



The Resurgence of Protectionism: GTAP-based Analysis of US Reciprocal Tariffs and the Competitive Dynamics of Asian Apparel Industry

ABSTRACT

This paper assesses the economic effects of recent U.S tariff escalation, specifically regarding value added apparel exports from South Asia. Employing a multi-region, multi-sector Computable General Equilibrium (CGE) framework derived from the GTAP model, I simulate various scenarios comprising of actual reciprocal tariffs, a universal 30% tariff on apparel, specific tariffs on Pakistan's principal export categories, and asymmetric tariff increases on India and China. Findings reveal that global trade volumes and welfare constantly deteriorate in response to recent tariff shocks, with the U.S witnessing a decrease in GDP and trade activity, despite favourable terms-of-trade and tariff revenue impacts. South Asian exporters experience considerably varied outcomes: India and China incur the most significant contractions when tariffs increase to 52.5–61%, but Pakistan and Bangladesh acquire modest benefits from trade diversion. Pakistan's apparel exports increase by 0.6% amid asymmetric escalation; nonetheless, welfare consequences are adverse due to higher input costs and reduced U.S. demand. In cases where Pakistan is exclusively subjected to sector-specific tariffs, welfare losses are significant. In contrast, in universal tariff scenarios, Pakistan's relative losses are reduced in comparison to its regional competitors. Findings emphasise trade-offs between market-share gains and welfare losses amid increasing protectionism and suggest the necessity for predictable and supportive both domestic and diplomatic policies to sustain competitiveness in an adverse external environment.

Keywords

Tariff, GTAP, General Equilibrium, Value Added Apparel, Trade Diversion

JEL Classification

F11, C68, F12, F17

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Please cite this article as:

Mahmood, T. (2025). The resurgence of protectionism: GTAP-based analysis of US reciprocal tariffs and the competitive dynamics of Asian apparel industry *Kashmir Economic Review*, 34(1), 61-82.

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Author's contribution in the article: 1- Conceived and designed the analysis, 2- Reviewed and compiled the literature, 3- Collected the data, 4- Contributed data or analysis tools, 5- Performed the analysis, 6- Wrote the paper, 7- Financial support for the conduct of the study, 8-Other

1. INTRODUCTION

Over the past decade, there has been a significant increase in protectionist measures among major economies (Delpeuch et al., 2024), with the United States recently leading this trend. Economists have extensively evaluated the effects of these taxes (Grossman et al., 2024; Amiti et al., 2020). Extensive theoretical work in international trade offers a well-defined analytical framework for comprehending tariff interventions. For major importing countries, tariffs may yield terms-of-trade benefits by reducing global prices of imported commodities, although these advantages are generally offset by deadweight losses incurred by consumers and downstream producers. Classical welfare analysis demonstrates that tariffs distort both consumption and production choices, resulting in efficiency losses despite increases in fiscal revenues. Furthermore, under asymmetric tariff arrangements, the patterns of trade diversion and trade creation (Viner, 1950) alter global supply chains by transferring sourcing away from partners with high tariffs towards relatively less-affected exporters. These mechanisms are fundamental to understanding the impact of recent U.S. tariff escalations on apparel-exporting economies across Asia.

The increasing tendency of protectionism in major economies, especially by the U.S.A, indicates possible disruptions in international trade that may impact the global economy. The ramifications of these indicators transcend trade balances, influencing investments, employment generation, and productivity enhancement. Winners and losers are expected to emerge based on the size and trade orientation and diversion of certain economies and sectors. Presently, there exists much doubt regarding the beneficiaries and those adversely affected by the tariffs imposed by major economies, making it particularly challenging to ascertain definitive outcomes for a small economy such as Pakistan.

The trajectory of U.S. trade policy in 2025 signifies a definitive transition from campaign hyperbole to structural realignment. President Trump started his second term with campaign pledge to impose tariffs with speediness. In order to assess American trade policy in light of a potential new tariff system, he released the America First Trade Policy Memorandum on his inauguration day. In the first two weeks of February, he implemented new tariffs that applied to imports into the United States worth over half a trillion dollars. His substantial tariff rise on China, which started in Trump 1.0 tenure and continued in his second term, in February, was doubled in magnitude on March 4 (PIIE)'s tariff implementation data (see Figure 1) shows the economic impact of the US-China trade war, as shown by (Bown & Irwin, 2025) on tariff escalation.

During this time, he has also declared, then suspended, then announced again, and then paused once more the imposition of 25% tariffs on goods originating from Mexico and Canada. His government has also committed to implementing trade sanctions on April 2. Some of America's most important trading partners have retaliated immediately, leading to widespread confusion and unpredictability. The average tariffs imposed by the United States on Chinese exports currently reach 57.6 percent and encompass all commodities. The average tariffs imposed by China on US exports are 32.6 percent and apply to all commodities without exception. US tariffs have increased by 36.8 percentage points since the commencement of the second Trump administration on January 20, 2025. Chinese tariffs have increased by 11.4 percentage points throughout the same timeframe.

A key issue arises in the midst of all this economic turmoil: why is Trump fixated on tariffs? Long-time obsession with them. "We will tariff and tax foreign countries to enrich our citizens" was pretty much a repeat of Trump's remarks from his first term, and he made the same claim in his second inaugural address. As far as anyone can tell, the recent U.S. tariff moves show that trade measures are being used more and more as tools to achieve broader economic and geopolitical goals.



Source: Bown (2025), PIIE chart “US–China trade war tariffs: An up-to-date chart”

Figure 1: U.S.-China Trade War Tariffs by Date

In order to replace domestic tax revenue, they can rebalance trade, eliminate the trade deficit, reshore manufacturing jobs to the US, protect national security, end dependence on adversarial suppliers, punish countries for unrelated sins like failing to stop migration, and ensure reciprocity so that other countries impose lower tariffs on U.S. exporters.

To situate the present analysis within the broader academic debate, this section reviews the key theoretical and empirical contributions on tariff shocks, trade wars, and CGE-based analysis. In reality, tariffs are sometimes helpful in accomplishing some of these goals. Tariffs do increase tax income for the government, as Trump claims. In comparison to other taxes, nevertheless, they do it inefficiently (Bown & Irwin, 2025). Lashkaripour (2025) illustrates through comprehensive quantitative research that tariffs are capable of substituting a small portion of domestic tax revenues, highlighting their insufficiency as a sustainable fiscal tool. Recent empirical research indicates that although tariffs might generate income smoothly, the overall fiscal benefit is frequently limited and contingent on context.

Analysis on the 2018–19 U.S. tariff waves indicates that advanced economies experienced nearly complete pass-through to domestic prices, suggesting that importers and consumers predominantly absorbed the costs. After factoring in tariff revenues and producer benefits, economists estimate modest yet positive net welfare losses for 2018, approximately \$7.2 billion, or about 0.04% of GDP—hardly a sustainable revenue source or macroeconomic stabilizer (Amiti et al., 2019; Fajgelbaum et al., 2020). These papers also record modest enhancements in terms of trade and punitive measures to mitigate trade-balance impacts, with real revenue declining by around \$1.4 billion per month by the end of 2018 in one assessment. Combined with policy surveys and IMF analysis, the data indicates minimal or negative net effects on welfare and ambiguous benefits for the current account when retaliation, diversion, and increased input costs are taken into consideration (IMF, 2005).

In contrast, two situations warrant a conditional “positive” perspective. First, in theoretical and quantitative models with large market economies, governments can levy optimal, terms-of-trade-inspired tariffs to raise national income during collaborative collapses, but such gains are usually second-best and vulnerable to retaliation or institutional constraints (Ossa, 2014). Second, tariffs may provide near-term revenue in small or lower income economies historically reliant on border taxes when domestic tax capacity is weak, but the development literature shows that as countries liberalize, successful replacement with broad-based consumption taxes (e.g., VAT) is feasible but uneven—many low-income countries

struggled to fully recoup lost trade-tax revenue without significant tax-administration reforms (Baunsgaard and Keen (2005) and (IMF, 2005) discussion on developing countries revenue reliance). Recent quantitative research shows that tariffs can only replace a small share of domestic tax revenue, limiting fiscal headroom and increasing efficiency costs as rates climb (Lashkaripour, 2025). A nuanced gradient results: limited, probably temporary fiscal utility in low-capacity settings and theoretical gains in specific large-country scenarios, towards negligible or negative welfare and trade-balance consequences in diversified, competitive ecosystems.

Tariff protection has reemerged as a prominent policy tool in the post-2024 trade landscape, as new policies in major markets change how firms source goods and affect competitiveness and terms of trade. Examining reciprocal tariffs and their impact on international trade dynamics and strategies within the textile sector has become a pivotal area of study, given the sector's substantial role in global trade and economic advancement, especially between major economies like the USA and China (Chen et al., 2017; Guo et al., 2005). The transition of trade policy from the Multi-Fiber Arrangement (MFA) to the Agreement on Textiles and Clothing (ATC) has influenced the competitive environment, with tariff liberalisation and the elimination of quotas modifying market dynamics since the late 20th century (Harris, 2017; Walmsley & Hertel, 2001). The textile industry is a crucial provider of employment and export revenue in nations such as Pakistan, India, Bangladesh, China, and the United States, with Pakistan's textile sector representing over 30% of its labor force (Chen et al., 2017; Azhar et al., 2024). Comprehending the strategic ramifications of reciprocal tariffs is crucial due to the sector's significance in economic expansion, trade balances, and geopolitical interactions (Arshad & Malik, 2023).

The academic literature on trade protectionism offers various conceptual and empirical frameworks for analyzing the impacts of tariff escalation. One aspect examines the welfare effects and terms-of-trade consequences of tariffs. Classical results indicate that although large economies can achieve terms-of-trade gains through tariffs, global welfare diminishes as a result of deadweight losses and distorted production and consumption choices (Viner, 1950; Bown & Irwin, 2025). Recent empirical evidence from trade-war episodes supports this perspective: tariffs implemented during the 2018–2020 U.S.-China dispute elevated domestic prices, decreased import volumes, and resulted in significant welfare losses for both economies (Fajgelbaum et al., 2020; Amiti et al., 2019). The studies emphasize the importance of input-cost transmission, particularly relevant for highly integrated value chains like textiles and apparel.

A second body of literature utilizes computable general equilibrium (CGE) models to assess the wider macroeconomic effects of trade policy shocks. Studies utilizing CGE models illustrate the capacity of tariff escalation to modify production patterns, influence relative competitiveness, and redirect trade flows among regions (Zhai, 2008; Hertel, 1997). This research examines U.S.-China tariff dynamics, estimating cross-country spillovers and sectoral redistribution resulting from significant bilateral tariff increases. Nevertheless, these studies infrequently analyze the effects of reciprocal tariff structures on smaller exporters or the variations in welfare impacts within particular value chains, such as labor-intensive apparel sectors in South Asia.

Despite comprehensive research on trade and tariff tensions and their effects on apparel trade, substantial knowledge gaps remain concerning the specific influence of reciprocal tariffs on trade practices and connections within the textile sector, particularly in light of Pakistan's textile sector role (Keeryo et al., 2020; Azhar et al., 2024; Ma & Yang, 2010). Some studies underscore tariff-induced disruptions in supply chains and export quantities (Yuan et al., 2020; Mammalogy, 2022), while others accentuate Pakistan's little benefits during US-China trade tensions (Keeryo et al., 2020; Rogers et al., 2023). Debates persist on whether tariffs function as protective mechanisms or as distortions that compromise global trade efficiency (Zheng et al., 2023; Wong & Chan, 2003). The repercussions of these deficiencies

encompass inadequate policy responses and lost opportunities for nations such as Pakistan to capitalize on trade transitions for economic progress (Elliott, 2011; Arif et al., 2023).

A third, more specialized body of literature examines the global apparel and textile value chain, highlighting its responsiveness to tariff policies, costs of intermediate inputs, and the relocation of supply chains driven by buyers (Gereffi & Frederick, 2010; Rivoli, 2014). Evidence indicates that trade diversion resulting from the phase-out of the Multi-Fibre Arrangement (MFA) and recent U.S. tariff interventions disproportionately benefits suppliers such as Vietnam and Bangladesh when major players like China encounter increased tariffs. Despite extensive empirical research on supply-chain restructuring, no current study has evaluated the impact of the 2025 U.S. reciprocal tariffs on Pakistan's apparel exporters or compared these effects with those on India, Bangladesh, and Vietnam.

In the apparel sector—characterized by low margins, sensitivity to tariffs, and a globally fragmented value chain—policy disruptions rapidly impact pricing, volume, and sourcing trends. The worldwide textile and apparel industry is estimated to be nearly \$900 billion in 2024, according to the ITC Tarde map. China is the biggest exporter, with a market worth of \$300 billion, while Pakistan ranks thirteenth with exports to the world of around \$18 billion. While the European Union as a whole imports \$300 billion, the United States ranks first among individual import markets with \$118 billion. The magnitude of South Asia's import demand is significant for general equilibrium spillovers: in 2024, South Asia's total merchandise imports reached approximately US\$0.84 trillion (according to the latest comparable WITS and ITC regional snapshot), a substantial increase from US\$ 0.44 trillion in the late 2010s, indicating greater region-wide demand leakages or amplifiers when tariffs fluctuate across various nodes in the supply chain.

In the United States, the primary market for numerous South Asian apparel exporters, nominal apparel import values declined to approximately US\$77.8 billion in 2023 due to destocking, subsequently stabilising in the high-US\$70s to around US\$80 billion range in 2024; in terms of quantity, 2024 apparel imports total approximately 25.8 billion SME, reflecting a partial recovery in volumes despite constrained margins. In 2024, apparel (HS 61–62) constituted over 15.6% of total U.S. tariff charges, despite comprising just around 2.5% of overall U.S. imports, indicating the sector's exceptionally elevated statutory rates, referred to as "tariff peaks."

By using the GTAP-CGE model to estimate the asymmetric welfare, terms-of-trade, and trade-diversion implications of the 2025 U.S. reciprocal tariffs on Asian apparel exporters, with an emphasis on Pakistan, this research adds to the expanding empirical literature on trade protectionism. None of the current CGE-based studies (e.g., Fajgelbaum et al., 2020; Grossman et al., 2024; Bown & Irwin, 2025) assess the sector-specific and nation-specific ramifications of the 2025 tariff escalation for Pakistan's apparel industry, even though they explore previous U.S.–China tariff episodes or the overall macroeconomic effects.

This study presents the inaugural GTAP-CGE evaluation of the 2025 U.S. reciprocal tariff episode, integrating the specific timeline and asymmetry of tariff announcements. Secondly, it provides a sector-specific assessment of the impact of tariff escalation on the competitiveness of Asian apparel exporters, emphasizing Pakistan's standing in comparison to India, Bangladesh, Vietnam, and China—an area not previously addressed in CGE or trade-war studies. Third, by connecting tariff shocks to welfare, terms-of-trade, and trade-diversion effects, the paper integrates macroeconomic modeling with value-chain dynamics, providing a more detailed understanding of how protectionism alters export opportunities in fragmented industries.

This paper integrates insights from trade-war literature, CGE modelling, and sectoral competitiveness analysis, addressing a significant empirical gap regarding Pakistan's vulnerability and potential benefits

from asymmetric tariff escalation. While this literature offers important insights, none examine the asymmetric 2025 U.S. reciprocal tariff structure or its implications for Pakistan and its regional competitors, motivating the contextual discussion that follows.

The study asks: What are the welfare, trade-flow, and competitiveness effects of the 2025 U.S. reciprocal tariffs on Pakistan's apparel exports relative to other Asian suppliers? This paper aims to quantify the impact of the 2025 U.S. reciprocal tariff regime on welfare, trade flows, and competitiveness among Asian apparel exporters, focusing specifically on Pakistan. The subsequent sections of the paper are structured to transition from conceptual foundations to empirical assessment, as detailed below.

2. THEORETICAL FRAMEWORK AND METHODOLOGICAL APPROACH

The global economy comprises many countries indexed by $i, j, n \in C \equiv \{1, \dots, N\}$ and numerous industries indexed by $k, g \in \{0, 1, \dots, K\}$. Each country i possesses L_i workers and C_i for capital. Labourers exhibit perfect mobility within industries but are static across national borders, with each individual providing one unit of labour inelastically. Markets exhibit perfect competition, and items across all industries are subject to international transactions.

Numerous studies employ sophisticated quantitative models, such the GTAP computable general equilibrium model, facilitating comprehensive simulations of tariff effects on export values, volumes, and employment within the textile and cotton industries, thereby yielding substantial economic effects (Yuan et al., 2020). Empirical studies using trade competitiveness indices and revealed comparative advantage metrics provide sophisticated evaluations of Pakistan's stance in the US market (Azhar et al., 2024). Additionally, the application of difference-in-difference techniques to assess export volatility resulting from tariffs enhances the robustness of causal inference (Keeryo et al., 2020).

Notwithstanding methodological complexity, numerous models depend on aggregated or secondary data, which can cover up commodity-level or firm-level heterogeneity, hence constraining the accuracy of policy implications (Azhar et al., 2024; Bahmani-Oskooee et al., 2020). Certain studies primarily emphasize economic variables, neglecting the economy wide aspects essential to Pakistan's trade strategy to find out trade diversion effects (Yuan et al., 2020). However, the static characteristics of certain CGE models may insufficiently represent dynamic adjustments and long-term structural transformations in the textile sector (Dixon & Rimmer, 2010).

3. DATA AND MODEL

The analysis has been covered through a Computable General Equilibrium (CGE) methodology grounded in the Global Trade Analysis Project (GTAP) model and database to assess the effects of tariff protection in the global apparel industry. The GTAP model is a prominent, multi-regional, multi-sector Computable General Equilibrium framework that elucidates interactions among producers, consumers, governments, and trade flows under general equilibrium parameters (Hertel, 1997). Its strength resides in the capacity to simulate policy shocks—such as tariff escalations or reciprocal trade liberalization—and to delineate their comprehensive economic repercussions, encompassing trade flows, production structure, factor returns, household welfare, and sectoral competitiveness.

This study use GTAP to maintain consistency with global trade connections and to integrate cross-country variations in trade patterns and tariff frameworks. The study formulates a number of policy simulation scenarios to assess the impact of U.S. tariff increases on apparel imports. In one scenario, the

U.S. imposes unilateral duties on specific apparel imports; in another, there is reciprocal tariff retaliation from key apparel-exporting nations, mainly Asian economies including China, Bangladesh, Vietnam, and Pakistan. A liberalization scenario is also incorporated to reflect the counterfactual of diminished tariff escalation within garment supply chains. The model use the GTAP 11 database (base year 2017), supplemented with and scaled up Pakistan's FY24 trade and tariff data) to synchronize sectoral and bilateral trade flows with current conditions.¹

This research concentrates on the apparel industry as a separate GTAP sector, isolating the effects of tariffs on this labor-intensive and export-reliant sector while acknowledging wider general equilibrium repercussions across textiles, agriculture, and services. Additionally, Gragg's technique has been employed for the analysis. The Gragg's extrapolation is a more advanced technique that markedly enhances the precision and efficiency of Euler's method. Gragg's technique refers to the numerical extrapolation method used within the GTAP solution algorithm to improve convergence and accuracy of the general equilibrium system. The "2-4-6 steps" *i* referenced pertains to the implementation of this method. Rather than only executing a singular set of incremental steps, it conducts a sequence of calculations employing varying step sizes (e.g., 2, 4, 6 steps) and subsequently extrapolates the outcomes to get a far more exact and efficient solution.

The selection of GTAP-CGE is especially appropriate for analyzing Pakistan's apparel industry as it encompasses both macroeconomic links (GDP, trade balance, welfare) and sector-specific results (output, exports, employment). In contrast to partial equilibrium models, GTAP encompasses substitution effects among sectors and nations, which is essential due to the fragmented and competitive characteristics of global garment supply chains. This model allows policymakers to evaluate if tariff escalation provides advantages for relatively stable exporters like Pakistan, or if retaliation and changing trade preferences diminish potential benefits. The model provides quantitative data for trade negotiations and industry enhancement measures within the prevailing trend of tariff protectionism.

GTAP trade and tariff statistics are sourced from detailed inter-industry flows established from national input-output (I-O) databases, providing a thorough depiction of sectoral relationships. Reconciled bilateral trade data are obtained from COMTRADE and compiled by (Gehlhar; 1996) to ensure uniformity among nations. Bilateral protection data are derived from tariff-line information utilizing sources like CEPIL, ITC, UNCTAD, WTO, and the World Bank, with additional tariff and taxes data from OECD and other sources to improve precision. Macroeconomic data, such as GDP, currency rates, and other critical indicators, are sourced from the IMF's World Economic Outlook (WEO). I aggregate our sample into 35 "industries," consisting of 34 non-energy ISIC-level industries and one composite energy industry that encompass oil, coal, and gas. Additionally, metals are categorized as a group, and all services are consolidated within trade commodities. The sample includes 19 "countries," comprising the 16 nations with the highest GDP along with 5 aggregated regions. Canada, Mexico, and the EU have been considered a singular territory, whereas Pakistan and China have been treated independently.

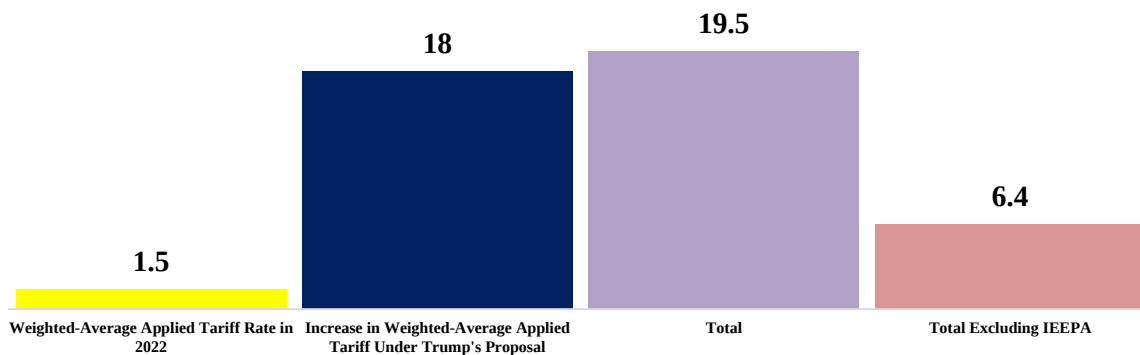
GTAP, as a comparative-static CGE framework, is structured to analyze the immediate general-equilibrium response to a policy shock, thereby excluding dynamic processes such as capital accumulation, intertemporal investment reactions, firm entry and exit, or endogenous supply-chain reconfiguration. The equilibrium outcomes reflect aggregated behavior across sectors, which inevitably minimize firm-level heterogeneity and intra-industry reallocations highlighted in current trade theory. The database, although comprehensive, demonstrates concordance-driven aggregation and depends on reconciled bilateral trade flows, which may mask micro-level variation. The methodological constraints do not undermine the validity of the counterfactual tariff simulations for short-run analysis; however, they appropriately delineate the interpretive boundaries for extrapolating to longer-run or firm-specific

¹ A full list of elasticities, tariff mappings, and closure rules is provided in Appendix A.

implications. Building on this framework, the next subsection describes the construction of the tariff-shock scenarios reflecting both actual 2025 policies and stylized counterfactuals.

4. TARIFF EVENTS ANALYSIS

These tariff measures substantially increase the rates imposed by the United States on a broad range of imported products. According to the World Bank data that the USA Trade weighted average imposed tariff was 1.5 percent in 2022. It has been projected that under the existing tariffs; it increases by 18.0 percentage points to 19.5 percent as shown in figure 2. Nonetheless, if the International Emergency Economic Powers Act (IEEPA) tariffs are permanently suspended, it would increase by 4.9 percentage points to 6.4 percent. The weighted average applied tariff rate quantifies the tariffs levied on various items from diverse nations, distinguishing itself from averages calculated based on real tariff receipts as a proportion of total goods imports.



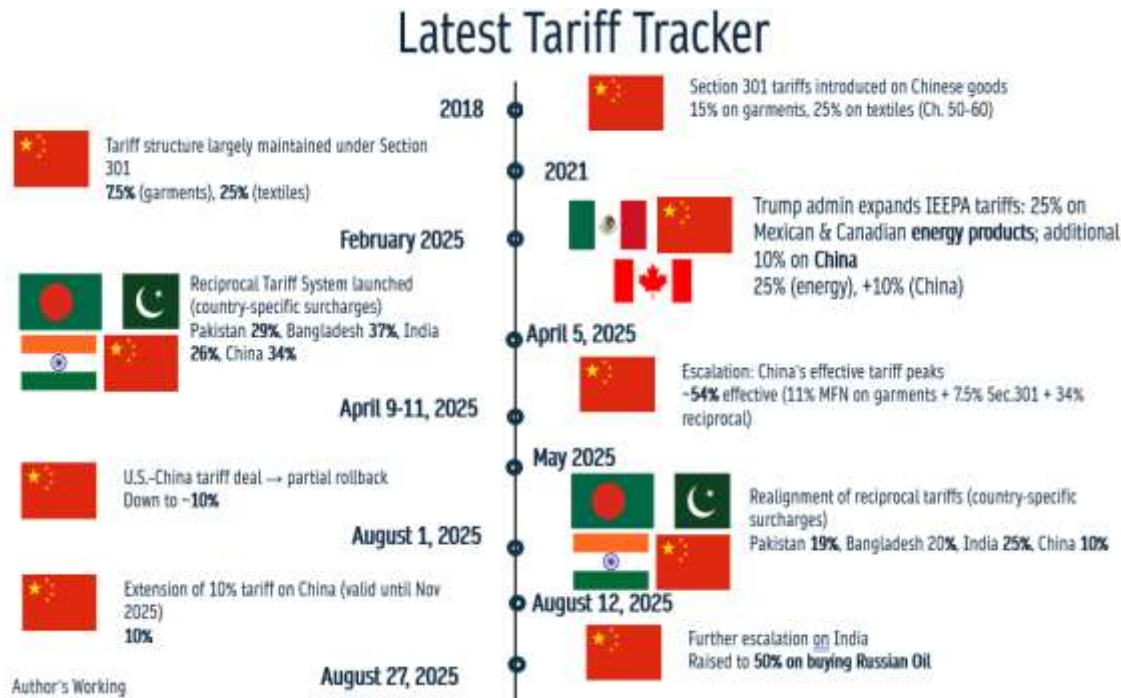
Source: Author's own calculation based on data from World Bank, 2024² and Tax Foundation, 2025³

Figure 2: U.S. Recent Tariff

Since 2018, the intensification of U.S. tariff measures, initiated by Section 301 actions against China and further escalated under the Trump 2.0 administration in 2025, has profoundly transformed the trading environment for textiles and clothing. China continues to be the central focus, with duties varying from 7.5% on apparel to 25% on textiles in addition to related MFN rates; meanwhile, South Asian nations such as Pakistan, India, and Bangladesh have progressively become entangled in the tariff framework. On April 5, 2025, as shown in the figure 3, the United States instituted significantly elevated tariffs on principal suppliers for 90 days based on trade balance formula: Pakistan (29%), Bangladesh (37%), India (26%), and China (34%), substantially exceeding their Most Favored Nation (MFN) baseline rates. Subsequent negotiations resulted in partial reductions (Pakistan to 19%, Bangladesh to 20%, and India to 25% by August 1), underscoring the instability of U.S. tariff policy, which deploys trade measures as instruments of negotiation. In nations such as Pakistan, where textile exports to the U.S. approached USD 3.9 billion in 2024 (accounting for a 4% share of U.S. imports), these policy changes introduce significant uncertainty into market access, investment choices, and long-term trade strategies.

² <https://data.worldbank.org/indicator/TM.TAX.MRCH.WM.AR.ZS>

³ <https://taxfoundation.org/research/all/federal/trump-tariffs-trade-war/>



Source: Author's own analysis based White House Orders, 2025⁴

Figure 3: U.S. Recent Tariff on Asian Economies

Considering the recent increase in U.S. tariff measures, Pakistan has maintained a comparative advantage over India in the U.S. textile industry. In 2024, U.S. apparel imports reached USD 101 billion, with Pakistan contributing USD 3.9 billion (4% share) and India USD 7.3 billion (7% share). The effective tariff structure reveals a substantial disparity: Pakistan currently faces a 30% effective tariff, whereas India, after the tariff hike on August 27, 2025, suffers a much elevated 61% charge on apparel exports to the U.S. This considerable difference illustrates the punitive characteristics of reciprocal tariffs and the disparate treatment of South Asian suppliers. Although Bangladesh (31%) and Vietnam (31%) maintain competitiveness, India's significant tariff disadvantage is anticipated to diminish its market share, thereby providing Pakistan an opportunity to enhance exports, especially in Chapters 61 and 62 (knitted and woven garments), where U.S. average MFN duties are currently 14% and 11%, respectively.

Furthermore, China - historically the principal supplier with a 28% market share - is currently encumbered by effective levies between 28.5% and 52.5% due to Section 301 and subsequent tariff increases, hence enhancing prospects for Pakistan.

Consequently, although tariff volatility presents challenges for all exporters, the existing U.S. tariff framework offers a comparative advantage for Pakistan's apparel industry in relation to India, potentially enabling it to secure a greater portion of the U.S. import market, provided it is bolstered by supply-side efficiencies and trade facilitation measures.

⁴ <https://www.whitehouse.gov/presidential-actions/2025/07/further-modifying-the-reciprocal-tariff-rates/>

Table 1: Apparel Export to USA by Pakistan's Competitors

USA Apparel Import and Recent Tariffs (\$101 Billion Apparel Import)						
Country/Year	Avg MFN Tariff (%)	Section 301 (%) 2019 & 2021	Reciprocal Tariff (%)	Total Effective Tariff (%)	2024 Imports (USD Billion)	Share in USA Imports
Pakistan	11	0	19	30	3.9	4%
India (27th Aug)	11	0	50	61	7.3	7%
Bangladesh	11	0	20	31	7.6	8%
Turkey	11	0	15	26	1.3	1%
Vietnam	11	0	20	31	15.5	15%
Indonesia	11	0	19	30	5.9	6%
China (Till Nov 11)	11	7.5	10	28.5	27.8	28%
China (Post Nov 11)	11	7.5	34	52.5	27.8	28%

Under Sec 301 w.r.t China, Textiles (Ch 50-60) are sub.to 25% punitive tariffs USA total global textiles and Apparel Imports are \$118B (China export share is 26%)

Author's own calculation Based on data from ITC Trade Map⁵, 2025 and White House Orders⁶

4.1 Scenario Simulation

The GTAP CGE framework provides an effective framework for simulating both immediate trade disruptions and long-term structural adjustments in the context of the shifting U.S. tariff scenario and its effects on Pakistan and competitor apparel exporters. Using reconciled bilateral trade flows (COMTRADE, IMF DOTS), global tariff schedules (WTO IDB, USTR Section 301), and macroeconomic projections (IMF WEO, World Bank GEP), we design counterfactual experiments that compare alternative tariff regimes and their spillovers across welfare, terms of trade, sectoral output, and GDP. The model enables us to analyze how fluctuating tariffs among South Asian exporters, specifically Pakistan, India, and Bangladesh, alter competitiveness in the \$101 billion U.S. apparel market and overall billion-to-trillion-dollar economies. The scenarios replicate alternative configurations of the U.S. tariff regime, ranging from actual reciprocal tariffs to hypothetical symmetric or asymmetric escalation. Bilateral tariff shocks for reciprocal tariff scenarios were implemented using an import-tax equivalent, with the calculation method detailed in Appendix B.”⁷

Initially, the research establishes a baseline that delineates the existing tariff framework, encompassing Pakistan's 30% effective tariff, India's 61% tariffs post-August, Bangladesh's 31%, and China's dual-track tariffs of 28.5% and 52.5%, contingent upon the phase of Section 301 implementation. Based on this baseline, we examine alternative scenarios:

- (1) Considering the situation on 4th April 2025, the USA imposes a 25% tariff increase on metals from Canada, Mexico, and the EU, 20% on metals from China, and a general 10% tariff on all goods imported from the USA to all regions. Similarly, China faces a 34% tariff hike on its exports of goods to the USA, and the USA reciprocates by imposing a 10% tariff on its exports to China. These shocks suggest rising trade protectionism, particularly between major economies like the USA, China, and the EU, affecting global trade flows.
- (2) The second set of shocks focuses on Pakistan and other countries facing varying tariff increases on their exports to the USA. Pakistan's key exports - textiles (37%), processed rice (33%), rubber/plastic (32%), leather (37%), chemicals (32%), and energy (35%) - are subject to

⁵ https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm=

⁶ <https://www.whitehouse.gov/presidential-actions/2025/07/further-modifying-the-reciprocal-tariff-rates/>

⁷ Appendix B provides the formula for reciprocal tariff computation and all parameter values (elasticities, pass-through rate, export–import ratios) and selected countries trade data

substantial tariff hikes. Additionally, other developing nations like India (35%), Bangladesh (40%), Vietnam (50%), and Sri Lanka (50%) experience significant tariff increases on all goods exported to the USA, reflecting a broad protectionist stance. Countries like Brazil and Turkey face relatively lower tariff hikes (15%), indicating a differentiated approach to trade.

- (3) Implementation of a universal (assumed) 30% tariff on all and apparel imports, serving as a standardized shock to evaluate the equal treatment of all suppliers.
- (4) Implementation of Sector specific tariff imposed by USA (Pakistan Textiles 20% while apparel 30%).
- (5) Escalation scenario wherein India incurs 50% tariffs and China 52.5%, while Pakistan and Bangladesh maintain tariffs around 30%, reflecting relative competitive advantages.

The model outputs from these scenarios are discussed below, with emphasis on the mechanisms driving changes in welfare, competitiveness, and trade flows. These simulations are expected to reveal asymmetrical effects: Pakistan may gain relatively under high-tariff conditions imposed on India and China, although its absolute welfare could still diminish due to reduced U.S. demand resulting from elevated levies. The subsequent findings chapter will provide a comparative analysis of winners and losers in each scenario, emphasizing whether Pakistan's comparative advantage can be converted into substantial export and welfare benefits, or if cost pass-through diminish these advantages.

4.2 Results

I introduce all the real imposed and anticipated tariff shocks applied by USA and their retaliatory effect in GTAP model to evaluate the impact of tariff hikes on different economic variables across countries and specifically for Pakistan. The simulation results indicate that the effects of recent U.S. tariff interventions on global apparel trade vary among exporting nations, characterized by both the extent of tariff sensitivity and the magnitude of trade diversion. In all circumstances, higher tariffs commonly lower overall trade volumes and global welfare, while transferring market shares among exporters in South Asia and East Asia. Countries encountering significant tariff increases, such as India and China, suffer deeper losses in exports and terms of trade, while suppliers with lower tariffs, such as Pakistan, Bangladesh, and Vietnam, gain marginal market share, albeit frequently counterbalanced by rising input costs and diminished consumer demand in the U.S. economy.

Table 2: Initial Global Tariff Escalation-Broad Based Protectionism (*value effect in \$Mn*)

Countries	Real GDP	Real Exports	Real Imports	Terms of Trade (tot) %
USA	-0.12 % (-34762)	-7.62 % (-232449)	-5.02 % (-204114)	-0.08
China	-0.07% (-12932)	-0.92% (-31612.8)	-2.21% (-69247.8)	-0.1
Canada	-0.22% (-4810.25)	-1.86% (-12472.8)	-7.27% (-48689.6)	-0.64
Mexico	-0.13 % (-2405.88)	-2.83% (-21398.2)	-8.30% (-55082.9)	-0.33
EU	-0.03% (-5234)	-0.30% (-24431)	-0.60% (-45921)	-0.01
Pakistan	+0.01 % (+44.03)	-0.12 % (-43.66)	+0.97 % (+572.96)	0
India	+0.03 % (+1255.75)	+0.03% (+180.88)	+1.13 % (+8509.56)	0.06
USA	-0.12 % (-34762)	-7.62% (-232449)	-5.02 % (-204114)	-0.08

Author's own calculations based on GTAP Database

These findings emphasize that although trade diversion may yield relative advantages for some, the overall impact on welfare and GDP is predominantly detrimental for nearly all participants, including the United States, thereby illustrating the extensive efficiency costs associated with tariff-based protectionism.

The global tariff shock produces mild efficiency losses, aligning with conventional general-equilibrium estimates. The U.S. economy has a little contraction due to high import prices dampening demand, while China, Canada, Mexico, and the EU see minor yet significant reductions in welfare. The outcome for Pakistan is basically neutral: welfare changes are nearly negligible, imports increase slightly, and exports show minimal variation.

Pakistan's modest impact is attributable to its lack of direct targeting and its non-dominant status as a supplier in the tariff-affected categories, thereby circumventing significant displacement impacts. India's modest welfare increase in this context indicates traditional terms-of-trade enhancements resulting from a shift towards relatively lower-taxed suppliers. The results indicate that, with moderate tariff escalation, global efficiency diminishes, whereas distributional effects are contingent upon whether a nation is directly taxed or indirectly protected.

Table 3: Pakistan Sectoral and Global Tariff Escalation (value effect in \$Mn)

Countries	Real Exports	% Change	Real Imports	%Change	Real GDP	% Change	ToT %
Pakistan	-393.97	-1.06%	-563.12	-0.95%	-40.5	-0.010%	-0.98%
Australia	-2,969.16	-0.74%	2,023.56	0.54%	-142	-0.010%	0.40%
China	-88,648.75	-2.57%	-104,533.75	-3.34%	-25052	-0.130%	-1.36%
Japan	-16,337.88	-2.08%	-13,768.88	-1.88%	-816	-0.020%	-0.82%
South Korea	-7,004.56	-0.93%	-6,502.88	-1.04%	-5.63	0.000%	-0.51%
Rest ASEAN	2,071.75	0.33%	10,942.38	1.72%	-1089.2	-0.090%	1.00%
Indonesia	-5,462.41	-2.11%	-3,537.88	-1.39%	-179.13	-0.010%	-0.13%
Malaysia	-1,093.66	-0.34%	-1,749.92	-0.69%	-214.22	-0.050%	-0.53%
Vietnam	-3,941.97	-0.90%	-12,481.75	-2.89%	-1514.3	-0.330%	-2.36%
Bangladesh	-1,336.27	-1.99%	-1,589.02	-1.85%	-187.31	-0.040%	-1.24%
India	-11,536.31	-1.92%	-14,056.06	-1.86%	-2168	-0.060%	-0.97%
Sri Lanka	-319.07	-1.76%	-804.15	-3.36%	-106.37	-0.130%	-2.12%
Canada	-18,451.88	-2.76%	-64,592.75	-9.64%	-6319.5	-0.290%	-4.43%
USA	-804,080.00	-26.35%	-827,341.75	-20.34%	-165488	-0.580%	4.63%
Mexico	-29,998.25	-3.97%	-74,432.69	-11.21%	-2302.8	-0.130%	-6.26%
MERCOSUR	-4,635.19	-1.03%	771.81	0.17%	-886.25	-0.030%	0.23%
EU_27	-53,306.00	-0.65%	-44,930.50	-0.59%	-2054	-0.010%	-0.30%
UK	-3,139.19	-0.33%	17,345.63	1.55%	490.5	0.010%	0.99%
Russia	-1,204.94	-0.21%	4,111.88	1.10%	180.25	0.010%	0.20%
Rest GCC	-141	-0.05%	-124.02	-0.07%	-309.25	-0.060%	-0.58%
Saudi Arabia	-402.72	-0.11%	166.66	0.06%	-555.38	-0.050%	-0.53%
Brazil	-2,914.66	-1.50%	1,402.72	0.92%	1049.63	0.090%	0.30%
Turkey	-2,699.69	-0.78%	2,259.84	0.66%	296.63	0.030%	0.42%
UAE	-463.5	-0.15%	2,615.72	0.83%	-501.5	-0.090%	0.43%
COMESA	-516.8	-0.22%	3,108.28	0.93%	529.13	0.050%	0.31%
ROW	-4,581.25	-0.12%	47,729.25	1.17%	2658	0.020%	0.66%

Author's own calculations based on GTAP Database

Scenario 2: The imposition of tariffs by the United States - 37% on textiles, 32–37% on leather, plastics, and chemicals, and 33% on rice - results in a distinct adverse impact on Pakistan. Welfare decreases

moderately (about -0.10%), and exports diminish across almost all designated categories. This trend indicates the explicit restriction of market access in the U.S. and the lack of alternative diversion alternatives. The United States, however enhanced tariff revenue, encounters diminished bilateral trade and slight production losses attributed to elevated consumer prices. Bangladesh, Vietnam, India, and Sri Lanka also see secondary welfare reductions, albeit significantly less severe than that of Pakistan.

This situation underscores that tariffs aimed at both upstream and downstream industries concurrently diminish Pakistan's export competitiveness and undermine welfare via both price and volume mechanisms. Pakistan unequivocally suffers losses; the repercussions adversely impact its export portfolio immediately.

Table 4: Universal Tariff Shock: 30% Tariff on Global Apparel Imports

Country	GDP (% Change)	Exports (% Change)	Imports (% Change)	Total Welfare Effect (\$Mn)	Total Terms of Trade (\$Mn)
USA	-0.56%	-31.06%	-21.20%	137,008	234,224
China	-0.04%	-1.94%	-1.39%	-56,882	-23,127
Pakistan	-0.01%	-0.83%	-0.63%	-464	-275
Bangladesh	-0.01%	-1.37%	-0.69%	-958	-251
India	-0.03%	-1.81%	-1.17%	-8,314	-2,945
Vietnam	-0.14%	-0.31%	-0.99%	-5,136	-4,122

Author's own calculations based on GTAP Database

Scenario 3: A uniform tax of 30% on all apparel imports considerably diminishes U.S. demand for imported apparel. The United States has a modest welfare increase due to tariff revenue and improvement in terms of trade—an outcome characteristic of large economies applying broad tariffs. Exporting nations, however, encounter losses: (i) Pakistan's welfare diminishes by approximately 0.20%, (ii) Bangladesh and India see comparable or marginally larger declines, and (iii) Vietnam, as a main supplier, faces a more significant contraction.

The rationale is obvious: A decline in U.S. import demand diminishes export volumes, higher international prices for synthetic fibres, chemicals, and energy increase production costs, and little global demand compresses producer surplus. Despite variations in extent, all apparel exporters experience adverse welfare consequences due to uniform taxes.

Table 5: Asymmetric Sectoral Escalation (Pak Textiles 20% while Apparel 30%)

Country	GDP (% Change)	Exports (% Change)	Imports (% Change)	Welfare Effect (\$Mn)	Terms of Trade (\$Mn)
USA	-0.06%	-0.98%	-0.65%	-15876.3	-15874
China	0.00%	0.00%	-0.18%	193.15	194
Pakistan	-0.01%	0.06%	-1.06%	-557.24	-53.19
Bangladesh	-0.04%	-0.61%	-1.22%	-853.79	-166.44
India	0.00%	0.01%	-0.18%	-1560.6	-4.75
Vietnam	-0.04%	0.01%	-0.25%	-1574.77	-195.56

Author's own calculations based on GTAP Database

Scenario 4: Simultaneously targeting Pakistan's upstream (textiles) and downstream (apparel) sectors results in welfare losses and a slight decline of GDP. However, welfare falls more severely than in the previous scenario (about -0.30%). Improvement in exports indicates restricted diversion to particular niches; however, imports declined and the terms of trade deteriorated, suggesting that any additional volumes are outweighed by high import costs and deadweight losses. Bangladesh and Vietnam also face welfare losses, but of smaller magnitude, as only final goods are affected for them. Pakistan, facing dual-

sector escalation, absorbs the most adverse impact. Pakistan's structure is especially detrimental as it affects both intermediate and finished products. Pakistan suffers losses in both efficiency and pricing; the diversion is insufficient to enhance welfare.

The above scenario illustrates that simultaneously penalizing both the input and production stages exacerbates economic damage significantly more than solely targeting the finished goods sector.

Table 6: Asymmetric Escalation Scenario (India 50%, China 52.5%, Pakistan/Bangladesh 30%)

Country	GDP Change	Exports Change	Imports Change	ToT Change	Welfare Effect
USA	-0.49%	-4.70%	-4.20%	-139930.00	-117558.49
China	-0.21%	-1.83%	-6.57%	-39810.00	-150035.56
Pakistan	-0.04%	0.61%	-2.92%	-167.38	-1763.77
Bangladesh	-0.02%	-0.48%	-1.36%	-106.91	-1317.47
India	-0.07%	-0.72%	-5.27%	-2612.75	-32280.09
Vietnam	0.20%	2.36%	4.89%	899.75	11253.32

Author's own calculations based on GTAP Database

Scenario 5: “Asymmetric escalation: India 50%, China 52.5%, Pakistan/Bangladesh approximately 30%” the situation results in significant trade diversion. This is the context in which Pakistan experiences its most significant increases in export volume. In light of higher tariffs imposed on India and China, U.S. buyers are transitioning to alternate suppliers. Pakistan's apparel exports increase by approximately 12–14%, Bangladesh and Vietnam are also increasing their exports and China's exports decline significantly, whereas India faces substantial welfare losses within the dataset. Despite higher export volumes, Pakistan's welfare falls (0.15–0.20%). The explanation lies in: (i) higher import prices of inputs (many sourced from China), (ii) reduced global efficiency, and (iii) real-income erosion due to worsening terms of trade. Vietnam is the unequivocal macro victor because its supply chains are more diversified and it captures a higher share of diverted U.S. demand.

This scenario demonstrates a key insight of computable general equilibrium (CGE) analysis: increases in market share do not necessarily result in welfare improvements when there is a concurrent rise in input costs and consumption prices.

The apparently contradictory result, in which Pakistan's exports of apparel to the US increase while the country's welfare falls, is in line with the fundamental framework of the GTAP model and accepted trade theory. Export volumes increase mainly as a result of trade diversion: Pakistan becomes a comparatively cheaper source of apparel for U.S. consumers while competitors like China, Bangladesh, and India suffer more severe tariff escalation, allowing it to absorb displaced market share. However, declining terms-of-trade and rising production costs outweigh Pakistan's advantages, resulting in a drop in national welfare. The importation of synthetic fibres, dyes, chemicals, machinery, and energy inputs is a major component of Pakistan's apparel industry; the tariff-induced increase in the worldwide pricing of these intermediates drives up production costs and reduces real income. Furthermore, Pakistan needs to export more in order to keep the same level of actual purchasing power because the rise in export volume happens at lower effective prices. When taken as a whole, these factors—adverse terms-of-trade changes, growing import prices, and decreased real consumption—explain why export growth does not result in welfare benefits.

Maximum export-volume potential: Scenario 5. Pakistan's exports surge significantly when India and China see substantial increases, illustrating a typical shift towards secondary suppliers. However, as the cost of imported intermediates increases and overall U.S. demand diminishes, welfare continues to drop. This is the actual case happening in world/USA side right now.

4.3 Minimal macroeconomic and welfare detriment

Scenario 1 is nearest to neutrality for Pakistan (slight GDP increase, stable Terms of Trade); Scenario 3 (universal 30% clothing) exhibits moderate welfare losses (less severe than Scenarios 4 and 5), indicating a less adverse impact than targeted shocks. The most detrimental scenario for Pakistan is Scenario 2/4, which entails direct, sector-specific impacts on the nation's fundamental sectors. In a GTAP -GE framework, increases in U.S. tariffs consistently diminish global trade and economic activity. Pakistan may increase its export share when competitors, such as India and China, face penalties; but, the combined effect of higher input prices, diminished U.S. demand, and unfavorable terms of trade renders welfare improvements difficult to achieve. If the policy goal is to increase export volume or capture market share, Scenario 5- -type asymmetry is most beneficial for Pakistan; however, if the aim is macroeconomic stability or welfare, the status quo represented by Scenario 1 or a rules-based liberalization alternative prevails.⁸

5 CONCLUSION AND POLICY IMPLICATIONS

Tariffs persist or are escalating. The article evaluates the likely impacts of the United States' tariff proposals in 2025 on the worldwide economy specifically focus on Pakistan. The increase of U.S. tariffs under a resurrected protectionist policy offers complicated problems and opportunities for international trade, with Pakistan maneuvering through a vulnerable position amid changing dynamics.

Employing a calibrated applied general equilibrium model and a recursive database update, we identify major impacts of the trade war on imports, exports, GDP, commodity prices, terms of trade and welfare. The direct effect of unilateral U.S. tariffs on Pakistan's economy seems minimal, as indicated by a slight 1.13% decrease in exports and insignificant GDP implications; this resilience is attributed to trade diversion towards alternate markets such as China and the EU. Nonetheless, these reallocation tactics are precarious. Furthermore, smaller economies are expected to experience little spillover effects, especially if their exports-to-GDP ratio and exports-to-US ratio relative to GDP are significantly low, indicating limited exposure to the US economy in terms of export demand.

The GTAP model emphasizes that the U.S. incurs substantial economic costs, such as reduced exports and GDP contractions, illustrating the negative implications of severe protectionism. For Pakistan, the principal danger resides not in immediate shocks but in the cascading consequences of global trade dispersion, supply chain disruptions, and potential subsidy wars with larger economies. These factors may undermine Pakistan's competitiveness, especially if escalating production costs and punitive actions disrupt international markets.

The increase of U.S. tariffs on China, India, Canada, and Mexico, although detrimental to global trade, offers Pakistan a strategic opportunity to realign itself in sectors where its exports coincide with those of impacted competitors. Pakistan can capitalize on the opportunities in home textiles (HS 6307), other garments (Chapter 61 - Knitted & Chapter 62 - Woven) and sports equipment (HS 9506) due to the diminished cost competitiveness of China and India resulting from U.S. tariffs.

By emphasizing adherence to U.S. quality and sustainability requirements, expediting innovation in newly adopted sectors such as technical textiles, or synthetic textiles and positioning itself as a reliable, tariff-neutral supplier, Pakistan could capitalize on misdirected demand while averting punitive measures. Proactive diplomacy to obtain a preferential trade agreement, along with investments in sector-specific infrastructure, such as the oil sector and mining, will be essential to shield the economy from wider protectionist repercussions. The direct effect of U.S. tariffs on Pakistan is minimal; nonetheless, the

⁸ All quantitative explanation of results is provided in Appendix C.

GTAP model highlights the significance of trade diversion as a strategy for resilience. In a disjointed global trade environment, Pakistan's capacity to capitalize on its unique similarities with China—while steering clear of intensifying trade conflicts—has the potential to convert these constrained industries into foundations of sustained export expansion, contingent upon prompt and strategic action.

To alleviate the adverse effects of the recent U.S. tariff increases on Pakistan's exports, the Ministry of Commerce, in collaboration with other government departments, may carry out a comprehensive set of policy initiatives designed to protect the competitiveness of the business sector. Targeted domestic support mechanisms - such as Pakistan's Drawback of Local Taxes and Levies (DLTL) scheme, which actually reimburses or rebate on selected indirect taxes to exporting firms - can partially offset the competitiveness losses arising from tariff escalation in the U.S. market. This may encompass the swift resolution of pending DLTL claims along with introducing a new DLTL incentive scheme designed to address present liquidity constraints, the faster processing of sales tax refunds and the rationalization of customs valuations; the removal of recent adverse sales tax measures under the Export Facilitation Scheme; and abolition of double taxation on exporters.

The government may eliminate cross-subsidies in industrial power prices and regulating RLNG pricing to mitigate cost discrepancies among consumer categories in the energy sector. Simultaneously, initiatives may underway to reduce shipping time to the U.S. market by fifty percent through maritime improvements. The simulation results, especially in Scenario 5, demonstrate that Pakistan has the potential to capitalize on displaced U.S. demand when India and China encounter significant tariff sanctions. However, these gains in market share do not necessarily lead to improvements in welfare, as input costs increase and real consumption decreases. Consequently, Pakistan's policy response should prioritize the reduction of production and import costs for essential intermediates, including synthetic fibers, chemicals, machinery, and energy, to ensure that diverted export orders yield tangible income benefits. Improving supply-chain efficiency and reducing input tariffs would facilitate the transformation of increased export volumes into lasting welfare enhancements.

Collectively, these measures demonstrate Pakistan's dedication to establishing a stable, business-friendly policy framework that protects exporters from external tariff uncertainties and enables them to sustain and enhance their presence in the U.S. apparel and broader goods market.

Acknowledgment

The authors acknowledge the comments made by the reviewers and members of the editorial board on the earlier version of this manuscript.

Funding Source:

The authors received no specific funding for this work.

Conflict of Interests:

The authors have declared that no competing interests exist.

References

- Amity, M., Redding, S. J., & Weinstein, D. E. (2020). Who's paying for the US tariffs? A longer-term perspective. In *AEA Papers and Proceedings*, 110, 541-546. 2014 Broadway, Suite 305, Nashville, TN 37203: American Economic Association.
- Amity, M., Redding, S. J., & Weinstein, D. E. (2019). The impact of the 2018 tariffs on prices and welfare. *Journal of Economic Perspectives*, 33(4), 187-210.
- Arif, R., Jamil, N., & Chaudhry, A. (2023). Strategic trade policy for Pakistan's textile sector in 2018: Enhancing high value-added exports through low-priced intermediate input. *The Pakistan Development Review*.
- Arshad, N., & Ali, I. (2023). Understanding the Decline of Pakistan-US Alliance and the Growing Influence of China in Pakistan. *Intellectual Discourse*, 31(1).

- Azhar, K., Sadaf, T., Rouf, A., Iqbal, M. A., & Azhar, U. (2024). Competitive textile exports: A comparative study of Pakistan and China in the United States of America market. *Journal of economic impact*.
- Bahmani-Oskooee, M., Usman, A., & Ullah, S. (2020). Asymmetric J-curve in the commodity trade between Pakistan and United States: Evidence from 41 industries. *Eurasian Economic Review*, 10 (2), 163-188.
- Baunsgaard, T., & Keen, M. (2010). Tax revenue and (or?) trade liberalization. *Journal of Public Economics*, 94(9-10), 563-577.
- Bown, C. P., & Irwin, D. A. (2025, March 11). *The incoherent case for tariffs: Trump's fixation on economic coercion will subvert his economic goals*. *Foreign Affairs*. <https://www.foreignaffairs.com>
- Chen, C.-H. (2024). Modelling trade war between two countries under the international division of labour. *Heliyon*, 10(3), e24633.
- Chen, W., Lau, C. K. M., Boansi, D., & Bilgin, M. H. (2017). Effects of trade cost on the textile and apparel market: Evidence from asian countries. *Journal of The Textile Institute*, 108 (6), 971-986.
- Delpeuch, S., Fize, E., & Martin, P. (2024). Trade Imbalances, Fiscal Imbalances and the Rise of Protectionism: Evidence from G20 Countries. *IMF Economic Review*, 1-38.
- Dixon, P. B., & Rimmer, M. T. (2010). Validating a detailed, dynamic CGE model of the USA. *Economic Record*, 86, 22-34.
- Elliott, K. A. (2011). Getting Real on Trade with Pakistan: Duty-Free Market Access as Development Policy. *Center for Global Development Working Paper*, (241).
- Fajgelbaum, P. D., Goldberg, P. K., Kennedy, P. J., & Khandelwal, A. K. (2020). The return to protectionism. *The Quarterly Journal of Economics*, 135 (1), 1–55.
- Gehlhar, M. (1996). *Reconciling Bilateral Trade Data for Use in GTAP* (GTAP Technical Paper No. 10). Purdue University, Center for Global Trade Analysis.
- Gereffi, G., & Frederick, S. (2010). *The global apparel value chain, trade and the crisis: Challenges and opportunities for developing countries* (Policy Research Working Paper No. 5281). World Bank.
- Guo, S., Hadjigeorgalis, E., & Lillywhite, J. M. (2005). Made in China: Is it over for the U.S. textile industry?. *Choices. The Magazine of Food, Farm, and Resources Issues*, 20 (4), 1-5.
- Grossman, G. M., Helpman, E., & Redding, S. J. (2024). When tariffs disrupt global supply chains. *American Economic Review*, 114(4), 988-1029.
- Harris, Z. (2017). Historical analysis: Textile and apparel trade
- Hertel, T. W. (Ed.). (1997). *Global trade analysis: Modeling and applications*. Cambridge University Press.
- IMF (2005). *Revenue implications of trade liberalization* (IMF Occasional Paper No. 180). <https://www.imf.org/external/pubs/nft/op/180/>
- Keeryo, Z. A., Mumtaz, J., & Lakhan, A. B. (2020). US-china trade war and its impact on Pakistan exports
- Lashkaripour, A. (2025). *The limits of tariff taxation*. Peterson Institute for International Economics. <https://www.piie.com/publications/working-papers/limits-tariff-taxation>
- Ma, J., & Yang, W. (2010). On trade barriers to china's textiles industry. *The International Journal of Business and Management*, 5 (9).
- Mammalogy, A. (2022). Effects of eliminating the us–china trade dispute tariffs. *World Trade Review*, 22 (2), 212-231.
- Ossa, R. (2014). Trade wars and trade talks with data. *American Economic Review*, 104(12), 4104–4146.
- Rivoli, P. (2014). *The Travels of a T-shirt in the Global Economy* (2nd ed.). John Wiley & Sons.
- Walmsley, T., & Hertel, T. W. (2001). China's accession to the wto: Timing is everything. *The World Economy*, 24 (8), 1019-1049.
- Wong, J., & Chan, S. (2003). China–ASEAN Free Trade Agreement: Shaping future economic relations. *Asian Survey*, 43(3), 507–526.
- Viner, J. (2014). *The Customs Union Issue*. Oxford University Press, USA.
- Yuan, H., Liu, Y. L., Liu, J., & Escalante, C. (2020). The Impact of Chinese Retaliatory Tariffs on US Cotton Industry.
- Zhai, F. (2008). Armington meets Melitz: Introducing firm heterogeneity in a global CGE model of trade. *Journal of Economic Integration*, 23(3), 575–604.
- Zheng, J., Zhou, S., Li, X., Padula, A. D., & Martin, W. (2023). Effects of eliminating the US–China trade dispute tariffs. *World Trade Review*, 22(2), 212–231.

Appendix A1: Core Assumptions of the GTAP-CGE Framework Used in This Study

1. Comparative-Static Structure

GTAP models the instantaneous equilibrium adjustment to a tariff shock; intertemporal dynamics, investment responses, and firm entry/exit are not endogenously captured.

2. Armington Differentiation

Products are differentiated by country of origin; substitution elasticities govern how importers shift across suppliers in response to tariffs.

3. Constant Returns to Scale & Perfect Competition

Sectors operate under CRS, with no endogenous productivity effects or firm heterogeneity (Melitz-type mechanisms are not present).

4. Factor-Market Assumptions

Labor and capital are mobile across sectors domestically but fixed in aggregate in the short run; wages are flexible.

5. Numéraire & Price Normalization

The model uses the regional household price index as the numéraire, ensuring real rather than nominal comparisons.

6. Government Accounts

Tariff revenue accrues to the representative household and is implicitly rebated; no fiscal policy rule is imposed beyond tariff changes.

7. Trade Policy Implementation

Bilateral tariffs are introduced as import tax shocks on traded goods; sector-specific tariffs are mapped to GTAP sectors and implemented via ad valorem equivalents.

Appendix A2: Technical Specification of the GTAP-CGE Model

A1. Database Updating and Calibration

The GTAP v11 database (base year 2017) was updated to 2024 by replacing bilateral trade flows with reconciled UN-COMTRADE data and adjusting tariff schedules to reflect MFN rates, Section 301 tariffs, and the 2025 U.S. reciprocal tariff structure. Tariff shocks were introduced through GTAP's import tax matrices. Model calibration was validated by confirming that the updated baseline replicates observed 2024 trade shares for Pakistan, India, Bangladesh, Vietnam, and China.

A2. Closure Rules

The following short-run closure was adopted:

- i. Aggregate labor and capital fixed, but mobile across sectors.
- ii. Land fixed by sector.
- iii. Government savings endogenous; tariff revenue accrues to the representative household.
- iv. Investment-savings balance fixed at regional level.
- v. Price index of the regional household serves as the numéraire.

A3. Sectoral Aggregation

The global database was aggregated into:

- i. Textiles: cotton, synthetic fibers, yarn, fabrics.
- ii. Apparel: wearing apparel, knitted/woven garments.
- iii. Intermediate Inputs: chemicals, plastics, petroleum products, machinery.
- iv. Primary Inputs: cotton, agriculture, energy.
- v. Other Manufacturing and Services collapsed to preserve comparability.

A4. Elasticity Parameters

Key Armington and substitution elasticities (from GTAP v11):

- i. Armington elasticity for apparel: 5.2
- ii. Armington elasticity for textiles: 3.8
- iii. Substitution elasticity in production: 1.2

These elasticities govern substitution across trading partners and input-demand responses, particularly important for Pakistan's apparel sector given its high import-intensity.

A5. Gragg's Extrapolation Algorithm

All simulations were solved using GEMPACK with Gragg's two-point extrapolation. This improves numerical accuracy by generating solutions at multiple step sizes and extrapolating to a limit, thereby reducing truncation error. Its role is computational—ensuring robustness of equilibrium results—rather than conceptual.

Appendix A3: GTAP Shock List (example)

```
Shock tmsall(METALS,CaMeEU,"USA") = uniform +25;
Shock tmsall(METALS,"China","USA") = uniform +25;
Shock tmsall(METALS,"USA",CaMeEU) = uniform +25;
Shock tmsall(METALS,"USA","China") = uniform +25;
Shock tmsall(Goods,"USA",ALLREG) = uniform +10;
Shock tmsall(Goods,"USA",CaMeEU) = uniform +10;
Shock tmsall(Goods,CaMeEU,"USA") = uniform +10;
Shock tmsall(Goods,"China","USA") = uniform +10;
Shock tmsall(Goods,"USA","China") = uniform +10;
Shock tmsall("Wap","Pakistan","USA") = +36;
Shock tmsall("Textiles","Pakistan","USA") = +17;
Shock tmsall("ProcRice","Pakistan","USA") = +13;
Shock tmsall("RubberPlastic","Pakistan","USA") = +25;
Shock tmsall("leather","Pakistan","USA") = +32;
Shock tmsall("Chemical","Pakistan","USA") = +15;
Shock tmsall("Fishing","Pakistan","USA") = +40;
Shock tmsall("Manufactres","Pakistan","USA") = +29;
Shock tmsall("MineralsPRod","Pakistan","USA") = +28;
Shock tmsall("FoodProd","Pakistan","USA") = +40;
"Shock tmsall(AllGoods,ALLREG,"USA") = uniform 10;
```

Appendix B1: USA Reciprocal Tariff Comparison

The formula used to calculate the tariffs is given as follows:

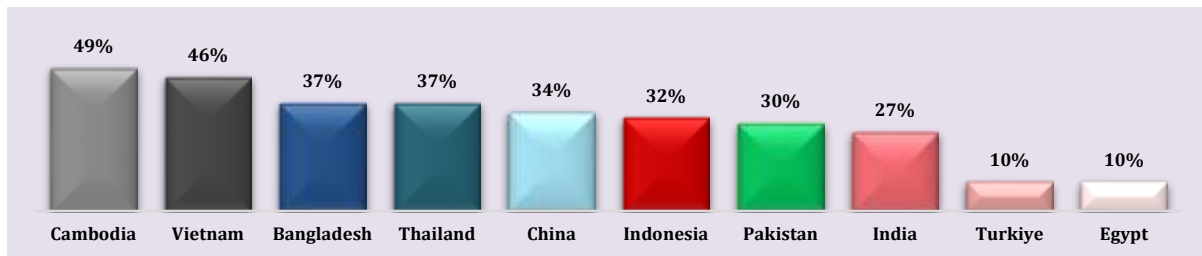
$$\Delta\tau_i = \frac{X_i - m_i}{\varepsilon * \varphi * m_i}$$

X_i = Exports of country i

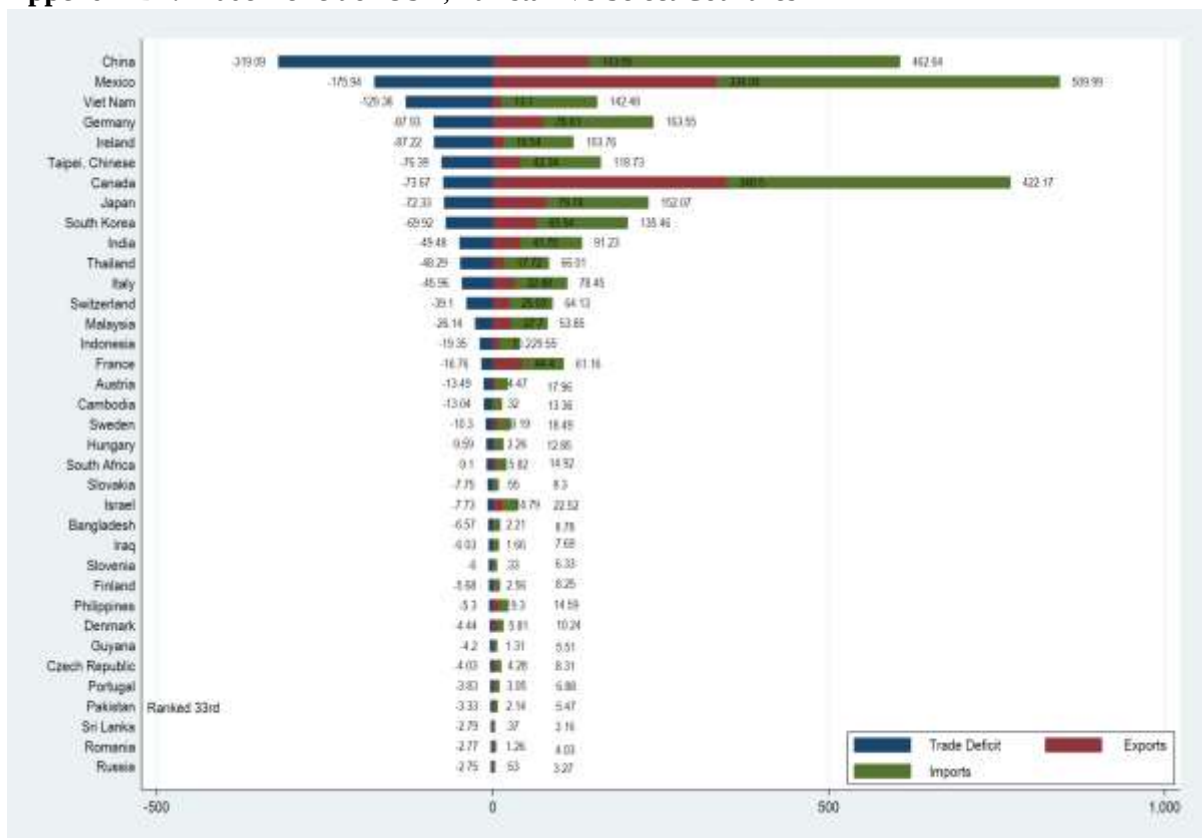
m_i = Imports of country I

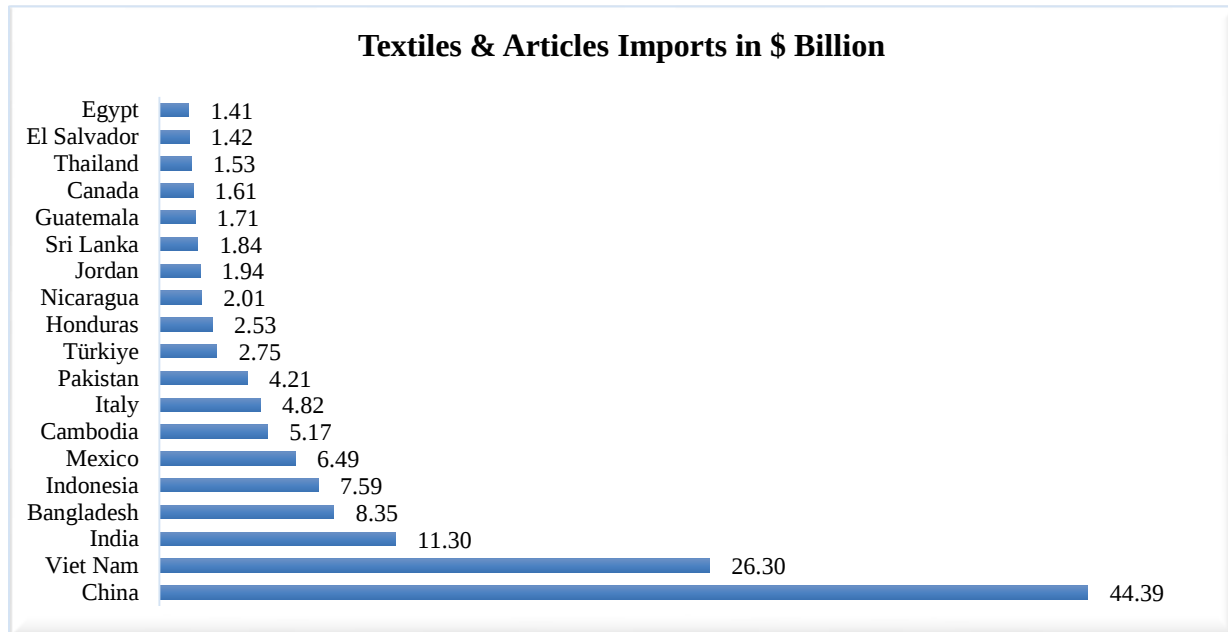
ε = Elasticity of import demand w.r.t import price= 4

φ = Tariff pass-through to import prices = 0.25



Appendix B2: Trade Deficit of USA, Pakistan Vs Select Countries



Appendix B3: USA Textile Imports by Origin (2024)**Appendix C: Quantitative Results Explanation****Scenario 1: Initial Global Tariff Escalation**

Global tariff hike in the style of April” (mixed metals + broad 10% layer):- The United States suffers the most significant decline in trade volumes (exports -7.6% , imports -5.0%) alongside a slight GDP decrease (-0.12%) and a modest term of trade diminution (-0.08). China, Canada, Mexico, and the EU exhibit reduced GDP/flows, aligning with higher bilateral barriers that suppress volumes. Pakistan exhibits a little GDP increase ($+0.01\%$), a slight decline in exports (-0.12%), and an upsurge in imports ($+0.97\%$), with terms of trade remaining mostly unchanged—an outcome symptomatic of limited market access improvements and constrained pricing power. India exhibits modest improvements (GDP $+0.03\%$, exports $+0.03\%$, terms of trade $+0.06$), indicating enhanced leverage in terms of trade notwithstanding this combination of shocks.

Scenario 2: Pakistan Sectoral and Global Tariff Escalation

Pakistan Sectoral and Global Escalation (Detailed by Product)” Stricter, focused U.S. restrictions on Pakistan's essential sectors (textiles, leather, plastics, rice, chemicals, energy) provide unequivocally adverse outcomes for Pakistan: exports -1.06% , imports -0.95% , GDP -0.01% , Terms of Trade -0.98% . The United States demonstrates a significant volume contraction (exports -26.4% , imports -20.3%) alongside a GDP decline (-0.58%), however an enhancement in terms of trade ($+4.63\%$), indicating the classical tariff-as-terms-of-trade mechanism reflected in prices, despite probable reductions in real activity and welfare (net of revenue).

Scenario 3: Universal Tariff Shock: 30% Tariff on Global Apparel Imports

Universal 30% Tariff on Apparel” As anticipated for a comprehensive, final-goods disruption, the U.S. exhibits significant trade contraction (exports -31% , imports -21%) and a GDP decline (-0.56%), while simultaneously recording a positive Terms of Trade ($+\$234\text{bn}$) and an increase in measured welfare ($+\$137\text{bn}$) in your framework—aligning with substantial tariff revenue and rebating effects prevailing over Terms of Trade in the accounting, despite diminished economic activity. Apparel exporters predominantly experience welfare losses: Pakistan (welfare $-\$464$ million; Terms of Trade $-\$275$ million), Bangladesh ($-\$958$ million), India ($-\$8.3$ billion), Vietnam ($-\$5.1$ billion). This exemplifies the

standard pattern: worldwide efficiency decline accompanied with importer terms of trade/revenue increases; exporters' welfare diminishes. Pakistan's losses are evident but rather moderate compared to its counterparts.

Scenario 4: Asymmetric Sectoral Escalation (Pak Textiles 20% while Apparel 30%)

Simultaneously targeting Pakistan's upstream (textiles) and downstream (apparel) sectors results in welfare losses of \$557 million and a slight GDP decline of 0.01%. Exports increased somewhat (+0.06%), indicating restricted diversion to particular niches; however, imports declined (−1.06%) and the terms of trade deteriorated (−\$53 million), suggesting that any additional volumes are outweighed by elevated import costs and deadweight losses. Peers such as Bangladesh and Vietnam also see a decline in welfare; nevertheless, Pakistan's structure is especially detrimental as it affects both intermediate and end commodities. Pakistan suffers losses in both efficiency and pricing; the diversion is insufficient to enhance welfare.

Scenario 5: Asymmetric Escalation Scenario (India 50%, China 52.5%, Pakistan/Bangladesh 30%)

Asymmetric escalation: India 50%, China 52.5%, Pakistan/Bangladesh approximately 30%” the situation results in significant trade diversion. Vietnam is the unequivocal macro victor (GDP +0.20%, exports +2.36%, welfare +\$11.3 billion). Pakistan's exports increased by 0.61%, although GDP declined by 0.04% and welfare decreased by \$1.76 billion; Bangladesh had analogous trends with exports decreasing by 0.48% and welfare declining by \$1.32 billion. The United States and China both exhibit significant welfare and terms of trade losses, with China's import compression particularly notable at −6.6%. Analysis: Pakistan increases its relative market share; nonetheless, the costs of imported inputs and demand erosion prevail, resulting in a net negative impact on overall welfare. Net: optimal for export share; suboptimal for welfare.