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Research Article

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The Impact of the Sino–US Trade War on Trade Diversion

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Abstract

Since 2018, when the United States imposed multiple rounds of large-scale tariff sanctions on China under the Section 301 Investigation, Sino–US trade friction has evolved into long-term strategic containment set against the backdrop of a profound restructuring of global value chains. This paper aims to systematically examine the trade diversion effect of Chinese exports under the trade war and its heterogeneous manifestations across industries. Drawing on industry-level trade data for 2006–2024, the study employs both stylized-facts analysis based on growth-rate trends and multivariate empirical testing models to compare the differential roles of the EU, ASEAN, and Belt and Road Initiative (BRI) countries as alternative trade markets.

Keywords: Sino–US trade war; trade diversion effect; export market diversification

Introduction

On May 14, 2026, a delegation led by the Trump administration visited China, and the bilateral diplomatic positioning shifted toward "constructive strategic stability," signaling that the relationship had entered a new normal of managing differences and long-term strategic competition. Against this macro context, an in-depth examination of the structural changes in trade flows carries significant strategic importance for assessing the resilience of industrial chains and national economic security.

Existing literature has largely focused on the macroeconomic impact of the trade war, transmission through global value chains, and the effects on a single region. Prior studies indicate that tariff shocks are transmitted and amplified along global value chains, and that different industries exhibit clear differentiation in their responses to trade friction [1]. Related empirical research confirms that, under the Sino–US trade friction, China's imports of intermediate goods have shown a tendency to shift toward the EU and BRI markets [2]. Quantitative analysis based on the GTAP model further verifies that BRI markets can effectively offset the external shocks arising from Sino–US trade friction [3]. At the micro level, research finds significant divergence in the development performance and coping capacity of different subsectors [4]. From the perspective of great-power competition strategy, the Sino–US trade friction is not a short-term trade conflict but rather carries long-term, structural evolutionary characteristics [5]. Nevertheless, existing research still has shortcomings: first, it fails to incorporate the EU, ASEAN, and BRI into a unified analytical framework, lacking horizontal cross-regional comparisons; second, tests of subsector heterogeneity are insufficient, making it difficult to precisely identify and distinguish trade-diversion industries from trade-suppression industries; and third, the dynamic evolutionary effects of trade diversion are insufficiently characterized.

This paper employs panel data on manufacturing subsectors for 2006–2024 to systematically examine the trade diversion effect of China's export trade under the Sino–US trade war and its industry heterogeneity, with particular emphasis on comparing differences in export absorption capacity among the three alternative markets of the EU, ASEAN, and BRI. The marginal contributions of this paper are threefold. First, it constructs a multi-region unified analytical framework that brings the EU, ASEAN, and BRI into the same research system, enabling parallel empirical tests of the trade diversion effect across the three markets and thereby filling the gap of missing multi-region comparisons in the existing literature. Second, it comprehensively covers 16 manufacturing subsectors and, through empirical analysis, clearly delineates trade-diversion industries from trade-suppression industries, further refining the evidence on industry heterogeneity and enhancing the precision and relevance of the conclusions. Third, it incorporates dynamic effect analysis to systematically reveal the phased evolutionary characteristics of trade diversion under the Sino–US trade friction, thereby providing solid empirical

support and decision-making references for stabilizing the overall foreign trade base, optimizing the export market layout, and enhancing the resilience of the industrial and supply chains.

1. Theoretical Basis and Research Hypotheses

The theoretical logic of this study rests on three points. First, tariff effect theory holds that tariffs impose trade restrictions through price and cost mechanisms; the additional tariffs levied by the United States on China directly raised cross-border transaction and compliance costs, weakening product competitiveness. Accordingly, we propose **Hypothesis H1 (Tariff Shock Effect)**: US tariff increases exert a significant suppressive effect on Chinese exports to the US, and the negative impact intensifies as the tariff rate rises.

Second, drawing on Viner's (1950) theory of trade diversion and the risk diversification theory [6], when bilateral trade costs surge abruptly, trade activity shifts toward third-party markets with more stable policies to hedge against the vulnerability arising from over-reliance on a single market [7][8]. To sustain export volumes, Chinese firms proactively redirect their export focus toward economies such as the EU, ASEAN, and the Belt and Road Initiative (BRI) countries [9]. Accordingly, we propose **Hypothesis H2 (Trade Diversion Effect)**: the obstruction of exports to the US significantly drives up exports to alternative markets.

Finally, based on the global value chain (GVC) division-of-labor theory [10][11], industry shocks exhibit chain-linked spillover effects and industry heterogeneity [12][13]. Accordingly, we propose **Hypothesis H3 (Industry Heterogeneity Effect)**: the trade diversion effect varies across industries—labor-intensive and standardized industries exhibit stronger diversion effects, whereas technology-intensive industries and those with a high degree of value-chain lock-in are more susceptible to sustained export suppression.

2.Research Design

2.1 Data Sources and Sample Selection

This study selects 2005–2024 as the research period, covering the entire process from China's steady growth following its WTO accession, to the shocks of trade friction, and the restructuring of supply chains. The sample countries take the United States as the core shock source, and select the EU, ASEAN, and 17 representative Belt and Road Initiative (BRI) countries as the recipient samples for trade diversion. At the industry level, the study focuses on 16 manufacturing subsectors. Regarding data processing, the core trade indicators are sourced from UN Comtrade and subjected to industry-standard conversion, then cross-validated against data from the General Administration of Customs of China; tariff data are derived from the WTO database; macroeconomic control variables and gravity-model variables come from the World Bank WDI and CEPII databases, respectively.

2.2 Model Specification

A fixed-effects model is employed, controlling for a linear time trend and adding year-level observable control variables. The specific equation is as follows:

$$growth_rate_{i,f,t} = \alpha + \beta_f \times (tariff_t) + \gamma_1 + \gamma_2 X_t + \delta \cdot year_num_t + \mu_i + \varepsilon_{i,f,t}$$

where *i*, *t*, and *f* denote industry, year, and export destination, respectively, with *f* covering the EU, ASEAN, and BRI countries(17 countries). The term $tariff_t$ represents the US tariff on China, X_t denotes the control variables, $\varepsilon_{i,f,t}$ is the error term, and $\delta \cdot year_num_t$ is the linear time trend, where I_f denotes the export growth rate of Chinese industry *I* to destination *f*.

3.Variable Definitions

Dependent variable: Year-on-year growth rate of exports. This measures the year-on-year growth rate of China's exports, disaggregated by industry and by destination (including the US, EU, ASEAN, and BRI countries), capturing changes in the direction of trade flows. Its unit is uniformly set as a percentage. In data processing, export values for each industry are extracted from customs data and their year-on-year changes are computed, thereby capturing the expansion or contraction of export scale across different industries under the background of trade friction.

Core explanatory variable: US weighted average tariff rate. This variable measures the differential impact of tariff policy changes on export growth rates toward different destinations by constructing an interaction term between the US weighted average tariff rate and the export destination. In economic terms, the coefficient of this variable reflects the percentage change in China's export growth rate to a specific market resulting from a 1% change in tariffs.

Control variables: The Herfindahl–Hirschman Index (HHI) is used to measure industry concentration; the closer its value approaches 1, the higher the degree of economies of scale or monopoly in the industry. This controls for differences in industry resilience to tariff shocks under different competitive structures. The number of patent applications and the year-on-year growth rates of government and corporate R&D expenditure are used to proxy technology intensity and innovation capacity, aiming to remove the interference of endogenous industrial technological progress on export growth and to identify the "net effect" of tariff shocks. The annual sum of China's stringency index, the annual sum of the US stringency index, the weekly sum of COVID-19 infections per million people globally, and the estimated total global actual infections (persons) measure the degree of impact of the pandemic. The stringency index (Oxford Stringency Index), based on the Oxford University tracker of countries' pandemic policy responses, is a quantitative indicator of policy intensity constructed by weighting nine indicators such as school closures and travel bans. China's and the US's pandemic stringency indices and global infection data are introduced to control for external disturbances arising from production disruptions, rising logistics costs, and asymmetric supply–demand fluctuations by quantifying policy intensity and pandemic scale. The GDP growth rates of the major trading partner countries are used to capture macro demand fluctuations and supply capacity changes in each market, excluding trade diversion driven purely by cyclical economic factors.

4.Descriptive Statistics

According to the descriptive statistics, the mean of the dependent variable (the growth rate of exports to the respective economies) ranges from 4.68% to 13.51%, with China's exports to ASEAN growing the fastest (13.51%), while EU exports to the US exhibit the greatest volatility (variance of 209.58). The mean of the core explanatory variable, "US total weighted average tariff," is 9.11%, with substantial volatility (variance of 65.92, ranging from 2.60% to 20.70%), suggesting a possible negative association with export growth. The control variables differ markedly: for example, China's GDP growth rate averages 7.95% and is relatively stable, whereas the pandemic-related stringency indices and infection counts exhibit an extremely wide range (e.g., global infections ranging from 25.13 million to 3.05 billion) due to only five effective sample periods, reflecting the non-uniformity and extreme volatility of the pandemic shock over the sample period.

5. Stylized Facts Analysis

5.1 The Trend of Sino–US Tariffs: Evolution from Long-Term Stability to High-Level Normalization

As shown in Figure 1, since 2010, Sino–US bilateral tariffs have undergone a dramatic evolution from "low-level operation" to "high-level oscillation." During 2010–2017, the US weighted average tariff on China remained at a very low level of around 3% for an extended period. The year 2018 marked a critical turning point: as multiple rounds of tariff lists were rolled out in rapid succession, the curve exhibited a vertical jump. Although a slight retreat occurred in 2020 under the influence of the "Phase One" agreement, tariffs still remained at a high level above 19%. Entering 2024–2025, driven by expectations of new legislation, tariffs showed signs of rising once again. It is thus evident that the high tariffs following the trade friction have taken on pronounced long-term and normalized characteristics.

5.2 Changes in China's Export Pattern: The Logic of Market Diversion Under External Shocks

Against the backdrop of persistently high tariffs, the geographic composition of China's exports has exhibited notable substitution and hedging characteristics. As shown in Figure 2, the growth-rate curve of China's exports reveals the profound adjustment of the trade pattern. First, exports to the US experienced a brief pulse of growth before the tariff increases of 2018, reflecting firms' "front-running exports" evasion behavior; however, once the policy took effect, growth rapidly turned negative and remained subdued for a prolonged period. Second, the cliff-like decline in exports to the US is strongly coupled with the counter-trend rise in exports to ASEAN and BRI countries, confirming a substantive shift of export focus toward emerging economies. Finally, the data also indicate that the cycle of declining export growth is significantly longer than the cycle of rising tariffs; this time lag suggests that supply-chain restructuring possesses considerable inertia and irreversibility.

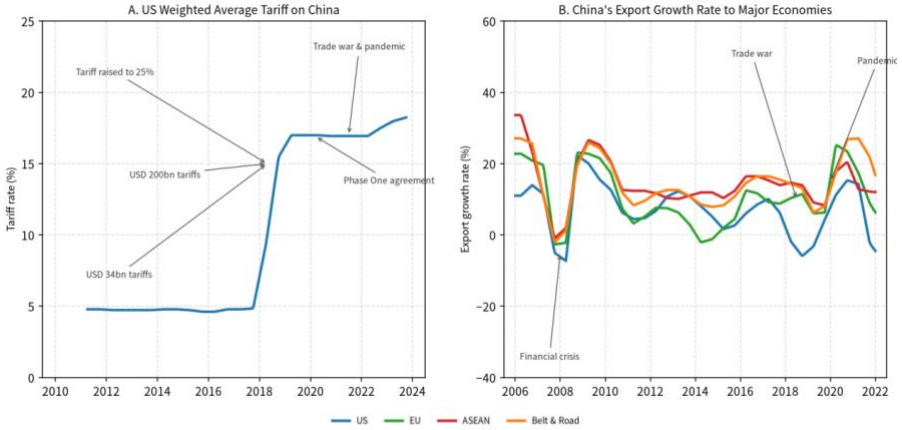


Figure 1 The US Weighted Average Tariff on China and China's Export Growth Rate to Major Economies

5.3 Industry Heterogeneity of China's Exports: Analysis Based on Manufacturing Subsectors

Although the macro-level exports exhibit a trend toward diversification, the performance of the sixteen manufacturing subsectors displays significant heterogeneity. As can be seen from Figure 3: on the one hand, industries represented by computers, communications, textiles, and furniture exhibit a "trade-diversion pattern," forming new "China–ASEAN–US" pathways through re-division of labor along the industrial chain, or successfully hedging risk by leveraging high product substitutability and demand from BRI countries, thereby achieving a geographic reorganization of supply chains. On the other hand, industries such as automobiles, ships, pharmaceuticals, and chemical products exhibit a "trade-suppression pattern": constrained by global value chain lock-in effects, extremely high switching costs, and specific market access barriers, tariff shocks have induced significant chain-like contraction rather than market migration. This divergence indicates that China's mid- and low-end industries and intermediate-goods industries have demonstrated greater flexibility in responding to external risks, whereas high-value-added and heavily regulated industries continue to face considerable supply-chain restructuring pressure amid a complex international situation.

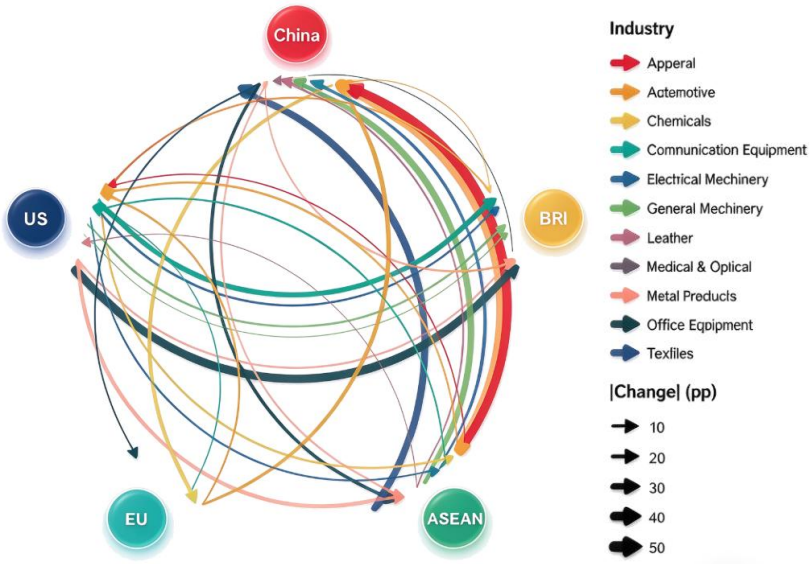


Figure 1 Regional-Industry Interaction Network

Data source: Author's calculations and visualization based on trade data from WITS.

6. Regression Results

6.1 Baseline Regression Results

Table 1 presents the baseline regression results. Models (1)–(4) adopt a gradual "stripping" strategy: starting from a specification containing only the core interaction terms and industry effects, controls are introduced successively for industry concentration (HHI), macro variables (patents, R&D, GDP, etc.), and a linear year trend. Among them, Model (4) is the main model of this paper. Model (5) replaces the linear trend with year fixed effects for a robustness check. All models use industry-clustered robust standard errors, designed to capture the growth differential of each export destination relative to the baseline group (exports to the US).

Table 1 Baseline Regression Results

Variable	(1)	(2)	(3)	(4)	(5)
Tariff×China–EU	−0.149	0.119	0.524***	0.603***	0.629***
	(0.107)	(0.110)	(0.116)	(0.120)	(0.121)
Tariff×China–ASEAN	0.037	0.305*	0.710***	0.789***	0.816***
	(0.153)	(0.149)	(0.157)	(0.157)	(0.159)
Tariff×China–BRI	0.131	0.400***	0.808***	0.887***	0.915***
	(0.102)	(0.082)	(0.104)	(0.103)	(0.100)
Control variables	No	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes

Variable	(1)	(2)	(3)	(4)	(5)
Observations	881	881	881	881	881
R^2	0.002	0.092	0.322	0.327	0.044
Adjusted R^2	0.007	0.095	0.316	0.320	0.330

*Note: The core explanatory variable data are sourced from WITS, GDP from the World Bank, pandemic data from Our World in Data, and industry concentration and technology-input variables from the National Bureau of Statistics. Computed and summarized using the R language. *** p<0.001, ** p<0.01, * p<0.05.*

The coefficients of Models (1)–(4) increase progressively and tend to stabilize, indicating that omitted variables had previously led to an underestimation of the trade diversion effect. The results of the main model (4) show that for every 1 percentage point increase in tariffs, China's export growth rate to the EU, ASEAN, and the BRI rises significantly by 0.603, 0.789, and 0.887 percentage points, respectively, relative to exports to the US (all significant at the 1% level), confirming a significant trade diversion effect, with the BRI countries exhibiting the strongest response.

6.2 Dynamic Effect Analysis

We employ an event-study approach, using 2016 (rel_year = −1) as the baseline period, to estimate the relative changes in China's export growth rates to different destinations in each year before and after the trade war. The model controls for industry and year fixed effects, with standard errors clustered at the industry level. The analysis is conducted below from two perspectives: the overall treated-group dynamics and channel-specific dynamics.

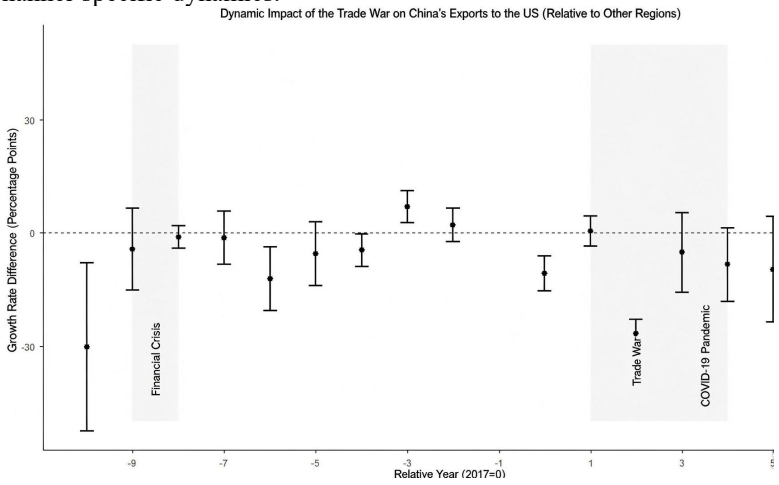


Figure 2 The Trade War's Impact on China–US Export Dynamics

Note: Author's own plot in R using the underlying data.

The dynamic analysis reveals that China's relative disadvantage in exports to the US had already emerged as early as 2017, when the Section 301 investigation was initiated (−10.77); in 2018, the coefficient was not significant due to firms' "front-running exports" effect; and in 2019, as tariffs escalated comprehensively, the negative shock reached its peak (−26.86). From 2020 to 2022, the negative impact eased and its significance diminished, owing to pandemic disruptions and hedging through market diversion; however, in 2023 the coefficient again turned significantly negative (−14.50), indicating that, against the backdrop of sustained tariffs and supply-chain restructuring, the negative shock of the trade war exhibits notable long-term persistence.

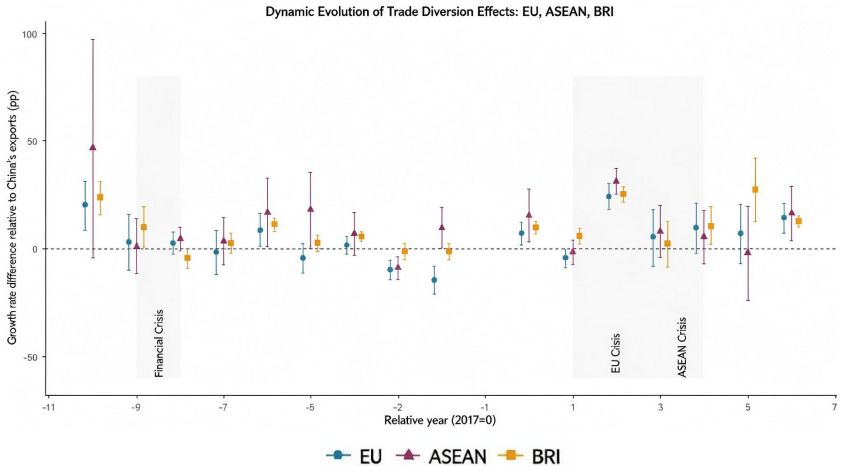


Figure 3 Dynamic Evolution of Trade Diversion Effects (EU, ASEAN, and BRI)

Note: Figure generated in R using the underlying data.

The above demonstrates that the Sino–US trade friction has significantly accelerated the diversified restructuring of China's export markets. The diversion effect toward the EU peaked in 2019 (coefficient of 24.14), subsequently retreated under pandemic disruptions, but turned significantly positive again in 2023 (14.23), indicating that, after European demand recovered, the advantage of imports from China was restored. The diversion toward ASEAN proved more sustained: the coefficient surged to 31.08 in 2019, remained positive throughout 2020–2022 despite pandemic fluctuations, and still reached 16.39 in 2023, confirming that ASEAN's role as a "China Plus One" supply-chain node has shifted from short-term substitution to strategic consolidation.

The diversion effect toward BRI countries was the most persistent and robust: it remained significant throughout 2017–2018, reached 25.12 in 2019, peaked at 27.35 in 2022, and still held at a high level of 12.63 in 2023, functioning as the "ballast" against external shocks. Meanwhile, China's export share to the US remained persistently weak, indicating that the impact of the trade friction carries long-term inertia. Overall, the friction has objectively accelerated the diversification of China's exports, and the regional supply-chain system centered on ASEAN and the BRI has become a key pillar sustaining China's trade resilience.

7. Research Conclusions and Policy Recommendations

Based on empirical analysis, this paper draws the following conclusions. First, the trade war significantly suppressed exports to the US, and the trade diversion effect holds overall. For every 1% increase in tariffs, China's export growth rate to the EU, ASEAN, and the BRI rises by 0.603, 0.789, and 0.887 percentage points, respectively, relative to exports to the US, with the reorientation of trade flows effectively hedging external shocks. Second, absorption capacity exhibits regional heterogeneity. BRI countries display the strongest resilience and absorption capacity, followed by ASEAN, which functions as a hub for industrial-chain re-export; the EU, by contrast, exhibits volatility constrained by standard barriers. Third, industry heterogeneity gives rise to two patterns. "Trade-diversion" industries such as computers, textiles, and machinery achieve market switching through supply-chain flexibility; whereas "trade-suppression" industries such as automobiles, pharmaceuticals, and chemicals face the risk of chain-like contraction owing to value-chain lock-in and high market access barriers. Fourth, the effect exhibits dynamic accumulation. Both the shock and the diversion intensify over time, and firms' supply-chain adjustments reflect long-term structural pressure and inertia. Accordingly, Chinese firms should implement tiered market diversification—with the BRI as the core, ASEAN as the hub, and the EU as a supplement—to optimize the export layout. The experience of localized, full-chain development in the textile and garment industry should be promoted, while the development of core technologies and local production capacity in industries such as electronics, automobiles, and pharmaceuticals should be

strengthened to enhance the autonomy and controllability of the industrial chain. For the electronics manufacturing sector, the RCEP should be leveraged to stabilize regional division of labor and address high-end shortcomings; for suppression-type industries, technological breakthroughs, mutual recognition of standards, and the cultivation of industrial clusters should be promoted. A dynamic trade-risk monitoring and early-warning mechanism should be established, guiding firms to plan their supply chains over the long term and improving the policy toolkit for stabilizing foreign trade.

References

1. Li Genqiang, Pan Weqing. Sino–US Trade Friction, Global Value Chain Division of Labor, and Welfare Effects. *Statistical Research*, 2022, 39(1): 75–90.
2. Jiang Muchao, Shu Li, Deng Xinghua. Trade War, Risk Exposure, and Intermediate Goods Imports. *Finance and Trade Research*, 2023, 34(3): 42–54.
3. Li Xiaoping, Zhang Zhou, Peng Shuzhou. Can the Belt and Road Initiative Alleviate the Negative Shock of the Sino–US Trade Friction? *Journal of Finance and Economics*, 2024, 50(9): 124–138.
4. Xu Zheng, Cheng Mengyao, Zheng Linhao. Strategic Choices for the Development of China's Private Economy Against the Background of US Tariff Increases. *Journal of Chongqing University (Social Science Edition)*, 2025, 31(4): 124–135.
5. Yu Miaojie. The Logic of the Sino–US Trade War and the Evolution of the Future Global Economic and Trade Landscape. *Journal of Liaoning University (Philosophy and Social Sciences Edition)*, 2025, 53(4): 1–8.
6. Zhang Chenghu, Yang Mengyun. Research on the International Impact of Sino–US Trade Friction and China's Countermeasures. *Theoretical Investigation*, 2018, (4): 93–98.
7. Du Yonghong. China's Foreign Economic Development Strategy Under the Background of Sino–US Trade Friction. *China Business and Market*, 2019, 33(1): 99–111.
8. Yu Zhen, Zhou Binghui, Xie Xubin, et al. Participation in Global Value Chain Restructuring and the Sino–US Trade Friction. *China Industrial Economics*, 2018, (7): 24–42.
9. Ning Guangjie. A Regional Statistical Study of Returns to Educational Human Capital. *Labor Economics Research*, 2021, 9(05): 45–66.
10. Xu Xianchun. Analysis of Accounting Methods for Macro Income Statistics Indicators. *Economics Dynamics*, 2020, (6): 4–18.