance if the annual rate is below 15% (Boyd et al. 2001); however, the relationship after exceeding 15% disappears (Boyd et al. 2001). Another study examined the impact of inflation on the performance of the banking sector with a focus on ASEAN-6 countries (Khue et al. 2020). The study evaluated the threshold effect of inflation and provided strong evidence of the inflation-threshold effect when assessing the link between banking performance and inflation (Khue et al. 2020). Butt and Chamberlain (2025) highlight that Islamic banks' market valuations are particularly vulnerable when inflation exceeds modest thresholds, while Fatnassi and Hammami (2024) demonstrate that both Islamic and conventional banks remain exposed to systemic contagion risks, challenging assumptions of inherent resilience. Similarly, Lassoued et al. (2025) find that inflation shocks amplify efficiency losses during COVID-19, underscoring the need for models that capture nonlinear macro-financial linkages.

Previous research focusing on dual banking systems, comparing conventional and Islamic banking, finds nuanced performance differentials, which vary by crisis duration and type. For instance, research on COVID-19, examining the ASEAN region, reveals that based on loan-to-deposit and adequacy ratios, Islamic banks demonstrated superior resilience; however, with respect to non-performing loans and return on assets, no significant differences are observed (Sugiono & Dasuki, 2023). Research with a specific focus on dual banking systems in the GCC shows that to manage financial risk during COVID-19, conventional banks demonstrated greater capacity, showing higher levels of liquidity and financial performance than Islamic banks (El-Chaarani et al. 2024). Previous research studying systemic risk has challenged the assumptions of inherent stability about Islamic banking. With the help of market-based systemic risk measures, studies have found that Islamic banks had not been immune to systemic events (Hashem & Abdeljawad, 2018; Fatnassi & Hammami, 2024). It shows that both banking models (conventional and Islamic) are vulnerable to downside risk. Moreover, contagion effects' studies have shown that

during a crisis, systemic factors in determining resilience and individual bank characteristics are more important than the banking model, i.e., conventional vs. Islamic banks. It shows crucial implications for supervision approaches and regulatory frameworks in dual bank systems (Hashem & Abdeljawad, 2018).

Country-specific evidence, i.e., literature focusing on individual GCC countries, shows significant variations in the resilience of conventional and Islamic banking. For example, research on Islamic banks in Bahrain reveals differential effects between COVID-19 and 2007's crisis, where the COVID-19 pandemic demonstrated a more pronounced impact on the financial performance of Islamic banks due to operational constraints (Al-Aradi & AlBalooshi, 2023). Another study, based on the UAE, finds that banking performance differentials are significantly influenced by corporate governance practices, with the positive impact of governance improvements on Tobin's Q evident in both conventional and Islamic banks (Mohammed et al., 2024). It demonstrates that, along with the banking model, institutional factors are also important in determining crisis resilience. These country differences are not merely anecdotal but reflect deeper institutional structures. Oman's relatively greater resilience aligns with its conservative provisioning requirements and lower exposure to international financial markets. In contrast, Saudi Arabia's greater vulnerability can be traced to its deep integration with global oil-linked revenues and capital flows, which amplify systemic and inflationary shocks. The UAE's sensitivity is often linked to its real-estate dependence and higher exposure to international capital cycles, while Bahrain's small open economy makes it structurally vulnerable to contagion effects. Such institutional and structural heterogeneity across GCC states explains why resilience outcomes diverge, even within a shared dual-banking framework.

GCC countries operating dual banking systems have critical implications for regulatory frameworks. Previous research investigating enterprise risk management and corporate governance in Islamic banks in the GCC shows positive links between risk management implementation and CSR practices; it suggests that governance mechanisms influence resilience capacity (Alsalami et al. 2023, Khémiri & Alsulami 2023). Moreover, supervisory framework research shows that greater supervision leads to enhanced regulatory compliance and improved resilience. It is observed that extraordinary support measures of the central bank and regulatory flexibility enable banks to improve risk governance and absorb shocks (Dedeloudis & Repousis, 2025).

Sharia compliance risk is another important factor, increasingly recognized by literature, affecting the resilience of Islamic banks. Previous research has revealed complex associations between various types of risks, including reputation, operational, market, and credit risks, and governance mechanisms (Mukhibad & Setiawan, 2022; Mukhibad et al., 2022). Shaira compliance research has revealed that during a crisis period, adherence to Islamic principles could both improve or restrict banking operations. Compliance may increase customer confidence and provide legitimacy, while operational constraints could bound flexibility in crisis response (Lahuri et al. 2024). S

Previous research has also discussed how systemic crises and high-inflation regimes affect forward-looking (Tobin's Q) versus backward-looking (NPL) resilience indicators for the given banking models. Systemic crises, including the COVID-19 pandemic and the global financial crisis, typically result in a decline in forward-looking indicators (Tobin's Q), reflecting market expectations about bank stability and profitability. During crisis periods, both conventional and Islamic banks see a decrease in Tobin's Q; however, empirical studies show that due to investors' concerns related to limited crisis adaptation options and operational rigidity under Sharia-compliant models, Islamic banks may face sharper declines than other commercial banks (Butt & Chamberlain, 2025; Khanifah et al., 2020). Tobin's Q becomes more volatile for less flexible institutions when inflation is high, since uncertainty intensifies market pessimism.

Backward-looking indicators, such as NPLs, lag initial market reactions, capturing how asset quality deteriorates as the inflation and crisis shocks flow through the loan portfolios of the banks. Previous research observes that credit risk deterioration is more efficiently managed by conventional banks, while post-crisis NPL trends of Islamic banks are more variable, and affected by unique business model attributes and country-specific regulatory support (Junjunan et al. 2022). Persistently high inflation worsens NPL formation, revealing the true credit risk and reducing repayment capacities of the borrowers (Abid et al. 2024). According to Butt and Chamberlain (2025), Islamic finance's unique principles, including asset-backed financing, risk-sharing, and prohibition of speculative activities and interest, offered a distinct framework for crisis response. While Islamic banks show resilience in credit risk management, they experience challenges in operational efficiency and liquidity management compared to conventional banks.

To enhance the resilience of conventional and Islamic banks in systemic crises in the future, several studies have suggested macroprudential measures that GCC policymakers can adopt. One of the ways is to strengthen capital buffers to enable banks to absorb losses during the period of crises, thus reducing the risk of insolvency (Dedeloudis et al. 2025). It is further suggested to implement strict liquidity requirements to ensure that banks hold sufficient liquid assets (high-quality) for meeting short-term obligations during crises (Yunita 2022). Other suggestions include dynamic loan loss provisioning (Igan et al. 2023), promoting strong corporate governance and risk management (Alsalami et al. 2023), macroprudential regulation flexibility (Igan et al. 2023), and encouraging financial innovation with Sharia compliance (Ichsan et al. 2024). These macroprudential steps, tailored for the dual banking environment of the GCC, can improve risk governance, build systematic buffers, and contain contagion effects, thereby increasing the resilience of both conventional and Islamic banks.

Although the similar resilience of Islamic and conventional banks has already been discussed in detail in other studies outlining individual institute of crisis such as the GFC, Arab Spring, oil price shocks, and the COVID-19 pandemic, there are limited studies that have consolidated these various and specific crises into one unified method of study like the very unique case of a dual-banking system in the GCC. Additionally, the current body of existing evidence on resilience remains disparate and inconclusive, with results differing according to crisis type, time horizon, and performance measure. The literature converges on three unresolved gaps. First, resilience assessments remain fragmented across crisis types and indicators, making it difficult to compare Islamic and conventional banks consistently. Second, the role of inflation thresholds as a nonlinear amplifier of systemic stress is underexplored in the GCC context, despite evidence from other regions. Third, while several studies acknowledge Shariah compliance broadly, few link specific contract structures (Murabaha, Ijarah, Musharakah) to resilience outcomes during high-inflation regimes. These gaps justify the present study's contribution: a dynamic panel threshold (System GMM) framework that integrates multiple crises, an empirically determined inflation threshold, dual resilience measures (Tobin's Q and NPL/TA), and country-level heterogeneity to provide a comprehensive, regime-sensitive estimate of bank stability in the GCC. This contribution also aligns with the evolving policy dialogue in the GCC, where regulators increasingly recognize the need to integrate inflation-aware provisioning, Shariah-compliant hedging tools, and macroprudential flexibility into dual-banking frameworks.

3. Methodology

3.1. Data

The panel spans 20052024, which is a long enough time horizon to capture several systemic crises, namely, the Global Financial Crisis (2008-2009), the Arab Spring (2011), the Oil Price Crash (2014-2016), and the COVID-19 pandemic (2020-2021).

This study uses a dataset that is compiled out of various trustworthy sources to provide representative coverage of not only bank-specific variables but also macroeconomic ones. The Refinitiv Eikon database is used to obtain bank-level data. Key financial indicators of the bank include its size (in terms of total assets), total assets, non-performing loans (NPLs), the market value of the company, and net loans. The resilience measure used in the study is Tobin Q, which is a ratio of the market value to total assets of each bank-year observation. The sample consists of both Islamic- and conventional-bank data in the Gulf Cooperation Council (GCC) countries.
The International Monetary Fund (IMF) and the World Bank are used to obtain macroeconomic variables, including inflation rate, GDP growth rate, interest rate, oil prices, and exchange rate. The choice of these macroeconomic indicators will cover the domestic and global economic conditions that could affect the performance and resilience of banks.

3.2. Pre-diagnostic tests

Before estimating the econometric models, pre-diagnostic tests are conducted to validate the quality and suitability of the panel data. These tests ensure that the assumptions underlying the estimation techniques are met, thereby enhancing the reliability and robustness of the results.

3.2.1. Unit root test

To determine the stationarity properties of the variables, the Fisher-type unit root test is employed. Developed by Maddala and Wu (1999), this test is particularly appropriate for unbalanced panel datasets. The Fisher test combines the p-values from individual unit root tests (e.g., Augmented Dickey-Fuller or Phillips-Perron) applied to each cross-sectional unit and allows for heterogeneity in the autoregressive parameters under the alternative hypothesis. Stationarity is a critical prerequisite in panel data analysis to avoid spurious regression results, especially when dealing with macroeconomic time series. The test results guide the appropriate transformation of non-stationary variables—usually through first differencing—to ensure the validity of the estimations.

3.2.2. Multicollinearity

To detect multicollinearity, two complementary approaches are used: the correlation matrix and the Variance Inflation Factor (VIF). The correlation matrix provides an overview of the linear relationships between explanatory variables, helping to identify any strong pairwise associations. However, because high correlation between two variables does not necessarily imply multicollinearity across the entire model, the VIF is calculated for each independent variable. The VIF quantifies how much the variance of an estimated regression coefficient is inflated due to multicollinearity with other variables. According to Akinwande et al. (2015), a VIF value greater than 10 is typically considered a sign of problematic multicollinearity. In this study, the inclusion of both tests ensures that the model is free from excessive collinearity that could distort coefficient estimates or reduce the explanatory power of the regressors.

3.3. Econometric models

This study employs a dynamic panel threshold model via System GMM to assess GCC bank resilience during systemic crises, incorporating inflation thresholds as a core innovation. The use of a threshold dummy (D_{it}^{inf}), rather than linear inflation, is grounded in the nonlinear relationship between price instability and banking stability in the GCC context. Inflation beyond a critical level (k), empirically determined via grid search, triggers disproportionate financial stress: eroding real asset values, amplifying funding costs, and heightening default risks. These effects are acutely asymmetric for Islamic banks due to their fixed-nominal-return contracts (e.g., Murabaha) and asset-liability mismatches, which magnify losses when inflation exceeds k. A linear specification would mask this regime-dependent vulnerability, failing to capture how inflation transitions from a marginal control variable to a systemic amplifier during crises. By isolating high-inflation regimes, the threshold enables precise identification of compound shocks and reveals when Islamic banks' resilience diverges from conventional peers. This approach aligns with GCC central banks' inflation-targeting frameworks and delivers actionable insights identifying critical thresholds where macroprudential intervention becomes essential to mitigate systemic risk. This approach aligns with GCC central banks' inflation-targeting frameworks and builds on evidence such as Ngo et al (2020), who document inflation threshold effects in ASEAN-6 banking sectors.
The study adopts Tobin's Q and non-performing loans (NPLs) as dependent variables to capture complementary dimensions of bank resilience in the GCC during systemic crises. Tobin's Q, defined as the ratio of a bank's market value to the replacement cost of its assets, serves as a forward-looking measure of resilience by reflecting investor confidence, growth prospects, and the perceived ability to generate returns under stress. A higher Tobin's Q during crises indicates stronger market valuation and adaptability, which is critical for signaling stability to stakeholders. In contrast, NPLs represent a backward-looking, balance-sheet-based indicator of asset quality deterioration, capturing the realized impact of crises on loan performance. Rising NPL ratios directly signal heightened credit risk, impaired profitability, and reduced capital buffers. The dual use of Tobin's Q and NPLs allows the analysis to bridge market-based expectations and on-balance-sheet realities, thereby providing a more holistic assessment of resilience. By examining both indicators under the dynamic panel threshold framework, the study can reveal whether inflation shocks affect market valuation and credit risk asymmetrically between Islamic and conventional banks when systemic crises occur.
Dynamic Panel Threshold Model (System GMM)

$$\begin{aligned}\text{TOBINQ}_{it} = {} & \alpha\text{TOBIN}_{it-1} + \beta_1\text{dummybank} + \beta_2\text{GFC} + \beta_3\text{ArabSpring} + \beta_4\text{OilCrash} + \beta_4\text{COVID} + \delta1(\text{Dummybank} * \text{GFC}) + \\ & \delta1(\text{Dummybank} * \text{ArabSpring}) + \delta1(\text{Dummybank} * \text{OilCrash}) + \delta1(\text{Dummybank} * \text{COVID}) + \theta_1\left(\text{Dummybank} * \text{GFC} * D_{it}^{inf}\right) + \\ & \theta_2\left(\text{Dummybank} * \text{ArabSpring} * D_{it}^{inf}\right) + \theta_3\left(\text{Dummybank} * \text{OilCrash} * D_{it}^{inf}\right) + \theta_4\left(\text{Dummybank} * \text{COVID} * D_{it}^{inf}\right) + \\ & \gamma_1(\text{Net_Loans}_{it}) + \gamma_2(\text{current Account Balance }_{it}) + \gamma_3(\text{Interest_Rate}_{it}) + \gamma_4(\text{GDP Growth}_{it}) + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)\end{aligned}$$

$$\begin{aligned}\frac{\text{NPL}_{it}}{\text{total assets}_{it}} = {} & \alpha\left(\frac{\text{NPL}_{it}}{\text{total assets}}\right)_{it-1} + \beta_1\text{dummybank} + \beta_2\text{GFC} + \beta_3\text{ArabSpring} + \beta_4\text{OilCrash} + \beta_4\text{COVID} + \delta1(\text{Dummybank} * \text{GFC}) + \\ & \delta1(\text{Dummybank} * \text{ArabSpring}) + \delta1(\text{Dummybank} * \text{OilCrash}) + \delta1(\text{Dummybank} * \text{COVID}) + \theta_1\left(\text{Dummybank} * \text{GFC} * D_{it}^{inf}\right) + \\ & \theta_2\left(\text{Dummybank} * \text{ArabSpring} * D_{it}^{inf}\right) + \theta_3\left(\text{Dummybank} * \text{OilCrash} * D_{it}^{inf}\right) + \theta_4\left(\text{Dummybank} * \text{COVID} * D_{it}^{inf}\right) + \\ & \gamma_1(\text{current Account Balance }_{it}) + \gamma_2(\text{Interest_Rate}_{it}) + \gamma_3(\text{GDP Growth}_{it}) + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)\end{aligned}$$

Where,

$$D_{it}^{inf} = \begin{cases} 1 \text{ if } Inflation_{it} > k \\ 0 \text{ otherwise} \end{cases}$$

DummyBank: Indicator for Islamic or a Conventional bank
GFC, Arab Spring, OilCrash, COVID: Time dummy variables for global crises
δ, θ , ϕ Coefficients for interaction terms
γ Coefficients for control variables
μ: Bank fixed effects
λ: Time fixed effects
ε: Error term

3.4. Post-diagnostic tests

To ensure the validity and robustness of the estimated results in both the Generalized Method of Moments (GMM), relevant post-diagnostic tests are conducted. These include the Hansen J-test for instrument validity and the Arellano-Bond test for second-order serial correlation (AR(2)), both of which are critical for assessing the reliability of instrumental variable estimators used in dynamic panel data analysis.

3.4.1. Hansen J-test of overidentifying restrictions

The Hansen J-test is used to evaluate the overall validity of the instruments employed in both GMM and 2SLS models. Specifically, it tests the null hypothesis that the instruments are uncorrelated with the error term and correctly excluded from the estimated equation. A p-value greater than 0.10 implies that the null hypothesis cannot be rejected, indicating that the instruments are valid and the model is not overidentified. In GMM estimation, the Hansen test is particularly preferred over the traditional Sargan test due to its robustness to heteroskedasticity (Roodman 2009). In the context of 2SLS, the Hansen test also serves as a critical diagnostic for the validity of externally supplied instruments and reinforces the reliability of causal inference drawn from the model.

3.4.2. Arellano-bond test for serial correlation (AR(2))

The Arellano-Bond test is applied to the differenced residuals of the dynamic panel model to detect second-order serial correlation. While first-order serial correlation (AR(1)) is expected in first-differenced models, the presence of second-order autocorrelation (AR(2)) would violate the GMM assumptions and indicate model misspecification. A non-significant AR(2) p-value ($p > 0.10$) implies that the error terms are not serially correlated beyond the first order, confirming the appropriateness of the instruments and the reliability of the GMM estimations (Arellano & Bond 1991). Although this test is primarily relevant to GMM models, the absence of autocorrelation also strengthens the case for the validity of instruments used in 2SLS, particularly when lags or internal instruments are employed.

4. Results and Discussion

4.1. Descriptive statistics

The descriptive statistics reveal that Tobin's Q, which measures bank performance, has a mean of 0.41 and a comparatively large standard deviation of 1.49. There are both severely undervalued and noticeably overvalued institutions in the sample, as seen by the wide range of market valuations across banks, which range from as low as 0.01 to a maximum of 46.48. The non-performing loans ratio has an average of 3.9% and a standard deviation of 6.9%, indicating that credit risk exists but varies greatly across banks, with some having essentially no loan defaults and others experiencing exceptionally high NPL levels of up to 99.8%. This demonstrates the exposure of specific banks to credit quality decline during the sample period.
In terms of control variables, net loans average around 18.3 billion USD, although there is a standard deviation of 28.6 billion. This demonstrates significant differences in balance sheet size and lending activity among GCC banks. Inflation rates range from deflationary times of -4.86% to inflationary pressures as high as 15.05%, with an average of 2.65% and significant fluctuation. Although GDP growth is generally positive, it may be very volatile, contracting by -7.08% in crisis years and increasing by 26.17% during times of fast economic progress. With an average current account balance of 9.25% of GDP and a large standard deviation of 8.21%, it indicates that certain countries consistently have surpluses while others have deficits. Interest rates range from 0.15% to 6.25%, with a mean of 2.82% and a standard deviation of 1.79, making them very steady when compared to other variables. This is a reflection of many GCC countries' pegged exchange rate contracts, which lead to monetary policy environments that are more stable.
In order to capture systemic shocks, crisis dummy variables were also created. On average, 9.9% of the sample is activated by the Global Financial Crisis (GFC) dummy, 5% by the Arab Spring, 14.9% by the oil price drop, and 10.1% by the COVID-19 pandemic. The significant systemic crises that the GCC countries and their banking sectors experienced over the sample period are highlighted by these dummies.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Tobin's Q	1,086	0.406	1.489	0.008	46.479
NPL/TA	912	0.039	0.069	0.000	0.998
Net Loans	1,098	18300000000	28600000000	-885000000	250000000000
Inflation	1,091	2.650	3.127	-4.863	15.050
Current Account balance (% of GDP)	1,077	9.249	8.214	-16.555	33.185
GDP Growth (Annual %)	1,148	3.765	4.743	-7.076	26.170
Interest Rate	1,089	2.815	1.794	0.150	6.250
GFC Dummy	1,148	0.099	0.299	0.000	1.000
Arab Spring Dummy	1,148	0.050	0.217	0.000	1.000
Oil price crash	1,148	0.149	0.356	0.000	1.000
COVID-19 dummy	1,148	0.101	0.302	0.000	1.000

4.1.1. Graphical analysis

Figure 1 presents the average Tobin's Q across major systemic crises in the GCC. A clear downward trajectory is evident, with values declining from above 0.40 during the Global Financial Crisis to around 0.25 in the COVID-19 period. This pattern reflects a cumulative erosion of market confidence in the banking sector, as Tobin's Q captures forward-looking investor expectations of profitability and stability. The relatively higher valuation during the GFC suggests that both Islamic and conventional banks initially maintained credibility, consistent with earlier findings that Islamic banks were less exposed to toxic assets. However, the sharp decline during the Arab Spring highlights the impact of regional political uncertainty on market sentiment. The subsequent fall during the oil price crash indicates the structural vulnerabilities of GCC banks to commodity-linked shocks, while the COVID-19 pandemic produced the lowest valuations, underscoring the severity of real-sector disruptions. Overall, the trend illustrates that successive crises not only reduced market valuations but also magnified concerns about the resilience of dual-banking systems in the region.

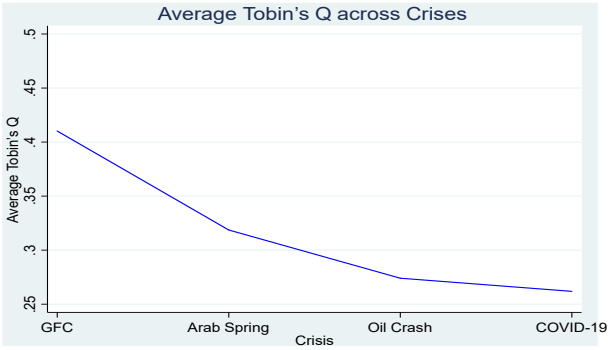

Fig. 1: Average Tobin's Q Across Major Systemic Crises in the GCC.

Figure 2 illustrates the evolution of average non-performing loans to total assets (NPL/TA) across successive crises. Unlike Tobin's Q, which reflects forward-looking market expectations, NPL/TA provides a backward-looking measure of actual credit risk. The results show a pronounced increase in NPL/TA from the Global Financial Crisis to the Arab Spring, indicating a deterioration in asset quality during periods of political instability. A slight decline is observed during the oil price crash, suggesting that banks absorbed part of the commodity shock through provisioning and regulatory support measures. However, the COVID-19 crisis resulted in the highest NPL/TA ratio (≈0.50), highlighting the severe impact of real-sector disruptions on borrower repayment capacity. Overall, the upward trajectory underscores how successive crises have exacerbated credit risk in GCC banks, with Islamic banks often cushioned by asset-backed contracts but still exposed to structural vulnerabilities under prolonged inflationary and pandemic pressures

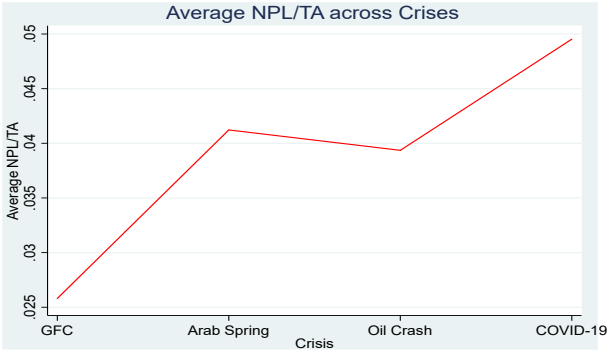

Fig. 2: Average Non-Performing Loans to Total Assets (NPL/TA) Across Successive Crises.

4.2. Unit root tests

The Fisher-type unit root test results indicate that all the variables in the study are stationary at their levels or first differences, as evidenced by the highly significant z-statistics and p-values. Variables such as total assets, net loans, inflation, GDP growth, TOBINQ, and others reject the null hypothesis of a unit root at the 1% significance level, confirming that they are integrated of order zero or one. This finding ensures the reliability of subsequent panel regression analyses, as it rules out the risk of spurious relationships caused by non-stationary data.

Table 2: Fisher-Type Unit Root Test Results

Variables	Z	p-value
D. Total Assets	-14.991	0.000***
Non-Performing Loans	-2.604	0.005***
Market Value for Company	-3.631	0.0005***
D.Net Loans	-14.138	0.000***
Inflation	-19.026	0.000***
Current Account Balance	-4.194	0.000***
GDP Growth	-15.844	0.000***
Interest Rate	-2.843	0.002***
Tobin's Q	-29.983	0.000***
NPL/TA	-7.309	0.000***

Note: ***, **,* Indicate Significance Level at 1%, 5% and 10% respectively.

4.3. Multicollinearity

The correlation coefficients between the variables are shown in Table 3. The findings indicate that there is little indication of severe collinearity and that correlations are typically weak to moderate. For instance, Tobin's Q and NPLTA have a negative correlation, which is in line with the theory that higher credit risk lowers business valuation. Inflation is weakly correlated with the current account balance and GDP growth. In addition, the crisis dummies show minimal correlations with bank-level and macroeconomic variables.

Table 3: Correlation Matrix

	Tobin's Q	NPL/TA	NL	Inf	CA	GDP Growth	IR	GFC	Arab Spring	Oil price	COVID-19
Tobin's Q	1										
NPL/TA	-0.098	1									
NL	-0.040	-0.134	1								
Inf	0.037	-0.085	-0.082	1							
CA	0.133	-0.005	-0.025	0.183	1						
GDP Growth	0.060	-0.069	-0.093	0.394	0.340	1					
IR	0.081	-0.105	0.128	0.185	0.224	0.323	1				
GFC	0.000	-0.057	-0.094	0.421	-0.036	-0.040	-0.085	1			
Arab Spring	-0.013	0.007	-0.056	-0.005	0.207	0.197	-0.113	-0.076	1		
Oil Price Crash	-0.038	0.002	-0.010	-0.040	-0.215	0.013	-0.231	-0.139	-0.096	1	
COVID-19	-0.033	0.056	0.099	-0.231	-0.177	-0.293	-0.339	-0.111	-0.077	-0.140	1

Note: Tobin's Q, ratio of a company's market value to the replacement cost of its assets; NPL/TA, Non-Performing Loans to Total Assets; NL, Net Loans; Inf, Inflation; CA, Current Account Balance; IR, Interest Rate. GFC (Global Financial Crisis), Arab Spring, Oil Price Crash, and COVID-19 are included as dummy variables.

The VIF results are included in Table 4 to further evaluate multicollinearity. With inflation having the highest value (1.81), all values fall considerably below the critical threshold of 10. This supports the reliability of the regression estimations by confirming that multicollinearity is not a serious problem in the dataset.

Table 4: Variance Inflation Factor (VIF) Results

Variable	VIF	1/VIF
Inflation	1.810	0.553
GFC Dummy	1.780	0.561
GDP Growth	1.630	0.615
Interest Rate	1.470	0.679
COVID-19	1.470	0.680
Oil Price Crash	1.360	0.733
Current Account Balance	1.260	0.793
Arab Spring	1.230	0.816
Net Loans	1.090	0.918
NPL/TA	1.030	0.966
Mean VIF	1.410	

4.4. Econometric models

The dynamic panel regression results using Tobin's Q as the dependent variable, in Table 5, provide critical insights into the resilience of Islamic and conventional banks in the GCC during systemic crises. The lagged dependent variable, L1. Tobin's Q is positive and highly significant, confirming strong persistence in firm value across periods, a pattern consistent with firm valuation stickiness in bank-based economies.

The bank dummy is positive, indicating that Islamic banks exhibit slightly greater resilience relative to conventional banks, though the effect is only marginally significant. The Global Financial Crisis (GFC) dummy shows a significant negative effect, indicating that systemic shocks during 2008–2009 eroded firm valuations across the GCC. This finding is in line with evidence of the crisis undermining global market efficiency (Motlagh & Babacan, 2015). By contrast, the Arab Spring dummy is positive and significant, suggesting that regional banks may have adapted quickly to shifting political and economic conditions, consistent with literature emphasizing the mixed and context-dependent effects of political shocks on financial markets (Alawfi & Vergos, 2017). Conversely, the COVID-19 dummy reveals a strong negative effect, underscoring the disruptive and unprecedented impact of the pandemic on firm value. This corroborates recent empirical evidence highlighting COVID-19's adverse impact on financial markets and firm fundamentals (Alhaddab et al. 2025).

The interaction terms shed further light on the resilience of Islamic versus conventional banks. The Bank dummy × GFC interaction is negative and significant, suggesting that Islamic banks were disproportionately vulnerable during the GFC, consistent with arguments that systemic fragility can undermine the stability of Islamic banking models despite their asset-based structures (Parashar & Venkatesh, 2010). Interestingly, the Bank dummy × Oil price crash is positive and highly significant, pointing to greater resilience of Islamic banks during commodity price downturns. The COVID-19 period reveals a nuanced picture. While the direct interaction between the bank dummy and COVID-19 is weakly negative, suggesting a modest vulnerability of Islamic banks relative to conventional peers, the higher-order interactions provide deeper insights. The positive and significant Bank×ArabSpring×DINF coefficient indicates that in high-inflation environments, Islamic banks' valuations improved relative to conventional banks. (Zar et al. 2020).

In contrast, the Bank×OilPriceCrash×DINF coefficient is negative and significant, highlighting that under high-inflation conditions, the oil price collapse had more severe adverse effects on Islamic banks. This can be attributed to the dual pressure of contracting fiscal revenues and high inflation, which eroded real returns and tightened liquidity. Islamic banks' structural constraints—such as limited hedging instruments and the fixed nature of markup-based contracts—further diminished their ability to absorb shocks, thereby reducing their resilience relative to conventional peers.

By comparison, the Bank×COVID-19×DINF interaction is positive and highly significant, suggesting that in high-inflation environments, Islamic banks weathered the pandemic more effectively than conventional banks. This relative resilience may be linked to policy design: GCC governments introduced payment deferrals, loan guarantee schemes, and liquidity support mechanisms that aligned closely with Islamic contracts, softening cash-flow pressures without the compounding effect of interest. Moreover, Islamic banks' stronger

capitalization and reliance on collateralized financing (murābaḥah, ijārah) allowed them to mitigate margin pressure more effectively than conventional peers, whose net interest margins were sharply compressed by aggressive rate cuts.

Country fixed effects further reveal heterogeneity in bank resilience across the GCC. Oman shows a positive and significant coefficient, suggesting stronger resilience compared to the base country (Bahrain). By contrast, Saudi Arabia and the UAE exhibit significantly lower valuations, reflecting heightened sensitivity to systemic shocks in larger, more globally integrated financial markets. Kuwait and Qatar show no significant deviations from Bahrain, indicating more muted differences in resilience. Collectively, these results underscore that resilience during systemic crises is shaped not only by bank type (Islamic vs. conventional) and crisis-specific dynamics but also by country-specific macro-financial conditions and policy responses across the GCC. Finally, the diagnostic tests confirm the robustness of the model. The Hansen test supports instrument validity, while the AR(2) test indicates no second-order autocorrelation in the residuals, validating the dynamic panel specification (Arellano & Bond 1991).

Table 5: GMM Model 1 Results

Tobin's Q	Coefficient.	Std. Err.	z	P>|z|
L1.Tobin's Q	1.075	0.040	27.150	0.000***
Bank dummy	0.275	0.145	1.890	0.059*
GFC Dummy	-0.319	0.063	-5.050	0.000***
Arab Spring Dummy	0.178	0.059	3.000	0.003***
Oil price crash	0.058	0.049	1.180	0.238
COVID-19 dummy	-0.746	0.055	-13.680	0.000***
Bank dummy*GFC	-0.187	0.085	-2.200	0.027**
Bank dummy*Arab Spring	-0.178	0.132	-1.340	0.179
Bank dummy* Oil price crash	0.329	0.066	4.990	0.000***
Bank dummy* COVID-19	-0.150	0.085	-1.770	0.077*
Bank dummy*GFC* D_{it}^{inf}	0.015	0.069	0.220	0.823
Bank dummy*Arab Spring* D_{it}^{inf}	0.287	0.138	2.070	0.038**
Bank dummy* Oil price crash*D_{it}^{inf}	-2.101	0.686	-3.060	0.002***
Bank dummy* COVID-19*D_{it}^{inf}	1.085	0.091	11.920	0.000***
Current Account Balance	0.032	0.003	10.780	0.000***
GDP Growth	-0.068	0.004	-17.510	0.000***
Interest Rate	-0.193	0.016	-11.820	0.000***
Net Loans	0.000	0.000	9.410	0.000***
i.country				
Kuwait	-0.220	0.170	-1.300	0.194
Oman	0.388	0.140	2.770	0.006***
Qatar	-0.421	0.447	-0.940	0.346
Saudi Arabia	-1.349	0.158	-8.520	0.000***
United Arab Emirates	-0.577	0.188	-3.060	0.002***
Constant	0.162	0.133	1.210	0.225
Prob > chi2	0.000***			
AR(2) Pr > z	0.959			
Hansen test Prob > chi2	0.272			

Note: ***, **,* Indicate Significance Level at 1%, 5% and 10% respectively.

The dynamic panel regression with NPL/TA as the dependent variable in Table 6 provides important evidence on the credit risk resilience of Islamic and conventional banks in the GCC under systemic shocks. The Arab Spring dummy shows a positive and significant effect, indicating that political unrest in the region contributed to higher credit risk, likely due to rising uncertainty and weakened borrower capacity. The interaction terms highlight notable differences between Islamic and conventional banks. The Bank dummy itself is insignificant, confirming no structural difference in NPL levels across the two systems in normal periods. However, during systemic crises, divergences emerge. The Bank dummy × Oil price crash is negative and highly significant, suggesting that Islamic banks experienced greater deterioration in asset quality relative to conventional banks during the oil price collapse (Padamja et al. 2016), possibly due to their concentration in asset-backed financing closely tied to real economic activity. Similarly, the Bank dummy × COVID-19 is negative and significant, indicating that Islamic banks were more adversely affected than conventional banks in terms of NPLs during the pandemic.

Interestingly, the three-way interactions with inflation thresholds reveal contrasting dynamics. The Bank dummy × Oil price crash × DINF is positive and highly significant, implying that in high-inflation environments (above 3%), Islamic banks' resilience improved relative to conventional banks during oil price shocks, possibly due to inflation-hedging features embedded in some Shariah-compliant contracts. Likewise, the Bank dummy × COVID-19 × DINF is positive and significant, suggesting that during the pandemic, Islamic banks were relatively more resilient in high-inflation settings, potentially reflecting policy support and their stronger deposit-based funding structures. Among the control variables, the Current Account Balance is negative and highly significant, indicating that weaker external balances exacerbate credit risk in the banking system. Net loans are modestly linked to greater credit risk. Country effects show that banks in Saudi Arabia report significantly lower NPLs compared to the reference (Bahrain), while Oman and Qatar also display weakly lower ratios. The UAE and Kuwait, by contrast, do not differ significantly.

Overall, these results suggest that NPL/TA shows modest persistence, with no baseline difference between Islamic and conventional banks. The Arab Spring increased NPLs, while other crises had no direct effect. Interaction terms reveal that Islamic banks were more resilient during the oil price crash and COVID-19, but this advantage reversed under high-inflation conditions, where credit risk rose significantly. Stronger current account balances reduced NPLs, while country effects indicate lower credit risk in Saudi Arabia, Oman, and Qatar relative to Bahrain. The diagnostic tests confirm model validity. The Hansen test supports the appropriateness of instruments, and the AR(2) test indicates no second-order serial correlation.

Table 6: GMM Model 2 Results

NPL/TA	Coefficient.	Std. Err.	z	P>|z|
L1. NPL/TA	0.145	0.088	1.650	0.100
Bank dummy	0.007	0.007	1.040	0.300
GFC Dummy	-0.009	0.006	-1.420	0.155
Arab Spring Dummy	0.011	0.004	3.160	0.002***
Oil price crash	-0.001	0.003	-0.490	0.623
COVID-19 dummy	-0.001	0.005	-0.190	0.852
Bank dummy*GFC	-0.011	0.013	-0.790	0.430
Bank dummy*Arab Spring	0.005	0.013	0.380	0.707
Bank dummy* Oil price crash	-0.009	0.003	-2.760	0.006***
Bank dummy* COVID-19	-0.024	0.009	-2.780	0.005***
Bank dummy*GFC* D_{it}^{inf}	0.015	0.012	1.210	0.225
Bank dummy*Arab Spring* D_{it}^{inf}	-0.010	0.013	-0.770	0.443
Bank dummy* Oil price crash*D_{it}^{inf}	0.095	0.029	3.230	0.001***
Bank dummy* COVID-19*D_{it}^{inf}	0.049	0.022	2.220	0.026**
Current Account Balance	-0.001	0.000	-6.550	0.000***
GDP Growth	0.000	0.000	-0.460	0.644
Interest Rate	-0.001	0.001	-0.740	0.461
Net Loans	0.000	0.000	2.030	0.043**
i.country				
Kuwait	-0.016	0.013	-1.190	0.233
Oman	-0.021	0.012	-1.730	0.083*
Qatar	-0.029	0.017	-1.700	0.090*
Saudi Arabia	-0.041	0.013	-3.140	0.002***
United Arab Emirates	0.004	0.014	0.260	0.797
Constant	0.043	0.012	3.560	0.000***
Prob > chi2	0.000***			
AR(2) Pr > z	0.449			
Hansen test Prob > chi2	0.376			

Note: ***, **,* Indicate Significance Level at 1%, 5% and 10% respectively.

5. Conclusion

This study set out to examine the resilience of Islamic and conventional banks in the GCC during four systemic crises: the Global Financial Crisis, the Arab Spring, the oil price crash, and COVID-19, using a dynamic panel threshold framework. By integrating both Tobin's Q and NPL/TA measures, the analysis provides a comprehensive view of bank resilience under crisis and inflationary regimes.

The results reveal that resilience is highly crisis-specific and context-dependent. Market valuations (Tobin's Q) declined sharply during the GFC and COVID-19, while the Arab Spring and oil price crash produced more adaptive responses. Credit risk (NPL/TA), on the other hand, rose significantly during the Arab Spring, underscoring the destabilizing effect of political unrest on loan portfolios, while other crises had weaker direct effects. Importantly, the inflation threshold effect reshaped resilience outcomes: when inflation exceeded 3%, Islamic banks' resilience diverged sharply from conventional peers. During the Arab Spring and COVID-19, Islamic banks displayed relative strength in high-inflation conditions, benefiting from supportive fiscal policies and the asset-backed nature of their contracts. Conversely, high inflation amplified vulnerabilities during oil price crashes, eroding the asset quality of Islamic banks more severely than that of conventional banks.

The comparison across indicators further highlights a duality of resilience: while Islamic banks often outperformed in market valuation terms, they exhibited higher sensitivity in asset quality when crises coincided with adverse inflation dynamics. This asymmetry demonstrates that forward-looking investor confidence and realized credit outcomes may not always align, particularly under compounded shocks.

Country-level differences add another layer of heterogeneity. Oman consistently showed stronger resilience, while Saudi Arabia and the UAE experienced more pronounced declines in valuations, reflecting their greater exposure to global financial linkages. Kuwait and Qatar showed muted differences relative to Bahrain, the base category, underscoring that national financial structures and policy responses condition resilience outcomes as much as banking models do.

Overall, the findings underscore that bank resilience in dual-banking GCC economies cannot be generalized across crises or inflation regimes. Instead, resilience is multidimensional—shaped by the type of systemic shock, the inflation environment, and country-specific macro-financial factors. The study contributes to the literature by demonstrating that resilience gaps between Islamic and conventional banks are contingent, inflation-sensitive, and indicator-specific. This calls for tailored macroprudential strategies that are both inflation-aware and crisis-specific, ensuring that stability frameworks capture the diverse vulnerabilities of dual banking systems.

Future research could build on these findings by examining how digital transformation, such as fintech adoption, blockchain-based sukuk issuance, and Islamic digital banking platforms, shapes resilience under crisis and inflationary regimes. In addition, incorporating environmental, social, and governance (ESG) considerations into the resilience framework would provide deeper insights into how sustainability factors interact with financial stability in dual-banking systems.

6. Policy Implications and Recommendations

The conclusions naturally lead to several important policy implications:

1) GCC central banks should recognize that inflation above a certain threshold acts as a systemic risk amplifier. Monetary policy should be closely coordinated with macroprudential authorities to keep inflation within a band that does not trigger disproportionate stress in the banking sector.
2) A one-size-fits-all regulatory approach is insufficient. Regulators need to acknowledge the asymmetric impact of crises on Islamic vs. conventional banks and design frameworks that address structural vulnerabilities in each model.
3) Policies should focus on enhancing liquidity management tools and developing Shariah-compliant hedging instruments against commodity price swings and inflation. Some progress has already been made in the GCC. For instance, Bahrain's Liquidity Management

Center facilitates Islamic interbank placements, while the UAE Central Bank's Term Deposit Facility includes Shariah-compliant versions to provide short-term liquidity buffers. Similarly, Saudi Arabia's domestic sukuk program has been used to strengthen Islamic banks' liquidity positions. Future instruments could include Islamic repo (collateralized murabaha) or profit-rate swaps structured on sukuk, providing hedging mechanisms without violating Shariah principles. Stress testing frameworks should also include severe oil price crash scenarios to reflect the region's dependence on hydrocarbons.

4) Regulation should continue to focus on building resilience to global financial contagion and pandemic-style demand shocks. The COVID-19 experience demonstrated the usefulness of payment deferral programs and government-backed guarantee schemes, which were particularly compatible with Islamic contract structures such as Murabaha and Ijarah. Embedding such tools into standing macro-prudential frameworks can help pre-empt systemic disruptions.
5) Regulatory stress testing and contingency planning should be tailored to specific crisis types, as banking models respond differently to financial, geopolitical, commodity, and real-sector shocks. Integration of digital innovations—such as blockchain-based sukuk issuance or Islamic fintech liquidity platforms—into these exercises could further enhance resilience and adaptability.

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