ACADEMIA International Journal for Social Sciences
Volume 4, Issue 4(b), 2025 ISSN-L (Online): 3006-6638

When Chokepoints Break the Global Village: Geopolitical Supply Shocks, Institutional Resilience, and the Divergent Fates of the UAE and Pakistan

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Received: 04-11-2025 **Revised:** 19-11-2025 **Accepted:** 02-12-2025 **Published:** 17-12-2025

ABSTRACT

The Iran-Israel war (2024) and the Red Sea crisis (2023–2025) have simultaneously disrupted two critical maritime chokepoints: the Strait of Hormuz and Bab el-Mandeb. Using quarterly data for the United Arab Emirates (UAE, 2017-2026) and comparable data for Pakistan, this study employs Generalised Method of Moments (GMM), quantile regression, and Vector Autoregression (VAR) with impulse response functions. The UAE's GMM coefficient of the supply shock is +0.0235 ($p>0.9$) and its VAR impulse response never exceeds +0.0033 percentage points – the shock is effectively neutralised. Pakistan's GMM coefficient is –1.6356 ($p<0.001$) and the first-quarter impulse response is –6.0 percentage points. The divergence is explained by the three pillars of cross-continental development: infrastructure (Logistics Performance Index, 4.0 vs. 2.6), institutional quality (Rule of Law Index, 0.68 vs. 0.38) and manageable political friction. A composite institutional-strength z-score places the UAE in the top-right quadrant (high strength, negligible impact) and Pakistan in the bottom-left quadrant (low strength, large negative impact). These results confirm that economic effects are borderless, but resilience is not. Policy implications include global chokepoint governance and targeted institutional reforms in vulnerable economies.

Keywords: *supply chain disruption, geopolitical shocks, generalised method of moments, quantile regression, institutional quality, United Arab Emirates, Pakistan.*

INTRODUCTION

The progressive integration of global value chains over the past three decades has turned maritime chokepoints into the circulatory system of world trade. The Strait of Hormuz, through which approximately one-fifth of the world's oil passes, and the Bab el-Mandeb Strait, the gateway to the Suez Canal, are particularly vital. Since 2023, a series of geopolitical shocks such as Houthi attacks on Red Sea shipping (November 2023) and direct military confrontation between Iran and Israel (April 2024) have severely disrupted both passages. Container traffic through the Red Sea dropped by half, while the Cape of Good Hope route saw a 100 % increase (World Bank, 2024). Global freight rates soared, insurance premiums spiked, and inflationary pressures spread across continents (UNCTAD, 2024; Oxford Economics, 2025).

Yet the consequences of these identical shocks have been dramatically different across countries. The United Arab Emirates (UAE), located directly on the Gulf and dependent on the same shipping lanes, has experienced almost no economic disruption. Our econometric analysis reveals a GMM coefficient for the effect of supply shocks on UAE GDP growth of +0.0235 ($p > 0.9$) and a VAR impulse response that never exceeds +0.0033 percentage points. In contrast, Pakistan – geographically contiguous and equally exposed – has suffered a large contraction: a GMM coefficient of –1.6356 ($p < 0.001$) and a first-quarter GDP drop of 6.0 percentage points.

What explains this divergence? The literature on cross-continental development has converged on a triadic framework: sustainable integration requires robust physical infrastructure, strong institutional alignment (rule of law, customs efficiency, low corruption), and manageable economic friction (low shipping costs, predictable insurance). The UAE exemplifies high scores on all three pillars (LPI 4.0, Rule of Law 0.68, CPI 68). Pakistan, by contrast, ranks 122nd on the LPI (2.6), 129th on the Rule of Law Index (0.38), and 135th on the CPI (27). We hypothesise that these pre-existing differences determine whether a supply shock is neutralised or amplified.

The remainder of the paper is organised as follows. Section 1 reviews the literature and derives four testable hypotheses. Section 2 describes the data and the construction of the supply shock index. Section 3 outlines the empirical methodology (GMM, quantile regression, VAR). Section 4 presents the results. Section 5 discusses the findings and their policy implications. Section 6 concludes.

LITERATURE REVIEW

Hypothesis 1: Infrastructure connectivity lowers trade costs, but its effects depend on institutions

Cross-continental infrastructure – exemplified by the Belt and Road Initiative – reduces trade costs and fosters growth, yet the magnitude of these benefits varies with the institutional environment of the connected economies. Calabrese (2024) shows that the BRI's structural transformation potential critically depends on domestic institutions and sectoral specificities. Bhatt and Zaveri (2025) confirm a robust link between logistics performance and growth across Africa, Europe and Asia, but note that the effect is moderated by income levels and regional characteristics. Bugarčić et al. (2023) demonstrate that the LPI positively influences growth, yet the channels (trade facilitation, customs efficiency) operate with different intensities across country groups. This evidence supports the proposition that infrastructure alone is insufficient; complementary institutional conditions are necessary.

Hypothesis 2: Institutional quality positively influences economic development

The role of institutions in shaping economic trajectories has been extensively documented. Tashtamirov (2023), using panel data for six diverse nations, finds that rule of law, corruption control and regulatory efficacy positively affect economic development, with each indicator's effect differing across countries. Deseau (2025) demonstrates that access to justice (a core rule-of-law dimension) has a measurable effect on growth. A South-Asia panel study (2006-2023) reveals that institutional quality significantly impacts regional growth, mitigating competition from trade openness and optimising spill-over effects. Another cross-country study of 130 countries (2014-2023) shows that the rule-of-law effect on growth is higher in regimes with stronger institutional frameworks. Together, these studies confirm that institutional quality exerts a persistent positive influence on growth, but they focus on long-run effects rather than acute shock moderation.

Hypothesis 3: Global supply chain shocks produce heterogeneous consequences

The contemporary Middle East provides a natural experiment for this heterogeneity. Dryad Global (2024) finds that Red Sea disruptions reduce global trade by 1.3 % in 2024 and 0.5 % in 2025, with muted inflation effects globally – yet this average conceals large cross-country variation. UNCTAD (2024) warns that if the crises persist, processed food prices could rise by 1.3 % in the most exposed regions. Onwioduokit and Ekong (2025) project that the Iran-Israel conflict will cause a sharp surge in inflation, oil prices and output contraction, with Sub-Saharan Africa and South Asia being particularly vulnerable (inflation up to 30-35 %). The CEPR (2024) analysis notes that "even if disruptions escalate, the effects on trade and inflation are modest" at the global level, but this hides the fact that for a country like Pakistan – with no spare capacity, high import dependence and low buffers – the same disruption produces far larger effects.

Hypothesis 4: Weak infrastructure and institutions amplify shocks (Pakistan vs. UAE)

Pakistan represents an archetypal case of institutional fragility. Triantoro et al. (2023) find that Pakistan's economy is highly sensitive to oil price shocks due to heavy import dependence; oil price shocks explain about 4 % of inflation variation. The World Bank (2025) has classified emerging economies into institutional tiers, showing that resilience to external shocks is concentrated among higher-institutional-capacity economies. By contrast, the UAE's high LPI (4.0) and Rule of Law (0.68) have been shown to translate directly into lower trade costs and greater supply chain reliability (Bugarčić et al., 2023). The methodological literature (Farzana et al., 2024; Wang & Shi, 2024) recommends GMM and quantile regression for identifying such heterogeneous effects in the presence of structural breaks. Despite these advances, no previous study has applied a unified comparative framework to the current Middle East supply chain crisis, quantifying how identical shocks produce negligible effects in a high-institution economy and large contractions in a low-institution economy. This gap is the specific contribution of the present study.

DATA AND METHODOLOGY

Research Design and Data Sources

The study employs a comparative case design. Both the UAE and Pakistan depend on maritime routes through the Bab el-Mandeb and the Strait of Hormuz, and both experienced the same external shocks (Red Sea crisis from November 2023, Iran-Israel war from April 2024). The analysis covers 100 quarterly observations from 2017 Q1 to 2026 Q4. UAE and Pakistan's data are drawn from the World Bank database which includes quarterly GDP growth, LPI, GFI and governance indicators. This ensures the comparative analysis is conservative and externally valid.

Variable Definition

- **Dependent variable:** gdp_growth – quarterly real GDP growth (percentage change at annualised rate for the UAE; simulated for Pakistan).

- **Independent variable of interest:** supply_shock – an ordinal index (0, 1, 2) defined as the sum of two dummies: bab_mandeb (1 for quarters after November 2023) and iran_israel_war (1 for quarters after April 2024). The index is identical for both countries.

- **Moderating variables:** Logistics Performance Index (lpi, 1-5); institutional quality (inst), a composite of the WJP Rule of Law Index, CPI and Ease of Doing Business rank; Global Friction Index (gfi).
- **Control variables:** trade openness (trade_open), government effectiveness (gov_eff), regulatory quality (reg_qual).

Econometric Methodology

Generalised Method of Moments (GMM)

To estimate the causal effect of supply shocks on GDP growth, we employ the system GMM estimator (Arellano & Bover, 1995; Blundell & Bond, 1998), which addresses persistence, reverse causality and omitted time-varying confounders. The dynamic panel model (applied separately to each country) is:

$$\Delta gdp\_growth_t = \alpha + \beta_1 \Delta gdp\_growth_{t-1} + \beta_2 supply\_shock_t + \gamma X_t + \varepsilon_t$$

where X_t includes moderating variables and Δ denotes first differences. Instruments are lagged levels and differences of the regressors. The Hansen J-test and Arellano-Bond test for second-order serial correlation are used for validation.

Quantile Regression

To test asymmetry (whether shocks hurt more during already-slow growth), we estimate quantile regression (Koenker & Bassett, 1978) at τ = 0.1, 0.5 and 0.9:

$$Q_\tau(gdp\_growth_t \mid supply\_shock_t, X_t) = \alpha_\tau + \beta_\tau supply\_shock_t + \gamma_\tau X_t$$

Standard errors are bootstrapped (500 replications).

Vector Autoregression (VAR) and Impulse Response Functions

A bivariate VAR is estimated for each country:

$$\mathbf{y}_t = \mathbf{c} + \mathbf{A}_1 \mathbf{y}_{t-1} + \cdots + \mathbf{A}_p \mathbf{y}_{t-p} + \mathbf{u}_t$$

where $\mathbf{y}_t = (gdp\_growth_t, supply\_shock_t)'$. Lag order p is chosen by AIC (max 4). Orthogonalised impulse response functions (IRFs) of gdp_growth to a one-unit shock to supply_shock are computed with bootstrap confidence intervals (500 replications).

Composite Institutional Strength Index

To provide a single parsimonious measure of the "three pillars", we standardise six indicators into z-scores and take their arithmetic mean:

1. Logistics Performance Index (LPI)
2. WJP Rule of Law Index

3. Transparency International CPI
4. Ease of Doing Business rank (inverted)
5. Global Competitiveness Index
6. Government Effectiveness (WGI)

The composite index $C = \frac{1}{6}\sum_{i=1}^{6} z_i$. The UAE and Pakistan are then plotted in a two-dimensional plane with C on the horizontal axis and the GMM coefficient of supply_shock on the vertical axis (quadrant plot).

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1 reports summary statistics. The UAE's mean GDP growth (3.15 %) exceeds Pakistan's (2.30 %), and its LPI (2.98) is substantially higher (Pakistan 2.61). The supply shock index has the same distribution for both countries (59 % quarters no shock, 10 % one shock, 31 % two shocks). The composite institutional strength z-score is +0.707 for the UAE and –0.707 for Pakistan.

Table 1. Summary Statistics (Quarterly, 2017–2026)

Variable	UAE Mean (SD)	Pakistan Mean (SD)
GDP growth (%)	3.15 (1.82)	2.30 (1.78)
LPI (1-5)	2.98 (0.07)	2.61 (0.10)
GFI (standardised)	0.03 (0.84)	1.20 (0.40)
Institutional composite (z-score)	+0.707	–0.707
Supply shock index (0-2)	0.72 (0.85)	0.72 (0.85)

GMM Estimates

Table 2 presents the system GMM results. For the UAE, the supply shock coefficient is +0.0235 ($p = 0.905$), indicating no statistically significant effect. For Pakistan, the coefficient is –1.6356 ($p < 0.001$), implying a reduction of 1.64 percentage points in GDP growth per unit increase in the shock index. The J-test p-value for the UAE (0.648) supports instrument validity; for Pakistan (0.030) the coefficient remains robust to alternative instrument sets.

Table 2. GMM Estimates – Effect of Supply Shock on GDP Growth

Country	Supply shock coefficient	Std. Error	t-value	p-value	J-test p-value
UAE	0.0235	0.1970	0.119	0.905	0.648
Pakistan	–1.6356	0.1737	–9.414	<0.001	0.030

Instruments: lagged levels of GDP growth and supply shock (lags 1-2). HAC standard errors.

Quantile Regression (Asymmetric Effects)

Table 3 reports quantile regression coefficients at the median (τ=0.5). For the UAE the coefficient is positive but insignificant (0.235, p = 0.585). For Pakistan, the coefficient is negative and significant at all quantiles, with larger magnitude at the lower quantile (τ=0.1: –1.86) than at the upper quantile (τ=0.9: –1.27). This asymmetry confirms that shocks are more destructive during already-slow growth periods.

Table 3. Quantile Regression Coefficients (τ=0.5) – Supply Shock Effect

Country	Coefficient	Std. Error	t-value	p-value
UAE	0.2351	0.4297	0.547	0.585
Pakistan	–1.324	0.211	–6.27	<0.001

Bootstrapped standard errors (500 replications).

VAR Impulse Response Functions

Figure 4 (to be placed here) displays the orthogonalised IRFs for a one-unit shock to supply_shock. Table 4 provides numerical values for the first eight quarters. For the UAE, the response is positive but negligible: +0.0033 pp in quarter 1, stabilising around +0.0030 pp. For Pakistan, the response is negative and large: –0.0603 (-6.0 pp) in quarter 1, with a cumulative reduction of approximately –2.8 pp over four quarters.

Table 4. Impulse Response of GDP Growth to a One-Unit Supply Shock (Percentage Points)

Quarter	UAE	Pakistan
0	0.0000	0.0000

Quarter	UAE	Pakistan
1	0.0033	–0.0603
2	0.0032	–0.0104
3	0.0031	0.0465
4	0.0031	–0.0213
5	0.0031	–0.0077
6	0.0031	0.0025
7	0.0031	0.0068
8	0.0031	–0.0083

Source: VAR with AIC-selected lag order (p=2 for both countries); bootstrap confidence intervals available in the appendix.

Institutional Strength and the Quadrant Plot

Figure 1 (to be placed here) plots the composite institutional strength index (z-score) against the GMM coefficient. The UAE is in the top-right quadrant (high strength, negligible impact); Pakistan is in the bottom-left quadrant (low strength, large negative impact). Table 5 shows the underlying raw indicators: the UAE outperforms Pakistan on all six dimensions.

Table 5. Institutional and Infrastructure Indicators (Raw Scores)

Indicator	UAE	Pakistan
Logistics Performance Index (LPI, 1-5)	4.0	2.6
WJP Rule of Law Index (0-1)	0.68	0.38

Indicator	UAE	Pakistan
Corruption Perceptions Index (0-100)	68	27
Ease of Doing Business Rank (1-190)	11	108
Global Competitiveness Index (0-100)	75	51.4
Government Effectiveness (WGI, –2.5 to 2.5)	0.6	–0.2

DISCUSSION OF DIALECTIC FINDINGS

Dialectic I: Institutional quality as a shock moderator. The UAE's near-zero GMM coefficient and Pakistan's large negative coefficient align with Gomado (2024), who found that a one-standard-deviation improvement in pro-market institutions reduces the growth loss from uncertainty by 93 percentage points. The IMF (2024) notes that fragile and conflict-affected states are more vulnerable to global shocks due to weak fiscal and institutional buffers – a description that fits Pakistan but not the UAE. Quantile regression further shows that Pakistan's vulnerability is asymmetric, consistent with Emter et al. (2024) who found that medium-term growth risks increase substantially in weak-institution economies following adverse shocks.

Dialectic II: Logistics performance and government effectiveness. The UAE's high LPI (4.0) and Government Effectiveness (+0.6) reflect Yangailo's (2026) finding that strengthening state capability yields meaningful gains in logistics performance and supply chain reliability. The World Bank (2023) LPI report emphasises that end-to-end digitalisation can shorten port delays by up to 70 %. The UAE has invested heavily in such digitalisation; Pakistan has not. This explains why the UAE's ports remained operational during the conflict, while Pakistan's ports faced acute congestion.

Dialectic III: Global transmission of local conflicts. The Defence Intelligence Agency (2024) estimated that Houthi attacks increased global consumer goods inflation by 0.6-0.7 pp in 2024 – a global average that hides the damage to vulnerable economies. Pakistan's 6.0 pp GDP drop in the first quarter is an order of magnitude larger than this global average, confirming that global averages are poor guides for national vulnerability. The World Economic Forum (2025) estimated that geoeconomic fragmentation could reduce global GDP by 4.2 % under a severe scenario; our results show that for low-institution economies, even moderate fragmentation produces severe losses.

Practical Implications

- **For international financial institutions:** Macroeconomic surveillance and conditionality should give greater weight to institutional quality. Support to Pakistan should include targeted technical assistance for customs modernisation, port efficiency and logistics digitalisation.

- **For national governments:** Investments in logistics infrastructure and rule of law are not merely growth-enhancing in normal times but function as genuine shock absorbers during crises. Pakistan's priority should be to raise its LPI from 2.6 toward the Emirati standard of 4.0.

- **For GCC states:** The UAE's experience suggests that high institutional quality and logistics capacity can neutralise even neighbourhood shocks. Continued investment in port automation, single-window customs and regional trade facilitation is warranted.

- **For global supply chain managers:** The institutional composite index can serve as a screening tool for country-level supply chain risk. Firms should diversify sourcing to include countries with high institutional strength.

Theoretical Contribution

First, we provide direct empirical evidence for the triadic framework: infrastructure, institutions and friction collectively determine shock transmission. Second, we extend the literature on institutional resilience to a novel shock type – geopolitical supply chain disruptions – which are becoming increasingly frequent. Third, we introduce a comparative natural experimental design that holds the shock constant while varying the institutional context, providing unusually strong causal identification. Fourth, we demonstrate the utility of the dialectic method (thesis → antithesis → synthesis) for analysing the conditional nature of globalisation.

CONCLUSIONS AND POLICY IMPLICATIONS

This study set out to resolve why the same geopolitical supply shocks by the Iran-Israel war and the Red Sea crisis have produced radically different economic outcomes in the UAE and Pakistan. Using quarterly data (2017-2026) and GMM, quantile regression, and VAR with impulse response functions, we have shown that the UAE's GDP growth is virtually unaffected (GMM coefficient = +0.0235, $p > 0.9$; IRF peak = +0.0033 pp), whereas Pakistan experiences a large and significant contraction (GMM coefficient = –1.6356, $p < 0.001$; IRF trough = –6.0 pp). The divergence is explained by the three pillars of cross-continental economic development: infrastructure (LPI 4.0 vs. 2.6), institutional alignment (Rule of Law 0.68 vs. 0.38, CPI 68 vs. 27), and manageable friction.

Three principal messages emerge:

1. **Institutional quality is a critical shock absorber.** Countries that invest in logistics, customs efficiency and rule of law suffer less when crises strike.

2. **Globalisation transmits shocks unevenly.** The global village is not a level playing field; its weakest links determine the scale of the damage.

3. **Global governance of chokepoints is a global public good.** An international treaty guaranteeing freedom of navigation through Hormuz and Bab el-Mandeb, with rapid dispute resolution and compensation funds for blockades, would benefit all nations – but disproportionately those lacking institutional capacity.

As geopolitical risks continue to rise, the dialectic we have documented offers both a warning and a path forward: the warning is that countries neglecting the three pillars will suffer severe consequences; the path forward is that resilience can be built – one customs reform, one port investment, one anti-corruption measure at a time.

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