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Macroeconomic Impact of Tariff Policies in Pakistan: An Empirical Assessment Ahead of the New Tariff Policy 2025-29

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Abstract: This study examines the dual role of Pakistan's tariff policy in raising fiscal revenue and shaping export competitiveness over the period 1981–2024. Using a Two-Stage Least Squares (2SLS) time-series framework, it estimates how tariff changes affect imports, exports, and government revenue. The results show that a one percent increase in tariff rates on production-related imports reduces their inflow by about 0.28 percent, while a one percent increase in production-related imports raises exports by about 1.26 percent. Together, these findings indicate that tariff rationalization supports export growth indirectly, by improving firms' access to the imported inputs used in domestic production. While tariff reductions encourage the import of essential inputs and strengthen export performance, higher tariffs generate only short-term revenue gains. The findings point to a clear trade-off: tariff elasticity of revenue is positive in the short run, whereas export elasticity is negative and statistically significant. These results are highly relevant as the Tariff Policy 2019–24 has concluded and a new framework for 2025–30 has just started. The study recommends gradual tariff rationalisation, a reduction in para-tariffs, and targeted protection for strategic industries to balance revenue considerations with long-term export competitiveness.

Keywords: Tariff rationalization, export competitiveness, government revenue, import elasticity, two-stage least squares (2SLS).

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1. Introduction

Tariffs have historically been an important policy instrument for developing countries, serving multiple objectives, including revenue generation, protection of local industry, and balance-of-payments management. In recent years, however, their role has expanded beyond fiscal and protective functions to include strategic trade and foreign policy considerations, especially amid growing global protectionism (World Bank, 2020).

In Pakistan, tariffs remain a major component of trade policy. The country's tariff regime is shaped by three main objectives: protecting domestic industries, promoting exports, and generating fiscal revenue. Tensions among these goals often lead to inconsistent outcomes. The first National Tariff Policy (NTP) 2019-24, introduced by the Ministry of Commerce, aimed to use tariffs as a trade policy tool, simplify tariff structures, and align them with export competitiveness. However, frequent changes driven by fiscal pressures and the use of para-tariffs diluted its impact. With the government now implementing the NTP 2025–30, a systematic evaluation of past tariff outcomes is timely and essential.

While global evidence (Kee et al., 2009; Amiti & Konings, 2007) shows that tariff reductions on imported inputs can enhance export performance by lowering production costs, Pakistan-specific research on this linkage remains limited. Most earlier studies have focused either on tariff–revenue relationships (e.g., Kemal, 2002; Iqbal & Zahid, 2015) or on broader liberalization episodes, without examining how tariff rationalization affects export growth through changes in import composition.

This study contributes to the literature by addressing that gap. It empirically examines the dual role of Pakistan's tariff policy, i.e., as a revenue instrument and as a determinant of export performance, using a Two-Stage Least Squares (2SLS) approach with disaggregated import categories (raw materials, intermediate, capital, and consumer goods).

The findings provide relevant insights for reviewing the implementation of the newly adopted Tariff Policy 2025-30, particularly in balancing fiscal objectives with long-term export competitiveness. By examining how tariff changes affect trade flows, production costs, and export capacity, the study offers evidence-based guidance for policymakers to design more coherent and sustainable tariff frameworks that strengthen Pakistan's industrial and trade resilience.

2. Pakistan's Tariff Structure and Policy Framework

The tariff policy is a central component of Pakistan's trade and fiscal policy. Each year, tariff adjustments and related tax measures are incorporated into the federal budget, which provides the legal basis for revisions to the customs tariff schedule. Although these changes undergo parliamentary scrutiny, the government retains the authority to amend duties during the fiscal year to address fiscal or trade needs (Farooq & Mustafa, 2021).

According to the Rules of Business (1973), the Ministry of Commerce (MoC) is primarily responsible for tariff and protection policies. The National Tariff Commission (NTC), operating under the MoC, evaluates requests from domestic industries and recommends tariff revisions, which the Federal Board of Revenue (FBR) implements through statutory regulatory orders (SROs). Together, these institutions form the operational backbone of Pakistan's tariff governance framework.

2.1 Classification of Tariffs

Pakistan's import duties comprise a mix of fiscal and regulatory instruments. The main categories include: Customs Duty (CD), Additional Customs Duty (ACD), Regulatory Duty (RD), Withholding Tax, Sales Tax, and Excise Duty.

2.1.1 Tariff Structure and Slabs

Pakistan's customs tariff follows the Harmonized System (HS-2017) classification, which spans 21 sections and 97 chapters. As of FY 2024-25, five tariff slabs remain in force: 0%, 3%, 11%, 16%, and 20% (Pakistan Customs Tariff, 2024-25). The multi-slab system reflects efforts toward rationalization, yet para-tariffs, such as regulatory and additional duties, often raise the effective protection rate beyond official levels.

2.1.2 Evolution and Policy Direction

Pakistan's tariff evolution has reflected alternating phases of liberalization and protectionism. The 1990s marked a shift toward trade liberalization, with tariff slabs reduced and non-tariff barriers dismantled (Zakaria, 2014). The mid-2010s brought tariff rationalization, consolidating slabs and lowering peak rates to promote efficiency. However, the late 2010s saw renewed protectionist trends, as fiscal pressures prompted higher duties on intermediate goods, reversing earlier liberal gains.

Despite multiple reforms, Pakistan remains among the more protected economies in Asia. Its Overall Trade Restrictiveness Index (OTRI) places it among the top ten globally (World Bank, 2020). This persistent protectionism has limited industrial diversification and export competitiveness.

2.2 Recent Policy Reforms

The National Tariff Policy (NTP) 2019-24 was Pakistan's first structured attempt to use tariffs as a trade policy tool rather than a revenue source. It removed duties on more than 2,000 tariff lines, primarily raw materials and capital goods, while emphasizing the principles of simplification, cascading, and strategic protection. Building on this experience, the National Tariff Policy (2025-30) aims to further rationalize tariffs by:

- Reducing the trade-weighted average tariff from 10.6% to 6% by FY2030
- Phasing out additional and regulatory duties
- Simplifying the Fifth Schedule and concessionary regimes
- Promoting export-led, technology-driven, and environmentally sustainable industries.

These reforms aim to create a predictable, transparent, and competitiveness-focused tariff environment aligned with Pakistan's broader industrial and export policy objectives.

With the National Tariff Policy (NTP 2019-24) now concluded and the NTP 2025-29 formally implemented, this is a crucial moment to evaluate how past tariff reforms have shaped Pakistan's trade outcomes.

As noted above, the new policy framework builds directly on the previous one, yet its success will depend on how effectively it addresses earlier weaknesses, specifically the complex, protectionist, and revenue-driven nature of the tariff regime. Therefore, a systematic analysis of the macroeconomic impact of previous tariff measures is essential to provide evidence-based insights for the implementation of the current policy.

The present study therefore builds on this evolving policy landscape to assess the effectiveness of tariff rationalization in improving Pakistan's trade performance and fiscal balance.

2.3 Structural Challenges in Pakistan's Tariff Regime

Despite repeated reform efforts, Pakistan's tariff system is often criticized for deep-rooted structural weaknesses. According to Tahir (2024), Pakistan's National Tariff Policy 2019-24 remained largely focused on revenue rather than serving as a tool for trade promotion and enhancing export competitiveness. Although the National Tariff Policy 2019-24 was designed to promote consumer welfare and reduce reliance on tariffs as a fiscal tool, the tariff structure remains overly complex, with multiple slabs, para-tariffs, and exemptions that raise the effective rate of protection above official averages.

A major issue is the fragmented institutional framework governing tariff decisions. Authority over tariff policy is divided among the Ministry of Commerce, the Federal Board of Revenue, and other entities with conflicting priorities and objectives, i.e., fiscal needs often override trade competitiveness goals. Furthermore, the frequent issuance of Statutory Regulatory Orders (SROs) and Customs General Orders (CGOs) increases discretion and erodes transparency.

The system's revenue bias has further constrained export growth. Approximately one-fourth of Pakistan's indirect tax revenue comes from import-related duties (FBR, 2023), reinforcing the government's reliance on tariffs as a fiscal tool rather than a trade instrument. This dependence, together with high tariffs on intermediate and capital goods, raises production costs and weakens export-oriented industries.

3. Literature Review

The literature on the role of tariff policy and trade performance has evolved considerably, highlighting how variations in import tariffs affect

both production efficiency and export competitiveness. This section reviews global and Pakistan-specific evidence on the relationship between tariffs, imports, exports, and economic growth, while identifying key methodological and contextual gaps in the existing literature.

3.1 Impact of Tariffs on Imports

A vast body of literature indicates that tariff liberalization has a positive impact on import volumes and diversity by lowering input costs and reducing trade barriers. These reductions enable economies to access a broader range of intermediate and capital goods, allowing firms to specialize in areas of comparative advantage and improve efficiency (Irwin, 2001). Reducing input tariffs can increase firms' access to high-quality imported materials, which in turn raises productivity and product quality (Goldberg et al., 2010; Halpern et al., 2015).

This effect is particularly significant for developing countries that rely heavily on imported inputs for industrial growth and export competitiveness. Studies from India, Colombia, and Hungary show that reductions in input tariffs significantly increased import volumes and product variety (Tovar, 2004; Cruz et al., 2015; Halpern et al., 2015). For instance, India's post-1991 reforms, in which average tariffs fell from 90% to 30%, expanded intermediate imports and accounted for roughly 30% of new product growth (Goldberg et al., 2010). These findings collectively affirm that tariff rationalization on imported inputs catalyzes greater efficiency and innovation.

In Pakistan, however, tariff liberalization has been slow and often driven by fiscal rather than trade objectives. The National Tariff Policy (2019-24) identified high input tariffs as a major barrier to export competitiveness and recommended reducing tariffs on intermediates and machinery to improve industrial efficiency. Early work by Kemal (1987, 2009) and PIDE (2019) highlighted the distortionary effects of high effective protection rates on import and production structures, calling for a shift from revenue-oriented to trade-facilitating tariff regimes.

3.2 Impact of Tariffs on Exports

The Lerner Symmetry Theorem proposes that import tariffs act as implicit taxes on exports by raising input costs and reducing export competitiveness. This theoretical insight is supported by empirical

evidence, i.e., lowering tariffs on imported inputs enhances export diversification, value, and survival rates (Cruz et al., 2015). Furthermore, Estevadeordal and Taylor (2013) concluded that reductions in tariffs on capital and input goods facilitate growth and export performance, while consumption-good tariff cuts primarily benefit consumers. The experiences of East Asian countries, such as South Korea and the Newly Industrialized Economies (NIEs), indicate a link between tariff policy and export growth. Lane (2025) finds that Korea's transition toward high-value manufacturing depended more on targeted incentives and facilitated imports of intermediates than on high protection of finished goods. Policy tools like duty-free input schemes and export rebates effectively mitigated the anti-export bias of import tariffs (Panagariya, 2018).

Jamil (2019) analyzed the impact of tariffs on export growth in Pakistan. His findings suggested that high tariffs on intermediates depressed sectoral export values, while lower-priced imported inputs improved export quality. The forthcoming National Tariff Policy 2025-30 forecasts that comprehensive tariff rationalization could raise Pakistan's exports by 10-14% (Ministry of Commerce, 2025). These findings reinforce the argument that tariff reductions on inputs indirectly promote export expansion by lowering production costs and enhancing competitiveness.

3.3 Impact of Tariffs on Economic Growth

The broader macroeconomic literature on international trade suggests that tariff rationalization is associated with improved productivity and long-run growth. Tariff reductions on inputs and capital goods boost investment and technological upgrading, while persistent protectionism can generate inefficiencies and rent-seeking (Estevadeordal & Taylor, 2013). Although Chang (2002) highlights that early industrialized countries such as the U.S., U.K., and Germany used tariffs selectively to nurture infant industries, contemporary analyses show that prolonged protection tends to suppress efficiency gains. Greenwald and Stiglitz (2006) emphasize that protection can only be effective when uniformly applied and supported by accountability mechanisms; otherwise, it results in entrenched inefficiencies.

In Pakistan, tariffs are typically used as a revenue-generating tool rather than as a trade policy instrument. Emran and Stiglitz (2005) suggest that while tariff liberalization enhances efficiency, developing countries must balance trade openness with fiscal sustainability. The challenge is to

design tariff reforms that maintain revenue adequacy while supporting industrial and export competitiveness. This trade-off remains central to Pakistan's tariff policy discourse, where fiscal imperatives often delay structural reforms.

3.4 Limitations in Existing Literature and Research Gap

The literature indicates that while international studies provide robust evidence of the benefits of tariff rationalization, Pakistan-specific empirical research remains limited. Most local analyses are descriptive and cannot address endogeneity between imports and exports. There is a need to establish a two-stage mechanism linking the impact of tariffs on imports and exports, particularly the role of input liberalization as a mediator. Tahir (2024) offers a valuable critique of the National Tariff Policy (NTP) 2019-24, emphasizing its continued use of tariffs as a fiscal tool rather than as an instrument for trade competitiveness. Using the Granger VAR and Double-Log models, the study concluded that high tariffs negatively affected GDP growth and contributed to the depreciation of Pakistan's rupee. It also highlighted weaknesses in governance and policy implementation, including the limited effectiveness of the Tariff Policy Board (TPB), the persistence of SRO-based exemptions, and a cascading tariff structure that unintentionally benefited large commercial importers over small and medium enterprises. However, despite its analytical depth, the study's empirical scope was narrow and short-term, and its conclusions were largely diagnostic rather than causal. The paper did not explicitly establish how tariff changes transmit through imports to affect exports, nor did it account for policy endogeneity or broader macroeconomic dynamics.

Existing studies also tend to focus on aggregate indicators, overlooking sectoral heterogeneity and the dynamic effects of tariff reforms. The current study contributes by integrating these strands and treating tariff rationalization as an exogenous policy shock to empirically test its causal effect on exports via imports using a Two-Stage Least Squares (2SLS) framework. This approach not only strengthens causal inference but also provides a nuanced understanding of how tariff rationalization can balance fiscal objectives with export-led growth.

4. Theoretical Background

International trade theory establishes the interdependence between imports and exports, especially in economies where imported intermediate

and capital goods are essential for production. Tariffs play a significant role in shaping this relationship by affecting the cost of production, the availability, prices, and quality of imported inputs that feed into export-oriented sectors. In Pakistan, which heavily relies on imported raw materials and machinery, tariff rationalization can have a positive impact on export performance by improving production efficiency and international competitiveness.

The Theory of Effective Protection (Corden, 1966) suggests that lowering tariffs on intermediate goods reduces effective protection for final producers, thereby lowering production costs and improving competitiveness. The Lerner Symmetry Theorem (Lerner, 1936) complements this by asserting that an import tariff acts like a tax on exports because it raises input costs for industries dependent on imported raw materials. This theorem provides the central conceptual basis for this study's empirical model linking tariffs, imports, and exports.

The New Trade Theory and Strategic Trade Theory (Krugman, 1987) further argue that under conditions of economies of scale and imperfect competition, government policies such as targeted tariff reductions or subsidies can enhance firms' productivity and help domestic industries expand in international markets.

Meanwhile, Endogenous Growth Theory (Romer, 1990) highlights that access to a wider variety of imported inputs and advanced technologies contributes to long-run productivity growth and innovation. Together, these frameworks explain how trade liberalization through tariff rationalization can boost exports by facilitating the import of high-quality intermediate goods and technology.

4.1 Conceptual Mechanism

Tariff rationalization influences trade outcomes through a two-stage mechanism linking policy reforms to export performance:

- **Stage 1 (Policy Shock to Imports):**

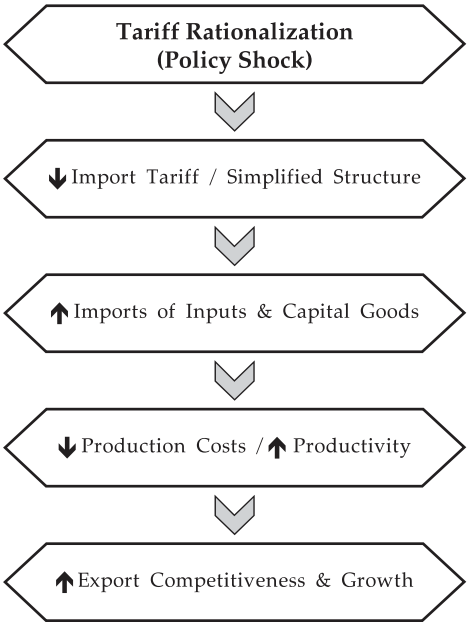
  When tariffs are reduced, the relative price of imported intermediates and capital goods also goes down, which stimulates higher import demand. Firms gain access to more affordable and higher-quality inputs.

- **Stage 2 (Imports to Exports):**

  The increase in imports improves a firm's production efficiency, reduces costs, and enables greater export competitiveness and diversification.

This mechanism is tested empirically using Two-Stage Least Squares (2SLS) estimation, with tariff rationalization serving as an instrument for imports to identify the causal effect of imports on exports while addressing potential endogeneity.

4.2 Stylized Causal Pathway



4.3 Econometric Implementation

- **Stage 1:** Imports = f (Tariff rates, Real GDP, Real Exchange Rate)
- **Stage 2:** Exports = f (Instrumented Imports, Real GDP, Real Exchange Rate)

The real exchange rate captures the relative price of domestic and foreign goods, whereas real GDP represents overall economic activity. Including these controls isolates the direct trade linkage rather than broader macroeconomic effects.

4.4 Exogeneity of Tariff Changes in Pakistan

In Pakistan, tariff reforms can be treated as exogenous policy shocks rather than market-driven responses. Tariff schedules are set through institutional mechanisms, including the Tariff Policy Board, the National Tariff Commission (NTC), and the Ministry of Commerce, under long-term frameworks such as the National Tariff Policy 2019-24 and the National Tariff Policy 2025-30. These reforms are designed to promote industrial competitiveness and fiscal balance, not to respond to short-term trade fluctuations. This policy sequencing supports treating tariff rationalization as an exogenous source of variation in trade costs, thereby satisfying the identification requirement for 2SLS estimation.

By treating tariff rationalization as a policy-driven exogenous intervention, this framework isolates the causal pathway through which tariff reforms affect exports via imports. The approach contributes to the literature on trade liberalization and export growth by emphasizing the enabling role of imports in facilitating export competitiveness, particularly in developing economies where imported inputs and machinery are vital for production. It bridges theoretical insights and empirical testing, providing a coherent basis for analyzing Pakistan's tariff–trade nexus.

5. Methodology

The study uses a two-stage empirical approach based on instrumental variables (IV) estimation with Two-Stage Least Squares (2SLS). The primary aim is to establish the causal impact of imports on exports. The variable tariff rationalization is treated as an exogenous policy shock affecting imports, while the real exchange rate and real GDP are included as macroeconomic controls in both stages.

Before estimating the model, standard unit root tests are conducted to verify the stationarity of all variables and ensure that the regression results are not affected by spurious correlations. After confirming the time-series characteristics, the 2SLS framework is implemented as follows.

Stage One: Estimating the Tariff-Import Relationship

The first stage estimates the effect of tariff rates on imports:

$$Imports_t = \alpha_0 + \alpha_1 TariffRate_t + \alpha_2 RealExchangeRate_t + \alpha_3 RealGDP_t + \epsilon_t$$

The estimated values from Stage 1 will serve as the instrumented (predicted) measure of imports, isolating the component of import variation driven by tariff changes.

Second Stage: Using Instrumented Imports to Explain Exports

In the second stage, the predicted imports are used to estimate their causal effect on exports:

$$Exports_t = \alpha_0 + \alpha_1 \hat{Imports}_t + \alpha_2 RealExchangeRate_t + \alpha_3 RealGDP_t + u_t$$

The use of tariff-based predicted imports helps resolve the endogeneity issue linked to the simultaneous movement of imports and exports by relying on exogenous, policy-driven variation in import behavior.

5.1 Estimation Strategy

The estimation strategy selected is Two-Stage Least Squares (2SLS), rather than Ordinary Least Squares (OLS), due to endogeneity concerns. By identifying variations in imports driven by tariffs, the IV setup helps isolate the exogenous component of import movements and provides a more credible estimate of their effect on exports.

To confirm the robustness of this technique, standard diagnostic tests are conducted, including the Durbin–Wu–Hausman (DWH) test. This test evaluates whether imports are endogenous and whether an IV estimator is necessary. The overall strength of the instrument is assessed using the first-stage F-statistic, with values above conventional thresholds indicating that tariffs serve as sufficiently informative predictors of imports. These checks help ensure that the instrument is both relevant and capable of producing consistent estimates in the second stage.

In all regressions, we used heteroskedasticity-robust standard errors to ensure reliable inference in the presence of potential non-constant variance. Collectively, these procedures support the use of 2SLS as a suitable estimation strategy for analyzing the import-export relationship in this study. Other time-series approaches, such as VAR, ARDL bounds testing, and structural-break models, were also considered. However, they were not adopted because the main objective of this study is to identify tariff-induced changes in imports and then exports, rather than to model

dynamic interactions or long-run cointegration relationships. Although VAR and ARDL frameworks can capture feedback effects and short-run adjustments, they are less suitable for isolating policy-driven exogenous variation in trade flows, which is central to the 2SLS design used here. Also, the annual sample of 44 observations provides limited degrees of freedom for estimating lag-intensive VAR/ARDL models or multiple structural breakpoints without risking over-parameterization. Given that major shifts in Pakistan's trade regime are already incorporated within the tariff series used as instruments, the IV-2SLS framework remains the most appropriate and empirically feasible strategy for the objectives of this study.

5.2 Data & Explanation of Variables

The paper uses annual time-series data from 1981 to 2024, collected from various officially published sources, including the National Tariff Commission (NTC), the Ministry of Commerce, the Pakistan Bureau of Statistics (PBS), the State Bank of Pakistan (SBP), and the Federal Board of Revenue (FBR). The variables included in the empirical analysis are tariff rates (overall and by category), imports (overall and by category), exports, the real exchange rate, and real GDP. All variables are expressed in natural logarithms, allowing coefficients to be interpreted as elasticities.

6. Import Variables and Classification

The analysis classifies imports into distinct groups based on end use. This categorization enables the study to assess how different import types respond to tariff changes and how they contribute to export performance. Accordingly, five standard import categories commonly used in the trade literature and aligned with Pakistan's HS-code reporting are used: overall imports, capital goods, consumer goods, intermediate goods, and raw materials.

This disaggregation helps capture the effects of production-related imports, such as capital, intermediate goods, and raw materials, versus final-consumption imports, such as consumer goods, on exports. The literature also supports the idea that different types of imports have different effects on exports, as access to cheaper raw materials, capital equipment like machinery, and intermediate inputs enhances industrial competitiveness and export capacity by lowering the cost of production (Grossman & Helpman, 1991; Amiti & Konings, 2007). The use of these

categories is therefore essential for understanding the channels through which tariff rationalization affects exports.

7. Tariff Variables

The corresponding tariff variables are constructed for the overall tariff rate as well as for category-specific tariffs on capital goods, consumer goods, intermediate goods, and raw materials. These measures capture how Pakistan's tariff structure influences exports by affecting import costs. By linking tariff changes to movements in import volumes and, consequently, to export performance, the analysis reflects the policy-driven channels through which tariff protection operates. Existing literature shows that high tariffs on production inputs reduce export competitiveness by raising domestic production costs and therefore act as a tax on exports (Goldberg & Pavcnik, 2016). In contrast, rationalizing tariffs on intermediate inputs and capital goods is associated with lower production costs and improved export-oriented growth.

8. Other Macroeconomic Variables

Other macroeconomic variables include exports of goods, representing Pakistan's total merchandise exports; the real exchange rate (RER), which measures relative price competitiveness adjusted for inflation differentials; and real GDP, which captures domestic economic activity and serves as a demand-side control. In this study, a higher RER indicates depreciation of the Pakistani rupee (PKR/USD), while a lower RER reflects appreciation.

Both RER and GDP are standard control variables in empirical trade studies. A higher RER is generally expected to support export growth and reduce import demand, while higher GDP typically reflects expanding production capacity and domestic demand, which tend to increase both imports and exports (Krugman et al., 2018; Goldstein & Khan, 1985).

Table 1: Data Sources for Variables

The table below provides that data sources of variables:

Variable	Data Source
Overall Imports of Goods	Pakistan Bureau of Statistics (PBS)
Capital Goods Imports	PBS (HS-code based classification)
Consumer Goods Imports	PBS (HS-code based classification)
Intermediate Goods Imports	PBS (HS-code based classification)
Raw Material Imports	PBS (HS-code based classification)
Overall Tariff Rate	Federal Board of Revenue (FBR), Pakistan Customs Tariff
Tariff Rate on Capital Goods	FBR, Pakistan Customs Tariff
Tariff Rate on Consumer Goods	FBR, Pakistan Customs Tariff
Tariff Rate on Intermediate Goods	FBR, Pakistan Customs Tariff
Tariff Rate on Raw Materials	FBR, Pakistan Customs Tariff
Exports of Goods	Pakistan Bureau of Statistics (PBS)
Real Exchange Rate (RER)	State Bank of Pakistan (SBP)
GDP (Real)	Pakistan Bureau of Statistics (PBS)

9. Data Cleaning and Aggregation Procedures

To maintain consistency across sources and over time, all datasets were cleaned and aggregated through a structured process. Annual series for imports, exports, GDP, tariff rates, and the real exchange rate for 1981–2024 were compiled from PBS, SBP, and FBR publications. Import categories were formed by grouping HS-code-level data into capital goods, consumer goods, intermediate goods, and raw materials using Pakistan's official classification. In earlier years, where gaps occasionally appeared, values were cross-checked with alternative PBS publications and trade yearbooks to ensure continuity. Outliers were examined through visual inspection and assessed against major policy changes or external shocks to distinguish genuine economic movements from potential data errors. Tariff rates for each category were converted into annual simple averages based on the customs schedules. Finally, all variables were placed in consistent units, aligned to the same time period, and transformed into natural logarithms for estimation. These steps help ensure comparability across variables and reduce measurement inconsistencies that could influence the empirical findings.

9.1 Summary Statistics of Variables (1981–2024)

This section presents summary statistics for all variables used in the empirical analysis. Table 2 provides an overview of their scale, variation, and distribution over the sample period 1981–2024.

Table 2: Descriptive Statistics

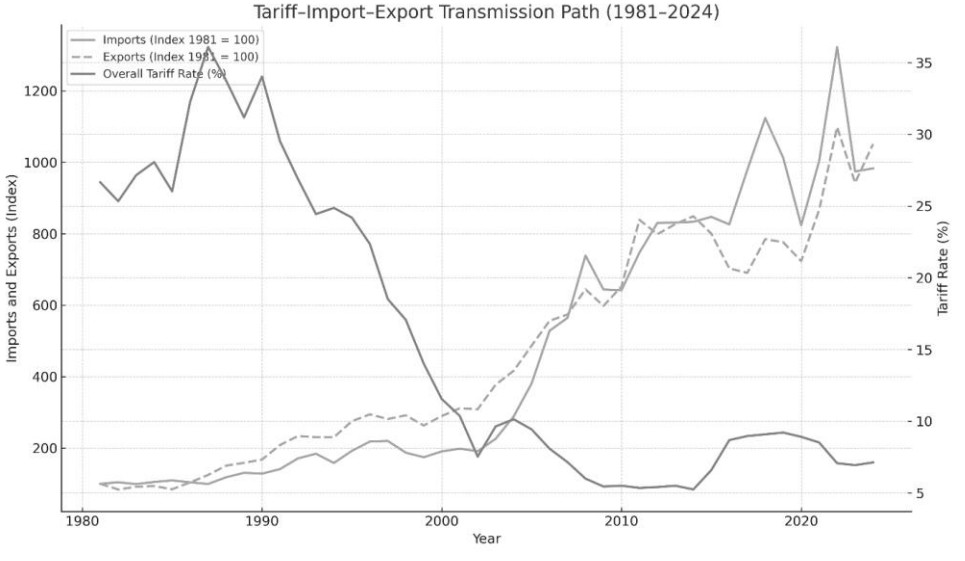
Variable	Mean	Std. Dev.	Minimum	Maximum	Observations
Overall Imports of Goods (M)	25,169.46	20,020.26	5,363.60	71,542.96	44
Imports of Capital Goods (CAPM)	5,258.21	3,800.43	1,424.54	13,128.58	44
Imports of Consumer Goods (CONM)	7,679.73	6,831.08	1,125.28	23,440.32	44
Imports of Intermediate Goods (INTM)	7,245.97	5,687.85	1,602.64	20,542.90	44
Imports of Raw Materials (RAWM)	4,953.74	3,912.04	1,131.99	14,392.57	44
Overall Tariff Rate (TARIFF)	15.82	10.19	5.24	36.10	44
Tariff on Capital Goods (CAPTARIFF)	14.48	9.22	5.08	32.90	44
Tariff on Consumer Goods (CONTARIFF)	25.24	17.48	6.35	59.46	44
Tariff on Intermediate Goods (INTTARIFF)	12.95	8.63	4.01	29.97	44
Tariff on Raw Materials (RAWTARIFF)	6.85	4.58	0.53	15.63	44
Exports of Goods (X)	13,735.43	8,987.53	2,489.20	32,492.94	44
Real Exchange Rate (EXR)	70.53	61.05	9.90	282.91	44
Gross Domestic Product (Y)	19,742,930	10,293,511	5,919,788	39,684,694	44

Notes:

1. Import and export values are reported in million USD, based on annual data for 1981–2024.
2. GDP is measured in million PKR at constant prices.
3. Tariff variables represent simple average applied tariff rates (%) for each product category.
4. The real exchange rate reflects the PKR–USD rate, adjusted for inflation differentials.
5. All statistics are computed using a balanced sample covering 44 observations (1981–2024).

Table 2 provides summary statistics for the variables used in the empirical analysis. The statistics show that the import categories display substantial variation, reflecting structural changes in Pakistan's production patterns and trade composition over the selected time period. Variables such as capital goods, intermediate goods, and raw material imports show relatively high dispersion, consistent with shifts in industrial demand and global price movements. Tariff rates also vary widely across categories, capturing multiple episodes of tariff reform. The real exchange rate shows a pronounced upward trend, indicating long-term depreciation of the Pakistani Rupee (PKR) relative to the US $. GDP and trade aggregates increase steadily over time, mirroring the overall expansion of economic activity. Together, these statistics provide a clear overview of the scale, volatility, and evolution of the key variables underlying the two-stage estimation framework.

Figure 1: Tariff – Import-Export Transmission Path (1981–2024)



Note: Authors' calculations.

The figure provides a clear visual account of the tariff–import–export transmission path that guides the empirical analysis. Pakistan's overall tariff rate has gradually declined since the early 1990s, particularly after the WTO commitments, reflecting repeated rounds of tariff rationalization. Over the same period, imports and exports have both increased, though imports have grown more rapidly. This pattern is consistent with Pakistan's dependence on imported raw materials, intermediate inputs, and capital goods. The figure reinforces the logic of

the two-stage estimation: lower tariffs tend to stimulate imports, especially those required for production, and these imports then contribute to export growth by lowering input costs, expanding production capacity, and improving competitiveness. Overall, the visual trend supports the theoretical idea that tariff reforms affect exports indirectly through their influence on import behavior.

10. Econometric Results

The empirical results are presented in several stages, starting with the time-series diagnostics. As a first step, it is important to examine the stationarity properties of the variables used in the analysis, given the dataset's long annual span. This ensures that the subsequent estimations are based on well-behaved series and are not affected by spurious relationships.

Each variable is assessed at the level and at first difference using both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The results are summarized in Table 3, which presents the outcomes of these tests and reports the order of integration for all variables included in the empirical model.

Table 3: Stationarity Test

	Level		First Difference	
Imports of Goods	1.100	0.9969	-8.453	0.0000
Imports of Capital Goods	-0.786	0.8129	-5.652	0.0000
Imports of Consumer Goods	0.813	0.9931	-7.692	0.0000
Imports of Intermediate Goods*	-0.287	0.9184	-8.217	0.0000
Imports of Raw Materials	0.239	0.9719	-7.498	0.0000
Overall Tariff Rate	-0.799	0.8094	-5.356	0.0001
Tariff Rate on Capital Goods	-0.686	0.8396	-5.516	0.0000
Tariff Rate on Consumer Goods	-0.766	0.8186	-5.607	0.0000
Tariff Rate on Intermediate Goods	-0.719	0.8311	-5.516	0.0000
Tariff Rate on Raw materials	-1.089	0.7118	-4.872	0.0003
Export of Goods	0.118	0.9635	-7.463	0.0000
Real Exchange Rate	-0.605	0.8588	-5.682	0.0000
Gross Domestic Product*	3.972	1.0000	-5.050	0.0002

** For these two series Phillips-Perron test statistics are used while for all other series Augmented Dickey-Fuller test statistics are used.*

Note. *For Imports of Intermediate Goods and GDP series, Phillips-Perron test statistics are reported; for other series, Augmented Dickey-Fuller test statistics are used. The null hypothesis for both tests is that the variable has a unit root (i.e. it is non-stationary). Asterisks indicate test type variation.*

The stationarity properties of the variables were examined using the Augmented Dickey-Fuller (ADF) test for most series, while the Phillips-Perron (PP) test was applied to Imports of Intermediate Goods and Gross Domestic Product (GDP) due to potential concerns about serial correlation and heteroskedasticity in those series. The results indicate that none of the variables were stationary at their levels. Across all series, the test statistics at the level were not sufficiently negative, and the associated p-values were substantially higher than conventional significance thresholds, often exceeding 0.70 and in some cases approaching 1.00. This indicates that the null hypothesis of a unit root could not be rejected for any of the variables at the level.

Upon first differencing, however, all variables became stationary. The first-difference test statistics were large in magnitude and negative, typically ranging from about -5 to -8, while the p-values were effectively zero (0.0000 or very close to it), indicating strong rejection of the null hypothesis of a unit root at the 1% level of significance. This outcome was consistent across imports of goods, capital goods, consumer goods, intermediate goods, and raw materials, as well as for the various tariff rate series, exports of goods, the real exchange rate, and GDP. Specifically, variables such as Imports of Goods and Imports of Intermediate Goods displayed particularly strong stationarity after differencing, with highly negative test statistics (-8.453 and -8.217, respectively), while the GDP series, although tested with the PP method, also became stationary after first differencing.

The results suggest that all series under investigation are integrated of order one, denoted as I(1). This finding is consistent with the general behavior observed in macroeconomic time series data, where variables such as imports, exports, GDP, and exchange rates typically exhibit unit-root characteristics at the level but become stationary after first differencing. Given these properties, the study uses the first-differenced forms of the variables in subsequent regression analyses to avoid spurious regression results and to ensure the robustness of the empirical findings.

10.1 Results of First- and Second-Stage Econometric Estimations

The results of first and second stage are discussed below:

Table 4: First-Stage Estimations: Impact of Tariff Rationalization on Imports

	Independent Variable				
	Overall Imports of Goods	**Imports of Capital Goods**	**Imports of Consumer Goods**	**Imports of Intermediate Goods**	**Imports of Raw Materials**
Constant	-0.117*	-0.135*	-0.103*	-0.150*	-0.103*
Tariff Rate	-0.293*	-0.148	-0.286**	-0.208*	-0.286**
Real Exchange Rate	-1.397*	-1.211*	-1.512*	-1.617*	-1.512*
Real GDP (Demand Side)	3.435*	3.722*	3.321*	4.232*	3.321*
Adjusted R-squared	0.7485	0.5658	0.5861	0.6335	0.5861
F-statistic	42.67	19.24	20.83	25.20	20.83
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000
Durbin-Watson stat	2.223	1.815	2.357	1.744	2.357

*Note that *, **, *** on the coefficients indicates the level of significance at 10%, 5% and 1% respectively.*

The first stage examines how tariff rationalization shapes Pakistan's import behavior across five major categories: overall imports, capital goods, consumer goods, intermediate goods, and raw materials. In each specification, imports are regressed on the tariff rate, the real exchange rate, and real GDP.

Across all categories, the tariff coefficient is negative, consistent with the standard expectation that reduced tariff protection encourages imports. For overall imports, intermediate goods, and raw materials, the effect is statistically significant at the 1 percent or 5 percent levels. This confirms that lower tariffs increase demand for goods central to domestic production. For capital goods, however, the coefficient is negative but not statistically significant, suggesting that factors such as credit conditions, investment cycles, and industrial policy incentives may play a larger role in shaping demand for machinery and equipment. This finding aligns with earlier work, including Athukorala (2012), which notes that capital goods imports often respond to broader macroeconomic conditions rather than tariff changes alone.

The real exchange rate has a negative and highly significant effect in all regressions, mostly at the 1 percent level. In this dataset, a lower value of the real exchange rate reflects currency appreciation. The negative coefficient therefore indicates that appreciation tends to make foreign

goods relatively cheaper, which encourages higher import volumes. The impact is particularly strong for consumer and intermediate goods, reflecting their sensitivity to price competitiveness.

The coefficient on real GDP in the first-stage results indicates that a 1 percent increase in economic activity leads to roughly a 3.4 percent rise in imports. This relatively large elasticity reflects Pakistan's structural dependence on imported inputs, especially intermediate goods and capital equipment that play a central role in domestic production. As the economy grows, both industrial output and consumer demand expand, increasing the need for imported inputs at a faster rate than GDP itself. Similar patterns are reported for other developing countries, where limited domestic manufacturing capacity makes growth strongly import-intensive, as noted by Athukorala (2012). Therefore, the estimated elasticity is consistent with Pakistan's production structure and the composition of its trade flows.

Real GDP shows a positive and statistically significant relationship with imports across all categories, generally at the 1 percent level. As the economy expands, both consumption and production rise, increasing the need for imported inputs. The relatively large GDP coefficients, especially for intermediate and capital goods, highlight how strongly Pakistan's industrial sector depends on imported materials and machinery during periods of economic growth.

The diagnostic statistics support the reliability of these findings. The adjusted R-squared values range roughly from 0.56 to 0.75, indicating that the explanatory variables account for a substantial share of the variation in import volumes. All F-statistics are significant at the 1 percent level, confirming the joint significance of the regressors. The Durbin-Watson values are close to 2, suggesting that autocorrelation is not a major concern. Overall, the results confirm that the tariff-induced component of imports is strong enough to serve as a valid instrument in the second stage.

In summary, the first-stage findings strongly support the identification strategy of this study. Lower tariffs increase the import of production-related goods, exchange rate movements significantly influence import behavior, and GDP growth raises import demand. The predicted import values from these models provide a suitable basis for the second-stage estimation.

Second-Stage Estimations: Impact of Predicted Imports on Exports

Table 5: Summary Results of Second-Stage Estimations

	Dependent Variable: Export of Goods				
	Overall Imports of Goods	**Imports of Consumer Goods**	**Imports of Raw Materials**	**Imports of Raw Materials and Capital Goods**	**Imports of Raw Materials, Capital and Intermediate Goods**
Constant	-0.012	-0.027	-0.013	-0.010	-0.060
Predicted Imports	0.214	-0.271	0.593**	0.853**	1.264***
Real Exchange Rate	-0.453	-0.760*	-0.646*	-0.741*	-0.669*
Real GDP (Supply Side)	1.334	1.950*	1.591**	1.616**	2.703*
Adjusted R-squared	0.3687	0.3653	0.4385	0.4091	0.4139
F-statistic	8.98	8.87	11.67	10.46	10.65
Prob(F-statistic)	0.0001	0.0001	0.0000	0.0000	0.0000
Durbin-Watson stat	1.801	1.740	1.921	1.819	1.820

Note that *, **, *** on the coefficients indicates the level of significance at 10%, 5% and 1% respectively.

The second-stage analysis examines how instrumented import values affect Pakistan's export performance. As shown in Table 5, the regression results indicate that exports are explained by predicted imports, along with the real exchange rate and real GDP. To understand how different types of imports contribute to export activity, the exercise is repeated using various combinations of import categories.

The evidence on predicted imports shows a clear distinction between consumption-related and production-oriented imports. When total imports or consumer goods imports are used as predictors, the coefficients are not statistically significant and, in some cases, are negative. This indicates that increases in these categories do not necessarily contribute to export growth, which is expected given that these imports largely consist of final-use products rather than inputs for domestic production.

A different pattern emerges when the analysis focuses on raw materials alone or on combinations that include raw materials,

intermediate goods, and capital goods. These categories yield positive, statistically significant coefficients. For instance, the elasticity for raw materials is 0.593 at the 5 percent significance level, while combining raw materials, intermediate inputs, and capital goods yields an elasticity of 1.264, significant at the 1 percent level. These results clearly show that imports tied to the production process, rather than finished consumer items, play an important role in supporting export activity.

These findings suggest that access to affordable inputs boosts competitiveness by lowering production costs and enabling firms to meet export demand more effectively. This aligns with international research showing that imported intermediate and capital goods enhance export performance by improving productivity, product quality, and firms' integration into global value chains (Amiti and Konings, 2007; Ahmed and Muhammad, 2020).

In this study, a higher real exchange rate indicates appreciation of the domestic currency. Under this definition, the negative coefficient indicates that appreciation has been associated with lower exports, consistent with standard trade theory because a stronger currency makes Pakistani goods more expensive in global markets. The negative sign for imports likely reflects structural features of Pakistan's import basket. Because many essential inputs are price-inelastic and tied to production requirements, episodes of depreciation often coincide with foreign exchange shortages or administrative constraints that limit access to imported inputs. In such periods, both imports and exports may fall simultaneously, leading to a negative relationship in the data.

Real GDP has a positive and statistically significant effect on exports across most specifications, indicating that stronger domestic economic activity expands supply capacity and supports higher export volumes.

The explanatory power of the second-stage models is moderate, with adjusted R-squared values ranging from about 0.36 to 0.44, typical for long time-series data subject to structural shifts and external shocks. All model F-statistics are significant at the 1 percent level, confirming the joint relevance of the explanatory variables. The Durbin–Watson statistics are close to 2, indicating no major concerns about autocorrelation.

Taken together, the results reinforce the study's central conclusion: production-related imports strongly and positively influence export performance, and tariff rationalization indirectly supports exports by improving access to key inputs. Currency appreciation has limited export competitiveness, while stronger GDP growth has supported export expansion.

To illustrate the practical importance of these elasticities, a simple simulation is presented in Table 6. The estimates suggest that a one percent increase in production-related imports raises exports by about 1.26 percent (Table 5), with larger increases in these imports translating into proportionally larger export gains. Because tariff rationalization works by improving access to such imported inputs, sustained reductions in tariffs on production-related goods can be expected to support export growth through this channel. These indicative results highlight the potential gains from sustained tariff rationalization, especially when reductions target inputs used in domestic production.

Table 6: Simulated Export Gains from Higher Production-Related Imports.

Scenario	Increase in Production Related Imports (%)	Estimated Increase in Imports (%)	Estimated Increase in Exports (%)
1	1%	1%	1.26%
2	2%	2%	2.53%
3	5%	5%	6.32%

Note: Authors' calculations.

11. Simulation Analysis

Using an export elasticity of 1.264, a simple simulation illustrates the potential export gains from tariff rationalization. A one percent increase in production-related imports corresponds to an export gain of about 1.26 percent; increases of two and five percent in such imports correspond to gains of about 2.53 and 6.32 percent, respectively. Tariff rationalization operates by easing access to these imported inputs, so lowering tariffs on production-related goods is the channel through which these gains would be realized. These indicative results show that even modest reductions in tariff protection can strengthen export performance by improving access to essential inputs and reducing production costs.

Table 7: Estimated Tariff Elasticity of Government Revenue

Variable	Coefficient	Interpretation
Tariff Rate	+0.84	A 1% increase in tariff rate raises revenue by 0.84%.
Imports	+1.12	A 1% increase in imports raises revenue by 1.12%.

Note: Authors' calculations.

12. Tariff Revenue Elasticity:

To estimate the responsiveness of government revenue to changes in tariff policy, a proxy measure was constructed using import values and applied tariff rates. The results indicate that a 1% increase in the tariff rate is associated with approximately a 0.84% increase in tariff revenue, holding import levels constant. Similarly, a 1% increase in import volumes raises revenue by 1.12%. This highlights that tariff revenue is sensitive not only to rate changes but also to import activity. It underscores the need for careful balancing between revenue goals and trade liberalization.

12.1 Policy Implications Based on Results

The second-stage results provide strong evidence that imports of raw materials, intermediate goods, and capital goods significantly improve export performance. This underscores the importance of tariff rationalization, particularly for production-related imports, as a means to promote export competitiveness. Given that a 2% reduction in tariffs could raise exports by more than 2.5% (as shown in the simulation table), gradual and targeted tariff reforms should be a key component of the New Tariff Policy (2025–29). Additionally, maintaining a competitive real exchange rate and supporting industrial expansion through infrastructure and finance policies will further reinforce the export gains achieved through trade liberalization.

12.2 Robustness Checks and Model Stability

To assess the robustness of the estimated results, a sensitivity check was conducted by including dummy variables for key policy and macroeconomic events. Dummies for trade liberalization (post-1995 WTO accession) and the 2008–2010 global financial crisis were added to the model.

The inclusion of these variables did not materially alter the estimated coefficients. The signs, magnitudes, and significance of the core regressors (tariff rate, exchange rate, and GDP) remained unchanged. This suggests that the main results are not driven by structural breaks or major external shocks, and that the model provides a consistent explanation of the trade-policy-export nexus in Pakistan.

The analysis confirms that tariff reductions stimulate imports and that production-related imports significantly boost exports. The results support targeted trade liberalization and macroeconomic management as critical pillars of an export-led growth strategy. This integrated view of import-export dynamics provides actionable insights for the upcoming tariff reform agenda.

13. Conclusion & Recommendations

This study examined how Pakistan's tariff structure affects import and export performance by combining a theoretical framework with a two-stage empirical approach. Drawing on trade theory that emphasizes the importance of imported inputs for production and competitiveness, the study applied a 2SLS approach to address potential endogeneity between imports and exports. Tariff changes were used as an external policy shock to trace their effects on import behavior, and the study applied standard time-series tests and diagnostic checks to ensure the reliability of the estimates.

The findings of this study show that, despite claims of rationalization, Pakistan's tariff structure continues to impose high costs on production inputs and limits the competitiveness of export-oriented industries. The econometric results confirm that a rise in tariffs reduces imports across all categories, with the sharpest effects on raw materials, intermediate goods, and machinery. These inputs form the foundation of Pakistan's value-added exports, and the second-stage results show that higher imports of these categories have a significant positive impact on export performance. A one percent increase in tariff rates raises government revenue by about 0.84 percent in the short run, but it also reduces access to essential inputs and weakens export growth.

The combined input category of raw materials, capital goods, and intermediate goods shows the strongest export elasticity, underscoring that improved access to these inputs is central to sustaining export

competitiveness. The sensitivity analysis indicates that even small increases in tariffs on these categories can restrict input availability and reduce export capacity. Although sector-level export losses could not be quantified due to data limitations, the elasticities clearly suggest that higher tariffs on critical inputs translate into lower production in export sectors.

The results point to the need for a more coherent and predictable tariff structure. Pakistan's tariff and import-tax system has become increasingly complex, with multiple duty slabs, para-tariffs, and formula-based charges that make the final effective rate difficult to determine. Experience with the National Tariff Policy 2019-24 shows that although the Ministry of Commerce reduced Customs duties, the positive impact was largely offset by increases in other import-related taxes administered by FBR. This prevented firms from benefiting from tariff reforms. Under the Rules of Business 1973, tariff policy formally lies with the Ministry of Commerce, but for many years FBR continued to dominate border tax decisions. The provision introduced in the National Tariff Policy 2025-30, which requires FBR to consult Commerce before making changes to import-related taxes, therefore needs to be implemented consistently so that tariff decisions align with competitiveness objectives rather than short-term revenue pressures.

Empirical evidence suggests that tariff rationalization should focus on lowering and simplifying rates on production-related inputs, particularly raw materials, intermediate goods, and machinery. These categories contribute most strongly to export performance once they enter the production process. Input tariffs should remain low and predictable to allow firms to plan procurement with greater certainty. Para-tariffs such as Regulatory Duty and Additional Customs Duty should be reduced because they push the effective tariff level far above the announced rate and raise production costs. The widespread use of SRO exemptions should be curtailed and replaced with a transparent, uniform tariff schedule. Tariffs on finished goods should also be reviewed, as excessively high rates create a protective bias that reduces competitive pressure and may lower product quality.

The elasticity results also highlight sectors that require particular attention. The textiles and apparel sector relies on imported fibers, chemicals, and machinery, and its export performance is highly sensitive to changes in input costs. Leather, sports goods, and surgical instruments

also depend on imported raw materials and specialized components, and higher input tariffs can quickly erode their export margins. The engineering goods sector, which relies heavily on imported machinery and intermediate components, is especially vulnerable to increases in input costs. Keeping tariffs low and stable for these categories will help maintain these sectors' competitiveness. Since the combined input category shows the strongest export elasticity, tariff caps or low-rate bands for machinery, raw materials, and intermediate goods would help prevent cost escalation and support an uninterrupted supply. These sector-specific priorities align with the objectives of the National Tariff Policy 2025-30 and can help integrate tariff decision-making with the broader export strategy.

Taken together, these measures can contribute to a more predictable, transparent, and competitiveness-oriented tariff regime, ensuring that the benefits of rationalization are not offset by increases in other import-related taxes and that tariff policy supports export growth more effectively.

The study has certain limitations. It relies on aggregate time-series data, which does not capture firm- or product-level variation in how tariff changes affect costs, productivity, or export behavior. Future work using sectoral or firm-level datasets may help identify more precisely how tariff-induced cost changes affect export margins and product upgrading. Non-tariff measures, logistics constraints, and quality standards, which interact with tariffs to shape competitiveness, also fall outside the scope of this analysis.

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