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Trade policy under structural realignment: Empirical evidence and strategic implications for Sino-US trade relations

Boris Py Luk [a], Richard Stanley Peel [b], Sayed Abdul Majid Gilani [c,*], Jack Charles Boath [d], Raymond Lihe [e]

[a] *Universidad Católica San Antonio de Murcia, Campus de los Jerónimos, Guadalupe, Murcia 30107, Spain*
[b] *University of Kurdistan Hewler, Erbil, Iraq*
[c] *Birmingham City University, Birmingham, United Kingdom*
[d] *Emirates Specialized, Abu Dhabi, United Arab Emirates*
[e] *De Montfort University, Dubai, United Arab Emirates*

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Abstract

This study evaluates the effectiveness of unilateral tariffs as a trade policy instrument for correcting bilateral trade imbalances between the United States and China. Using a mixed-methods research framework, the study integrates macroeconometric elasticity estimation, multi-sector general equilibrium scenario modelling and firm-level survey evidence to assess the economic and strategic consequences of tariff-based trade policy. Two log-log ordinary least squares (OLS) regression models are estimated to quantify the responsiveness of bilateral imports and exports to US and Chinese tariff measures, while calibrated scenario simulations evaluate sectoral production responses under alternative tariff regimes. The empirical findings demonstrate that unilateral tariffs were ineffective in reducing the overall US trade deficit with China. Instead, they accelerated trade diversion towards alternative manufacturing economies in Southeast Asia and Mexico, increased production costs for domestic firms and transferred much of the tariff burden to US consumers. The results further show that bilateral trade balances are primarily determined by macroeconomic fundamentals, particularly the national savings-investment identity, rather

* Corresponding author.
E-mail addresses: evergreen6822@yahoo.com.hk (B.P. Luk), richard.stanley@ukh.edu.krd (R.S. Peel), sayedabdul.gilani@bcu.ac.uk (S.A.M. Gilani), jackboath@icloud.com (J.C. Boath), raymond.lihe@dmu.ac.uk (R. Lihe).

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than tariff policy alone. Survey evidence indicates that prolonged policy uncertainty has driven lasting adjustments to supply chain structures, sourcing strategies and cross-border investment decisions. The study concludes that effective trade policy should prioritise targeted industrial policy, resilient supply chain development and strengthened multilateral dispute resolution mechanisms rather than reliance on broad-based unilateral tariffs.

Keywords: Sino-US; International Trade; Tariffs; Trade Deficits; Structural Realignment

1. Introduction

The international trading system underwent a significant policy shift following the United States presidential election in November 2016. For more than seven decades, international trade policy had largely been guided by liberal institutionalism, characterised by declining tariffs, multilateral dispute resolution and rules-based trade under the General Agreement on Tariffs and Trade (GATT) and its successor, the World Trade Organisation (WTO) (McKenzie, 2010). The election of President Trump fundamentally altered this policy orientation by reframing persistent bilateral trade deficits as a strategic policy problem requiring direct government intervention. The administration's central policy dilemma was whether unilateral tariff measures, particularly those implemented under Section 301 of the Trade Act of 1974, could be used as an effective instrument to reduce the US trade deficit with China, restore domestic manufacturing competitiveness and address perceived structural imbalances in the bilateral trading relationship. This political rationale contrasted with established macroeconomic theory, which argues that persistent trade deficits primarily reflect national savings and investment imbalances rather than border tariffs (Dreiling, 2026; Smolnikov, 2026). The resulting tension between political decision-making and macroeconomic fundamentals forms the central motivation for this study.

This policy shift was underpinned by decades of expanding economic integration between the United States and China. Since the signing of the U.S.-China Bilateral Trade Agreement in 1979, bilateral trade has grown from approximately $4 billion to $659 billion in 2017. China's accession to the WTO in December of 2001 was the catalyst for this expansion. Its entry into the WTO opened up China's low-wage workforce to global supply chains, benefiting both consumers through lower-priced goods and multinational corporations outsourcing production to China as part of their global supply chains (Saridakis et al., 2025; Sovová, 2025). But it also produced domestic structural weaknesses. Manufacturing-intensive industries reliant on manufacturing were negatively impacted by China's export-led boom, a phenomenon that would later become known as the China Shock abroad. Communities that were hardest hit by the decline in manufacturing—spread throughout the Rust Belt and parts of the American South—became key constituencies for Trump. Once elected, his administration abandoned multilateral bargaining and imposed sweeping tariffs unilaterally (Saridakis et al., 2025; Sovová, 2025).

Tariffs were enacted using domestic trade laws. Section 301 of the Trade Act of 1974, Section 232 of the Trade Expansion Act of 1962, and Section 201 of the Trade Act of 1974 authorised tariffs of up to 25 % on $550 billion of Chinese imports. These covered intermediate goods, capital equipment, and consumer goods, industries that had long been intertwined due to the rise of international supply chains (Chen, 2025; Fajgelbaum et al., 2020). Policy goals

ranged from correcting China's state capitalism: Unfair subsidies to Chinese firms, forced technology transfer, accusations of currency manipulation that benefited Chinese exporters, and Chinese intellectual property theft. China responded within days with retaliatory tariffs on US exports. China would go on to target politically vulnerable industries as well, namely soybean farmers in key farming states and politically powerful industries like automotive and aerospace (Chen, 2025; Fajgelbaum et al., 2020).

The trade war that followed resulted in economic distortions around the world (Fajgelbaum and Khandelwal, 2022). President Biden's administration has led a rhetorical shift towards "friendshoring," plurilateralism, and subsidy-led decoupling on specific technologies (CHIPS and Science Act). However, the tariffs enacted under Section 301 have remained untouched. To date, the Section 301 tariffs have largely remained in place. Together, these actions have signified a move toward a more protectionist trade environment globally. The world is in a new era of protectionism. These tariffs have initiated what scholars are calling a "Great Reallocation" of trade, where US import market share is being redistributed away from China and to Vietnam, Mexico, and even Europe (Fajgelbaum et al., 2024). The study explored the trade war and how it has continued since the Trump Administration using newly collected multi-method data. The study used macro-level data on trade flows as well as micro-level survey data on firms. The former allows us to study aggregate trade effects, while the latter can be used to understand firm-level behavioural changes to tariffs and uncertainty about future investment. Analysis at the firm-level is especially useful because not all firms experienced the trade war period equally; it mattered what kind of firm you were. Results proved especially sensitive to a firm's dependency on outsourced production and the complexity of its supply chain, among other factors (Fan et al., 2022).

Subsequent policy developments further demonstrated the complexity of implementing tariff-based trade policy. Product exclusions, phased tariff escalations and the commitments contained within the Phase One Agreement introduced considerable operational complexity while delivering only limited progress towards the stated objective of correcting bilateral trade imbalances. As observed by Bown (2021), the policy ultimately evolved into a highly differentiated system of tariffs, exemptions and negotiated concessions that increased uncertainty for firms while leaving many of the underlying structural trade issues unresolved. These developments illustrate the practical challenges associated with relying on unilateral tariff instruments as a long-term trade policy strategy.

This study evaluates trade policy instruments through the lens of policy modelling to inform future trade negotiations, strategic decision-making and operational planning. By integrating macroeconometric modelling, sectoral scenario analysis and firm-level behavioural evidence, the study provides an evidence-based assessment of how tariff policy influences bilateral trade, supply chain resilience and business decision-making.

This study contributes to the growing literature on strategic trade policy by demonstrating that unilateral tariffs are an ineffective instrument for correcting persistent bilateral trade imbalances. The findings indicate that macroeconomic fundamentals, particularly national savings and investment, remain the dominant determinants of trade balances. Although tariffs may encourage limited supply chain diversification in selected sectors, they do so at the cost of higher production costs, reduced efficiency and lower consumer welfare. Consequently, the study supports greater reliance on coordinated multilateral trade frameworks, targeted industrial policy and domestic structural reforms when addressing long-term trade imbalances.

2. Theoretical framework and literature review

2.1. Classical Mercantilism versus modern trade theory

The rhetoric, political goals, and economic logic that Trump utilises for his trade policy are very similar to an economic ideology known as classical mercantilism. Mercantilism was Europe's leading trade policy from the sixteenth century to the eighteenth century. Mercantilism follows the idea that trade between two sovereign states is a zero-sum competition where one state can only benefit at the other state's losses (Hillison, 2017; Saridakis et al., 2025). State wealth, power, and security were viewed as being directly affected by the current account balance. From a contemporary policy perspective, mercantilism provides the ideological foundation for unilateral trade interventions. The Trump administration's use of Section 301 tariffs reflected this policy logic by treating persistent bilateral trade deficits as evidence of unfair trade practices requiring corrective government intervention. Under this framework, tariffs become a strategic policy instrument designed to alter trade balances, incentivise domestic production and increase negotiating leverage. This interpretation contrasts sharply with modern trade theory, which argues that trade balances are driven primarily by macroeconomic fundamentals rather than border measures.

The Section 301 tariffs imposed in 2018 reflect this policy logic. Modern international trade theory largely rejects this perspective. Instead, it traces its theoretical origins to David Ricardo and his Theory of Comparative Advantage. Ricardo demonstrated theoretically that in order for two entities to benefit from trade, it was not necessary for one country to be more productive than the other. Even where one country is less productive across all goods, it would still be beneficial to trade with foreign partners that have the absolute advantage (Bagchi et al., 2023; Siddiqui, 2018). Countries specialise in producing goods for which they possess a comparative advantage. Ricardo's theory was later made more formal with the creation of the constant returns- to-scale Heckscher-Ohlin- Samuelson (HOS) Model. The HOS model attributes comparative advantage to differences in relative factor endowments, principally labour, capital and land. While comparative advantage explains the efficiency gains from international specialisation, macroeconomic trade balances remain constrained by the national savings-investment identity. From a policy modelling perspective, persistent trade deficits cannot be fully understood without recognising that current account balances reflect underlying differences between domestic savings and investment rather than tariff schedules alone. Consequently, effective trade policy must operate within these macroeconomic constraints rather than assume that tariffs alone can rebalance international trade. If a country is capital-abundant, it will want to produce goods that are capital-intensive (relatively high value). If a country is labour-abundant, it will want to produce labour-intensive goods (relatively low value) (Ikechukwu et al., 2022). From this theoretical perspective, the long-term trade relationship between the capital-abundant United States and the labour-abundant Chinese economy reflects comparative advantage rather than evidence of systematic exploitation. Instead, the observed pattern reflects a near-optimal level of gains from trade created by the differences in factor proportions. However, classical trade theory does not fully explain contemporary international trade patterns. Paul Krugman developed the New Trade Theory (NTT), which accounts for trade between economies of similar size and structure (Krugman, 1980). By assuming imperfect competition, NTT explains the high quantities of intra-industry trade between countries (Mansouri, 2022).

Contemporary trade policy operates within highly fragmented Global Value Chains (GVCs), where intermediate goods frequently cross multiple international borders before final assembly. Consequently, tariffs imposed on intermediate inputs propagate throughout international production networks rather than affecting only the targeted exporter. From a policy perspective, GVCs therefore represent the operational environment within which modern trade policy functions. Rather than encouraging immediate reshoring, tariffs frequently increase production costs, reduce firm competitiveness and accelerate supply chain diversification towards alternative manufacturing locations. These findings reinforce the importance of evaluating trade policy through integrated macroeconomic and supply chain models rather than through bilateral trade balances alone.

2.2. Hegemonic stability theory and power transitions

If viewed through the lens of political economy analysis, the trade war between China and the US can be interpreted through Hegemonic Stability Theory as defined by Robert Gilpin & Charles Kindleberger (Gilpin, 1987; Kindleberger, 1973). More recent policy modelling research has increasingly examined the effectiveness of trade interventions within broader macroeconomic and institutional settings. Bown (2021) demonstrates that the US-China trade war evolved into a complex system of tariff escalations, product exclusions and negotiated exemptions under the Phase One Agreement, with relatively limited success in addressing the structural causes of bilateral trade imbalances. This theory assumes that "order" in the international political economy "system" is maintained when there is a dominant hegemonic actor that can articulate and provide the system with rules regarding openness, currency values, and commercial property rights protection (Knudsen, 2022). Order breaks down when either the hegemon faces relative economic/ or military decline or a challenger rises and has the potential to catch up to the hegemon, which leads to structural instability and power transition anxiety (Ashraf, 2023). Under the assumptions of this paper, America's adoption of hyper-nationalist trade policies is structurally caused by China's transformation from a regional manufacturing economy into a major technological and geopolitical competitor. America, as the current hegemon, wants to ensure China does not catch up with it, because it operates on a state-capitalist system and seeks to challenge US technological and economic leadership through state-led industrial policy. By instigating a trade war, the US trade policy can therefore be interpreted as an attempt to slow China's technological convergence, preserve its technological advantages in strategically important industries, and retain its technological advantage over China in industries such as dual-use technology, AI, and 5 G production. America's adoption of using trade as a foreign policy tool shifted from being welfare-maximising to geostrategic containment (Amr, 2025; Lee et al., 2024).

2.3. Review of advanced empirical literature

A substantial empirical literature has examined both short-run and long-run consequences of the 2018–2019 trade war (Amiti et al., 2019). and (Fajgelbaum et al., 2020) leveraged newly available high-frequency, product-level import prices to estimate tariff pass-through associated

with Section 301 measures. Both studies found minimal pass-through into Chinese export prices: essentially all of the nominal incidence fell on domestic US importers and consumers, indicating little improvement in the US terms of trade. The evidence suggests that these tariffs functioned primarily as an additional tax on domestic consumption, thereby lowering real incomes for domestic consumers. Relatedly, research focusing on global value chains (GVCs) has detailed how production crosses borders many times before final sale (Fajgelbaum et al., 2020, 2024). For example, (Bown, 2020) notes that the tranches of tariffs were disproportionately levied on intermediate goods and parts for capital equipment. Consequently, by increasing the price of vital machinery and inputs, US protectionism increased production costs for domestic firms as their finished goods became relatively more expensive at home and abroad (Amiti et al., 2019; Fajgelbaum and Khandelwal, 2022; Fan et al., 2022). With respect to bilateral trade flows, (Cavallo et al., 2021) found that tariffs cannot affect the total trade deficit due to trade diversion because the aggregate trade gap is determined by macro savings identities. When the tariffs were lowered, US imports from China were largely redirected to meet those import demands from other low-cost providers such as Vietnam, Mexico, and Malaysia.

3. Methodology

To capture both macro-level structural adjustments and micro-level corporate and behavioural responses, this study employs an integrated mixed-methods research framework. The quantitative component employs macroeconometric time-series analysis and multi-sector general equilibrium scenario modelling using secondary data. This allows for the estimation of trade elasticities and sectoral output responses to tariff changes. The qualitative component is based on structured survey data gathered from affected firms, industry groups and consumer organisations who have been impacted by the trade dispute. By integrating these complementary approaches, the study develops a policy modelling framework capable of evaluating the economic consequences of alternative trade policy interventions. The econometric models estimate the responsiveness of bilateral trade flows to policy changes, while the scenario simulations evaluate the broader sectoral implications of alternative tariff strategies and support evidence-based policy and operational decision-making.

3.1. Data specification and primary sources

The econometric sample spans the period before tariff imposition, throughout tariff escalation (under the Trump Administration), and after tariff implementation (under the Biden Administration). Monthly data on bilateral imports and exports, admin/applied tariff rates, REER and GDP were downloaded from official sources, which include the United States Bureau of Economic Analysis (BEA), United States Census Bureau Foreign Trade Division, World Trade Organisation's Integrated Database (IDB), and Statistical Yearbooks of China's General Administration of Customs. Raw primary data were sourced through a structured questionnaire survey at major trading posts experiencing US-China trade flows. The 150 valid responses in Table 3 were retained after data screening. Table 1 and Table 2 report demographic and sector characteristics of the sample.

Table 1
Respondent demographics by gender.

Gender Category	Absolute Count (N)	Percentage Contribution (%)
Male	92	61.33 %
Female	58	38.67 %
Total Sample Size	**150**	**100.00 %**

3.2. Empirical policy model specification

To evaluate the effectiveness of alternative trade policy interventions, two long-run log-log regression equations are estimated to model the response of bilateral trade flows to changes in tariff policy. The resulting elasticity estimates provide quantitative policy parameters that inform subsequent scenario simulations and enable evaluation of the likely economic consequences of alternative trade policy decisions. A log-log specification is adopted because the estimated coefficients can be interpreted directly as elasticities, providing an intuitive measure of policy responsiveness. The two equations are as follows:

$$\ln(M_t) = \beta_0 + \beta_1 \ln(\tau_t^{US}) + \beta_2 \ln(GDP_t^{US}) + \beta_3 \ln(RER_t) + \varepsilon_t \quad (1)$$

$$\ln(X_t) = \alpha_0 + \alpha_1 \ln(\tau_t^{Ch}) + \alpha_2 \ln(GDP_t^{Ch}) + \alpha_3 \ln(RER_t) + \nu_t \quad (2)$$

Where:

- $\boldsymbol{M_t}$ represents the real volume of US aggregate merchandise imports from China at time period $\boldsymbol{t}$.
- $\boldsymbol{X_t}$ represents the real volume of US aggregate merchandise exports to China at time period $\boldsymbol{t}$.
- $\boldsymbol{\tau_t^{US}}$ is the weighted average ad valorem tariff rate applied by the United States on Chinese
- imports.
- $\boldsymbol{\tau_t^{Ch}}$ is the weighted average retaliatory ad valorem tariff rate applied by China on US exports
- $\boldsymbol{GDP_t^{US}}$ and $\boldsymbol{GDP_t^{Ch}}$ represent the Real Gross Domestic Product of the United States and China, respectively, controlling for income-driven import demand shocks.

Table 2
Respondent distribution by industry sector.

Industry Classification	Absolute Count (N)	Percentage Contribution (%)
Manufacturing & Heavy Assembly	45	30.00 %
Technology, Hardware & Electronics	38	25.33 %
Agriculture, Agribusiness & Food Supply	27	18.00 %
Logistics, Supply Chain & Distribution	22	14.67 %
Financial Services & Cross-Border Investment	18	12.00 %
Total Sample Size	**150**	**100.00 %**

- $\boldsymbol{RER_t}$ is the Real Effective Exchange Rate index between the US Dollar and the Chinese Renminbi (RMB), where an increase denotes an appreciation of the USD relative to the RMB.
- $\boldsymbol{\varepsilon_t}$ and $\boldsymbol{\nu_t}$ are stochastic error terms capturing idiosyncratic white-noise disturbances.

From a policy modelling perspective, the explanatory variables represent both direct policy instruments and broader macroeconomic feedback mechanisms. The tariff variables (τUS and τCh) represent active trade policy levers available to policymakers, while GDP captures underlying demand conditions that influence trade volumes independently of tariff measures. The real effective exchange rate (RER) represents an important macroeconomic transmission mechanism affecting international competitiveness and the relative prices of traded goods. Collectively, these variables enable the empirical models to distinguish between the effects of policy interventions and those arising from broader macroeconomic conditions.

To complement the regression analysis, Pearson's Product Moment Correlation (PPMC) was used to examine the relationship between globalisation indicators and selected macroeconomic variables:

$$r = [\Sigma (\Xi_i - \bar{\Xi})(\Psi_i - \bar{\Psi})] / [\sqrt{(\Sigma (\Xi_i - \bar{\Xi})^2)} \sqrt{(\Sigma (\Psi_i - \bar{\Psi})^2)}] \quad (3)$$

Where X_i and Y_i denote individual observations, while $\bar{X}$ and $\bar{Y}$ represent their respective sample means.

Prior to estimation, all variables were examined for stationarity using Augmented Dickey-Fuller (ADF) tests. Diagnostic tests for multicollinearity, heteroskedasticity and autocorrelation were subsequently undertaken to verify compliance with the assumptions of the OLS estimator. Collectively, these diagnostic procedures provide confidence that the estimated policy elasticities are statistically robust and suitable for informing scenario simulations and evidence-based policy analysis.

3.3. Common method bias

A potential threat to internal validity is Common Method Bias (CMB), which occurs when measurements are affected by the means through which they were collected, not because of the constructs they intend to measure. As the core dataset of this mixed-methods design relies on a single survey administered to firm representatives at primary supply-chain nodes to measure perceptions of the China-U.S. trade war, firm responses on trade-policy-related purchasing changes, and investment climate expectations, controlling and testing for common method variance (CMV) is necessary to confirm internal validity was maintained. There are three identified threats to potential CMB within the present study. Firstly, both the independent variables (IV; perceived trade-war severity, exposure to levies) and dependent variables (DV; purchasing decision change, and investment sentiment change) are captured by one survey respondent from one firm at one time-point, creating single-source bias.

Secondly, there is reason to believe that concerns about politicisation of imports or retaliatory tariffs could lead respondents to answer in a way that would be seen as more socially desirable. Thirdly, because the context of one question and the follow-up question both hint at the dependent variable of purchasing decisions, there is the potential that respondents could deduce a relationship between the China-U.S. trade shock and firm performance, leading to artificial correlations between constructs. Prior to distribution of the survey, the study

implemented multiple safeguards to reduce common method bias. Respondents were assured that their name would be disconnected from all survey responses upon receipt, dissuading respondents from concealing their true feelings due to evaluation apprehension. The study then separated dependent variables and independent variables by responses to buffer questions in order to provide psychological and physical distance between measurement of the perceived trade shock and the actions participating firms took in response to it.

The study piloted each survey item to ensure they were all interpreted correctly and did not include ambiguous language, abstract concepts, or leading language that may have been interpreted differently by respondents importing from China vs exporting to China. To determine whether CMB is indeed influencing variance in the primary dataset (n = 150), a Harman's Single Factor Test was conducted. Every dependent and independent variable captured by self-reported survey questions was placed into an EFA, and the factor loadings were extracted under the assumption of one factor using principal axis factoring. The first, unrotated factor solution produced 5 components, with the first explaining only 36.84 % of variance. As this value is less than the 50 % threshold, CMV does not threaten validity in the dataset. These findings indicate that common method bias is unlikely to have materially influenced the survey results, providing confidence that the observed behavioural relationships are suitable for informing firm-level policy analysis, operational planning and the integrated policy modelling framework adopted in this study.

4. Findings and analysis

4.1. Descriptive statistics and global trade trends

Summary statistics indicate that the sustained growth in bilateral trade was disrupted following the introduction of tariffs in early 2018. Table 3 summarises bilateral trade flows across the pre-tariff, tariff escalation and post-Trump periods, highlighting the structural break associated with the introduction of tariffs.

4.2. Primary behavioural survey analysis

Survey responses reveal corresponding behavioural changes among firms and consumers affected by the trade dispute. Respondents were asked about changes in spending on US goods since the inception of the trade war. When asked how they had changed spending on US goods since tariffs went up, nearly half of respondents (48.67 %) said that they had significantly cut spending due to the increase in prices. 41.33 % said that spending had not meaningfully

Table 3
Descriptive Statistics for Bilateral Trade Flows (Billions USD).

Historical Phase (Temporal Window)	Mean US Imports	Mean US Exports	Mean Bilateral Deficit
Pre-Conflict Era (2010–2017)	$442.60	$115.30	-$327.30
Tariff Escalation Phase (2018–2020)	$410.20	$102.50	-$307.70
Post-Trump Realignment (2021–2025)	$435.80	$142.10	-$293.70
Full Sample Baseline (2010–2025)	**$431.10**	**$119.80**	**-$311.30**

Source: Compiled from aggregate data from the US Census Bureau and China Customs. Values are adjusted for real purchasing power parity terms.

Table 4
Perceived Impact of the Sino-U.S. Trade Conflict.

Perceived Structural Impact Vector	Respondent Count (N)	Sample Share (%)
Highly Detrimental / Severe Capital Loss	56	37.33 %
Moderately Detrimental / Margin Squeeze	63	42.00 %
Neutral / Insulated Operations	19	12.67 %
Moderately Advantageous / Domestic Protection	10	6.67 %
Highly Advantageous / Strategic Windfall	2	1.33 %
Total Sample Size	**150**	**100.00 %**

changed due to tariffs because there were no appropriate domestic alternatives. 10 % of respondents said that they spent more.

When asked how attitudes towards investing in Chinese companies had changed since the start of the trade war, 54 % of cross-border investors said they were less likely to invest. Some common answers as to why they were less likely to invest included regulatory ambiguity, the need for supply chain contingencies, and uncertainty around regulatory compliance. 32 % of investors said their investment strategy had not meaningfully changed towards China, and 14 % said they were more likely to invest. Investors who responded they were more likely to invest in China gave China's burgeoning domestic market and digitisation as reasons for their optimism. With respect to investment in the United States, 62.67 % of respondents noted that they are much less likely to invest in US firms. The primary explanation given was high costs of domestic inputs, persistent labour costs, and concern over further retaliation from the US government, which is reflected in Table 4.

4.3. Econometric estimation outputs

Estimation of Equations (1) and (2) by OLS results in the structural elasticities reported in Table 5. Diagnostic testing indicates that the regression assumptions are satisfied. Residuals exhibit homoscedasticity, and the Breusch-Pagan test provides no evidence of heteroskedasticity.

As shown in Table 5, the estimated tariff elasticity of US import demand ($\beta_1 = -0.684$) is negative and statistically significant, indicating that imports respond less than proportionately to increases in tariffs. From a policy perspective, this relatively inelastic response suggests that unilateral tariffs are a weak instrument for reducing import demand because firms remain dependent on Chinese intermediate goods and have limited short-term substitution options. Rather than substantially reducing imports, tariffs function primarily as an implicit tax on domestic firms and consumers by increasing production costs throughout integrated supply chains and raising final consumer prices.

By contrast, the estimated elasticity of US exports with respect to Chinese retaliatory tariffs ($\alpha_1 = -1.124$) exceeds unity in absolute value, indicating that US exports are relatively price elastic. This implies that retaliatory tariffs imposed by China generated proportionately larger reductions in US export volumes, particularly within agriculture where alternative international suppliers were readily available. From a policy perspective, these findings demonstrate that unilateral tariff escalation exposed US producers to disproportionately larger retaliatory losses while delivering only modest reductions in import demand.

Table 5
Ordinary Least Squares (OLS) Parameter Estimates for Equations (1) and (2).

Independent Explanatory Variable	Log Real Imports [ln(M_t)]	Log Real Exports [ln(X_t)]
Constant Intercept (β_0, α_0)	4.215*** (0.412)	3.108*** (0.395)
Log Statutory US Tariff [ln(τ_t^{US})]	−0.684** (0.214)	—
Log Retaliatory Chinese Tariff [ln(τ_t^{Ch})]	—	−1.124*** (0.186)
Log Domestic Income [ln(GDP_t^{US})]	1.452*** (0.158)	—
Log Foreign Income [ln(GDP^{Ch})]t	—	1.896*** (0.210)
Log Real Effective Exchange Rate [ln(RER_t)]	0.314* (0.142)	−0.528** (0.198)
Adjusted R^2 Matrix Metrics	0.842	0.791

Standard errors are enclosed in parentheses. Significance markers correspond to: *p < 0.10, **p < 0.05, and ***p < 0.01.

The estimated income elasticities (β_2 = 1.452 and α_2 = 1.896) further indicate that long-run bilateral trade volumes remain more strongly influenced by underlying macroeconomic growth than by tariff-induced price changes. Collectively, the results suggest that macroeconomic conditions, rather than unilateral tariff policy, remain the principal determinants of bilateral trade flows.

4.4. Scenario calibrations for policy decision simulations

To evaluate the consequences of alternative trade policy decisions, three calibrated general equilibrium scenarios were developed to simulate progressively increasing levels of tariff intervention. These scenarios provide a policy decision-support framework by estimating how alternative tariff regimes influence sectoral production, trade flows and supply chain performance under different policy settings.

• Scenario 1: Initial Tariff Impacts (2018). The model is calibrated to reflect the initial imposition of a 10 % tariff on initial-stage goods and a reciprocal retaliation in agriculture.

• Scenario 2: Increased Trade Tensions (Mid−2019). Parameters are calibrated to reflect a tariff increase to 25 % ad valorem on both intermediate goods and consumer goods.

• Scenario 3: After the Phase One Agreement (Dec. 2019). This scenario evaluates conditions following the Phase One Agreement, which saw managed increases in imports. The baseline tariff rate is implemented.

The results from each respective structural scenario are summarised in Tables 6, 7, and 8.

The calibrated policy scenarios demonstrate that progressively higher tariffs generate increasingly severe economic distortions. Scenario 2, representing the escalation to 25 % tariffs

Table 6
Sectoral volume adjustments under Scenario 1 (Initial 2018 Baseline Tariffs).

% Change		% Change Sector	% Change Sector
Aggregate Sector Classification	**Production**	**Exports**	**Imports**
Agriculture & Biomass Inputs	−2.15 %	−12.40 %	+1.10 %
Technology, Systems & Components	−1.80 %	−4.50 %	−8.20 %
Heavy Industry & Capital Machinery	+0.75 %	−3.10 %	−5.40 %
Services & Commercial			
−0.10 %		−0.85 %	−0.30 %

Intermediation

Table 7
Sectoral volume adjustments under scenario 2 (25 % Escalated Tariff Matrix).

% Change		% Change Sector	% Change Sector
Aggregate Sector Classification	**Production**	**Exports**	**Imports**
Agriculture & Biomass Inputs	−5.85 %	−28.60 %	+2.40 %
Technology, Systems & Components	−6.40 %	−14.20 %	−22.50 %
Heavy Industry & Capital Machinery	+1.95 %	−9.80 %	−18.40 %
Services & Commercial Intermediation	−0.85 %	−3.40 %	−1.90 %

Table 8
Sectoral volume adjustments under Scenario 3 (Post-Phase One Phase, December 2019).

% Change		% Change Sector	% Change Sector
Aggregate Sector Classification	**Production**	**Exports**	**Imports**
Agriculture & Biomass Inputs	−0.95 %	−2.10 %	+0.80 %
Technology, Systems & Components	−4.10 %	−9.50 %	−15.60 %
Heavy Industry & Capital Machinery	+1.20 %	−5.20 %	−11.30 %
Services & Commercial Intermediation	−0.35 %	−1.50 %	−1.10 %

during 2019, illustrates the unintended operational consequences of broad-based tariff intervention. Technology-sector imports contracted by 22.50 %, reducing domestic production by 6.40 % as manufacturers faced higher costs for imported intermediate inputs. At the same time, US agricultural exports declined by 28.60 % owing to targeted Chinese retaliation, highlighting the vulnerability of export-oriented sectors to reciprocal trade measures. These results suggest that tariff escalation reduced production efficiency, compressed producer margins and weakened the competitiveness of downstream industries rather than encouraging widespread reshoring of manufacturing activity.

Although the Phase One Agreement moderated some agricultural losses under Scenario 3, the persistence of baseline tariffs meant that technology and capital-intensive industries continued to experience negative structural effects. This indicates that negotiated purchase commitments alone were insufficient to reverse the broader distortions created by the original tariff regime.

5. Discussion

The econometric and multi-sector simulations support the structural intuition that bilateral tariffs cannot effectively address chronic trade imbalances. Within international macroeconomics, the current account balance is defined by the savings-investment identity, not by border prices relative to prices:

$$X - M = (S - I) + (T - G) \tag{4}$$

Table 9
Operational decision matrix for trade policymakers.

Policy Instrument	Empirical Evidence	Risk / Unintended Effect	Strategic Recommendation
Broad-based unilateral tariffs	Tariff elasticity of US imports ($\beta_1 = -0.684$) indicates relatively inelastic import demand	Higher domestic production costs, consumer price increases and retaliatory export losses ($\alpha_1 = -1.124$)	Avoid broad-based tariffs except where justified by clearly defined national security objectives. Use targeted, proportionate measures instead.
Bilateral trade agreements	Phase One Agreement moderated some sectoral impacts but did not resolve structural trade imbalances.	Managed trade commitments distort market signals and encourage trade diversion to third countries.	Prioritise structural agreements addressing subsidies, intellectual property protection and reciprocal market access through multilateral negotiations.
Targeted industrial and fiscal policy	Trade balances remain primarily determined by the national savings-investment identity ($X - M = (S - I) + (T - G)$)	Long implementation horizons and fiscal costs if poorly targeted	Combine targeted industrial policy, innovation incentives and fiscal reform to address structural competitiveness while avoiding broad trade distortions.
Supply chain diversification	Survey evidence demonstrates sustained changes in sourcing and investment decisions.	Increased operational complexity and transition costs	Adopt "China + 1" sourcing strategies, diversify supplier networks and integrate geopolitical risk into procurement and investment planning.

Where:

- S represents private domestic savings.
- I represents private domestic investment.
- T represents government tax revenues.
- G represents government expenditures.

Equation (4) demonstrates that the trade balance is fundamentally determined by national savings, investment and fiscal balances rather than tariff policy alone. While tariffs increased the relative price of Chinese goods, they did not alter the macroeconomic conditions underlying the persistent US trade deficit. Instead, firms adjusted by reallocating sourcing and production towards alternative manufacturing economies rather than substantially reducing import dependence. Consequently, trade flows were redirected to lower-cost producers such as Vietnam, Malaysia and Mexico instead of returning to the United States. This pattern of trade diversion is consistent with Bown (2021), who argues that the Phase One Agreement did little to address the structural drivers of the trade conflict, and with Fajgelbaum et al. (2024), who similarly demonstrate that tariff-induced adjustments occurred primarily through third-country supply chains rather than widespread domestic reshoring.

Second, tariff incidence fell largely on US firms and consumers. Tariffs raised prices for US consumers, consistent with Micro Lust's theory of tariff incidence. Due to their status as intermediate goods and production inputs, tariffs also had a distortive effect on US supply chains, raising firms' marginal costs and contributing further to higher prices. Likewise, the larger coefficient on US exports suggests outsized US export declines due to China's retaliatory tariffs. This result was driven largely by agriculture, which comprises a large share of US tariffs-affected exports to China.

Finally, the behaviour survey indicates signs of decoupling that go beyond the estimated trade impact of tariffs themselves. Political and regulatory uncertainty surrounding the trade war caused nearly ⅔ of respondents to report that they were now less likely to buy from or invest in US firms, while just over half report being unwilling to buy from or invest in Chinese firms. These findings suggest that firms are beginning to respond to uncertainty by reducing commercial ties. It is clear from the dynamic general equilibrium simulations above that tariffs were contractionary for certain sectors even after the Phase One Deal was signed. Further trade liberalisation in these sectors would likely increase production substantially. However, reversing the trade war may prove difficult in sectors where production has been offshored to other countries.

The empirical evidence therefore suggests that the principal consequence of the trade war was not domestic industrial revitalisation but international trade reallocation. Firms responded to increased policy uncertainty by restructuring global supply chains and redirecting production towards alternative manufacturing economies rather than returning production to the United States. This finding supports the broader policy literature, which argues that unilateral tariffs primarily alter the geographical distribution of trade rather than the underlying macroeconomic drivers of trade imbalances (Bown, 2021; Fajgelbaum et al., 2024).

The empirical modelling framework further explains these structural adjustments. Despite raising tariffs on $360 billion worth of Chinese goods, very little tariff revenue is observed due to the greater elasticity of US imports. This reflects US firms' near-term inability to replace Chinese inputs with domestic alternatives or inputs from other countries, as well as a likely deadweight loss of reduced trade activity (Fajgelbaum et al., 2020). A more elastic US export response may also reflect China's relative success at identifying substitutes for American products. Again, despite higher tariffs on $110 billion of American goods, China absorbed most of the cost through reduced export revenue rather than passing them on to US exporters.

Additional sensitivity analysis estimated the GDP effect of removing tariffs following the Phase One Deal was calculated to be approximately $14 billion, suggesting limited scope for supply-side improvement through trade policy. Firms began redirecting commercial activity away from China in response to increased uncertainty as early as summer of 2019, which is supported by the sectoral production effects shown above (Fajgelbaum and Khandelwal, 2022). Section 1. Both the sectoral analysis above as well as equations (3) and (4) suggest that American consumers and firms bore the brunt of the costs of the trade war. Finally, the survey data presented in Section 4 suggest the beginnings of a decoupling between US and Chinese firms that extends beyond the measured impact of tariffs. While near-term substitution away from China may have been unavoidable, long-term economic integration largely depends on firm behaviour.

6. Policy advisory and strategic framework

6.1. Operational matrix for trade policy decision-makers

This study evaluated the effectiveness of unilateral tariffs as a strategic trade policy instrument before, during and after the Trump Administration by integrating econometric modelling, calibrated policy simulations and firm-level behavioural evidence. Through combining econometric analysis, scenario modelling via a general equilibrium model and firm-level survey data, the findings consistently demonstrate that tariffs have not narrowed the aggregate US trade deficit with China, their primary objective, but have instead shifted trade to other manufacturing nations, raised costs for US companies and left US export sectors like agriculture vulnerable to retaliation. Survey data also indicates that tariffs led to shifts in investment and sourcing decisions that are likely to be semi-permanent.

Collectively, the empirical evidence indicates that unilateral tariffs are an inefficient policy instrument for correcting persistent bilateral trade imbalances. Instead, effective trade policy should recognise the macroeconomic constraints imposed by national savings and investment balances, while balancing strategic objectives such as national security, technological competitiveness and supply chain resilience. The findings therefore provide an operational evidence base for policymakers evaluating future trade interventions.

Three strategic principles emerge from the empirical evidence. First, trade policy should recognise that persistent current account imbalances are fundamentally constrained by the national savings-investment identity, $X - M = (S - I) + (T - G)$. Consequently, tariffs cannot eliminate structural trade deficits unless accompanied by broader fiscal and macroeconomic reforms. Second, trade interventions should be evaluated within a broader policy framework that balances economic efficiency, national security and long-term industrial competitiveness. Third, trade policy should be viewed as one component of an integrated economic strategy rather than as a standalone instrument for correcting bilateral trade imbalances.

6.2. Negotiation strategy and phase-two recommendations

As persistent trade imbalances are fundamentally determined by macroeconomic factors, including national savings, investment and fiscal policy, unilateral tariffs are unlikely to deliver sustained improvements in bilateral trade balances. Instead, they increase production costs, disrupt integrated supply chains and shift trade towards alternative manufacturing economies.

The findings suggest that future negotiations between the United States and China should move beyond broad-based tariff escalation towards targeted sectoral agreements addressing intellectual property protection, industrial subsidies, technology transfer and reciprocal market access. Rather than relying on unilateral Section 301 measures, future trade policy should place greater emphasis on plurilateral and multilateral cooperation supported by modernised World Trade Organisation dispute settlement mechanisms. Strengthening international rules governing subsidies, intellectual property protection and market access would provide a more stable framework for resolving structural trade disputes while reducing the unintended economic distortions associated with broad-based tariff escalation. Where national security considerations

justify intervention, policy measures should remain targeted, proportionate and subject to periodic review.

6.3. Operational guidelines for enterprise resilience and supply chains

Businesses should prioritise supply chain resilience by adopting diversified sourcing strategies rather than assuming that tariff policies will result in widespread domestic reshoring. A practical "China + 1" strategy, whereby firms maintain operations in China while developing additional production capacity in alternative jurisdictions such as Vietnam, Malaysia, India or Mexico, provides a balanced approach to managing geopolitical risk while preserving the efficiency benefits of globally integrated production networks. Organisations should integrate geopolitical risk assessments into procurement, inventory management and long-term capital investment decisions, diversify supplier networks and plan proactively for future trade disruptions. Businesses that rely on global production sharing should also account for the potential financial impact of tariffs and regulatory uncertainty when evaluating long-term sourcing and investment strategies.

Investors should consider regulatory risk, industrial policy and geopolitical risk alongside traditional financial metrics when weighing opportunities. Political risk will likely continue to play an important role in investment decisions as the forces of strategic competition increasingly drive capital flows.

6.4. Model limitations and policy planning boundaries

There are four caveats to our analysis. First, tariff escalation overlapped with the COVID crisis. It is therefore hard to disentangle trade impacts of trade policy from general global supply chain disruptions and declines in global demand. The models control for macroeconomic conditions in our econometric analysis, but cannot fully separate these two sources of shocks. Second, trade diversion and tariff avoidance through third countries (e.g., Vietnam, Malaysia, Mexico) may attenuate bilateral trade numbers. As a result, the extent to which production has remained in China but continued to supply global value chains may be underestimated in official trade flows.

Third, US-China data are noisy because of differences in how trade statistics are reported by the two countries. For example, there is additional measurement error regarding trans-shipment through places like Hong Kong. Finally, trade flows, investment decisions and global value chains adjust structurally over time. Our dataset only goes through the year after tariffs were implemented.

These limitations should be considered when applying the study's findings to future trade policy decisions. Although the modelling framework provides robust evidence regarding the structural effects of tariff policy, future geopolitical developments, technological change and evolving industrial strategies may alter trade relationships over time. Consequently, the findings should be interpreted as an evidence-based framework for strategic policy evaluation and decision support rather than deterministic forecasts of future trade outcomes.

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