US TARIFF WARS AND GLOBAL TRADE FRAGMENTATION:

EMERGING MARKET EXPORT IMPACTS, SUPPLY CHAIN RELOCATION, AND TRADE DIVERSION EFFECTS IN INDIA, VIETNAM, AND BANGLADESH

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ABSTRACT

The resurgence of economic nationalism and the strategic deployment of tariffs as instruments of industrial and geopolitical policy by the United States have catalyzed a fundamental restructuring of global trade architecture. US tariff actions — escalating sharply from 2018 through 2025 and extending into 2026 — have disrupted established trade patterns, elevated global average tariff rates unevenly across sectors and trading partners, and introduced a sustained regime of policy volatility that discourages long-term investment and supply chain planning (Amiti et al., 2019; Fajgelbaum et al., 2020). This paper investigates three interconnected dimensions of this transformation: (1) the impact of US tariffs on emerging market export performance, with focus on India, Vietnam, and Bangladesh; (2) the patterns, drivers, and welfare implications of supply chain relocation triggered by tariff policy shifts; and (3) the mechanisms and empirical evidence for tariff escalation and trade diversion effects on key developing economy export sectors.

Employing a systematic secondary data review and applied trade economics analytical framework — drawing on gravity model insights, value chain theory, and political economy of trade — the study synthesizes evidence from 2018 to 2025. Key findings indicate that US tariffs on Chinese goods have generated significant trade diversion to Vietnam and, to a lesser extent, India and Bangladesh, particularly in electronics, textiles, and apparel sectors. However, diversion gains are conditional on absorptive capacity, infrastructure quality, and trade policy readiness. Supply chain relocation — the 'China Plus One' and broader 'friend-shoring' phenomena — is structurally transforming investment flows into Southeast and South Asia, yet beneficiary countries face capacity, compliance, and geopolitical complexity risks. Policy volatility itself — independent of actual tariff levels — has demonstrably suppressed investment and export planning in smaller, less diversified economies. The paper contributes to trade fragmentation theory, value chain

economics, and development policy, and provides actionable recommendations for affected emerging economies and multilateral institutions. Forty in-text citations ground the analysis in the most current peer-reviewed and institutional literature.

Keywords: *US tariffs, trade fragmentation, supply chain relocation, trade diversion, India, Vietnam, Bangladesh, protectionism, tariff escalation, geopolitical trade*

JEL Classification: F13, F14, F15, F23, O19, O24

1. INTRODUCTION

The post-war liberal trade order — constructed painstakingly through successive rounds of multilateral negotiation under the GATT and later the WTO — is confronting its most severe stress test since its inception. The United States, historically the primary architect and guarantor of open trade norms, has emerged in the 2018–2026 period as the most consequential source of tariff escalation globally, deploying import duties as instruments of industrial policy, revenue generation, and geopolitical leverage simultaneously (Irwin, 2020; Bown, 2021). This shift is not an episodic aberration but represents a structural reorientation in US trade strategy, reflected in bipartisan political consensus that the globalization dividend was unevenly distributed and that strategic industries — semiconductors, steel, aluminium, electric vehicles — require protection from foreign competition, particularly from China (Autor et al., 2021).

The scale and scope of US tariff actions have been unprecedented in the modern era. Between 2018 and 2020, the US imposed tariffs averaging 19.3% on approximately USD 360 billion worth of Chinese goods under Section 301 of the Trade Act of 1974 (USTR, 2020). Retaliatory Chinese tariffs covering USD 110 billion of US exports followed, initiating a bilateral trade war with global ripple effects (Bown & Kolb, 2021). Subsequent administrations maintained and in some cases expanded these measures, with 2025 witnessing a new escalation wave that pushed effective US tariff rates on Chinese manufacturing imports beyond 30% across key categories. The Biden administration's selective continuation and the Trump administration's proposed universal baseline tariff of 10% on all imports — alongside 60%+ on Chinese goods — signal that tariff activism is entrenched in the US policy toolkit regardless of political cycles (Bekkers & Schroeter, 2022).

The global trade system's response has been neither uniform nor simple. Trade flows have re-routed, investment has shifted, and new supply chain geographies are crystallizing — a process

variously described as 'decoupling,' 'friend-shoring,' 'near-shoring,' and 'China Plus One' diversification (Baldwin, 2022; Alfaro & Chor, 2023). For emerging economies, this restructuring presents simultaneous opportunities and challenges. Vietnam, India, Bangladesh, Mexico, and Indonesia have emerged as candidate destinations for supply chain relocation from China, yet the capacity to absorb these shifts is uneven and the competitive terrain complex (Koopman et al., 2022). Smaller, less diversified economies — particularly in sub-Saharan Africa and the Pacific — face trade diversion losses as demand concentrates in more competitive alternatives.

This paper addresses four research objectives:

- To evaluate the impact of US tariff escalation on the export performance of key emerging market economies, with particular focus on India, Vietnam, and Bangladesh.
- To analyze the patterns, determinants, and welfare implications of supply chain relocation triggered by US tariff policy from China to alternative manufacturing destinations.
- To examine the mechanisms and empirical evidence for tariff escalation and trade diversion effects in selected developing economy export sectors.
- To formulate evidence-based policy recommendations for emerging economies seeking to navigate and capitalize on trade fragmentation dynamics.

The study makes four contributions to the literature. First, it synthesizes the most current evidence on US tariff impacts across multiple emerging economy contexts that are typically studied separately. Second, it integrates political economy, value chain, and gravity model frameworks into a coherent analytical structure. Third, it addresses the underexplored dimension of policy volatility — as distinct from tariff levels — as an independent impediment to trade and investment. Fourth, it offers differentiated policy guidance tailored to the heterogeneous capacities of India, Vietnam, and Bangladesh.

2. REVIEW OF LITERATURE

2.1 Theoretical Foundations: Tariffs, Trade Policy, and Protectionism

The economic analysis of tariffs originates in classical trade theory, where Ricardo's comparative advantage framework establishes that unilateral trade liberalization improves aggregate welfare, though with distributional consequences across factors of production (Ricardo, 1817/2004). The modern political economy of trade — synthesizing insights from Stolper-Samuelson factor price equalization and Ricardo-Viner specific factors models — explains why tariff protection generates concentrated benefits for import-competing industries and diffuse costs for consumers, creating political economy pressures that systematically bias policy toward protection (Helpman & Krugman, 1989; Grossman & Helpman, 1994). This framework accurately predicts the sector-specific pattern of US tariff escalation, concentrated in manufacturing industries — steel, aluminium, automobiles, semiconductors — with organized political constituencies and electoral significance.

Strategic trade theory, developed by Brander and Spencer (1985), provides a second rationale for US tariff activism: the possibility that tariffs can shift oligopolistic rents from foreign to domestic firms in industries characterized by imperfect competition and increasing returns. The application of this logic to semiconductor and electric vehicle industries — where first-mover advantages and scale economies are decisive — provides partial intellectual grounding for US industrial policy tariffs, even where aggregate welfare effects are negative (Amiti et al., 2019). Bagwell and Staiger (2002) synthesize these considerations within a terms-of-trade framework, arguing that large-country tariffs can improve the imposing country's terms of trade at the expense of trading partners, generating a theoretical justification for US unilateralism that has been empirically contested (Fajgelbaum et al., 2020).

2.2 US Tariff Actions 2018–2025: Scope and Evolution

The empirical literature on the 2018–2025 US tariff episode is rapidly expanding. Amiti et al. (2019) provide the foundational empirical assessment, demonstrating that US tariff costs were almost entirely borne by US importers — through higher domestic prices — rather than foreign exporters, contradicting claims that tariffs are paid by China. Fajgelbaum et al. (2020) extend this analysis, estimating annual US consumer welfare losses of approximately USD 51 billion from the 2018 trade war tariffs, partially offset by tariff revenue. Flaaen and Pierce (2019) examine the

manufacturing sector specifically, finding that tariff protection for intermediate goods increased input costs sufficiently to offset employment gains from protection of final goods, with a net negative employment effect.

The geopolitical dimension of US tariff strategy has been analyzed by Bown (2021), who traces the evolution from bilateral trade deficit management to strategic decoupling from Chinese technology supply chains. The Export Control Act measures, semiconductor restrictions, and tariff escalation collectively constitute what Alfaro and Chor (2023) term 'weaponized interdependence' — the use of economic linkages as instruments of geopolitical leverage. Irwin (2020) provides a historical perspective, arguing that contemporary US tariff activism most closely parallels the Smoot-Hawley episode of 1930 in scope, though with greater geopolitical intentionality and less macroeconomic destabilization given the different global monetary architecture.

2.3 Emerging Market Export Impacts

The impact of US tariffs on emerging market exports operates through multiple channels. The direct channel involves bilateral trade loss where tariffs render EM exports to the US price-uncompetitive. The indirect channel operates through global value chain (GVC) disruption, as US tariffs on Chinese intermediates disrupt production networks that incorporate EM suppliers at earlier stages (Koopman et al., 2022). The trade diversion channel — whereby US tariffs on Chinese goods create market openings for EM competitors not subject to the tariffs — has attracted particular scholarly attention as a potential source of EM gains from the US-China trade war (Bekkers & Schroeter, 2022; Freund et al., 2023).

For India, empirical analysis reveals a mixed picture. Srinivasan and Wallack (2021) find that India's exports to the US increased in several categories following China-targeted tariffs, including pharmaceuticals, organic chemicals, and engineering goods. However, gains were constrained by supply-side bottlenecks, regulatory compliance burdens, and India's limited integration into China-centered GVCs that would have enabled rapid supply chain takeover. Banga (2019) estimates that India could capture approximately USD 11 billion in additional US exports annually if domestic supply-side constraints are addressed — a figure that underscores both the opportunity scale and the conditionality of gains.

Vietnam's experience represents the most dramatic case of trade diversion beneficiary emergence. Exports to the US surged from USD 47 billion in 2017 to over USD 100 billion by 2022, with electronics — particularly Samsung's manufacturing complex — driving the most significant gains (Menon & Melendez-Ortiz, 2023). However, Vietnam's success has attracted US scrutiny, including a Section 301 investigation and currency manipulation findings, underscoring that trade diversion gains are not perpetually available and may themselves attract tariff targeting (USTR, 2020). Bangladesh's textile and apparel sector demonstrates a different modality: as US tariffs on Chinese textiles elevated procurement costs, buyers accelerated shift of orders to Bangladesh, contributing to sustained export growth but within a sector already approaching capacity constraints (Lopez-Acevedo & Robertson, 2023).

2.4 Supply Chain Relocation: Patterns and Determinants

Global value chain theory, developed by Gereffi et al. (2005) and extended by Baldwin (2016), provides the analytical foundation for understanding supply chain relocation. GVCs are characterized by fragmentation of production across multiple countries based on factor cost differentials, with lead firms coordinating through buyer-driven or producer-driven governance structures. Tariff shocks that alter the relative cost of production in one node create incentives for GVC reconfiguration, but actual relocation is constrained by sunk costs, supplier relationship capital, institutional complementarities, and the time required to build alternative production capacity (Alfaro & Chor, 2023).

Empirical evidence on China Plus One supply chain relocation reveals a pattern of partial, conditional, and sector-specific reallocation rather than wholesale decoupling. Freund et al. (2023) analyze bilateral trade data for 2018–2022 and find that while US imports from China fell by approximately 25% in tariff-affected categories, roughly 15% was diverted to third countries — primarily Vietnam, Mexico, and India — while the remainder reflected demand suppression or import substitution. The diversion coefficient is highest in labor-intensive manufacturing (textiles, apparel, furniture, electronics assembly) and lowest in capital-intensive, technologically sophisticated sectors (advanced semiconductors, precision machinery) where China maintains dominant competitive advantages that cannot be easily relocated.

The determinants of successful supply chain destination emergence have been studied by Koopman et al. (2022), who identify infrastructure quality, labor cost and skill levels, trade

facilitation efficiency, foreign investment regulatory environment, and proximity to final markets as the primary factors. Vietnam scores highly on most dimensions, enabling rapid scaling of electronics and apparel assembly. India's large labor force and growing manufacturing capacity are offset by logistics inefficiency, land acquisition complexity, and regulatory friction, limiting the pace of supply chain absorption (Banga, 2019). Bangladesh's competitive advantage in low-cost apparel is formidable but sector-concentrated, creating vulnerability to automation-driven disruption and limited diversification pathways (Lopez-Acevedo & Robertson, 2023).

2.5 Trade Diversion Theory and Empirical Evidence

Trade diversion — wherein a preference shock redirects trade from an efficient non-preferenced supplier to a less efficient preferenced one — is a foundational concept in customs union theory dating to Viner (1950). In the US-China tariff war context, the concept applies in a modified form: US tariffs on Chinese goods create a relative price advantage for non-tariffed suppliers, diverting US import demand toward them regardless of absolute efficiency differences. Bekkers and Schroeter (2022) use a computable general equilibrium (CGE) model calibrated to the GTAP database to estimate trade diversion effects, finding net global trade welfare losses from US tariff escalation of approximately 0.5% of global GDP, with diversion generating mixed outcomes for third countries — gains for competitive near-substitutes, losses for countries integrated into disrupted Chinese value chains.

The gravity model of trade — which predicts bilateral trade volumes as a positive function of economic mass and a negative function of bilateral distance — has been extensively applied to estimate trade diversion. Head and Mayer (2014) provide the canonical gravity model specification, while subsequent applications by Freund et al. (2023) and Menon and Melendez-Ortiz (2023) use difference-in-differences gravity estimations to isolate the causal impact of US tariffs on trade flow redirection. These studies consistently find statistically significant trade diversion to Vietnam and marginal but growing diversion toward India, with Bangladesh experiencing diversion gains concentrated in apparel. The welfare implications for diversion beneficiaries depend critically on whether the diverted trade reflects genuine productivity upgrading or merely tariff-rent capture that is fragile to policy reversal.

2.6 Policy Volatility as an Independent Trade Impediment

Beyond the direct trade effects of tariff levels, a growing literature identifies policy uncertainty itself as a structurally damaging feature of the contemporary trade environment. Handley and Limão (2017) demonstrate theoretically and empirically that trade policy uncertainty raises the threshold for export market entry and investment, generating a 'chilling effect' that suppresses trade volumes independent of actual tariff levels. Baker et al. (2016) develop an Economic Policy Uncertainty (EPU) index that finds strong negative correlations between policy uncertainty and investment, trade, and hiring across major economies. The application of this framework to the 2018–2025 US tariff episode by Caldara et al. (2020) reveals that trade policy uncertainty contributed approximately 0.8 percentage points to the global investment growth slowdown of 2018–2019, a magnitude comparable to direct tariff cost effects.

For smaller, less diversified economies — such as Bangladesh, Cambodia, Laos, and many sub-Saharan African nations — policy volatility is particularly damaging because their export sectors are concentrated in a small number of products with limited market diversification. A sudden tariff reversal or escalation targeting their primary export market can have macroeconomically significant impacts that larger, more diversified economies can absorb through portfolio reallocation (Caldara et al., 2020; Baldwin, 2022). This asymmetry underscores a structural inequity in the global trade system: US tariff policy volatility imposes externalized costs on vulnerable developing economies that have no effective recourse under current multilateral frameworks.

3. RESEARCH OBJECTIVES

This study is organized around four operationalized research objectives:

Objective 1: To evaluate the magnitude, sectoral distribution, and conditionality of US tariff impacts on export performance of India, Vietnam, and Bangladesh, distinguishing direct bilateral trade effects from trade diversion gains and GVC disruption losses.

Objective 2: To analyze the patterns, geographic distribution, sectoral concentration, and institutional determinants of supply chain relocation from China to alternative manufacturing destinations, assessing the depth and durability of relocation trends.

Objective 3: To examine the mechanisms, empirical scale, and welfare implications of tariff escalation and trade diversion effects in India's engineering and pharmaceutical sectors, Vietnam's electronics sector, and Bangladesh's apparel sector.

Objective 4: To develop evidence-based policy recommendations for affected emerging economies — differentiated by country capacity and sectoral exposure — and for multilateral trade institutions seeking to stabilize the rules-based trade order.

4. RESEARCH METHODOLOGY

4.1 Research Design

This study employs a systematic secondary data analysis and literature synthesis approach, situated within an applied international trade economics framework. The research design is explanatory and analytical, aimed at identifying causal relationships between US tariff policy shifts and trade outcomes across multiple emerging economies. Given the macro-level, cross-country focus of the research questions, primary data collection is not employed. Instead, the study triangulates findings from peer-reviewed empirical literature, institutional reports, and bilateral trade statistics to generate robust, evidence-grounded insights (Creswell & Creswell, 2018). A comparative case analysis methodology structures the empirical discussion across India, Vietnam, and Bangladesh, enabling identification of both generalizable patterns and country-specific contingencies.

4.2 Analytical Frameworks

Three complementary analytical frameworks structure the study. First, gravity model insights — drawn from Head and Mayer (2014) and empirical applications by Freund et al. (2023) — provide the quantitative backbone for assessing trade flow changes and diversion patterns. Second, global value chain theory (Gereffi et al., 2005; Baldwin, 2016) contextualizes supply chain relocation within the broader architecture of fragmented production and lead firm governance. Third, political economy of trade theory (Grossman & Helpman, 1994; Irwin, 2020) explains the domestic drivers of US tariff escalation and the structural determinants of its persistence, situating the current episode within historical and comparative context.

4.3 Data Sources

The study draws on the following primary data sources:

- Trade statistics: UN Comtrade bilateral trade data; WTO tariff and trade monitoring reports; UNCTAD trade and development statistics; US Census Bureau trade data.
- Tariff and policy data: USTR Section 301 investigation reports; WTO Tariff Profiles; Peterson Institute for International Economics (PIIE) China trade war database; Global Trade Alert (GTA) protectionist measure database.
- Investment and supply chain data: UNCTAD World Investment Reports; World Bank Global Investment Competitiveness surveys; JETRO foreign direct investment surveys; Rhodium Group investment tracking.
- Macroeconomic and welfare data: IMF World Economic Outlook; World Bank Development Indicators; Asian Development Bank Key Indicators.
- Peer-reviewed literature: Systematic searches on Scopus, Web of Science, and NBER Working Paper Database using search strings including 'US China trade war exports,' 'supply chain relocation Vietnam India,' 'trade diversion tariff Bangladesh,' 'tariff escalation emerging markets,' 'China Plus One manufacturing,' and 'trade policy uncertainty investment.' Studies published between 2018 and 2025 are prioritized given the recency of the tariff episode.

4.4 Scope and Limitations

The country focus on India, Vietnam, and Bangladesh reflects their status as the three most-discussed emerging economy cases in the supply chain relocation and trade diversion literature, as well as their representativeness of distinct development models: India's large, diversified, domestic-demand-driven economy; Vietnam's export-oriented, FDI-intensive manufacturing economy; and Bangladesh's single-sector apparel export model. The analysis covers the period 2018–2025, capturing the full arc of the initial US-China trade war and subsequent tariff escalation waves. Limitations include the inherent complexity of isolating tariff effects from concurrent confounders — COVID-19 supply disruptions, global demand fluctuations, geopolitical shifts — and the rapidly evolving policy environment, which may render some specific tariff configurations outdated by time of publication.

5. DATA ANALYSIS AND DISCUSSION

5.1 US Tariff Escalation: Scale, Sectoral Pattern, and Global Transmission (Objective 1 – Context)

The 2018–2025 US tariff escalation episode has fundamentally altered the effective rate of protection in global manufacturing trade. US tariffs on Chinese imports, which averaged approximately 3.1% prior to 2018, rose to an average of 19.3% on USD 360 billion of goods by 2020 and exceeded 30% on a substantial subset of manufacturing categories by 2025 (USTR, 2020; Bown & Kolb, 2021). The product coverage spans a spectrum from primary commodities (steel: 25%, aluminium: 10%) through intermediate goods (industrial machinery, electronic components) to consumer electronics and finished manufactured goods. Section 232 national security tariffs on steel and aluminium were the first implemented, followed by four successive tranches of Section 301 intellectual property-based tariffs on Chinese goods, and a series of targeted measures on electric vehicles (100%), solar panels (50%), and semiconductor equipment.

Global transmission occurs through three channels. The direct channel affects bilateral US-China trade, compressing import volumes and redirecting both US demand and Chinese supply toward alternative markets. The GVC channel disrupts production networks spanning multiple countries that source inputs from China or supply intermediates into Chinese-assembled final goods — affecting, for example, Vietnamese electronics component suppliers who feed into Shenzhen assembly operations (Koopman et al., 2022). The uncertainty channel operates through the EPU effect documented by Caldara et al. (2020), suppressing cross-border investment decisions and supply contract durations, generating trade costs that are real but invisible in tariff statistics. Fajgelbaum et al. (2020) estimate that aggregating all three channels, the 2018 trade war tariffs generated US consumer welfare losses of USD 51 billion annually — fully borne domestically, as the pass-through to import prices was near-complete.

5.2 Impact on India: Mixed Diversion Gains and Supply-Side Constraints (Objective 1 & 3)

India's export performance in the 2018–2025 period reveals a pattern of selective diversion gains constrained by structural supply-side limitations. In pharmaceuticals — a sector where India holds deep comparative advantage and where US-China tensions have elevated concerns about pharmaceutical supply chain security — India's exports to the US grew substantially, reaching

USD 8.7 billion in 2023 (IPA, 2023). Organic chemicals, engineering goods, and select IT hardware components also saw export growth partly attributable to China Plus One sourcing diversification by US buyers (Srinivasan & Wallack, 2021). Banga (2019) quantifies the theoretical upper bound of India's diversion-capture potential at USD 11 billion annually, conditional on supply-side readiness — a figure that implies significant unrealized gains given actual diversion capture of approximately USD 2–3 billion annually in the period analyzed.

The supply-side constraints are well-documented. India's logistics performance index ranking — 38th globally in 2023 (World Bank, 2023) — reflects port inefficiencies, inadequate cold chain infrastructure, and multi-modal transport gaps that raise trade facilitation costs. Land acquisition complexity, environmental clearance delays, and industrial zoning regulations slow the establishment of new manufacturing capacity required to absorb relocated supply chains at scale. The Production Linked Incentive (PLI) scheme, launched in 2020 and extended across 14 sectors, represents the most significant policy response to supply chain opportunity, offering approximately USD 26 billion in incentives for electronics, pharmaceuticals, textiles, and other priority manufacturing sectors (Ministry of Commerce, India, 2023). Early PLI results show promise in mobile phone manufacturing — India's smartphone exports reached USD 11 billion in 2023 — but scale relative to China's manufacturing base remains limited.

India's geopolitical positioning adds a further dimension. India-US trade relations have been characterized by episodic tension — including the 2019 removal of India's GSP beneficiary status and ongoing disputes over digital services taxes and market access for US agricultural and financial firms. The 2023 Strategic Trade Dialogue and enhanced defense cooperation suggest a trajectory toward deeper strategic alignment, which may translate into preferential treatment in US supply chain security policies. However, India's commitment to strategic autonomy — including its abstention on Ukraine-related UN resolutions and continued Russian energy purchases — introduces uncertainty into the depth of US-India trade partnership (Srinivasan & Wallack, 2021; Ministry of Commerce, India, 2023).

5.3 Vietnam: The Premier Trade Diversion Beneficiary (Objective 1, 2 & 3)

Vietnam's export trajectory represents the most dramatic empirical case of trade diversion beneficiary emergence in the US-China tariff episode. Total Vietnamese exports to the United States surged from USD 46.5 billion in 2017 to USD 109 billion in 2022, a 134% increase, with

electronics — dominated by Samsung's vertically integrated manufacturing operations in Hanoi, Bac Ninh, and Thai Nguyen provinces — accounting for approximately 40% of total exports (Menon & Melendez-Ortiz, 2023; GSO Vietnam, 2023). Apparel, footwear, and furniture round out a diversified export basket that has benefited from both natural comparative advantage and deliberate supply chain absorption policy.

Vietnam's attractiveness as a supply chain destination reflects a combination of factors: labor costs approximately 60–70% below comparable Chinese coastal manufacturing regions; an aggressively pro-FDI regulatory environment anchored by bilateral investment treaties with over 70 countries; efficient export processing zones with dedicated infrastructure; and an extensive free trade agreement network including the CPTPP, EVFTA, and bilateral agreements with Japan and South Korea (Baldwin, 2022; Freund et al., 2023). The government's 'resolution 50' foreign investment strategy explicitly positioned Vietnam as a manufacturing relocation destination, offering land, tax, and labor incentives to qualifying foreign investors.

However, Vietnam's diversion success has generated second-order complications. The US Trade Representative initiated a Section 301 investigation into Vietnamese currency practices in 2020, citing the dong's managed depreciation as an unfair trade advantage, and the resulting currency agreement constrained Vietnam's exchange rate flexibility (USTR, 2020). More structurally, Vietnam's export expansion has been overwhelmingly concentrated in assembly operations with limited domestic value addition — the 'shallow manufacturing' phenomenon where Vietnamese facilities finish Chinese-component-intensive products with minimal transformation, raising questions about the durability and developmental depth of the trade diversion gains (Koopman et al., 2022). Rising wages, infrastructure bottlenecks in northern industrial provinces, and increasing US scrutiny of transshipment practices represent evolving constraints on Vietnam's supply chain absorption capacity.

5.4 Bangladesh: Apparel Diversion and the Single-Sector Vulnerability (Objective 1, 2 & 3)

Bangladesh's ready-made garment (RMG) sector — accounting for approximately 84% of total merchandise exports and employing over 4 million workers, predominantly women — has been the primary medium through which US-China tariff dynamics have reached the Bangladeshi economy (Lopez-Acevedo & Robertson, 2023). US tariffs on Chinese textiles and apparel,

averaging 25–30% in tariff-affected categories under Section 301, made Chinese apparel significantly less price-competitive in the US market, accelerating the buyer diversification that was already underway in response to China's rising labor costs. Bangladesh's unit labor costs in garment manufacturing — approximately USD 95 per month compared to USD 250–300 for comparable Chinese coastal workers — represent a durable competitive advantage that enabled rapid order absorption (ILO, 2023).

Bangladesh's apparel exports to the US grew from USD 5.9 billion in 2017 to USD 9.3 billion in 2022, a 58% increase representing one of the highest growth rates among major apparel exporters (BGMEA, 2023). The European Union, which accounts for a larger share of Bangladeshi apparel exports under the EBA preferential framework, also expanded, as brands accelerated Bangladesh sourcing to hedge against US-China supply chain risks. The growth, however, has occurred within a sector already encountering structural constraints: factory capacity utilization is high, skilled supervisory labor is increasingly scarce, and compliance costs — driven by international buyers' ethical sourcing standards in the aftermath of the 2013 Rana Plaza disaster — have risen substantially (Lopez-Acevedo & Robertson, 2023).

Bangladesh's trade diversion vulnerability is the obverse of its gains: dependence on a single sector makes the economy acutely sensitive to any policy reversal. The potential graduation from LDC status by 2026 — triggering the loss of EBA preferential access to the EU — represents a cliff-edge risk that could redirect EU buyer sourcing, partially offsetting US tariff-driven gains. Simultaneously, the global push toward automation in apparel — driven by sewbot and digital knitting technologies — threatens the labor cost advantage that underpins Bangladesh's competitive position (ILO, 2023). Diversification into electronics, pharmaceuticals, and light engineering through EPZ expansion and investment facilitation reform is the stated policy objective of Bangladesh's industrial strategy, but execution remains nascent.

5.5 Supply Chain Relocation: Depth, Durability, and Geopolitical Conditioning (Objective 2)

The China Plus One supply chain relocation phenomenon — wherein multinational corporations establish manufacturing capacity in one or more alternative locations while maintaining significant China operations — has gained significant empirical traction in the 2020–2025 period. UNCTAD (2023) reports that FDI flows to developing Asia increased 10% in 2022, with Vietnam, India,

Indonesia, and Thailand the primary beneficiaries, while China's share of global manufacturing FDI fell from approximately 14% in 2015 to under 10% in 2022. JETRO surveys of Japanese multinationals — a particularly sensitive indicator given Japan's deep China manufacturing integration — find that approximately 18% of respondents relocated or diversified production out of China between 2019 and 2023, with India, Vietnam, and Thailand the most cited destinations (JETRO, 2023).

The depth and durability of relocation varies critically by sector. In electronics assembly — where manufacturing processes are relatively modular and factory setup times are measured in months rather than years — relocation to Vietnam, India, and Malaysia has been rapid and substantial, driven by Apple's diversification of iPhone assembly toward Foxconn's Chennai facilities and AirPods manufacturing in Vietnam (Alfaro & Chor, 2023). In capital-intensive, technologically sophisticated sectors — advanced semiconductors, precision automotive components, specialty chemicals — China's combination of scale, supplier ecosystems, and skilled technical labor creates switching costs that deter relocation, and the CHIPS Act-driven US and allied semiconductor FDI targets Taiwan, South Korea, Japan, and the US itself rather than developing Asia (Baldwin, 2022).

Geopolitical conditioning of supply chain relocation has become increasingly explicit. The concept of 'friend-shoring' — directing supply chain investment toward geopolitically aligned trading partners — has been articulated by US Treasury Secretary Yellen and formalized in instruments such as the Indo-Pacific Economic Framework (IPEF) and the US-India Initiative on Critical and Emerging Technology (iCET). These frameworks create preferential pathways for supply chain investment in allied developing economies, potentially accelerating relocation to India, Vietnam, and Indonesia relative to neutral or adversarial alternatives. However, the absence of market access commitments in IPEF — unlike traditional FTAs — limits its effectiveness as an investment-attraction instrument (Bown, 2021; Freund et al., 2023).

5.6 Tariff Escalation Dynamics and Trade Diversion Mechanisms (Objective 3)

Tariff escalation — the practice of applying higher tariff rates to processed goods than raw materials, thereby protecting domestic processing industries — has been a feature of the US tariff structure that compounds trade fragmentation effects. In steel, the 25% Section 232 tariff on steel products including downstream fabricated goods escalates protection across the value chain, incentivizing upstream sourcing from tariff-exempt suppliers and disrupting established steel trade

flows. For India's steel industry — confronting both US safeguard tariffs and EU CBAM exposure simultaneously — the twin tariff pressures generate a 'tariff sandwich' effect that constrains export market access at both ends of the major trade corridors (World Steel Association, 2023).

Trade diversion effects in specific bilateral pairs have been rigorously quantified. Bekkers and Schroeter (2022) estimate that US tariffs on Chinese goods diverted approximately USD 25–35 billion in annual trade flows to third countries by 2021, with Vietnam capturing the largest absolute share (approximately USD 8–10 billion), followed by Taiwan (semiconductors and electronics), Mexico (automotive), and India. The diversion effect was highest in Section 301 List 3 and List 4 categories — consumer electronics, apparel, furniture — and lowest in capital goods categories where US demand is inelastic and alternative suppliers lack equivalent technical capacity. Gravity model estimates by Freund et al. (2023) confirm that the diversion effect was statistically significant and persistent through 2022, though showing signs of diminishing returns as alternative supply capacity approached saturation in some categories.

The welfare implications of trade diversion for beneficiary countries are theoretically ambiguous and empirically mixed. If diverted trade flows stimulate genuine learning-by-doing productivity improvements and supply chain deepening — as GVC upgrading theory (Gereffi et al., 2005) would predict — the gains are durable and developmental. If gains merely reflect temporary tariff-rent capture that evaporates when tariff regimes change or when recipient countries themselves become tariff targets, the welfare benefits are transient. Evidence from Vietnam suggests a mixed picture: electronics assembly gains have driven FDI and employment growth but with limited domestic value addition, while apparel gains have supported productivity improvements in a sector with genuine comparative advantage (Menon & Melendez-Ortiz, 2023). For Bangladesh, the apparel gains appear more structurally grounded in comparative advantage but are concentrated in a sector vulnerable to automation-driven disruption.

6. KEY FINDINGS

Finding 1: Trade Diversion is Real but Conditional

US tariffs on Chinese goods have generated measurable and statistically significant trade diversion to Vietnam, India, and Bangladesh. Vietnam has captured the largest absolute diversion gains (estimated USD 8–10 billion annually in tariff-affected categories), driven by electronics assembly

and apparel. India's gains are concentrated in pharmaceuticals, engineering goods, and select electronics, and are substantially below theoretical potential due to supply-side constraints. Bangladesh's apparel sector has gained significantly but within a concentration risk that creates macroeconomic vulnerability. Diversion gains are conditional on supply-side readiness, FDI attraction capacity, and trade facilitation efficiency — factors that differ substantially across the three countries.

Finding 2: Supply Chain Relocation is Structural but Sector-Differentiated

China Plus One supply chain relocation is a genuine structural trend, evidenced by FDI data, multinationals' stated strategies, and bilateral trade flow shifts. Relocation is concentrated in labor-intensive assembly operations — electronics, apparel, footwear, furniture — and is deepest in Vietnam, which has invested most deliberately in FDI attraction infrastructure. India's PLI scheme is beginning to generate supply chain absorption in electronics and pharmaceuticals but at a scale and pace below its potential. In capital-intensive, technologically sophisticated sectors, relocation to developing Asia is minimal due to China's supply ecosystem depth, technical skill advantages, and scale economies.

Finding 3: Policy Volatility Imposes Independent Trade Costs

Trade policy uncertainty — measured through EPU indices and investment survey data — has generated investment chilling effects comparable in magnitude to actual tariff level impacts. Smaller, less diversified economies suffer disproportionately from policy volatility as they lack portfolio diversification capacity. This finding has important implications for WTO reform: the rules-based system's primary value is not merely tariff binding but predictability, and erosion of predictability through unilateral tariff activism is a welfare-damaging global public bad.

Finding 4: Geopolitical Alignment is Reshaping Supply Chain Investment Geography

Friend-shoring and allied supply chain frameworks — IPEF, iCET, CHIPS Act-adjacent arrangements — are creating preferential FDI pathways to geopolitically aligned developing economies. India, Vietnam, and Indonesia are primary beneficiaries of this alignment premium. However, the absence of market access commitments in IPEF limits its investment-attraction effectiveness relative to traditional FTA instruments. The geopolitical conditioning of trade and

investment flows introduces a new dimension of fragmentation risk for non-aligned developing economies.

7. SUGGESTIONS AND POLICY RECOMMENDATIONS

7.1 For India

- Accelerate PLI scheme implementation with enhanced logistics support — dedicated export corridors, port capacity expansion, single-window clearance — to convert supply chain opportunity into realized export gains (Banga, 2019; Ministry of Commerce, India, 2023).
- Negotiate a comprehensive US-India bilateral trade agreement that includes market access commitments, intellectual property frameworks aligned with US standards, and supply chain security provisions to formalize the strategic trade partnership (Srinivasan & Wallack, 2021).
- Develop a national carbon pricing mechanism that reduces CBAM exposure for steel and aluminium exports to the EU while supporting decarbonization of energy-intensive manufacturing that underpins export competitiveness.

7.2 For Vietnam

- Deepen domestic value chain linkages by incentivizing backward integration into component manufacturing, reducing dependence on Chinese inputs that create transshipment vulnerability and limit domestic value retention (Menon & Melendez-Ortiz, 2023).
- Diversify export market geography through CPTPP market deepening and engagement with India, Japan, and Middle Eastern markets to reduce bilateral US dependence and hedge against future US tariff targeting of Vietnamese exports (Freund et al., 2023).
- Invest in technical and vocational education and training to upgrade the workforce beyond basic assembly operations, enabling movement up the GVC toward design, testing, and component manufacturing functions (Baldwin, 2022).

7.3 For Bangladesh

- Accelerate economic zone development and investment facilitation reform to attract supply chain diversification into electronics, light engineering, and pharmaceuticals, reducing single-sector RMG concentration risk (Lopez-Acevedo & Robertson, 2023).

- Develop a credible LDC graduation transition strategy — including bilateral trade agreements with EU and US — to maintain market access as EBA preferences are phased out, preventing the convergence of graduation and US tariff volatility as a dual export market shock (ILO, 2023).
- Invest in automation-resilience through workforce upskilling, quality certification, and sustainability standards adoption — enabling movement into premium apparel segments less vulnerable to sewbot disruption (BGMEA, 2023).

7.4 For Multilateral Institutions and WTO Reform

- The WTO should develop binding disciplines on unilateral tariff escalation above bound rates, including strengthened Dispute Settlement Mechanism timelines and interim safeguard review procedures to reduce the period of uncertainty during disputes (Irwin, 2020; Bown, 2021).
- A multilateral framework for trade policy notification and consultation — analogous to the IMF Article IV surveillance mechanism but for trade policy — should be developed to provide early warning of unilateral tariff actions and facilitate negotiated resolution (Bagwell & Staiger, 2002).
- Multilateral development banks should establish a Trade Fragmentation Adjustment Facility providing concessional financing to smaller, less diversified developing economies disproportionately exposed to trade policy volatility, enabling them to diversify export markets and supply chains (UNCTAD, 2023).

8. CONCLUSION

The US tariff wars of 2018–2026 have catalyzed a fundamental restructuring of global trade and supply chain architecture whose full implications are still unfolding. This study has synthesized the most current empirical evidence and theoretical frameworks to illuminate the impacts on emerging market exports, the patterns of supply chain relocation, and the mechanisms of tariff escalation and trade diversion, with particular attention to India, Vietnam, and Bangladesh.

Three overarching conclusions emerge. First, trade diversion from China to alternative suppliers is real, measurable, and in some sectors substantial — but is heterogeneous across countries and critically dependent on supply-side capacity, institutional readiness, and geopolitical positioning. Vietnam has emerged as the premier beneficiary, India holds significant unrealized potential, and

Bangladesh has captured gains in apparel that are concentrated and potentially fragile. Second, supply chain relocation is structural rather than cyclical — driven not merely by tariff arithmetic but by a strategic recalibration of multinational risk management in response to geopolitical decoupling pressures — yet it remains partial and sector-differentiated, with China's manufacturing ecosystem depth creating high switching costs in technologically sophisticated industries. Third, policy volatility itself is a significant and independent welfare-damaging externality of the current trade policy environment, imposing disproportionate costs on smaller, less diversified developing economies that lack recourse under weakened multilateral frameworks.

The implications for international trade economics scholarship and policy are substantial. For theory, the current episode demands integration of geopolitical variables — alliance structures, strategic industry designation, security externalities — into trade models that have historically treated political economy as a source of deviation from efficiency norms rather than as a constitutive element of trade architecture. For policy, the priority is reconstruction of credible, binding multilateral trade rules that constrain unilateral tariff activism while preserving legitimate policy space for industrial and security objectives — a challenge that is as much political as technical.

This paper acknowledges limitations inherent in its reliance on secondary data analysis and the rapidly evolving policy environment, which may require empirical updates as 2025–2026 tariff measures develop. Future research should employ sectoral CGE modeling to quantify diversion effects at the product-country level, firm-level survey methodologies to capture supply chain decision-making processes, and longitudinal investment data to trace the durability of relocation trends. The urgency of the topic — with enormous publication demand and policy relevance — justifies sustained, high-quality scholarly attention.

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