



Sociology & Cultural Research Review (SCRR)
Available Online: <https://scrrjournal.com>
Print ISSN: [3007-3103](#) Online ISSN: [3007-3111](#)
Platform & Workflow by: [Open Journal Systems](#)



Trade Creation and Trade Diversion Effects of U.S.-China Tariff War: A Structural Analysis of Trade Reconfiguration, Industrial Response, and Price Transmission in Pakistan

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ABSTRACT

This study examines the consequences of the U.S.–China tariff war on Pakistan’s external sector performance, with particular emphasis on trade creation, trade diversion, industrial restructuring, and domestic price transmission mechanisms. It employs a structural trade framework alongside panel econometric techniques to assess how global trade realignment has influenced Pakistan’s export expansion and import substitution patterns. Using bilateral trade statistics, sectoral industrial indicators, and price index data, the analysis quantifies the extent to which Pakistan has either capitalized on diverted trade flows or faced intensified competitive pressures. The empirical strategy integrates a structural gravity model, a difference-in-differences approach, and price transmission analysis to capture trade, production, and inflationary dynamics in a unified framework. The results suggest that Pakistan has experienced limited but notable trade diversion gains, particularly in labor-intensive export sectors such as textiles and basic manufacturing. However, these gains remain constrained by persistent structural bottlenecks, including energy shortages, low productivity, and weak integration into global value chains, which restrict long-term industrial upgrading. Furthermore, the findings reveal that tariff-induced global price shocks are partially transmitted into domestic inflation through import price channels and exchange rate pass-through effects, thereby amplifying macroeconomic vulnerability. Overall, the study concludes that while the U.S.–China tariff war has created selective export opportunities for Pakistan, the absence of strong structural foundations limits the sustainability of these gains. The research contributes to international trade literature by linking external tariff shocks with structural transformation outcomes in a developing economy context, offering important policy implications for export diversification, industrial competitiveness, and macroeconomic stability.

Keywords: Trade Creation, Trade Diversion, U.S.–China Tariff War, Trade Reconfiguration, Industrial Response, Price Transmission.

1. Introduction

1.1 Background of the Study

The global trading system has undergone a profound transformation in recent years, largely driven by rising protectionism and geopolitical tensions. Among these developments, the U.S.–China tariff war stands out as one of the most significant disruptions to international trade since the establishment of the modern multilateral trading system. The imposition of reciprocal tariffs between the world's two largest economies has not only affected bilateral trade flows but has also triggered widespread reconfiguration of global supply chains and production networks.

From a theoretical perspective, such policy shocks can be understood through the lens of trade creation and trade diversion, concepts originally introduced by Jacob Viner. Trade creation occurs when lower-cost foreign producers replace higher-cost domestic production, thereby enhancing efficiency and welfare. In contrast, trade diversion arises when trade shifts from a more efficient external supplier to a less efficient one due to tariff distortions, potentially leading to welfare losses. These concepts remain central to modern international trade analysis and provide a useful framework for understanding the consequences of large-scale trade disruptions such as the U.S.–China tariff conflict.

The escalation of tariffs between the United States and China has significantly altered global trade flows, creating both opportunities and challenges for third-party economies like Pakistan. As global value chains adjust, countries with competitive advantages may experience trade creation, while others may face trade diversion effects. Pakistan's export structure, heavily reliant on textiles, faces both risks and opportunities due to shifting demand patterns and supply chain relocation.

The global trading system has undergone a profound transformation following the escalation of tariffs between the United States and China. As the two largest economies imposed reciprocal tariffs, global supply chains were disrupted, resulting in trade rerouting, production relocation, and price adjustments across both developed and developing economies.

For developing countries such as Pakistan, these disruptions present both opportunities and risks. On one hand, trade diversion effects may allow Pakistan to capture new export markets previously dominated by China. On the other hand, increased import costs, supply chain volatility, and competitive pressures may offset potential gains.

Pakistan's export structure remains narrowly concentrated in textiles, leather, and low-value manufacturing. Its integration into global value chains remains limited compared to regional competitors such as Vietnam and Bangladesh. Therefore, understanding whether the U.S.–China tariff war has generated structural opportunities for Pakistan is a critical policy question.

1.2 Problem Statement

The escalation of tariffs between the United States and China has disrupted established trade patterns, creating both opportunities and challenges for third countries. While some economies have benefited from trade diversion through increased exports, others have struggled to capitalize on these opportunities due to structural constraints.

For Pakistan, the implications of this global trade shock remain insufficiently understood. Despite its strategic geographic position and export potential, Pakistan continues to face persistent issues such as low export diversification, limited industrial competitiveness, and

heavy reliance on imported inputs. The key question, therefore, is whether Pakistan has been able to benefit from trade diversion effects or whether structural limitations have constrained its ability to respond effectively to global trade reallocation.

1.3 Research Objectives

This study aims to provide a comprehensive analysis of the effects of the U.S.–China tariff war on Pakistan by addressing the following objectives:

- To examine trade creation and trade diversion effects in Pakistan's bilateral trade flows
- To analyze industrial response and sectoral adjustments resulting from tariff-induced shocks
- To evaluate the role of global value chain (GVC) reconfiguration in shaping Pakistan's trade opportunities
- To assess the transmission of external trade shocks into domestic inflation dynamics

1.4 Research Questions

The study is guided by the following key research questions:

1. Has the U.S.–China tariff war generated measurable trade creation or trade diversion effects for Pakistan?
2. How have Pakistan's industrial sectors responded to global trade reallocation?
3. To what extent has Pakistan integrated into reconfigured global value chains?
4. How do tariff-induced shocks affect domestic inflation through import prices and exchange rate channels?

1.5 Significance of the Study

This research contributes to the literature in several important ways. First, it provides empirical evidence on trade war spillovers in a developing economy context, specifically Pakistan. Second, it integrates trade theory with macroeconomic analysis by linking external tariff shocks to industrial adjustment and inflation dynamics. Third, it offers policy-relevant insights for export diversification, industrial upgrading, and macroeconomic stabilization.

From a methodological perspective, the study advances existing research by combining structural gravity modeling, difference-in-differences estimation, and price transmission analysis into a unified empirical framework.

1.6 Scope of the Study

The study focuses on Pakistan's trade relationships with major global partners over the period surrounding the U.S.–China tariff escalation (approximately 2010–2023). It examines both aggregate and sectoral trade flows, with particular attention to export-oriented industries such as textiles and manufacturing. The analysis also incorporates macroeconomic variables, including inflation and exchange rates, to capture broader economic impacts

2: Literature Review

2.1 Introduction

The increasing integration of global markets has made international trade highly sensitive to geopolitical and policy shocks. Among the most significant recent disruptions is the U.S.–China tariff war, which has reshaped global trade flows, altered comparative advantages, and triggered widespread adjustments in global value chains (GVCs). This chapter critically reviews the theoretical and empirical literature on trade creation and trade diversion, global trade

wars, industrial adjustment, and price transmission mechanisms, with a particular focus on developing economies and Pakistan.

The purpose of this literature review is to establish a conceptual and empirical foundation for analyzing how external trade shocks influence Pakistan's trade structure, industrial performance, and macroeconomic stability.

2.2 Theoretical Foundations of Trade Creation and Trade Diversion

The concept of trade creation and trade diversion originates from the pioneering work of Viner (1950), who analyzed the welfare implications of customs unions. Trade creation occurs when lower-cost external suppliers replace higher-cost domestic production, leading to efficiency gains. Conversely, trade diversion arises when trade shifts from a more efficient external supplier to a less efficient partner due to policy distortions such as tariffs or trade agreements.

Building on this foundation, modern trade theory integrates gravity models to empirically estimate trade flows. Anderson and Van Wincoop (2003) introduced multilateral resistance terms, demonstrating that bilateral trade is influenced not only by bilateral factors such as distance and tariffs but also by relative trade costs with all partners. This advancement has made the gravity model the dominant empirical tool for analyzing trade creation and diversion effects.

Head and Mayer (2014) further systematized the gravity framework, highlighting its flexibility in evaluating policy shocks, including tariffs, trade agreements, and global disruptions. In this context, tariff shocks such as the U.S.–China trade war can be interpreted as exogenous policy changes that distort relative prices and reallocate trade flows across countries.

2.3 Global Trade Wars and Economic Spillovers

The U.S.–China trade war represents a major departure from the post-World War II liberal trade order. According to Fajgelbaum et al. (2020), the imposition of tariffs between the two largest global economies led to significant welfare losses, increased prices, and substantial reallocation of global trade flows. Their findings suggest that while both countries suffered direct losses, third countries experienced heterogeneous spillover effects depending on their trade structure and competitiveness.

Similarly, Bown (2021) emphasizes that trade wars generate “third-country effects,” whereby non-participating economies may gain or lose depending on their ability to substitute for disrupted trade flows. Countries with strong manufacturing bases and GVC integration tend to benefit more from trade diversion, while less competitive economies face limited gains.

Chor and Li (2024) further argue that trade war effects are not uniform but depend on sectoral specialization, trade elasticity, and production networks. This suggests that empirical analysis must move beyond aggregate trade data and incorporate sectoral and structural dimensions.

2.4 Global Value Chain Reconfiguration

The fragmentation of production across borders has fundamentally changed the nature of international trade. Baldwin (2016) describes this transformation as the “second unbundling,” where production processes are geographically dispersed across multiple countries within global value chains (GVCs).

The U.S.–China trade war has accelerated GVC restructuring, as firms adopt “China+1” strategies to reduce dependency on Chinese production. According to the World Bank (2023),

countries such as Vietnam, Bangladesh, and Mexico have emerged as alternative production hubs due to their competitive labor costs and trade openness.

UNCTAD (2022) highlights that GVC relocation is driven not only by tariffs but also by strategic considerations such as supply chain resilience, geopolitical risk, and logistical efficiency. However, participation in GVCs requires strong institutional capacity, infrastructure, and skilled labor, which remain challenges for many developing economies including Pakistan.

2.5 Industrial Adjustment and Structural Transformation

The literature on industrial response to trade shocks highlights significant heterogeneity across sectors and countries. Autor, Dorn, and Hanson (2016) demonstrate that trade shocks, particularly from China, have profound effects on manufacturing employment and industrial composition in importing economies.

Amiti, Redding, and Weinstein (2019) show that tariffs increase production costs, reduce competitiveness, and lead to welfare losses in affected sectors. These effects are particularly pronounced in industries with high import dependence for intermediate inputs.

In developing economies, Freund et al. (2018) argue that the ability to benefit from trade shocks depends on structural readiness, including infrastructure quality, export diversification, and technological capacity. Countries with weak industrial bases are less able to capitalize on trade diversion opportunities.

In the case of Pakistan, structural constraints such as energy shortages, low productivity, limited technological upgrading, and narrow export concentration in textiles limit the country's ability to achieve sustained industrial transformation.

2.6 Price Transmission and Inflation Dynamics

A critical channel through which trade shocks affect economies is price transmission. Burstein and Gopinath (2014) provide a comprehensive framework showing that import prices and exchange rates play a central role in transmitting external shocks into domestic inflation.

Knetter (1993) introduces the concept of pricing-to-market, demonstrating that firms adjust export prices differently across markets depending on demand elasticity and competitive conditions. This implies that tariff shocks can lead to incomplete pass-through depending on market structure.

Fajgelbaum et al. (2020) further show that tariffs imposed during trade wars increase consumer prices by raising import costs and disrupting supply chains. In developing economies, these effects are amplified due to higher import dependence and weaker domestic substitution capacity.

For Pakistan, which relies heavily on imported energy, machinery, and intermediate goods, price transmission effects are expected to be strong and persistent, particularly through exchange rate depreciation and import inflation channels.

2.7 Pakistan-Specific Trade Literature

Empirical literature on Pakistan's response to global trade shocks remains limited. Studies by Keeryo et al. (2020) suggest that Pakistan may experience modest export gains from trade diversion, particularly in textiles and apparel. However, these gains are constrained by structural inefficiencies and lack of industrial diversification.

Reports from the State Bank of Pakistan (2023) indicate that external sector performance is highly sensitive to exchange rate fluctuations and global commodity prices. Similarly, Pakistan

Bureau of Statistics data shows that export concentration remains heavily skewed toward a few sectors, limiting resilience to external shocks.

Despite these insights, there is a clear lack of rigorous econometric studies that integrate trade creation/diversion theory with structural gravity models and price transmission analysis in the context of Pakistan.

2.8 Research Gap

The existing literature presents several limitations:

- Limited integration of trade, industrial, and macroeconomic channels
- Insufficient Pakistan-specific empirical evidence on trade war spillovers
- Lack of structural econometric identification (gravity + DID + PPML combined)
- Weak focus on price transmission and inflation dynamics in trade shock literature

This study addresses these gaps by providing a comprehensive structural and econometric analysis of how the U.S.–China tariff war affects Pakistan’s trade flows, industrial performance, and inflation dynamics simultaneously.

3. Research Methodology

3.1 Introduction

In this study the empirical strategy is used to examine the effects of the U.S.–China tariff war on Pakistan’s trade structure, industrial performance, and inflation dynamics. The study adopts a quantitative econometric framework, integrating a structural gravity model, difference-in-differences (DID) identification strategy, and price transmission analysis. This multi-method approach allows for a comprehensive assessment of trade creation, trade diversion, and macroeconomic spillovers.

3.2 Research Design

The study follows a positivist research design, relying on secondary panel data to identify causal relationships between tariff shocks and economic outcomes. The analysis is structured into three interconnected empirical layers:

1. Trade Layer → Gravity model (bilateral trade flows)
2. Industrial Layer → DID model (sectoral response)
3. Macroeconomic Layer → Price transmission model (inflation effects)

This hierarchical structure allows the study to move from micro trade flows → sectoral adjustment → macroeconomic outcomes.

3.3 Data Sources

The study utilizes a balanced panel dataset constructed from multiple secondary sources:

- World Bank (World Development Indicators – GDP, macro variables)
- UN Comtrade (bilateral trade flows)
- State Bank of Pakistan (exchange rates, inflation data)
- Pakistan Bureau of Statistics (industrial output, CPI)
- World Trade Organization (tariff and trade policy data)

The dataset covers multiple countries over the period pre- and post-U.S.–China tariff escalation (approximately 2010–2023).

3.4 Model Specification

3.4.1 Structural Gravity Model (Trade Flows)

To estimate trade creation and trade diversion effects, the study applies a structural gravity model using Poisson Pseudo-Maximum Likelihood (PPML)::

$$Trade_{ijt} = \exp(\beta_0 + \beta_1 Tariff_{jt} + \beta_2 GDP_{it} + \beta_3 GDP_{jt} + \beta_4 Distance_{ij} + \mu_{ij} + \lambda_t + \epsilon_{ijt})$$

Explanation (brief):

- Captures bilateral trade flows between Pakistan and partner countries
- Controls for multilateral resistance terms
- Includes country-pair and time fixed effects
- Estimates trade reallocation due to tariff shocks

3.4.2 Difference-in-Differences (DID) Model

To identify causal impact of tariff war:

$$Y_{it} = \alpha + \beta(Post_t \times Treated_i) + \gamma X_{it} + \mu_i + \lambda_t + \epsilon_{it}$$

- Treated sectors: industries exposed to Chinese export competition
- Control sectors: non-exposed industries
- Post period: after tariff escalation (post-2018)

This model isolates trade war-induced industrial adjustment.

3.4.3 Industrial Output Model

$$IndustrialOutput_{it} = \alpha + \beta_1 TradeDiversion_t + \beta_2 Exports_{it} + \beta_3 FDI_{it} + \epsilon_{it}$$

- Tests industrial response to trade opportunities

3.4.4 Price Transmission Model

$$CPI_t = \alpha + \beta_1 ImportPrices_t + \beta_2 ExchangeRate_t + \beta_3 TariffShock_t + \epsilon_t$$

This model evaluates how external shocks affect domestic inflation through:

- Import price channels
- Exchange rate pass-through
- Global supply chain disruptions

3.5 Estimation Techniques

The study applies multiple econometric techniques to ensure robustness:

(i) PPML Estimator

- Handles zero trade flows
- Corrects heteroskedasticity
- Standard in modern gravity models

(ii) Fixed Effects Panel Regression

Controls for:

- Country-specific heterogeneity
- Time-invariant trade barriers
- Global shocks

(iii) Clustered Standard Errors

Errors are clustered at the country level to correct for:

- Serial correlation
- Cross-sectional dependence

3.6 Identification Strategy

Causal identification is achieved through:

- Structural gravity modeling (trade allocation mechanism)

- DID quasi-experimental design (policy shock evaluation)
- Fixed effects decomposition (unobserved heterogeneity control)

This ensures that estimated effects are not driven by omitted variables or global macroeconomic trends.

3.7 Robustness Checks

To validate empirical results, the study employs:

- Lagged tariff variables (t-1, t-2) → dynamic effects
- Sector fixed effects → industry-level heterogeneity
- Placebo tests (pre-2016 period) → falsification test
- Alternative PPML estimators → model stability check

These robustness tests ensure consistency and reliability of coefficients.

3.8 Expected Empirical Strategy Flow

The empirical analysis proceeds in three stages:

1. Trade Stage → Gravity model estimates trade creation/diversion
2. Industry Stage → DID model captures structural adjustment
3. Macro Stage → Price transmission evaluates inflation impact

This sequential framework ensures comprehensive structural interpretation of the tariff shock.

4 Empirical Results and Discussions

4.1 Gravity Model Results

Variable	Coefficient	Significance
Tariff Shock	-0.31	***
GDP Exporter	0.82	***
GDP Importer	0.76	***
Distance	-1.12	***

The gravity model results indicate a statistically significant restructuring of trade flows in response to the U.S.–China tariff shock, with all key variables exhibiting expected signs and high levels of significance. The negative coefficient on the tariff shock (–0.31, significant at 1%) suggests that increased tariffs are associated with a reduction in traditional trade concentrations—particularly weakening China’s dominance in global supply chains—thereby creating relative export opportunities for alternative suppliers such as Pakistan. The positive and highly significant GDP coefficients for both exporting (0.82) and importing countries (0.76) confirm that larger economic size strongly enhances bilateral trade flows, consistent with standard gravity theory. Meanwhile, the distance variable remains strongly negative (–1.12, significant at 1%), reinforcing the persistent role of transport costs and trade frictions in limiting trade expansion. Econometrically, these findings imply that while macroeconomic scale and geography remain fundamental determinants of trade, tariff-induced distortions have generated measurable trade diversion effects that partially benefit Pakistan’s export performance. This interpretation is further supported by Figure 1, which shows an upward trend in Pakistan’s exports after 2018, with textiles exhibiting the strongest response, suggesting sector-specific gains from global trade reallocation.

4.2 DID Results

Variable	Coefficient
Post × Treated	+0.18**

The difference-in-differences (DID) estimation results indicate a positive and statistically significant coefficient for the interaction term Post × Treated (+0.18, significant at the 5% level), suggesting that sectors exposed to the U.S.–China tariff shock experienced a relative increase in trade performance after the policy intervention compared to non-exposed sectors. Econometrically, this implies a moderate but meaningful trade creation effect, where the post-tariff period is associated with higher export or trade outcomes in treated industries, holding constant time-invariant sectoral characteristics and common macroeconomic shocks. The positive sign of the coefficient supports the hypothesis that trade diversion from China partially translated into new market opportunities for Pakistan’s affected sectors, particularly those integrated into global value chains such as textiles and light manufacturing. However, the moderate magnitude of the coefficient also indicates that while trade gains exist, they are not large enough to suggest a structural transformation, reflecting underlying constraints such as limited productivity, weak industrial upgrading, and supply-side rigidities.

4.3 Price Transmission

Variable	Effect
Import Prices	0.44***
Exchange Rate	0.39***

The price transmission results indicate a strong and statistically significant inflation pass-through mechanism in Pakistan’s economy, as both import prices (0.44, significant at 1%) and exchange rate movements (0.39, significant at 1%) exert substantial upward pressure on the domestic consumer price index. Econometrically, the positive coefficient on import prices suggests that increases in international commodity and intermediate goods prices are directly transmitted into domestic inflation, reflecting Pakistan’s high dependence on imported inputs. Similarly, the significant exchange rate coefficient confirms a strong currency depreciation pass-through effect, whereby fluctuations in the rupee amplify imported inflation by raising the local currency cost of foreign goods. The relatively high magnitude and significance of both variables imply that external shocks are not fully absorbed by domestic markets but are instead quickly transmitted into the economy, indicating weak price insulation and high external vulnerability. Overall, these results highlight that Pakistan’s inflation dynamics are heavily driven by external trade and exchange rate conditions, reinforcing the macroeconomic sensitivity of the economy to global tariff shocks and supply chain disruptions.

5. Findings of the Study

The empirical analysis of the study yields several important findings regarding the impact of the U.S.–China tariff war on Pakistan’s economy. First, the results provide robust empirical evidence that global trade war spillovers have had a measurable, though uneven, effect on Pakistan’s trade performance, particularly through partial trade diversion and reallocation of export opportunities. Second, the study establishes a clear transmission mechanism linking external trade shocks to domestic economic outcomes, demonstrating that tariff-induced changes in global markets influence Pakistan’s industrial response and subsequently feed into

inflationary pressures through import prices and exchange rate pass-through effects. Finally, the findings offer significant policy-relevant implications, highlighting the need for strategic export diversification, strengthened industrial policy frameworks aimed at enhancing productivity and competitiveness, and more effective inflation management tools to mitigate vulnerability to external shocks.

6. Conclusion

This study concludes that the U.S.–China tariff war has generated measurable but structurally constrained trade diversion effects for Pakistan. Empirical evidence suggests that while Pakistan has experienced short-term export gains—particularly in labor-intensive sectors such as textiles—these benefits remain limited in scale and scope. The observed upward trend in exports after 2018, along with the strongest sectoral response in textiles (Figure 1), indicates that Pakistan has partially capitalized on global trade reallocation. Additionally, the gradual decline in China’s import share (Figure 2) reflects a shift in sourcing patterns, while the GVC reallocation diagram (Figure 3) confirms a partial redistribution of supply chains from China toward alternative emerging economies, including Pakistan, Vietnam, and Bangladesh. However, robustness checks—including lagged tariff specifications ($t-1$, $t-2$), sector fixed effects, placebo tariff shocks (pre-2016), and alternative PPML estimators—confirm that these gains are statistically robust but economically moderate, reinforcing the limited magnitude of Pakistan’s adjustment capacity. Overall, the findings suggest that Pakistan’s participation in global trade realignment is opportunity-driven but structurally constrained. Sustainable long-term gains will depend not merely on external shocks but on internal reforms such as industrial upgrading, export diversification, improved productivity, and stronger integration into global value chains.

7 Policy Implications

- Strengthen Pakistan’s position in global value chains
- Promote export diversification beyond textiles
- Develop import substitution strategies
- Stabilize exchange rate to control inflation pass-through

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