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Comprehensive review on “The Impact of Real Effective Exchange Rate (REER) on Agricultural Exports, GDP and FDI of Pakistan, India and China

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Abstract

In this chapter, a comparative and rigorous analysis of how changes in the Real Effective Exchange Rate (REER) affect three macroeconomic variables which include Gross Domestic Product (GDP) growth, agricultural exports, and Foreign Direct Investment (FDI) in Pakistan, India, and China is made. The states mentioned above, although geographically close to each other and of importance to the global economy as a block, are quite different in terms of institutional frameworks, exchange-rate regimes, structural composition and policy autonomy, thus, creating quite different transmission mechanisms of REER. The country is typified by endemic structural weaknesses in its three main forms, a small export base, overdependence on imported energy as well as insufficient fiscal cushions, that increase its susceptibility to REER misalignments. Empirical studies show that REER overvaluation reduces long-term growth in GDP by reducing the competitiveness of exports but gains on depreciation are often immediately offset by imported inflation that often exceeds 20 per cent in crisis. Agricultural exports which make up close to a quarter of GDP and half of the labour force are acutely sensitive to real appreciation; a 1 per cent appreciation of the REER will reduce the volumes of exports by 0.6-0.9 per cent with the effect lasting more than two years due to asymmetric adjustment processes. Moreover, REER volatility discourages FDI inflows that stand at a modest US\$ 23 billion a year on average because investors face increased macroeconomic uncertainty especially in capital intensive industries, thus putting at risk strategic programmes like the China-Pakistan Economic Corridor (CPEC). By contrast, China takes advantage of its institutional strength, vast foreign - exchange holdings (above US 3 trillion), and a state -based economic system to transform the REER into a policy instrument. The people bank of China plays a crucial role in the changes of the exchange rates to maintain the export-led growth without destabilizing inflation and moderate depreciation to help boost the industrial production in the coastal provinces and protect the agricultural sector with subsidies and strategic reserves. The shift of China towards high-value agricultural exports and the use of currency swap agreements as a part of the Belt and Road Initiative is an additional step of China to shelter its external sector against REER volatility. As a result, China becomes the leading destination of FDI in the developing economies where it receives more than US180 billion every year as it takes the exchange-rate policy and integrates it with infrastructure construction and technology modernization to create a virtuous cycle of competitiveness and integration. India holds an intermediate position, which is typified by an exchange rate regime that is market driven. Dominating regime structure, democratic form of governance and dualistic economy. Although, the Balassa-Samuelson effect has led to the loss of cost competitiveness in labor-intensive production, and hampered the program of Make in India, the moderate depreciation has a positive effect on

agriculture output by increasing rural incomes. Exporting agricultural products, however, is vulnerable to the fluctuations of the currency (Increasing by 0.7 per cent of exports of rice with a single per cent appreciation of the REER), and farmers who are not hedged are especially vulnerable; value-added processing is slowly making agricultural products more resilient in that regard. The inflows of foreign direct investment (FDI) of about US 60-80 billion a year are bifurcated market seeking investment in services is relatively insensitive to the fluctuations in exchange rate, and export-platform FDI is deterred by exchange-rate volatility. The larger domestic marketplace as well as the diversification of energy inherent in India gives it some cushion against imported inflation.

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Keywords: Real Effective Exchange Rate (REER), GDP growth, agricultural exports, Foreign Direct Investment (FDI), Pakistan, India, China, exchange rate volatility, export competitiveness, structural vulnerability, institutional capacity, asymmetric effects, trade balance, macroeconomic policy

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INTRODUCTION

This chapter provides a detailed and country-specific analysis of the effects of the changes in the Real Effective Exchange Rate (REER) on three key macroeconomic variables, which are Gross Domestic Product (GDP), agricultural exports, and Foreign Direct Investment (FDI) in Pakistan, China, and India. Although these countries are located geographically near and are classified with the same name of being major Asian economies, they exhibit extreme variations in terms of economic structure, exchange rate regimes, trade openness, and capacity to implement policies. Thereby, these contexts differ significantly depending on the mechanisms of transmission and the magnitudes of the effects of REER. Based on recent empirical research, this study compiles research outcomes of the different econometric studies, policy briefs, and sector surveys to deliver a subtle view of the weaknesses and policies of each country.

Pakistan: Structural Fragility and REER-Driven Macroeconomic Volatility

Historically, the Pakistani economy has been plagued by endemic structural weaknesses, which include an export base that is largely restricted to low-value textiles, excessive dependence on imported energy and imported intermediate products and frequent current-account deficits that trigger balance-of-payments crises. The Real Effective Exchange rate (REER) in this fragile setting acts not as a price signaling mechanism, but as an important point in determining the macroeconomic stability and growth path. The empirical evidence proves many times that the misalignments in the REER, particularly overvaluation, have negative effects in the GDP, agricultural exports, and foreign direct investments

REER and GDP Growth

The exchange rate and gross domestic product (GDP) nexus in Pakistan is neither linear nor intuitive (Farooq and Azam, 2021). By utilizing the time-series data available since 1972 and employing the autoregressive distributed lag (ARDL) methods of cointegration, Farooq and Azam (2021) reveal that the overvaluation of the REER has a significant negative influence on the economic growth in the long-term. This impact is realised via an appreciated REER that undermines export competitiveness, especially in the labour-intensive industries which form the foundation of the Pakistani tradable economy (Siddique et al., 2020). The resultant shrink import earnings deter industrial activity and fiscal earnings, hence further limiting macro-economic stability

(Ahmad et al., 2021). Additionally, the attempts to rectify overvaluation by means of depreciation often cause imported inflation, due to the high dependence that a country has on foreign energy and raw materials, which negates any temporary benefits of growth (Qasim et al., 2021). Although nominal depreciation may offer some short-term benefits to the increase in export quantities, the resulting advantages are regularly offset by imported inflation (Ahmad et al., 2021).

More than 80-percent of the oil imported to Pakistan and a significant portion of machinery and raw materials is imported; that is why a weaker currency increases the costs of production, reduces the real wages of the population and promotes the inflation, which often exceeds 20-percent during crisis periods (Qasim et al., 2021). This inflation spiral erodes household consumption, which is almost 80 per cent GDP and increases the real cost of foreign-debt servicing, which eventually documents the sustainability of growth (Ali and Hussain, 2021). The regularly used expansionary monetary policy, which occurred to boost growth, has the opposite effect of causing real appreciation due to increased differentials in inflation, which worsens the trade deficit and decreases net exports (Lakhan and Mumtaz, 2022). This policy issue highlights that there is hardly a room to do macro-economic man oeuvres in the structurally limited economy in Pakistan (Mumtaz et al., 2022).

REER and Agricultural Exports

Agriculture is one of the pillars of the Pakistani economy, as it contributes around 23 percent to the gross domestic product and employs close to 38 percent of the country labor force (Fiaz et al., 2020). Other major export products are basmati rice, cotton, citrus fruits, and seafood- good products that are characterized by high price sensitivity in the foreign markets (Saleem & Shafiullah, 2020). The real effective exchange rate (REER) appreciation has a significant negative impact on the competitiveness of these exports with a 1% real appreciation being linked to a decline in agricultural export volumes of between 0.6-0.9 percent especially to rice and cotton (Saleem & Shafiullah, 2020). Smallholder farmers are prone to this because of low profit margins and access to financial hedging instruments (Saleem & Shafiullah, 2020).

The effect of the exchange rate fluctuations is asymmetric: depreciation results in small and short-term export benefits, and appreciation leads to significant and long-term contractions with a duration of more than two years (Khurshid et al., 2021). Any gains by farmers as a result of depreciation of agricultural products in the domestic market can be short-lived; moreover, it will also bring up the cost of imported inputs to farmers such as diesel, fertilizers, and pesticides, thus reducing the net income and global competitiveness (Iqbal, Shahid, and Rashid, 2022). Even though there are the potential benefits of energy subsidies and export-financing plans to reduce these shocks, the financial constraints have more often than not hampered their effective application (Ali & Fiaz, 2020).

REER and Foreign Direct Investment (FDI)

The inflows into Pakistan through the foreign direct investment have been stuck at a sluggish trend with the average being only \$2 to 3 billion annually, which is significantly lower compared to similar economies like Bangladesh or Vietnam (Rehman et al., 2021). Macroeconomic instability is the main factor that discourages such inflows, and in this case the variability of real effective exchange rate (REER) is playing a central role in deterring long-term investment, particularly in the capital-intensive sectors, including energy, infrastructure, and manufacturing (Aziz and Aslam, 2021).

Frequent devaluations, which are normally associated with adjustment programmes supported by the IMF, are seen by the investment stakeholders as an indicator of policymaking uncertainty and increasing currency risk (Begum and Khan, 2021). The exchange rate volatility also weakens investor confidence by affecting the performance of equities market and increasing the risk of capital depreciation (Begum & Khan, 2021). Its wider context of the emergent markets means that REER instability is a quite strong negative predictor of FDI inflows, with Pakistan being one of the most vulnerable countries thanks to its poor institutional quality and rampant political uncertainties (Doytch&Guven, 2021).

Even such large-scale initiatives as the ChinaPakistan Economic Corridor (CPEC) faces the problem of delays in implementation, with Chinese investors expressing apprehensions about rupee depreciation and difficulties with the possibility of returning profits (Degong, Ullah, Ullah& Arif, 2023). As a result, mismanagement of the REER increases the structural weaknesses of Pakistan, which further enhances a vicious cycle of balance-of-payments crises, sudden currency adjustments, imported inflation, and constantly low investment (Aslam et al., 2021; Doytch et al., 2021). The lack of a viable exchange-rate system, fiscal tightening, and wholesale reforms to diversify the export base and reduce reliance on imports limits the future prospects of Pakistan in terms of drawing sustainable FDI (Degong et al., 2023).

China: Managed Stability and Strategic REER Policy

China is in sharp contrast with Pakistan. China, the second-largest economy and the highest exporter in the world, has a managed-floating exchange-rate policy, which puts a premium on macroeconomic stability, export competitiveness and strategic industrial upgrading. People Bank of China (PBOC) proactively interferes in the foreign exchange markets to limit the undue volatility so as to make the real effective exchange rate (REER) a policy tool rather than a cause of volatility. As a result, the changes in REER in China are more likely to have controlled, and usually positive, impacts on the GDP, agricultural exports and foreign direct investment

REER and GDP Growth

Traditionally, export-based industrialization and massive internal investment have been the drivers of the gross domestic product development in China (Bashir and Wei, 2020). The impact of exchange-rate changes on industrial output is substantial, especially in the provinces closely connected to the global value chains, which can be supported with wavelet coherence analyses (Bashir and Wei, 2020). Unlike Pakistan, the large domestic market, and the government-led investment in China are the strong buffer mechanisms to external shocks, thus, allowing the net exports to increase without triggering hyperinflation (Li and Liu, 2020). A modest undervaluation of the real effective exchange rate (REER) enhances the competitiveness of the manufacturing sector and contributes to the growth of GDP, particularly in those provinces that are highly dependent on exports, such as Guangdong and Zhejiang (Li and Liu, 2020).

The high foreign-exchange reserves of China, which are more than 3 trillion, and strict capital controls are further seen to be given the capacity of this nation to deal with external shocks, such as U.S. trade tariffs and worldwide financial turmoil, without the need to disrupt the currency (Li and Liu, 2020). State-subsidized energy prices and strategic grain reserves can even help to reduce the inflationary pass-through when global energy prices are up and the cost of agricultural inputs is up, which helps to maintain REER stability in the agricultural sector (Ma, Zhang, and Yu, 2022). This well-

established institutional and policy framework allows China to separate domestic stability of prices with the external exchange parameters, which offers a strategic edge that is mostly still lacking in most developing markets (Ma et al., 2022).

REER and Agricultural Exports

Despite the agricultural industry being a significant portion of the GDP, agriculture is essential to food security and to the employment in China (Chen, and Zhang, 2019). The exports of labor-intensive agricultural goods including vegetables, fruits, and aquaculture are greatly decreasing based on a study of trade data in 2000-2017, which is greatly affected by REER appreciation (Chen and Zhang, 2019). The negative effect, however, is still significantly less significant than in Pakistan or India, which can be explained as well by the economies of scale, the developed cold-chain logistics, and the promotion institutions supported by the state (Chen and Zhang, 2019).

. With the understanding that prices are also sensitive, China has made a calculated shift towards exporting higher-value agricultural products, such as processed foods and organic products, which are less sensitive to exchange rate changes (Chen and Zhang, 2019). In addition, the Belt and Road Initiative (BRI) has promoted diversification of the market into Central Asia and Africa where the Chinese agribusinesses are based with bilateral trade agreements that commonly include currency swap deals aiming to shield themselves against the REER fluctuations (Chen & Zhang, 2019).

REER and Foreign Direct Investment (FDI)

China keeps topping the list of the developing economies as the main beneficiary of foreign direct investments, receiving more than 180 billion every year, which is registered by Li and Liu (2020). Nonetheless, the actual effective exchange rate (REER) distortion, particularly the most common overvaluation, discourages the inflow of foreign capital and multinational enterprises reconsider the comparative advantage of China with regards to labour costs and production efficiencies (Li & Liu, 2020). Chinese policymakers, in turn, prefer a proactive approach, which allows allowing measured and controlled weakening of the renminbi and, in the meantime, distributing resources to infrastructure and human-capital investment to receive high-quality, productivity-driven FDI (Li and Liu, 2020).

Firm-level studies support the fact that the inflows of FDI have a positive association with export performance, creating a virtuous cycle of technological improvements, efficiency, and increasing the integration into the global value chains (Anwar and Nguyen, 2018). Additionally, the outbound FDI projects by China, such as those within the China-Pakistan Economic Corridor, are sensitive to the valuation of the RMB, but the state can overcome these short term fluctuations in the REER with sovereign-wealth funds and policy-supported financial instruments, thus making sure that strategic investments can withstand such changes in the short term (Degong and Arif, 2023). Essentially, China applies its institutional ability, the freedom of choice in a macroeconomic policy, and its sheer economic mass to transform the REER into a prospective weakness into a carefully engineered tool that pushes growth and extends its economic influence globally (Li et al., 2020; Degong et al., 2023).

India: Democratic Complexity and Mixed REER Outcomes

India exists in the interim between feebleness of Pakistan and state-controlling China. India has mixed and contradictory effects of the REER due to a market driven

exchange rate regime, democratic institutions and a diversified but unevenly developed economy. The Reserve Bank of India (RBI) acts in order to prevent excessive volatility although, in general, the rupee is allowed to float, and it is more likely to be exposed to the occurrence of global financial cycles and commodity price shock

REER and GDP Growth

Since the early 2000s, the real effective exchange rate (REER) of India has been moving in a certain direction, i.e. towards an appreciation, which, again, can be explained by the strong growth in non-traded sectors supported by the Balassa-Samuelson mechanism and sustained levels of inflows (Bhowmik, 2017). This appreciation has undermined price competitiveness in the country particularly in the manufacturing sector, which is labor intensive like textile and electronics, which have remained core to Indian diversification agenda (Bhowmik, 2017).

In addition, exchange-rate volatility is another factor that undermines the performance of exports; a long-term cointegrating relationship exists between the stability of the exchange rate and manufacturing export, which highlights a serious impediment to the success of the so-called Make in India project (Jyoti, 2021). A moderate real depreciation, on the other hand, can be an agent of stimulus to the growth of agricultural GDP by raising farm-gate prices and supporting rural demand, which is a partial offset to industrial head winds that are currently plaguing the economy (Sahoo and Jha, 2022).

Contrary to its neighbor Pakistan, India boasts of a reasonably large domestic market and relatively low reliance on imported energy resources - benefits it has by producing its own coal and owning a strategic petroleum reserve, reducing inflationary carry overs in terms of currency depreciation (Sahoo and Jha, 2022). However, with being a net importer of oil, the country is exposed to exogenous energy shocks and the sudden increase in oil prices tends to start rupee depreciation, increase the current-account deficit, and raise sovereign borrowing rates (Tan, Gopalan, and Sharma, 2019).

REER and Agricultural Exports

India is one of the leading world exporters of rice, spices, seafood and sugar; however, its farm food exports have been in a critical position affected by the real effective exchange rate (REER) (Kaur and Sharma, 2022). One percent real appreciation helps to reduce rice exports by 0.7 percent and marine products exports by 1.1 percent as it has been prepared in a sectoral analysis that highlights the price elasticity of the goods (Kaur and Sharma, 2022).

This weakness is further compounded by the situation of small-scale cultivators and micro-, small-, and medium-sized enterprises (MSMEs), who are deprived of such tools as forward contracts, financial hedging instruments, and thus left on the mercy of sudden stagnation of the rupee appreciations (Rahman and Mamun, 2020). The negative effect is not limited to specific industries: the positive correlation between REER appreciation and the aggregate balance of trade in India is positive (and the most affected groups are agricultural commodities) (Agarwal and Singal, 2013). However, there has been a shift in India toward exalted agro-processing (frozen foods, ready-to-eat meals, branded spice blends) that started to reduce price sensitivity and thus strengthened the resilience of exports to the fluctuations of the exchange rate (Agarwal et al., 2013; Kaur et al., 2022).

REER and Foreign Direct Investment (FDI)

India has received much FDI an average of 60-80 billion every year, due to the large consumer base and comparatively relaxed investment policies (Aslam & Rehman, 2021). But in the context of export-oriented manufacturing industries, volatility in the real effective exchange rate (REER) discourages foreign investment whereas having a trivial effect on market-seeking FDI in industries such as retail and telecommunications (Aziz and Rehman, 2021). This deviation represents a representational manifestation of the double-faceted economic structure of India; a world-dependent export sphere exists alongside a domestically oriented economy that is relatively resistant to changes in the exchange rates (Asslam and Aziz, 2021).

Asymmetrical impacts of exchange-rate volatility, in turn, on both trade and investment in various time horizons; on the short-run, fluctuations in exchange rate lead to adverse effects, preventing exports, whereas, on a longer-term basis, stability in the exchange rate encourages the evolution of FDI-related export platforms, which is discussed in the context of a wavelet-based analysis (Ali and Kumar, 2019). Specifically, depreciation has a stronger stimulatory effect on exports compared to appreciation being offensive, an unequal strength force featured in the trade between India and the United States (Bahmani-Oskooee and Ghodsi, 2020).

However, in contrast to China, poor physical infrastructure, unpredictability of the rules, and the lack of trade facilitation in India increase the negative effect of the REER volatility on the overall investor confidence (Ali et al., 2019; Bahmani-Oskooee et al., 2020). This nation-specific discussion shows that the effect of REER cannot be homogeneous and predictable at all but exists in the structural, institutional, and policy background of every economy. Institutional weakness in Pakistan adds value to the dangers of any changes in the exchange rates, the strong capacity to act as a state in China turns the exchange-rate into a strategic resource and the diverse outcomes of the democratic complexity in India are a mosaic of consequences. These insights allow empirical basis and support the policy suggestions that are to be presented in later chapters.

A Comparative Perspective

While Pakistan, India and China differ in economic size, institutional strength and policy autonomy, all three economies are deeply affected by movements in the Real Effective Exchange Rate. In Pakistan, REER instability reflects broader macroeconomic vulnerabilities, constraining GDP growth, agricultural exports and FDI. In India, a managed float allows for greater resilience, but exchange rate volatility still poses risks to export competitiveness and investor confidence. In China, strategic REER management has supported export-led growth, though the economy now faces new challenges in balancing internal and external stability.

This country-wise analysis highlights the need for tailored policy responses:

- Pakistan requires structural reforms, energy sector efficiency, and exchange rate stabilization.
- India must strengthen macroeconomic fundamentals and reduce oil import dependency.
- China should move toward greater exchange rate flexibility to support high-quality development.

Collectively, the experiences of these three nations underscore the central role of the REER in shaping economic outcomes in an interconnected global economy.

1. **Comparative Trilateral Framework:** While numerous studies examine REER effects in individual countries, this research offers a systematic, side-by-side analysis of Pakistan, India, and China—three major Asian economies with divergent institutional capacities, exchange rate regimes, and development trajectories. This comparative lens reveals how the *same macroeconomic variable* (REER) produces *radically different outcomes* based on structural context.
2. **Integration of Macroeconomic Triad:** The study uniquely links REER dynamics to three interdependent pillars GDP growth, agricultural exports, and FDI demonstrating their co-evolution rather than treating them in isolation. This holistic approach captures feedback loops (e.g., how REER-driven export performance influences FDI, which in turn affects GDP).
3. **Emphasis on Asymmetry and Nonlinearity:** Building on recent advances in econometrics (e.g., NARDL), the study underscores the asymmetric effects of REER appreciation versus depreciation particularly in Pakistan and India challenging linear policy assumptions that treat exchange rate movements as symmetric shocks.
4. **Policy-Relevant Nuance:** The analysis moves beyond theoretical generalizations to offer context-specific policy insights: it explains why depreciation boosts Chinese exports without inflation but triggers crises in Pakistan, and how India's dual economy creates divergent FDI responses. This granularity enhances the practical utility for policymakers.
5. **Incorporation of Contemporary Challenges:** The study integrates energy dependency, institutional quality, and global value chain integration into the REER framework factors often overlooked in traditional trade models thereby reflecting the realities of 21st-century emerging economies.

Despite the depth of existing literature, this review reveals several critical gaps that this study helps address and others that remain open for future research:

This reviewed literature consistently shows that:

REER misalignments negatively affect GDP growth, trade balance and FDI in Pakistan, India, and China.

The impact is asymmetric: depreciation has short-term benefits, but appreciation causes long-term damage.

Agricultural exporters and FDI inflows are highly sensitive to REER volatility, especially in institutionally weak economies.

Developed countries are more resilient due to diversified economies and strong institutions.

However, a critical research gap remains: most studies focus on single-country or single-variable analyses. Few provide a tri-country comparative assessment of how REER simultaneously affects GDP, agricultural exports, and FDI across Pakistan, India and China three economies with differing levels of development, policy autonomy and global integration.

This study aims to fill that gap by conducting a comprehensive, multi-variable, country-wise analysis that integrates the effects of REER, oil prices, and institutional quality on economic outcomes. By doing so, it contributes to a more nuanced understanding of exchange rate dynamics in emerging Asia and offers policy-relevant insights for sustainable

1. **Lack of Cross-Country Comparative Studies:** Most empirical work focuses on a single country (e.g., Siddique et al., 2020 on Pakistan; Li & Liu, 2020 on China). There is a dearth of integrated analyses that systematically compare transmission mechanisms across economies with different policy regimes, which this study fills.
2. **Under-Explored Agricultural-FDI Nexus:** While REER's impact on agricultural exports and FDI is studied separately, few works examine how REER-induced agricultural performance influences agro-industrial FDI a gap this study begins to bridge by linking farm-level competitiveness to investment climate.
3. **Limited Use of Nonlinear and Time-Frequency Methods:** Many studies still rely on linear ARDL models. Although recent works (e.g., Fiaz et al., 2021; Ali & Kumar, 2019) apply NARDL and wavelet analysis, these techniques are not yet standard in REER literature, especially in Pakistan and India. This study advocates for their wider adoption.
4. **Neglect of Institutional Mediation:** While Ullah & Khan (2021) and Aslam et al. (2021) note the role of institutions, most REER studies treat economies as homogeneous. There is a need for more granular analysis of how governance, rule of law, and state capacity condition REER outcomes—a dimension this study highlights through the China–Pakistan contrast.
5. **Insufficient Attention to Energy–REER Interaction:** The compounding effect of oil price shocks and REER misalignment critical for net importers like Pakistan and India is often treated as a control variable rather than a core transmission channel. This study foregrounds this interaction as a structural vulnerability.
6. **Data Limitations at Micro-Level:** While Ali (2020) uses transaction-level data for Pakistan, similar firm- or farm-level evidence is scarce for India and China, limiting causal inference. Future research should expand micro-data collection across all three countries.
7. **Dynamic Policy Simulation Gap:** Most studies are diagnostic, not prescriptive. There is a need for computable general equilibrium (CGE) or DSGE models that simulate the effects of alternative REER management strategies, something this study motivates but does not implement

LITERATURE REVIEW

Pakistan's Experience with REER: Evidence from Empirical Studies

Siddique et al. (2020) measured the asymmetric impacts of the effectual exchange rate movements in real terms with respect to competitiveness in the export of Pakistan using nonlinear Autoregressive Distributed Lag (NARDL) model at Harmonised System 2-digit level. Their results affirmed that the decline in the value of the REER had a positive impact on the revealed comparative advantage (RCA) of the leading Pakistani industries like textiles and rice hence boosted the exports. Meanwhile, the appreciation of the REER had a great negative effect, undermining competitiveness and increasing the trade deficit. In a second model, they showed that the increase in

values of RCA indexes, growing world income and REER depreciation all had a negative effect, increasing the reduction in the trade-balance deficit of Pakistan. This work offered a solid empirical support that REER misalignment, specifically overvaluation, is a structural bottleneck on the performance of Pakistan in terms of the external sector.

Shah et al. (2022) expanded the examination and incorporated the environmental and energy dimensions into the nexus of REER-growth nexus in Pakistan. They used nonlinear ARDL cointegration of data on 1972 to 2019 and discovered that depreciation and appreciation of REER asymmetries occur on energy use and also carbon emissions. Depreciation made fossil fuel imports, particularly oil and gas, more prominent; in doing so, production costs and environmental degradation increased, but the industrial output stayed the same, and it was not the case that it was put in its place. It was stressed in the study that sustained real appreciation was detrimental to manufacturing, but sudden devaluation promoted inflation and environmental expenses. Their work highlighted that there is a need to have coordinated exchange rate, energy and environmental policies in order to guarantee long term growth without impairing ecological stability. The article by Ahmed and Qureshi (2022) also used a nonlinear ARDL framework to explore the connection between real exchange rate and economic growth on the basis of 1975 and 2020. They discovered that REER overvaluation had a huge suppressive effect on GDP growth in the long run whilst depreciation only had short-run effects which were soon consumed by imported inflation. The research found some threshold effects: above some given level of misalignment the adverse effects on growth became bigger. Their findings supported the perception that the policy of exchange-rate must focus on stability over the exploitative devaluation in Pakistan. Monetary and exchange-rate tools would not be able to stimulate growth sustainably without structural changes to bring down the level of dependence on imports, especially imports of energy.

Malik and Khurshid (2021) established a specific study which is in the agricultural sector to determine the asymmetrical responses to exchange-rate volatility by using the NARDL model. They discovered that an increase in exports of agricultural products due to the depreciation of REER was quite subtle and it lasted only in the short run but precipitated considerable conditions due to the appreciation which lasted more than two years, with contractions being deep and prolonged. The cause of this asymmetry was company-inflexible production adjustment, access to little credit, and the lack of hedging devices among the small-holders. The analysis cautioned that recurrent incidences of genuine appreciation usually at times when there were capital inflows or IMF-brought stability caused permanent harm to export-based agricultural communities. Export -credit guarantees and forward-market development were proposed as a policy recommendation to cushion farmers against exchange-rate shocks

. Ali (2020) offered micro-levels of transaction information in the Pakistani agricultural export sector, which the author used to examine the customs information and thus, he attributed fluctuations in exchange rates to the export decision-making of the firm. His result upheld the fact that a one-percent appreciation of the real appreciation decreased export in 0.8 percent with the greatest effect to be on basmati-rice exporters and cotton to China, Iran, and Indonesia. The large agro-processors were rather susceptible to volatility, especially to smaller and less financially advanced companies. The paper has identified the rising exchange-rate volatility as having precipitated a rise in the cases of contract cancellations, less predictability in the

order and a subsequent reduction in investment in quality improvement. Therefore, Ali (2020) successfully related macroeconomic exchange-rate policy to micro-economic trade behaviour by emphasizing the distributional implications of mishandled REER.

Iqbal and Rashid (2022) examined domestic price transmission mechanisms, which showed that a depreciation of the exchange rate increased the output prices of agriculture but increased the process of input prices particularly the costs of imported diesel, fertilizers, and pesticides. The net profitability of the farm was damaged by this dual effect even though the nominal revenues were higher. They used time-series analysis on the years 1980 to 2020 and proved that an increase in the money supply further enhanced this process, which induced inflation without an equivalent rise in productivity. Their study warned them against the use of depreciation as a blanket solution to rural income growth, particularly in the economy where imported agricultural inputs exceeded more than 70 percent. They believed that subsistence farmers should be supported in a sustainable way that requires specific subsidies and incentive to promote import substitution in agricultural chemicals.

Kousar and Ahmad (2022) suggested the policy interventions to eradicate the vulnerability caused by REER in agricultural sector in Pakistan. Energy subsidies, and export-finance schemes, they argued, might also partially offset the negative impact of oil-price and currency changes. In a partial-equilibrium model, they had estimated situations in which structured subsidies on diesel and pre-shipment credit decreased the spread of transmission of exchange-rate volatility to farm-level decision-making. They, however, admitted that fiscal limitations and governance problems limit the expansion of such interventions. Their investigation consequently struck the right ratio between practical policy formulation and practical organizational constraints, providing a roadmap to survival in the face of macroeconomic instability.

Ullah and Khan (2021) diverted their attention to foreign direct investment (FDI) and examined their interaction with the institutional quality whereby the volatility of the REER interacted in shaping investment inflows. They analyzed panel data on 2000-2020 and established that the uncertainty in an exchange-rate was a strong discouragement to FDI, especially the infrastructure development and manufacturing. Nonetheless, this impact was weakened in those provinces that are more typified by effective rule of law, enforcement of contracts, and efficiency in bureaucracy. The poor nature of the institutional environment in Pakistan increased the investor risk perceptions to an extent where the REER stability will not be enough to attract long-term funds. It was found that the policy on exchange-rate policy should be coupled with governance reforms in order to enhance dramatically FDI opportunities.

According to Begum and Khan (2021), the volatility of REER was associated with developing financial markets, such that frequent devaluations weakened performance in the stock-market and investor confidence. They were able to illustrate through GARCH models that uncertainty in exchange rate augmented equity-market volatility, which deterred both portfolio and direct investment. According to their findings, macroeconomic instability was spilled in the financial markets in a negative feedback loop that limited capital formation. In the case of Pakistan, to establish this cycle, credible foreign-exchange management was among other steps in addition to extending further financial intermediation and availability of risk-hedging instruments. Chaudhry and Faheem (2021) placed the dynamics of REER in a larger macroeconomic context by looking at the relation of both oil prices and government spending and financial development. They discovered that the negative effect of

REER misalignment on GDP was magnified by oil price shocks because of increasing the current account and provoking inflation. Perhaps the whole effect could be counterbalanced by public expenditure on productive infrastructure, and untargeted subsidies increased fiscal deficits and currency scores. The holistic nature of their policy emphasized the fact that exchange-rate policy could not exist on its own without the fiscal and energy policies in an economy that was structurally weak like that of Pakistan.

India's Response to REER Fluctuations: Insights from the Literature

In (2021) Jyoti made a study of the long-run correlation between exchange-rate variability and the path of manufacturing exportation using an ARDL cointegration model on a panel of 1993:2019. The results supported the importance of a fixed real effective exchange rate (REER) to support growth in exports, especially in the setting of the "Make in India" program. Volatility, either in the form of appreciation or depreciation, was also identified to significantly disrupt supply chains and put foreign direct investment oriented to export platforms at a disadvantage. The enquiry thus highlighted an issue of policy dilemma that a moderate degree of depreciation would benefit competitiveness, but extreme volatility would hinder the plans of long term investment. In turn, Jyoti suggested a regime of managed float, which would balance external competitiveness and macroeconomic predictability.

Tang and Abosedra (2021) used a quantile-on-quantile regression to exhibit the impact of the heterogeneous effects of REER on the Indian income distribution. They found that a real depreciation advantage is that it impacts positively lower-income households by increasing rural jobs and rural agricultural wage money but, at the same time, negatively affects urban consumers by raising import prices. This asymmetry of distribution makes the monetary policy torturously complicated because exchange-rate changes may have regressive or progressive impacts depending on current economic conditions. The authors thus proposed complementary social safety nets aimed at providing protection to vulnerable groups when it comes to depreciation periods just so, that competitiveness gains do not undermine equity.

A sector analysis in the agricultural export of India conducted by Kaur and Sharma (2022) showed that when there is an appreciation of the REER at 1 per cent, a contraction of the exports on rice of 0.7 per cent and a drop of marine products of 1.1 per cent can be observed. The biggest beneficiaries of sudden rupee appreciation were small and medium-sized exporters who in most cases have no entry to forward contracts hedging strategies. The paper reported the effects of such shock occurrences that break seasonal planting and harvesting choices leading to welfare-misallocating production. However, they found a positive trend, which was a value-added export, such as frozen shrimp or branded spices, exhibiting less price elasticity, indicating that agro-processing may enhance resilience.

These findings were supported in disaggregated trade data by Rahman and Mamun (2020) who gave particular focus to the fact that agricultural exporters of India are faced with significant costs of hedging currency risks. Their predictions show that 12-15 cent among smallholder cooperatives is limited by the exchange-rate volatility and inhibits export participation. The authors suggest broadening the scope of the Export Credit Guarantee Corporation and coming up with trade invoicing in the key partner economies like ASEAN and Africa in rupee. Their research fills the gap between trade

finance and exchange-rate policy and provides effective tools of export growth inclusiveness.

The article by Aslam and Aziz (2021) reviewed the determinants of foreign direct investment in South Asia and in specific to India. They found that REER volatility discourages export based FDI but has low effects on market seeking investment in retail or telecommunication sector. This twofold is the bifurcated economy of India, but in which there is co-existence of a globally linked manufacturing industry and a service sector that is domestically oriented. This paper claims that by stabilizing the REER of the export-oriented zones in India and allowing it to be flexible in the domestic sectors, India is able to attract high-quality FDI.

More so, the volatility can then be mitigated through institutional quality, in particular, the ease of doing business. Ali and Kumar (2019) used a wavelet-based temporal decomposition to reveal that the impact of the exchange rates on the exports of India is changing over time horizons. The volatility in the short term discourages trade activities, and long-term stability in the REER encourages the export platforms dependent on FDI. Their frequency analysis indicates that investors are sensitive to other lasting trends more than volatile work. These results provide support to a policy doctrine which puts more emphasis on the predictability of exchange rates in the medium term than short term intervention which is consistent with the Indian macro-prudential structure as it advances.

Bahmani-Oskooee and Ghodsi (2020) had reported asymmetric income effect on bilateral India-U.S. flows having found that the effects of depreciation on exports are more negative than those on investment. Such asymmetrical J-curve means that there is some resiliency in the export structure of India perhaps because of product differentiation and supply-chain integration. The paper argues that yen depreciation to a moderate level can provide net benefits to the trade as long as it is not coupled with macro-economic instability. This is a finer point of view going against the barebones explanation that depreciation is intrinsically harmful in policy circles.

In a study by Sahee (2015), researchers discovered that the average real depreciation is a foundation of agricultural GDP as it increases farm-gate prices, and promotes rural demand. Compared to Pakistan, the Indian domestic market is large, and therefore, taking over some of the inflationary shock, whereas domestically produced coal minimizes reliance on imported energy. However, being a net importer of oil, India is also vulnerable to the world oil price shock that will lead to rupee depreciation and increase the current account deficit. The authors support the creation of strategic petroleum insurance and investment in renewable energy to enhance macro-economic cushions.

Tan and Sharma (2019) examined the sub-national level of export performance in India and found that the states with good infrastructure and logistics are less sensitive to the REER volatility. Such spatial heterogeneity means that the domestic policy, especially the increase of transport and digital access, can counterbalance the exchange dangers. Their findings support a two-pronged approach: To make the macro-REER more stable and at the same time to enhance micro-level facilitation of trade to increase export resilience at the regional level.

China's Management of REER: Findings from Existing Research

Bashir and Wei (2020) used wavelet coherence to examine the Chinese response to exchange-rate movements using its industrial production. The authors established that

the coastal provinces highly embedded in the global value chains were resilient to actual effective exchange-rate (REER) variability, and that depreciation of the value rate triggered electronic and machinery production. On the other hand, the impact was dampened inland territories, marking the existence of sharp spatial inequalities in China export economy. Most importantly, the People Bank of China (PBOC) applied dynamic control to preempt extreme volatility and thus enabled the depreciation to facilitate growth without causing inflation or capital flight.

This finding has been confirmed by a 2018 study by Zhang of the misalignment of REER and performance on export performance, among Chinese provinces, where over-valuation was found to limit export growth specifically in the labor-intensive sectors. Gradual approach of adjustment by the PBOC that allows a controlled depreciation in times of global slowdowns allowed it to maintain competitiveness without startling markets. According to Zhang, the success of China was the results of having huge foreign reserves and capital controls, which most developing economies lack policy levers. The paper makes China a model in strategic exchange-rate management in an open economy.

The case presented by Weng and Wang (2021) on the agricultural exports in China revealed that the increase in REER led to decreased shipment of vegetables, fruits, and aquaculture products. The effects were, however, not as strong as in South Asia due to government-supported logistics, cold-chain, and export-promotion agencies. The authors have mentioned the strategic preference towards processed and organic foods, which are less price-sensitive and can set higher prices. This upgrading plan cushioned agro-exporters in China against naked competition due to pure exchange-rate competition, which restored resiliency in the long term.

In 2020, Zhao was able to corroborate this trend by stating that the Chinese agricultural companies were more dependent on the ability to differentiate products in terms of quality, rather than lead in terms of cost. Based on firm-level data, Zhao found that the impacts on the environment of REER were decreasing in the process of advancing up the value chain by exporters. This had been enabled by policy support of R&D, food-safety certification and e-commerce platforms. This research implied that industrial policy should complement exchange rate policy in order to maintain development of agricultural exports in high value world market.

Further clarification of the relationship between exchange, rate volatility and China farm export came in the study by Chen and Zhang (2019), as they studied the impact of the volatility on China farm export and found that it decreased agricultural export, but state subsidies and strategic reserves mitigated the effect of farm-price transmission. In contrast to Pakistan, China was able to decouple internal agricultural markets to external exchange-rate pressure with the help of administered prices and buffer stocks. This institutional capacity helped China to remain stable in rural areas even during the global forex turbulence, a luxury most emerging economies have no access to. In 2021, Bashir and Wei extended agricultural production with VARs to indicate that stable REER reduced the cost of production, and the modern input was invested in order to increase the output. When the episodes of depreciation are controlled, it might increase export-based agriculture, but volatility inhibited long-term investments in land and technology. This study strengthened the assumption that it was predictability, and not level that was central to agricultural growth in an open economy.

A study by Zou and Wei (2021) on the provincial location of FDI inflows in China demonstrated that stability of REER was a source of high-quality investment in technology and green manufacturing. The over-valuation discouraged FDI, but the PBOC managed to stop permanent misalignment through timely interventions. This paper has highlighted how China has been engaging in currency swap contracts with Belt and Road to hedge outward FDI, hence making sure that RMB changes did not interfere with the strategic projects like CPEC. This pro-active risk management was a demonstration of the Chinese institutional strength in investment in the world. A 2023 study of Chinese outward FDI at CPEC by Degong and Arif found that RMB valuation affected the viability of projects, but this was alleviated by policy bank and sovereign wealth funds. The Chinese state-owned enterprises had implicit currency-risk guarantees and thus, they can pursue strategic objectives regardless of the short-term

movement of REER. This was very different to the case of private investors in Pakistan or India which did not have such support. The research paper depicted the changes in the exchange rate risk where institutional strength ensured that it became a variable as opposed to being a constraint. This national level generalization establishes a strong hierarchy of REER resilience: China exploited institutional strength and policy space to turn REER into a strategic asset; India displayed partial resilience based on market size and gradual upgrading but was susceptible to oil shocks; Pakistan experienced structural weaknesses, whereby the mismanagement of REER accentuated the underlying vulnerabilities. Such observations give the policy recommendations, which takes the empirical basis in the following chapters.

Synthesis and Research Gap

This reviewed literature consistently shows that:

REER misalignments negatively affect GDP growth, trade balance, and FDI in Pakistan, India, and China.

The impact is asymmetric: depreciation has short-term benefits, but appreciation causes long-term damage.

Agricultural exporters and FDI inflows are highly sensitive to REER volatility, especially in institutionally weak economies.

Developed countries are more resilient due to diversified economies and strong institutions.

However, a critical research gap remains: most studies focus on single-country or single-variable analyses. Few provide a tri-country comparative assessment of how REER simultaneously affects GDP, agricultural exports, and FDI across Pakistan, India and China three economies with differing levels of development, policy autonomy and global integration.

This study aims to fill that gap by conducting a comprehensive, multi-variable, country-wise analysis that integrates the effects of REER, oil prices, and institutional quality on economic outcomes. By doing so, it contributes to a more nuanced understanding of exchange rate dynamics in emerging Asia and offers policy-relevant insights for sustainable

Summary Table:

Authors & Year Pakistan	Independent Variable	Dependent Variable	Model/ Method	Data Source	Significant or not
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Siddique, Anwar & Quddus (2020)	REER (depreciation/appreciation), RCA index, world income (Yw)	RCA index (Model 1); Trade Balance (Model 2)	Nonlinear ARDL (NARDL)	HS-2 export data, World Bank, IFS; Not specified (likely 1980s–2010s)	Yes– Asymmetric effects confirmed; REER depreciation ↑ RCA & improves TB
Shah et al. (2022)	REER (depreciation/appreciation)	Energy consumption, CO ₂ emissions, GDP	Nonlinear ARDL	World Bank, BP Statistical Review; 1972–2019	Yes– Asymmetric impact on energy use and emissions
Ahmed & Qureshi (2022)	REER (overvaluation/depreciation)	Real GDP growth	Nonlinear ARDL	World Bank, SBP; 1975–2020	Yes– REER overvaluation ↓ long-run GDP
Fiaz, Malik & Khurshid (2021)	REER volatility (asymmetric)	Agricultural exports	NARDL	State Bank of Pakistan, FAO; Not specified	Yes– Appreciation causes prolonged export decline
Ali (2020)	REER (real appreciation)	Firm-level agricultural export volumes	Transaction-level regression	Pakistan Customs data; Not specified	Yes– 1% appreciation ↓ exports by 0.8%
Iqbal, Shahid & Rashid (2022)	Exchange rate, money supply	Agricultural prices, input costs	Time-series regression	SBP, FAO; 1980–2020	Yes– Depreciation ↑ output prices but also input costs
Kousar, Rehman & Ahmad (2022)	REER, oil prices, energy subsidies	Agricultural export resilience	Partial equilibrium simulation	Government reports, World Bank; Not specified	Yes (simulated)– Subsidies reduce REER pass-through
Ullah & Khan (2021)	REER volatility, institutional quality	FDI inflows	Panel regression	UNCTAD, WGI; 2000–2020	Yes– Volatility ↓ FDI; institutions mitigate effect
Begum & Khan (2021)	REER volatility	Stock market performance	GARCH model	PSX, SBP; Not specified	Yes– Volatility ↑ market risk, ↓ investor confidence
Chaudhry, Faheem, Hussain & Ahmad (2021)	Oil prices, REER, public expenditure	GDP growth	ARDL	World Bank, SBP; Not specified	Yes– Oil shocks amplify REER misalignment effects
India Jyoti (2021)	REER volatility	Manufacturing exports	ARDL cointegration	RBI, UN Comtrade; 1993–2019	Yes– Stability crucial for export growth

Tang & Abosedra (2021)	REER (depreciation)	Household welfare (by income quantile)	Quantile-on-Quantile Regression	NSSO, RBI; Not specified	Yes– Heterogeneous distributional effects
Kaur & Sharma (2022)	REER appreciation	Agricultural exports (rice, marine)	Sectoral regression	APEDA, RBI; Not specified	Yes– 1% appreciation ↓ rice exports by 0.7%
Rahman & Mamun (2020)	Exchange rate volatility	Agricultural export participation	Disaggregated trade regression	UN Comtrade ; Not specified	Yes– Volatility ↓ participation by 12–15%
Aslam, Aziz & Rehman (2021)	REER volatility, institutional quality	FDI (by type)	Panel regression (South Asia)	UNCTAD, WGI; Not specified	Yes– Volatility ↓ export-platform FDI only
Ali, Shahbaz & Kumar (2019)	REER volatility	Total exports	Wavelet coherence analysis	RBI, UN Comtrade ; Not specified	Yes– Long-run stability encourages FDI-linked exports
Bahmani-Oskooee & Ghodsi (2020)	REER changes	Bilateral exports (India–US)	Asymmetric ARDL	USITC, RBI; Not specified	Yes– Depreciation ↑ exports more than appreciation ↓ them
Sahoo & Jha (2022)	REER depreciation	Agricultural GDP	Time-series analysis	MOSPI, RBI; Not specified	Yes– Moderate depreciation ↑ rural income
Tan, Gopalan & Sharma (2019)	REER, infrastructure quality	Sub-national exports	Panel regression (state-level)	RBI, Ministry of Commerce; Not specified	Yes– Better infrastructure ↓ REER sensitivity
China Bashir & Wei (2020)	REER changes	Industrial production	Wavelet coherence	NBS, PBOC; Not specified	Yes– Coastal provinces responsive to REER
Zhang (2018)	REER misalignment	Provincial exports	Panel regression	China Statistical Yearbook; Not specified	Yes– Overvaluation ↓ export growth
Weng & Wang (2021)	REER appreciation	Agricultural exports (vegetables, aquaculture)	Regression with sectoral data	China Customs, FAO; Not specified	Yes– Negative effect, but muted by logistics
Zhao (2020)	REER	Agricultural exports (by value chain position)	Firm-level regression	MOA, firm surveys; Not specified	Yes– REER impact ↓ with value addition
Chen & Zhang (2019)	Exchange rate volatility	Agricultural exports	Time-series regression	China Statistical Yearbook;	Yes– Volatility ↓ exports, but

Bashir & Wei (2021)	REER stability	Agricultural production, input investment	VAR model	Not specified NBS; Not specified	buffered by state policy Yes– Stability ↑ output and investment
Zou & Wei (2021)	REER stability	Provincial FDI inflows	Provincial panel regression	MOFCOM, PBOC; Not specified	Yes– Stability attracts high-quality FDI
Degong, Ullah, Ullah& Arif (2023)	RMB valuation (REER proxy)	Outward FDI (CPEC projects)	Qualitative + institutional analysis	CPEC reports, PBOC; Not specified	Yes (qualitative) – State hedging neutralizes REER risk

SUMMARY

Empirical studies on Pakistan consistently demonstrate that the Real Effective Exchange Rate (REER) exerts significant and often asymmetric effects on key macroeconomic variables. Siddique, Anwar and Quddus (2020) confirm that REER depreciation enhances Pakistan's revealed comparative advantage (RCA) and improves the trade balance, while appreciation harms both. This finding is reinforced by Fiaz, Malik and Khurshid (2021) and Ali (2020), who show that agricultural exports particularly rice and cotton are highly sensitive to REER appreciation, with even a 1% real appreciation reducing export volumes by 0.7–0.8%. Ahmed and Qureshi (2022) further establish that REER overvaluation suppresses long-run GDP growth, a result amplified by oil price shocks, as shown by Chaudhry et al. (2021). Moreover, REER volatility deters FDI (Ullah & Khan, 2021) and undermines financial market stability (Begum & Khan, 2021), though institutional quality can partially offset these effects. Policy interventions like energy subsidies may mitigate pass-through effects (Kousar et al., 2022), but structural vulnerabilities persist.

In India, the REER–macroeconomic relationship exhibits partial resilience shaped by market size and policy context. Jyoti (2021) and Tan et al. (2019) find that REER stability is crucial for manufacturing and sub-national export performance, with better infrastructure reducing exchange rate sensitivity. Agricultural exports remain vulnerable Kaur and Sharma (2022) report a 0.7% decline in rice exports per 1% REER appreciation but value addition offers some insulation. Studies also reveal distributional asymmetries: REER depreciation benefits rural households (Tang & Abosedra, 2021; Sahoo & Jha, 2022) while hurting urban consumers. On FDI, Aslam et al. (2021) and Ali et al. (2019) distinguish between export-platform and market-seeking investment, showing that only the former is sensitive to REER volatility. Notably, Bahmani-Oskooee and Ghodsi (2020) find an asymmetric J-curve in India–U.S. trade, where depreciation boosts exports more than appreciation harms them, suggesting inherent resilience.

China, by contrast, demonstrates strategic mastery over REER dynamics through strong institutions and policy coordination. Bashir and Wei (2020, 2021) and Zhang (2018) show that REER depreciation supports industrial and agricultural output, especially in coastal and export-oriented regions, while state mechanisms such as buffer stocks, administered pricing, and logistics infrastructure dampen volatility impacts (Chen & Zhang, 2019; Weng & Wang, 2021). Zhao (2020) highlights a structural shift toward quality-based competitiveness, which reduces reliance on cost advantages and diminishes REER sensitivity. On investment, Zou and Wei (2021)

confirm that REER stability attracts high-quality provincial FDI, while Degong et al. (2023) illustrate how state-backed hedging neutralizes currency risk in outward FDI (e.g., CPEC). Collectively, these findings reveal a clear hierarchy: China leverages institutional strength to transform REER into a policy tool, India shows adaptive but incomplete resilience, and Pakistan remains trapped in a cycle of structural fragility exacerbated by REER mismanagement.

Comparative Perspective: REER Effects in Asian, Developed, and Underdeveloped Countries

The empirical literature on the Real Effective Exchange Rate (REER) reveals stark contrasts in how economies at different stages of development respond to exchange rate fluctuations. The experiences of Pakistan (underdeveloped), India (emerging/developing), and China (upper-middle-income with state-led development model) all part of Asia highlight a spectrum of vulnerability, resilience, and strategic capacity that mirrors broader global patterns observed when comparing underdeveloped, developing, and developed nations.

Underdeveloped Economies (e.g., Pakistan, Sub-Saharan Africa, Fragile States)

As evidenced in Pakistan's case, underdeveloped economies exhibit high structural vulnerability to REER misalignment. Studies by Siddique et al. (2020), Ahmed and Qureshi (2022), and Ullah and Khan (2021) consistently show that REER overvaluation severely constrains GDP growth, erodes export competitiveness, and deters FDI. This vulnerability stems from:

- Narrow export bases (e.g., textiles, raw agricultural goods),
- Heavy import dependency on energy and intermediate goods,
- Weak institutions that fail to mitigate investor risk,
- Limited access to hedging instruments for small exporters (Ali, 2020; Fiaz & Khurshid, 2021).

These features are common across underdeveloped regions. For instance, Adenutsi and Agyei (2020) find similar REER sensitivity in Sub-Saharan African agricultural exports, while studies on fragile states (e.g., Afghanistan, Nepal) show that remittance-driven REER appreciation triggers Dutch disease, harming tradables (Saadat et al., 2024; Essayyad et al., 2018). In such contexts, REER volatility is a source of macroeconomic instability, not a policy tool.

Developing/Emerging Economies (e.g., India, ASEAN, Latin America)

India represents a middle ground: more resilient than Pakistan but less insulated than China. Its larger domestic market, partial industrial diversification, and democratic institutions allow some absorption of REER shocks. Jyoti (2021) and Sahoo and Jha (2022) show that moderate depreciation can support rural incomes and manufacturing, while Tan and Sharma (2019) demonstrate that infrastructure quality reduces regional REER sensitivity. However, India remains exposed to oil price shocks and institutional bottlenecks that amplify REER risks (Aslam & Aziz, 2021; Bahmani-Oskooee&Ghodsi, 2020).

This pattern aligns with findings from other emerging economies:

- In ASEAN, REER appreciation has eroded competitiveness in labor-intensive sectors (AbuDalu et al., 2014),
- In Latin America, exchange rate volatility deters FDI unless offset by strong governance (Doytch&Guven, 2021).

Thus, institutional quality and structural diversification not just income level determine REER resilience in developing economies.

Developed Economies (e.g., OECD Countries)

In contrast, developed nations exhibit high REER resilience due to:

- Diversified, high-value export baskets (e.g., machinery, services, technology),
- Deep financial markets that provide hedging instruments,
- Independent central banks that manage inflation expectations,
- Strong institutions that reduce policy uncertainty.

For example, in the U.S. and EU, REER fluctuations have muted effects on trade balances due to pricing-to-market behavior and invoicing in domestic currencies (Magee, 1973; Goldberg & Tille, 2008). FDI flows are driven more by market size and rule of law than exchange rate levels. While REER misalignment can affect sectoral competitiveness (e.g., German manufacturing), it rarely triggers macroeconomic crises.

China: A Hybrid Model

China defies simple categorization. Though technically a developing economy, it mimics developed-country resilience through state capacity rather than market depth. As Bashir and Wei (2020), Zhang (2018), and Degong and Arif (2023) show, China uses foreign exchange reserves, capital controls, strategic subsidies, and state-backed hedging to neutralize REER risks. Its shift toward high-value exports and Belt and Road currency swaps further insulates it from volatility. Thus, China demonstrates that institutional strength can substitute for income-level advantages—a lesson for other emerging economies.

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