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Gulf Corridor and Macroeconomic Vulnerability: A Scenario-Based Stress Test

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Gulf Corridor and Macroeconomic Vulnerability: A Scenario-Based Stress Test

Dr Syed Muhammad Salman and Abdul Mateen[*]

ABSTRACT

This study explores how a hypothetical Gulf-centred geopolitical crisis may affect Pakistan's macroeconomic fragility, as well as that of Bangladesh, Sri Lanka, India, the Philippines and Bhutan. The paper brings together remittance exposure from Gulf Cooperation Council (GCC) countries, energy import, shipping, export demand, foreign exchange, inflation, reserve, policy rate, and growth channels in a bounded Macroeconomic Vulnerability Index. Governance-fiscal fragility is conceptualised as an amplifier that separates direct exposure from state absorptive capacity. Under the reported asymmetric shocks, Pakistan has the highest adjusted vulnerability, followed by Sri Lanka; Bangladesh and India are in the middle, while the Philippines and Bhutan have the lowest vulnerability scores. The paper introduces a policy-oriented stress-testing framework of remittance-energy-logistics vulnerability. These comparative results remain conditional on the assumed shocks and calibration. The study is not meant for forecasting but for assessing the extent of vulnerability under hypothetical geopolitical shocks.

Keywords: Geopolitical Risk, Remittances, Stress Testing, Energy Shocks, Macroeconomic Vulnerability, Policy Responses, South Asia

JEL Classification Codes: F24; F51; F41; C63; H63

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1. INTRODUCTION

Geopolitical conflict, remittances and incomes, the cost and supply of energy, volatile capital flows and fiscal constraints are now closely connected. A military or diplomatic crisis in one country or region could ripple through the oil and LNG markets, the freight and insurance markets, the expectations of exchange rates, food prices, labour migration and remittance corridors Today, geopolitical risk is not just a security challenge, but a macroeconomic factor that worsens the Balance of Payments (BoP), raises unexpected inflation, dampens growth and weakens institutional absorptive capacity (Caldara and Iacoviello 2022; Bloom 2009; IMF 2022). COVID-19 exposed the fragility of production supply chains; the Russian invasion of Ukraine became a heterogeneous shock to distant regions; and Red Sea/Suez disruptions have disproportionately increased maritime insecurity and trade costs (World Bank 2022; UNCTAD 2024; IMF 2024).

The policy challenge is thus one of compounding exposure. Steep imported energy costs, shipping delays and remittance compression are no longer three isolated adverse events; they spread through the foreign exchange market, inflationary expectations and the fiscal budget. An oil price shock is not restricted to a 'Gulf shock'. It reduces household welfare as migrant income falls, it cuts firms' profits because of costly imports and logistics, and it strains state resources through reserve depletion and higher subsidies to protect the most vulnerable segments of society. The study aims to provide insights into the extent and severity of vulnerability to a geopolitical conflict where countries have low absorptive capacity and institutional resilience.

The Gulf is a geostrategic choke point in this fragile system. It is a major energy hub, one of the busiest maritime transit zones, a source of abundant liquidity and home to millions of migrants. A hypothetical Gulf-centred geopolitical disruption can thus adversely affect both closely and loosely connected components: oil and LNG markets, shipping, insurance and transit routes, labour demand in the GCC region, remittances, export demand, foreign exchange liquidity and external financing conditions. A hypothetical geopolitical shock for the South and Southeast Asian economies can increase import costs, reduce remittance inflows and put strain on both inflows and outflows of the BoP.

Remittances originating from the Gulf region have some particular importance. They customarily contribute to smoothing consumption and foreign exchange liquidity (Frankel 2011; Mandelman 2013; Giuliano and Ruiz-Arranz 2009); paradoxically, they can also serve as shock transmitters from the economies hosting the migrants. Pakistan, Bangladesh, Sri Lanka and India have long-running Gulf Cooperation Council (GCC) labour corridors. In Pakistan, remittances, fuel imports, reserves, inflationary expectations, debt service, the credibility of the IMF programme and fiscal space are closely interlinked (IMF 2025; World Bank 2025). Remittances are not just household income; they are integral to the macro-financial architecture in the sample countries and influence economic stability.

The study examines how hypothetical Gulf-centred geopolitical shocks adversely affect remittance-dependent and energy-dependent sample countries. The study seeks to analyse three gaps. First, a hypothetical Gulf-centred crisis is not an isolated shock; the Gulf is a remittance-energy-logistics-external-demand nexus. Second, the risk of a crisis in the Middle East is usually narrowly defined through oil prices, ignoring the role of migrant income and household transfer channels. Third, historical regressions are not well suited to a forward-looking shock whose channels can be simultaneous and asymmetric.

The study makes the following contributions: (1) builds a GCC remittance exposure architecture; (2) designs symmetric and asymmetric shocks; (3) creates a recursive MVI, and (4) it adds a nonlinear amplifier, in the form of governance-fiscal fragility. The study is designed as a six-country stress test, not a forecast of vulnerability in the event of regional conflict. The study uses data from the World Bank's World Development Indicators (WDI) and the International Monetary Fund's International Financial Statistics (IFS) database.

2. LITERATURE REVIEW AND PROPOSITIONS

The economic impact of geopolitical risk is both identifiable and measurable. According to Caldara and Iacoviello (2022), geopolitical risks affect employment, financial conditions and investment. Bloom (2009) and Carrière-Swallow and Céspedes (2013) highlight that uncertainty-induced investment delays can be more harmful in countries with weaker policy buffers. The asymmetric impact of the same shock is also explained by open economy macroeconomic models, which highlight the roles of import dependence, reserve adequacy, external debt, fiscal space and institutional credibility. System-dynamics theory asserts that shocks travel through feedback loops and time lags; import costs raise FX pressure, depreciation feeds inflation, inflation drives policy rates, and tightening weighs on growth and demand (Sterman 2000). The transmission channels in Table 1 are model propositions; they are not designed as empirically tested hypotheses. Proposition 1, multi-channel external fragility transmission, is the mechanism that connects Proposition 2 (remittance loss vulnerability) and Proposition 3 (import cost pressure).

Remittances are important financial flows that can lower poverty, contribute to development and stabilise the external accounts and consumption (Adams and Page 2005; Aggarwal et al., 2011; Frankel 2011). Their stabilising power is, however, conditional and dependent on a host of factors. Regional shocks can reduce migrants' incomes and depress employment prospects. The higher the remittance exposure to the GCC countries, the more vulnerable the recipient countries are to remittance loss.

An uninterrupted supply and affordable prices of energy products are crucial to fuel importing countries. Oil shocks vary in their intensity depending on respective countries' share in supply and demand (Kilian 2009; Kilian and Murphy 2014) and affect importers and exporters differently (Cashin et al., 2014). An increase in energy prices will increase import costs, reduce current account balances, and escalate inflation. Geopolitical shocks adversely affect maritime logistics, as shipping costs weigh on trade performance and

delivery times (Limão and Venables 2001; Hummels 2007). Freight costs, insurance premium and rerouting are no longer firm-specific issues but have a macro dimension. Higher export market exposure leads to export loss vulnerability when geopolitical shocks are accompanied by a decline in external demand. Propositions 3-5 address energy dynamics, escalating transport, insurance and rerouting costs, and export loss probabilities.

The first-round effects of Gulf-centred shocks are transmitted to the foreign exchange market. Declining remittances reduce foreign exchange supply, higher energy and shipping costs increase FX demand, and export losses reduce external receipts. Exchange rate pass-through studies suggest that depreciation can feed into domestic prices (Ito and Sato 2008; Forbes et al., 2018; Ha et al., 2020). The export advantage of depreciation is offset by higher production costs, which include the cost of imported inputs, fuel, machinery and working capital (Amiti et al., 2014; Gopinath and Itskhoki 2010). The capacity to absorb regional shocks is affected by fiscal space indicators: debt service payments, the level of twin deficits, the origin of FX reserves, IMF dependence and institutional quality (Baldacci et al., 2011; Manasse and Roubini 2009; Reinhart and Rogoff 2009). Proposition 6 examines how FX pressure in round 2 affects depreciation, inflation, interest rates, reserves, demand and growth. Proposition 7 explains how cost pressure decreases exports, growth trajectory and gains from depreciation. Proposition 8 assumes that governance-fiscal fragility aggravates other dimensions of vulnerability. Proposition 9 suggests that compound asymmetric shocks may reflect vulnerability more accurately than a single isolated shock.

Table 1: **Summary of Model Propositions and Theoretical Channels**

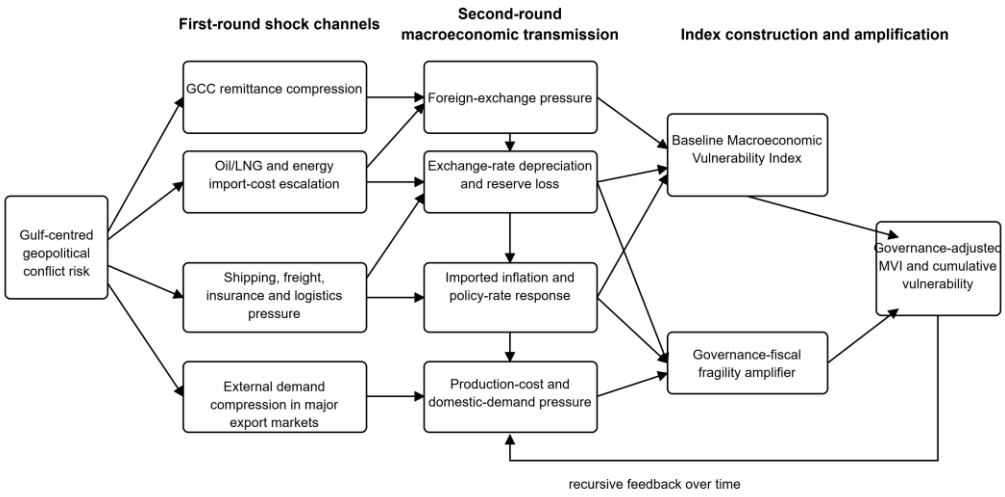
Proposition	Core Channel	Expected Effect
P1	Geopolitical risk	Multi-channel vulnerability
P2	GCC remittances	Remittance loss vulnerability
P3	Oil/LNG energy imports	Import cost pressure
P4	Shipping/logistics	Freight and insurance vulnerability
P5	External demand	Export loss vulnerability
P6	Foreign exchange	Depreciation inflation reserve pathway
P7	Production cost	Export and growth loss
P8	Governance-fiscal fragility	Amplification
P9	Asymmetric persistence	Nonlinear cumulative vulnerability

Source: Authors' construction from the literature review.

3. CONCEPTUAL MODEL AND METHODOLOGY

Figure 1 summarises the conceptual model. Gulf-centred conflict-risk enters through four first-round channels, which in turn affect second-round indicators: FX pressure, depreciation and reserve loss, imported inflation and policy rate response, and production cost/domestic demand pressure. The baseline MVI aggregates final pressure components. Governance-fiscal fragility then amplifies or contains the baseline score, producing a governance-adjusted MVI and cumulative vulnerability.

Figure 1: Conceptual Model of Gulf-Centred Geopolitical Shock Transmission



Source: Authors' conceptual framework.

The study employs a quantitative scenario-based system dynamics simulation rather than regression analysis. This is appropriate because the shock is forward-looking and the joint channels cannot be fully observed. The paper follows the simulation and stress testing literature. Simulation and stress testing have been used effectively to model disruptions and contagious shocks that pass through interconnected systems, affect multiple channels simultaneously and have few or no precedents (Ivanov 2023; Tse et al., 2024; Dolgui et al., 2025; Liu et al., 2025). Five symmetric and five asymmetric scenarios are modelled. The symmetric scenarios assume shock intensities of 10% to 50% on remittances, energy and shipping, while external demand compression ranges from 5% to 17%. Asymmetric scenarios are more realistic policy stress scenarios: A1 to A5 refer to remittance-heavy, oil-heavy, logistics-heavy, export-demand and extreme-combined respectively. Table 2 presents the shock architecture.

Table 2: Scenario Shock Architecture

Scenario	Type	Remit.	Energy	Shipping	Demand
S10	Symmetric	10	10	10	5
S20	Symmetric	20	20	20	8
S30	Symmetric	30	30	30	11
S40	Symmetric	40	40	40	14
S50	Symmetric	50	50	50	17
A1 Remit-heavy	Asymmetric	45	15	15	8
A2 Oil-heavy	Asymmetric	15	45	20	8
A3 Logistics-heavy	Asymmetric	15	20	50	10
A4 Export-demand	Asymmetric	20	20	25	30
A5 Extreme-combined	Asymmetric	50	50	50	25

Source: Shock values are initial scenario assumptions in %, not final proportional outcomes. Asymmetric scenarios differ in total intensity and composition.

The sequential model architecture is presented in the following equations. First-round shocks are introduced at period *t* and second-round variables are updated sequentially to avoid contemporaneous circularity; production cost pressure is treated as an intermediate channel, and the final index is bounded to avoid mechanical proportional escalation (OECD 2008; Sterman 2000).

The first step is to estimate the value of remittances received from GCC economies. GCC remittance exposure is calculated as:

Equation (1): GCC Remittance Value

$$GCCREM_{i,t} = \sum_{g=1}^{6} REM_{i,g,t}$$

where GCCREM is total GCC remittance exposure of country *i* in period *t*, and REM represents remittances received by country *i* from GCC source country *g* in period *t*.

Equation (2): GCC Remittance Share

The GCC remittance share is calculated as:

$$GCCSHARE_{i,t} = \frac{GCCREM_{i,t}}{TREM_{i,t}}$$

where GCCSHARE is the share of total remittances of country *i* that originates from GCC economies in period *t*, and TREM is total remittance inflow.

Equation (3): Remittance Shock

The remittance shock under each scenario is calculated as:

$$REMSHOCK_{i,s,t} = \rho_s \times GCCREM_{i,t}$$

where REMSHOCK measures simulated remittance loss for country *i*, under scenario *s*, and in period *t*. The parameter ρ_s represents the scenario-specific remittance reduction rate, which may take values of 0.10 to 0.50.

Equation (4): Remittance Loss as a Share of Total Remittances

To compare remittance shock across countries, remittance loss is also expressed relative to total remittances:

$$REMLossShare_{i,s,t} = \frac{REMSHOCK_{i,s,t}}{TREM_{i,t}}$$

where REMLossShare measures the proportion of total remittance inflows lost under scenario *s*.

Equation (5): Energy Import Cost Shock

The energy import cost shock is calculated as:

$$ENERGYSHOCK_{i,s,t} = FUELIMP_{i,t} \times \omega_s$$

where ENERGYSHOCK is the energy cost shock for country *i* under scenario *s*, in period *t*; FUELIMP represents the monthly fuel or energy import value where direct data are

available, or an energy import exposure index where monthly values require standardisation; and $\omega_s$is the assumed oil, LNG, or energy price shock under scenario *s*.

Equation (6): Shipping and Logistics Cost Shock

The shipping and logistics cost shock is calculated as:

$$SHIPSHOCK_{i,s,t} = TRADEEXP_{i,t} \times \sigma_s \times \tau$$

where SHIPSHOCK is the shipping cost shock, TRADEEXP is total trade exposure, σ_s is the assumed shipping cost increase under scenario s, and τ is the logistics pass-through weight representing the portion of traded goods cost affected by freight, insurance, rerouting, and maritime risk premiums.

Equation (7): Total Import-Cost Shock

The combined import-cost shock is calculated as:

$$IMPCOST_{i,s,t} = ENERGYSHOCK_{i,s,t} + SHIPSHOCK_{i,s,t}$$

where IMPCOST captures the total imported-cost pressure arising from energy, shipping, logistics, insurance, and trade cost channels.

Equation (8): External Demand Compression

External demand compression is calculated as:

$$EXTDEM_{i,s,t} = EXTEXP_{i,t} \times \delta_s$$

where EXTDEM is the simulated export demand compression for country *i*; EXTEXP represents externally exposed exports, and δ_s is the assumed demand compression rate under scenario *s*. The broader EXTEXP notation is preferred because the shock may affect more than the United Stated-European Union (US-EU) export channel.

Equation (9): Production Cost Shock

The production cost shock is calculated as:

$$PRODCOST_{i,s,t} = \alpha_1 ENERGYSHOCK_{i,s,t} + \alpha_2 SHIPSHOCK_{i,s,t} + \alpha_3 ERDEP_{i,s,t-1} + \alpha_4 IRSHOCK_{i,s,t-1}$$

where PRODCOST is the simulated production cost pressure, ERDEP captures exchange rate depreciation from the previous period, and IRSHOCK captures the policy interest rate shock from the previous period. Lagged values are used to reduce contemporaneous circularity in the recursive simulation.

Equation (10): Depreciation Competitiveness Benefit

The possible export benefit of exchange-rate depreciation is intentionally capped as depreciation may not translate fully into higher exports when imported input costs and weak external demand dominate. The capped depreciation benefit is calculated as:

$$DEPBEN_{i,s,t} = min[\, K \times EXTDEM_{i,s,t}\,,\; ERGAIN_{i,s,t}\,]$$

where DEPBEN is the limited export-competitiveness benefit from depreciation, ERGAIN is the potential increase in export receipts from depreciation, and K is the maximum offset

parameter. In the baseline simulation, K may be set at 0.20, indicating that depreciation can offset at most 20% of export-demand loss.

Equation (11): Net Export Loss

The net export loss is calculated as:

$$EXPORTLOSS_{i,s,t} = EXTDEM_{i,s,t} + PRODCOST_{i,s,t} - DEPBEN_{i,s,t}$$

where EXPORTLOSS captures the combined effect of external demand compression and production cost pressure after allowing for the limited competitiveness benefit of depreciation.

Equation (12): Foreign Exchange Pressure

Foreign exchange pressure is calculated as:

$$FXPRESS_{i,s,t} = REMSHOCK_{i,s,t} + EXPORTLOSS_{i,s,t} + IMPCOST_{i,s,t}$$

where FXPRESS measures the combined external sector pressure arising from remittance loss, export loss, and import cost escalation. Import cost pressure enters with a positive sign because a higher import bill increases foreign exchange stress.

Equation (13): Exchange Rate Depreciation Response

Exchange rate depreciation is simulated as a function of lagged foreign exchange pressure and previous period reserve loss:

$$ERDEP_{i,s,t} = \beta_1 FXPRESS_{i,s,t-1} + \beta_2 RESLOSS_{i,s,t-1}$$

where ERDEP is the simulated exchange rate depreciation, and RESLOSS is reserve loss from the previous period. The lagged structure prevents exchange rate depreciation from depending on a same period FX pressure that is itself affected by export loss and production cost.

Equation (14): Inflation Shock

The inflation shock is calculated as:

$$INFSHOCK_{i,s,t} = (\gamma_1 IMPCOST_{i,s,t} + \gamma_2 ERDEP_{i,s,t}) \times FOODENERGY_{i,t}$$

where INFSHOCK represents simulated inflationary pressure, and FOODENERGY represents the food and energy weight or pass-through sensitivity in the domestic consumption basket.

Equation (15): Policy Interest Rate Shock

The policy interest rate response is calculated as:

$$IRSHOCK_{i,s,t} = \chi \times INFSHOCK_{i,s,t}$$

where IRSHOCK represents the simulated policy-rate shock and χ captures the monetary policy response to inflationary pressure.

Equation (16): Reserve Loss

Reserve loss is calculated as:

$$RESLOSS_{i,s,t} = \max(0, \eta_1 \text{FXPRESS}_{\text{i,s,t}} - \eta_2 \text{CAPINFLOW}_{\text{i,t}})$$

where RESLOSS represents simulated reserve depletion and CAPINFLOW represents capital inflows or external financing support. The max operator is used because reserve loss cannot be negative; if external financing exceeds FX pressure, the reserve loss value is set to zero.

Equation (17): Domestic Demand Loss

Domestic demand loss is calculated as:

$$DDEMLOSS_{i,s,t} = \theta_1 REMSHOCK_{i,s,t} + \theta_2 INFSHOCK_{i,s,t} + \theta_3 IRSHOCK_{i,s,t}$$

where DDEMLOSS captures the decline in domestic demand due to lower remittance income, higher inflation, and higher interest rates.

Equation (18): Growth Loss

Growth loss is calculated as:

$$GROWTHLOSS_{i,s,t} = \phi_1 EXPORTLOSS_{i,s,t} + \phi_2 REMSHOCK_{i,s,t} + \phi_3 INFSHOCK_{i,s,t} + \phi_4 IRSHOCK_{i,s,t} + \phi_5 DDEMLOSS_{i,s,t}$$

where GROWTHLOSS represents the simulated value of decline in economic activity. It is driven by export loss, remittance loss, inflationary pressure, interest rate tightening, and domestic demand contraction.

Equation (19): Feedback Effect on Future Export Loss

The dynamic feedback loop is introduced through the following equation:

$$EXPORTLOSS_{i,s,t+1} = \lambda_0 EXPORTLOSS_{i,s,t} + \lambda_1 PRODCOST_{i,s,t} + \lambda_2 GROWTHLOSS_{i,s,t}$$

where EXPORTLOSS in period t+1 is affected by current export loss, current production cost pressure, and current growth loss. This equation captures the cumulative nature of the external fragility spiral.

Equation (20): Baseline Macroeconomic Vulnerability Index

The baseline Macroeconomic Vulnerability Index is calculated as:

$$MVI_{i,s,t} = W_1 Z(REMLossShare_{i,s,t}) + W_2 Z(IMPCOST_{i,s,t}) + W_3 Z(EXPORTLOSS_{i,s,t}) + W_4 Z(FXPRESS_{i,s,t}) + W_5 Z(INFSHOCK_{i,s,t}) + W_6 Z(IRSHOCK_{i,s,t}) + W_7 Z(RESLOSS_{i,s,t}) + W_8 Z(GROWTHLOSS_{i,s,t})$$

where MVI represents the overall macroeconomic vulnerability score of country *i* under scenario s in period *t*, Z represents standardised values of each simulated component, and W1 to W8 are component weights. Production cost pressure is not included as a separate component of the final MVI because it already enters the index indirectly through export loss and growth loss.

Equation (20a): Governance-Fiscal Fragility Score

The governance-fiscal fragility score is introduced to capture country-specific absorptive capacity and crisis-management structure:

$$GFF_{i,t} = mean[Z(GOVWEAK_{i,t}), Z(FISCDEF_{i,t}), Z(\text{DEBSERVICE}_{i,t}), Z(IMFDEP_{i,t}), Z(SOCSPENDGP_{i,t}), Z(DEFAULTISK_{i,t})]$$

where GFF captures governance weakness, fiscal deficit pressure, debt service burden, external financing dependence, social spending gap, and default risk exposure. This layer distinguishes direct exposure from the ability of the state to absorb the shock without magnifying social and macroeconomic stress.

Equation (20b): Country-Specific Nonlinear Amplifier

The country-specific nonlinear amplifier is calculated as:

$$AMP_{i,t} = exp(\lambda GFF_{i,t})$$

where AMP is the country-specific amplification factor, λ controls the strength of governance-fiscal amplification. A higher GFF produces a higher nonlinear adjustment, implying the same external shock generates greater vulnerability in fiscally constrained or weakly governed economies.

Equation (20c): Governance-Adjusted Macroeconomic Vulnerability Index

The governance-adjusted MVI is calculated as:

$$MVIADJ_{i,s,t} = 100\left[1 - \left(1 - \frac{MVI_{i,s,t}}{100}\right) \text{^} AMP_{i,t}\right]$$

where MVIADJ is the final nonlinear vulnerability index after governance-fiscal adjustment. For a baseline MVI between 0 and 100, the transformation is bounded between 0 and 100 to prevent the model from treating higher shock intensities as simple linear multiples of lower shock intensities.

Equation (21): Equal Weight Vulnerability Aggregation

$$W_1 = W_2 = W_3 = W_4 = W_5 = W_6 = W_7 = W_8 = \frac{1}{8}$$

The model uses eight baseline vulnerability channels and gives each channel equal weight.

Equation (22): Cumulative Vulnerability Over the Simulation Horizon

$$CMVI_{i,s} = \sum_{t=1}^{T} MVIADJ_{i,s,t}$$

where CMVI measures the accumulated governance-adjusted vulnerability of country *i* under scenario *s* over the full simulation horizon T. The simulation may be run over 12-month and 24-month horizons.

Main Empirical Interpretation

The final interpretation of the simulation is based on the following external fragility mechanism:

$WarShock \rightarrow\rightarrow (REMSHOCK + IMPCOST + EXTDEM)$ and

$(\text{REMSHOCK} + \text{IMPCOST} + \text{EXTDEM}) \rightarrow\rightarrow (\text{FXPRESS} + \text{ERDEP} + \text{INFSHOCK} + \text{PRODCOST} + \text{EXPORTLOSS})$ then

$$(FXPRESS + ERDEP + INFSHOCK + PRODCOST + EXPORTLOSS + GFF) \rightarrow \rightarrow MVIADJ$$

The framework exhibits how a hypothetical shock is transmitted through first-round channels: remittance loss, import cost escalation, shipping and insurance costs, and export demand compression. These first-round shocks then generate second-round pressures through foreign exchange stress, depreciation, inflation, production cost increases, and export losses. Finally, the governance-fiscal fragility indicator determines how much these pressures are absorbed or amplified into the final nonlinear vulnerability index.

4. RESULTS AND DISCUSSION

Pakistan has the highest share of its remittances from the Gulf (55.78%), followed by Bangladesh (48.84%), Sri Lanka (41.64%), India (32.43%), the Philippines (17.15%) and Bhutan (2.50%). Hence, Pakistan, Bangladesh and Sri Lanka are heavily dependent on remittances from the Gulf region, whereas India receives the largest absolute remittances from the Gulf among the sample countries, but its dependence is modest. Table 3 reports the remittance share, GFF score, and minimum and maximum MVI of each sample country. Pakistan has the highest GFF score (100), closely followed by Sri Lanka (95.16). A high GFF score indicates poor governance and a fragile institutional structure.

Table 3: **Exposure, Governance-Fiscal Fragility and Asymmetric Vulnerability Results**

Country	GCC share (%)	GFF	Min MVI	Max MVI	Interpretation
Pakistan	55.78	100.00	44.73	99.95	Highest exposure amplification nexus
Sri Lanka	41.64	95.16	33.62	95.45	High amplification and escalation
Bangladesh	48.84	25.81	24.06	64.43	Remittance export middle tier
India	32.43	0.00	17.36	44.60	Large but diversified exposure
Philippines	17.15	7.26	9.74	29.98	Lower GCC concentration
Bhutan	2.50	20.16	3.99	20.85	Low exposure small economy sensitivity

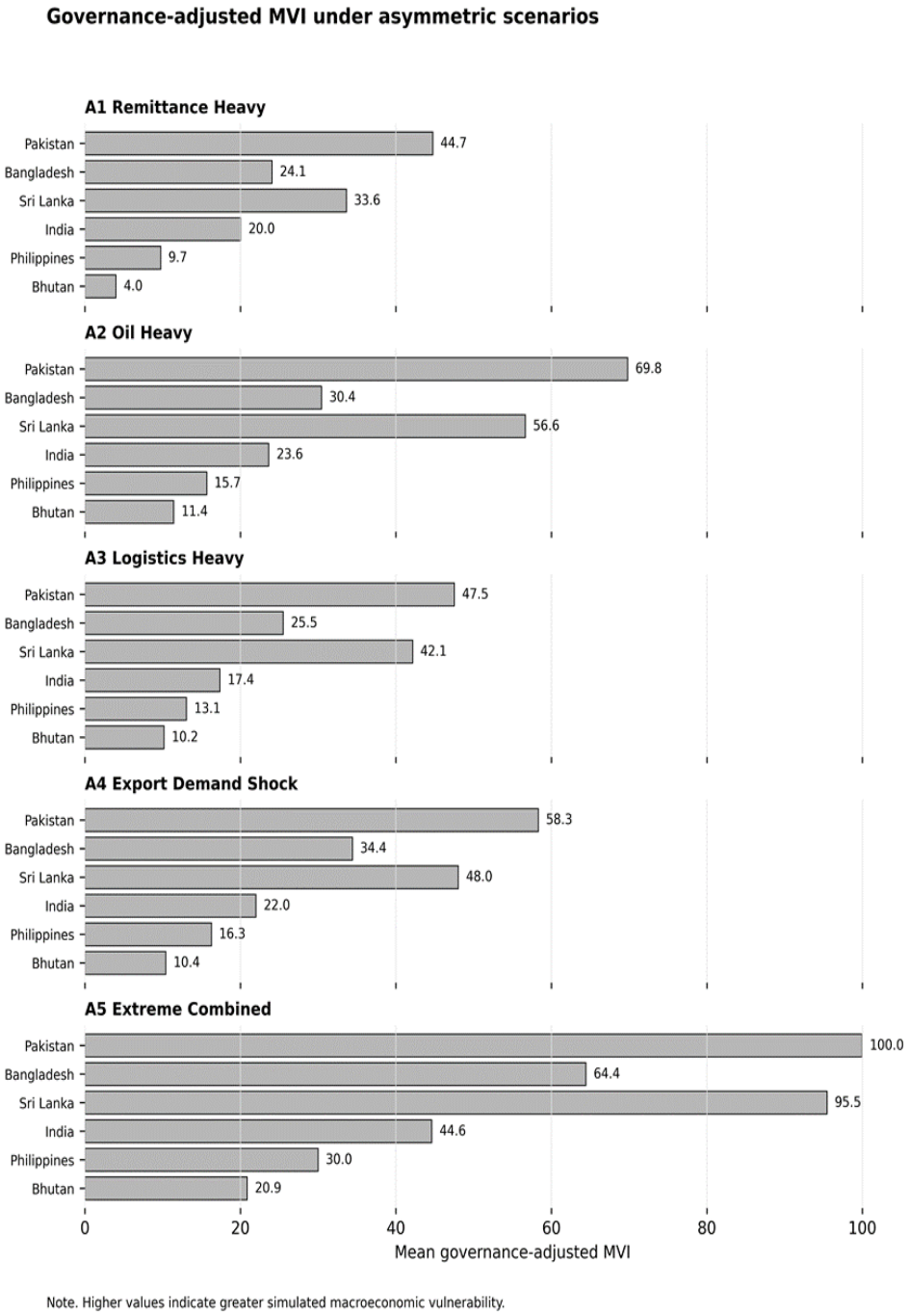
Source: MVI range is across asymmetric scenarios.

The MVI values underscore the validity of the calculation approach, as the ranking persists under both symmetric and asymmetric scenarios. However, consistency of vulnerability ranking does not imply static relationship. It indicates that the hierarchy is driven by exposure and amplification and that vulnerability levels vary significantly across scenarios. In the remittance-heavy scenario, Pakistan's governance-adjusted MVI is 44.73 while in the extreme combined scenario, it is 99.95. MVI of Sri Lanka ranges from 33.62 to 95.45. Bangladesh's reported scores across asymmetric scenarios range between 24.06 and 64.43.

The findings are reinforced by the scenario-wise interpretation. The remittance-heavy scenario suggests that the risk to income and remittances is most pronounced where the GCC remittance share is greater, government absorptive capacity is limited, and the institutional framework is inefficient. Even in the oil-heavy scenario, which has a small remittance shock, the same countries have higher vulnerability scores, since higher oil prices inflate import bills and put pressure on the exchange rate and interest rates. Logistics, shipping and insurance expenses can become a macroeconomic issue when they affect the key import and export margins. Bangladesh's export demand scenario score exceeds its remittance-heavy score because external vulnerability also holds for foreign demand. The extreme-combined scenario produces the highest scores because it imposes the greatest initial shock intensity.

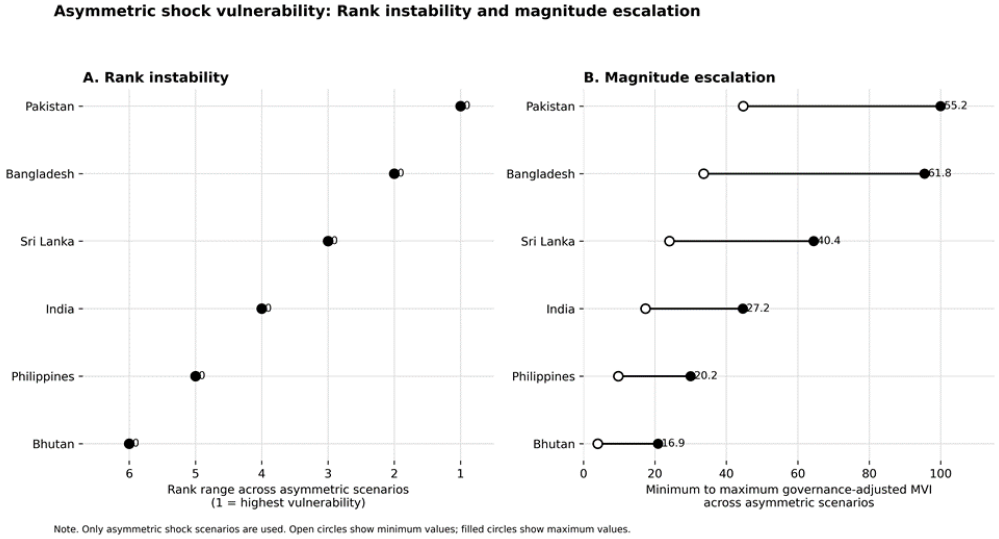
Magnitude escalation is more consequential than rank instability. No rank switching is observed across the asymmetric scenarios. The wider the escalation range, the more susceptible a country is to a shock: Sri Lanka has an escalation range of 61.84 points, Pakistan 55.23 points, Bangladesh 40.37 points, India 27.24 points, the Philippines 20.24 points and Bhutan 16.86 points. Figures 2 and 3 show that Pakistan and Sri Lanka remain persistently highly vulnerable and that the vulnerability ranking is stable across scenarios.

Figure 2: Governance-Adjusted MVI under Asymmetric Scenarios



Source: Authors' simulation results.

Figure 3: Rank Instability and Magnitude Escalation



Source: Authors' simulation results.

The Gulf-centred shock is hybrid and complex, as it engulfs energy prices, shipping costs, migrant income, remittances, export demand and uncertainty about external funding.

The study separates vulnerability from exposure; a country may have high exposure to risk dimensions but comparatively low vulnerability. Scale, diversification, absorptive capacity and institutional framework mitigate amplification: India has the largest absolute exposures in many economic variables, but this need not translate into comparably higher vulnerability.

5. CONCLUSION AND RECOMMENDATIONS

Remittances should be treated as a strategic asset. A Gulf remittance monitoring cell comprising the central bank, commercial banks, exchange companies, overseas employment authorities and diplomatic missions in the Gulf region should be established. The cell should monitor remittance inflows, transaction costs, settlement times and the adoption of digitalisation, and pick up signals from the labour market. In addition, there should be a comprehensive energy-risk dashboard covering energy stocks, refinery capacity, energy-sector fuel demand, shipping insurance, war-risk premiums and import-payment timelines.

Reserve adequacy should be tied to months of fuel import cover, external debt due in the next 12 months, the import bill for essential food and medicines, and lost remittances. Export policy should not be based on the presumption that a devaluation always increases competitiveness. Depreciation may lead to increased costs of imported inputs, so alternative energy sources, the provision of working capital, an uninterrupted supply of imported

inputs, value addition in exported goods and market diversification are required. To create sufficient fiscal space, the scale of social protection spending and subsidies should be rationalised; high impact cash transfers, food security and health and education should be maintained, while low productivity spending and untargeted subsidies should be eliminated.

The regional policy priorities are country-specific. Sri Lanka needs debt transparency, co-ordination of creditors, logistics-risk planning, rebuilding of reserves and tourism export resilience. Diversification of export markets, upgrading of value chains, energy reliability and remittance formalisation are required in Bangladesh. Even though India is comparatively less exposed to some Gulf-centred geopolitical shocks, it should not compromise on energy security and remittance corridor monitoring. Measures for the protection of overseas workers and the formal remittance system should be further strengthened in the Philippines. Contingency planning for fuel, tourism, imports and external financing should be continued for Bhutan. Table 4 presents the targeted policy architecture.

Table 4: Targeted Policy Architecture

Policy Area	Immediate Action	Medium-Term Logic
Remittances	Monitor GCC corridors, costs and delays	Formal digital channels and GCC labour coordination
Energy/LNG	Fuel import stress dashboard	Diversify energy and reduce circular debt
External buffers	Reserves linked to debt, fuel and remittance-at-risk	Credible reserve rebuilding and financing discipline
Exports	Protect export working capital and energy reliability	Value addition and market diversification
Social protection	Ring-fence targeted support	Reduce untargeted subsidies and improve tax capacity

Source: Authors' own.

The study should not be treated as a tool for forecasting actual vulnerability. It is not a forecasting exercise but a hypothetical scenario-based analysis of economic vulnerability in the sample countries in the event of a geopolitical crisis. Data frequency varies across countries and in variables. Governance-fiscal fragility is an artificial construct; alternative weights, expert scores, PCA weighting and Monte Carlo shock distributions should be considered for robustness in future research. The findings, interpretation and conclusions of the study are also limited by calibration uncertainty, the double counting of some variables, sample-dependent scaling, and the absence of reported historical validation. These limitations do not diminish the policy relevance of the study. A well-defined and

explicit stress-test design can help expose potential external fragilities, and potential sources of domestic fragility, in advance of the impact.

The framework can be extended in three ways in future research. First, higher frequency data on freight rates, LNG cargo prices, exchange rates, FX reserves and remittance corridors could be used, which may help dynamic calibration. Second, Monte Carlo simulations can be used to generate uncertainty bands on shock parameters. Third, alternative weighting schemes, such as PCA or weights proposed by experts, can be used to check the robustness of the ranking under various composite index assumptions. The present framework should be treated as a policy test and a foundation for empirical improvement in future research.

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