A Tariff Exposure Dataset for the U.S. Vehicle Supply Chain: Policy Evidence from the 2025–2026 Tariff Expansions

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Abstract

This paper documents the expansion of U.S. tariff policy during 2025–2026 and introduces a new, reproducible dataset measuring tariff exposure across the commercial and light vehicle supply chain. The analysis compiles detailed information from Federal Register notices and administrative actions, including Section 301 and Section 232 measures as well as antidumping and countervailing duty investigations, and organizes these policies into a consistent product-level panel at monthly frequency. By harmonizing tariff schedules with trade weights and supply-chain classifications, the dataset provides a transparent framework for measuring the intensity and timing of tariff exposure across vehicle-related industries.

In addition, the paper presents a set of stylized facts describing the evolution of key economic outcomes, including production, sales, prices, employment, and freight costs, during periods of tariff expansion. These descriptive patterns reveal substantial heterogeneity across segments of the vehicle market and highlight the role of input-cost channels and global supply-chain linkages in shaping industry dynamics.

The resulting data infrastructure is designed to support future empirical analysis of trade policy, including causal identification strategies based on sector-specific exposure variation. More broadly, the paper contributes to the measurement of tariff exposure in modern manufacturing networks and provides a publicly reproducible foundation for analyzing the economic effects of recent trade policy interventions.

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1 Introduction

Recent years have witnessed a renewed and sustained use of tariffs as a central instrument of U.S. trade policy. Beginning with the U.S.–China trade conflict in 2018, the United States implemented large-scale tariff measures under Section 301 of the Trade Act of 1974 and Section 232 of the Trade Expansion Act of 1962. These policies affected hundreds of billions of dollars of international trade and generated widespread debate regarding their effects on domestic production, prices, and supply chains.

A growing empirical literature documents that these tariff increases were associated with higher input costs for U.S. manufacturers, shifts in sourcing patterns, and measurable impacts on prices and trade flows. These findings highlight the importance of analyzing tariff policies within the context of global production networks, where intermediate inputs cross borders multiple times before final assembly.

This paper focuses on the recent expansion of U.S. tariffs during 2025–2026, with particular emphasis on the commercial and light vehicle supply chain. The automotive sector provides a particularly informative setting for studying trade policy shocks due to its reliance on globally integrated supply chains and its dependence on imported intermediate inputs. Tariff changes affecting upstream inputs may therefore propagate through production networks and influence domestic manufacturing activity, pricing decisions, and supply-chain organization.

Rather than proposing a broad research agenda, this paper makes a more focused contribution. It documents the recent expansion of U.S. tariff policy, constructs a structured dataset of tariff measures affecting the vehicle supply chain, and presents a set of stylized facts describing key economic outcomes associated with these policy changes. The resulting dataset provides a transparent and reproducible foundation for future empirical analysis of tariff exposure.

The paper contributes in three ways. First, it compiles and systematizes recent U.S. tariff policy changes across Section 301, Section 232, antidumping and countervailing duties, and related measures. Second, it constructs a product-level dataset that tracks tariff exposure across the vehicle supply chain at monthly frequency. Third, it documents stylized facts on production, sales, prices, employment, and trade patterns that characterize the economic environment surrounding recent tariff expansions.

2 Motivation and Policy Context

This paper documents the expansion of U.S. tariff policy during 2025–2026 and its relevance for the commercial and light vehicle industries. These policy changes represent a continuation and deepening of the trade interventions introduced during the 2018–2019 period, occurring in a post-pandemic environment characterized by supply-chain restructuring, elevated inflation, and persistent geopolitical tensions.

The central objective is to convert a large set of regulatory documents, including Federal Register notices and administrative actions, into a structured dataset that can be used to measure tariff exposure. Existing policy information is typically fragmented and difficult to integrate with economic data. By organizing these policy changes into a consistent product-level panel, this paper provides a foundation for empirical analysis of tariff exposure across sectors.

Unlike forward-looking research proposals, this paper focuses on delivering a concrete data product and documenting the economic environment in which these policies operate. The dataset constructed here is designed to support future causal analysis while remaining fully transparent and reproducible.

2.1 Tariff Policy Changes Affecting the Commercial and Light Vehicle Industries, 2018–2019

This section documents the major tariff policy developments during 2018–2019 affecting commercial vehicles, light vehicles, and associated automotive components classified primarily under Chapter 87 of the Harmonized Tariff Schedule (HTS). The summary is based on official Federal Register notices and administrative actions issued by U.S. trade authorities.[1]

The tariff measures implemented during this period were primarily introduced under Section 301 of the Trade Act of 1974 following an investigation conducted by the Office of the United States Trade Representative (USTR) into China's policies related to technology transfer, intellectual property, and innovation. Although the policy initiative was not designed specifically for the automotive sector, a substantial number of products used throughout vehicle supply chains were included in the tariff lists. As a result, manufacturers of commercial vehicles and light vehicles faced increased costs for a variety of imported intermediate inputs.

The policy developments described below form the institutional background for the empirical analysis conducted in Sosa (2026). That study constructs product-level tariff exposure indices using HS6 import data and pre-period China import shares in order to quantify the intensity of Section 301 tariff exposure faced by U.S. vehicle-related industries.

[1] All primary documents cited in this section are compiled from Federal Register notices collected in the author's policy dataset.

2.1.1 Implementation of Section 301 Tariff Lists

The most significant policy development during 2018–2019 was the phased implementation of tariffs on imports from China under Section 301 of the Trade Act of 1974.

In June 2018, the USTR announced the first tranche of tariffs, commonly referred to as List 1, covering approximately $34 billion in imports from China.[2] These tariffs were implemented at a 25 percent ad valorem rate and became effective on July 6, 2018. The list included numerous industrial products used in manufacturing supply chains, including machinery, electronic components, and specialized parts used in transportation equipment production.

A second tranche, List 2, was announced in August 2018 and covered approximately $16 billion in additional imports from China.[3] Like List 1, these tariffs were imposed at a 25 percent rate and expanded the scope of products subject to import duties, including additional industrial components used in transportation equipment and automotive manufacturing.

In September 2018, the USTR introduced a much broader tariff package, commonly referred to as List 3, covering approximately $200 billion in imports from China.[4] Unlike the earlier lists, these tariffs were initially implemented at a 10 percent rate, with a scheduled increase in 2019. The scope of List 3 was substantially broader and included a wide range of manufactured goods, many of which are used as intermediate inputs in automotive supply chains.

2.1.2 Tariff Escalation and Policy Adjustments in 2019

Trade tensions between the United States and China intensified during 2019, resulting in several adjustments to the existing Section 301 tariff framework.

In May 2019, the United States increased the tariff rate applied to products covered under List 3 from 10 percent to 25 percent, significantly increasing the effective tariff burden on importers sourcing goods from China.[5]

[2] Notice of Action Pursuant to Section 301: China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, Federal Register, June 20, 2018, https://www.federalregister.gov/documents/2018/06/20/2018-13248/notice-of-action-pursuant-to-section-301-chinas-acts-policies-and-practices-related-to-technology.

[3] Notice of Action Pursuant to Section 301: China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, Federal Register, August 16, 2018, https://www.federalregister.gov/documents/2018/08/16/2018-17891/notice-of-action-pursuant-to-section-301-chinas-acts-policies-and-practices-related-to-technology.

[4] Notice of Modification of Section 301 Action: China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, Federal Register, September 21, 2018, https://www.federalregister.gov/documents/2018/09/21/2018-20662/notice-of-modification-of-section-301-action-chinas-acts-policies-and-practices-related-to.

[5] Modification of Section 301 Action: China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, Federal Register, May 9, 2019,

Later in 2019, the USTR introduced a fourth tranche of tariffs targeting approximately $300 billion in additional Chinese imports. This tranche was divided into two groups. List 4A took effect in September 2019 with an initial tariff rate of 15 percent, covering a variety of consumer goods as well as certain vehicle-related components.[6]

The remaining portion, List 4B, was scheduled for implementation later in 2019 but was postponed following the partial trade agreement reached between the United States and China toward the end of the year.

2.1.3 Product-Level Coverage of Automotive Components

Although complete vehicles were largely excluded from the Section 301 tariff lists, the measures covered a wide range of automotive intermediate inputs used in both commercial vehicle and light vehicle production.

Examples of affected categories include electrical wiring equipment and electronic control modules used in vehicle electronics; structural metal components and fasteners used in chassis and body assemblies; automotive lighting systems, sensors, and electronic accessories; rubber and plastic components used in vehicle interiors and exterior fittings; and specialized machinery and equipment used in vehicle manufacturing processes. Many of these products fall under HTS Chapter 87 as well as related chapters covering industrial inputs used in transportation equipment production. Consequently, the tariffs primarily affected the upstream automotive supply chain, increasing input costs for domestic vehicle manufacturers rather than directly targeting finished vehicle imports.

2.1.4 Implications for the Vehicle Sector

The Section 301 tariff measures implemented during 2018–2019 represented one of the largest trade policy interventions affecting U.S. manufacturing supply chains in recent decades. For the commercial and light vehicle industries, the tariffs altered the cost structure of imported intermediate inputs sourced from China and introduced new uncertainty into cross-border supply relationships.

Because modern vehicle production relies heavily on globally integrated supply chains, tariffs applied to intermediate goods can propagate through the production process by increasing

https://www.federalregister.gov/documents/2019/05/09/2019-09681/modification-of-section-301-action-chinas-acts-policies-and-practices-related-to.

[6] Notice of Modification of Section 301 Action: China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, Federal Register, August 20, 2019, https://www.federalregister.gov/documents/2019/08/20/2019-17990/notice-of-modification-of-section-301-action-chinas-acts-policies-and-practices-related-to.

costs, encouraging supplier substitution, or altering sourcing strategies. These dynamics provide the motivation for the empirical analysis conducted in Sosa (2026), which quantifies tariff exposure at the product level and examines how these policy changes are associated with changes in U.S. commercial vehicle production and sales outcomes.

2.2 Tariff Policy Changes Affecting the Commercial and Light Vehicle Industries, 2025–2026

This section summarizes major tariff-related policy developments during 2025–2026 affecting commercial vehicles, light vehicles, and associated automotive components classified primarily under Chapter 87 of the Harmonized Tariff Schedule (HTS). The summary is based on official Federal Register notices and administrative actions issued by U.S. trade authorities.[7]

2.2.1 Implementation of USMCA Automotive Provisions

In January 2025, U.S. Customs and Border Protection issued interim final regulations implementing preferential tariff treatment and related customs provisions under the United States–Mexico–Canada Agreement (USMCA), including provisions directly applicable to automotive goods.[8]

The rule clarified preferential treatment eligibility, duty-deferral programs, drawback rules, and documentation requirements for automotive imports. Correcting amendments were later issued in September 2025 to address technical inconsistencies in the initial implementation.[9]

In February 2026, additional procedures were announced governing documentation requirements for medium- and heavy-duty vehicles qualifying for preferential tariff treatment under the USMCA. These procedures were introduced following the imposition of additional tariffs on specified medium- and heavy-duty vehicles and vehicle parts.[10]

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[7]All primary documents cited in this section are compiled from Federal Register notices collected in the author's policy dataset.

[8]Agreement Between the United States of America, the United Mexican States, and Canada (USMCA) Implementing Regulations Related to Textile and Apparel Goods, Automotive Goods, and Other USMCA Provisions, Federal Register, January 17, 2025, https://www.federalregister.gov/documents/2025/01/17/2025-00550/agreement-between-the-united-states-of-america-the-united-mexican-states-and-canada-usmca.

[9]Agreement Between the United States of America, the United Mexican States, and Canada (USMCA) Implementing Regulations; Correcting Amendments, Federal Register, September 8, 2025, https://www.federalregister.gov/documents/2025/09/08/2025-17122/agreement-between-the-united-states-of-america-the-united-mexican-states-and-canada-usmca.

[10]Procedures for Submissions by Importers of Medium- and Heavy-Duty Vehicles Qualifying for Preferential Tariff Treatment Under the USMCA To Determine U.S. Content, Federal Register, February 2, 2026, https://www.federalregister.gov/documents/2026/02/02/2026-02049/procedures-for-submissions-by-importers-of-medium–and-heavy-duty-vehicles-qualifying-for.

Taken together, these actions reinforced the regulatory architecture governing North American automotive trade while simultaneously tightening compliance and content verification requirements.

2.2.2 Expansion of Section 232 Tariffs on Automobiles and Parts

A significant policy development during 2025 was the expansion of tariffs under Section 232 of the Trade Expansion Act.

In September 2025, the Department of Commerce adopted procedures establishing a formal tariff inclusion process for automobile parts covered under a presidential proclamation adjusting imports of automobiles and automobile parts.[11]

This was followed by an October 2025 action formally adjusting imports of medium- and heavy-duty vehicles, medium- and heavy-duty vehicle parts, and buses into the United States.[12]

These actions marked a broadening of national-security-based tariffs beyond passenger vehicles into heavier commercial vehicle segments. Subsequent notices addressed tariff offsets and administrative inclusion procedures, indicating further institutionalization of the expanded Section 232 framework.[13]

2.2.3 Antidumping and Countervailing Duty Investigations

In parallel with structural tariff measures, 2025–2026 witnessed numerous antidumping (AD) and countervailing duty (CVD) investigations affecting vehicle-related goods.

Several investigations targeted imports from China under HTS Chapter 87 classifications:

- Brake drums classified under subheading 8708.30.50.[14]

[11] Adoption and Procedures of the Section 232 Automobile Parts Tariff Inclusions Process, Federal Register, September 17, 2025, https://www.federalregister.gov/documents/2025/09/17/2025-18015/adoption-and-procedures-of-the-section-232-automobile-parts-tariff-inclusions-process.

[12] Adjusting Imports of Medium- and Heavy-Duty Vehicles, Medium- and Heavy-Duty Vehicle Parts, and Buses Into the United States, Federal Register, October 22, 2025, https://www.federalregister.gov/documents/2025/10/22/2025-19639/adjusting-imports-of-medium–and-heavy-duty-vehicles-medium–and-heavy-duty-vehicle-parts-and-buses.

[13] Section 232 Tariff Offsets and Inclusion Processes for Automobiles and Vehicle Parts, Federal Register, November 26, 2025, https://www.federalregister.gov/documents/2025/11/26/2025-21114/agency-information-collection-activities-submission-to-the-office-of-management-and-budget-omb-for.

[14] Brake Drums From China and Turkey; Scheduling of the Final Phase of Countervailing Duty and Antidumping Duty Investigations, Federal Register, February 7, 2025, https://www.federalregister.gov/documents/2025/02/07/2025-02365/brake-drums-from-china-and-turkey-scheduling-of-the-final-phase-of-countervailing-duty-and.

- Low-speed personal transportation vehicles classified under multiple Chapter 87 subheadings, including 8703.10.50 and 8707.10.00.[15]
- Passenger vehicle and light truck tires from China.[16]
- Truck bed covers classified under subheading 8708.29.51.[17]

Other investigations involved chassis and subassemblies imported from Mexico, Thailand, and Vietnam under HTS 8716.39.00 and 8716.90.50, as well as van-type trailers and related components from Canada, China, and Mexico (U.S. International Trade Commission 2025a, 2025b).

The concentration of investigations involving Chinese imports is notable, particularly in core vehicle components such as braking systems, tires, and structural accessories.

2.2.4 Implications for the Vehicle Sector

The 2025–2026 policy developments reflect three broader trends in U.S. trade policy affecting the automotive industry.

First, the use of Section 232 authority expanded beyond traditional metals protection into a wider set of vehicle-related products, including medium- and heavy-duty vehicle components. Second, antidumping and countervailing duty instruments continued to target Chinese automotive and industrial inputs, reinforcing existing trade restrictions. Third, regulatory procedures governing tariff implementation and compliance became increasingly formalized through administrative rulemaking and enforcement mechanisms.

For commercial and light vehicle industries, these developments imply heightened exposure to tariff-based trade remedies and increased scrutiny of cross-border sourcing relationships. The policy environment during this period is characterized not by isolated trade actions but by a sustained and structurally embedded intervention in automotive trade flows.

[15] Low Speed Personal Transportation Vehicles (LSPTVs) From China; Scheduling of the Final Phase of Countervailing Duty and Antidumping Duty Investigations, Federal Register, February 11, 2025, https://www.federalregister.gov/documents/2025/02/11/2025-02467/low-speed-personal-transportation-vehicles-lsptvs-from-china-scheduling-of-the-final-phase-of.

[16] Passenger Vehicle and Light Truck Tires From China; Institution of a Five-Year Reviews, Federal Register, January 2, 2026, https://www.federalregister.gov/documents/2026/01/02/2025-24199/passenger-vehicle-and-light-truck-tires-from-china-institution-of-a-five-year-reviews.

[17] Truck Bed Covers From China; Institution of Antidumping and Countervailing Duty Investigations, Federal Register, March 2, 2026, https://www.federalregister.gov/documents/2026/03/02/2026-04026/truck-bed-covers-from-china-institution-of-antidumping-and-countervailing-duty-investigations-and.

3 Industrial Context

Understanding tariff exposure in the vehicle supply chain is particularly relevant for firms involved in logistics, manufacturing, and procurement. Tariff changes can affect sourcing strategies, input prices, inventory management, and production planning. By providing a transparent framework for measuring tariff exposure at the product level, the dataset developed in this project may help firms and policymakers monitor how trade policy changes propagate through complex supply chains.

According to the U.S. Bureau of Economic Analysis, the motor vehicle and parts manufacturing sector accounted for approximately 2.3 percent of total U.S. GDP in 2024, with an estimated output value of roughly $450 billion.[18] The sector is a major employer, supporting over 900,000 jobs directly and millions more indirectly through its extensive supply chain.[19] It is also a critical component of the broader manufacturing ecosystem, with deep linkages to steel, aluminum, electronics, and other intermediate goods sectors.

The vehicle sector is highly integrated into global value chains, with significant import penetration of both final products and intermediate inputs. For example, in 2024 approximately 40 percent of light vehicles sold in the United States were imported.[20] The share of imported parts and components used in U.S. vehicle production exceeds 50 percent for many categories of automotive inputs.[21] This high degree of trade exposure makes the vehicle sector particularly sensitive to changes in tariff policy, as cost increases from tariffs can directly affect production costs, pricing decisions, and ultimately demand for vehicles.

Moreover, the sector's reliance on steel and aluminum inputs means that it is also indirectly affected by tariffs on these upstream materials. Tariffs imposed under Section 232 of the Trade Expansion Act of 1962 on steel and aluminum imports raised input costs for downstream manufacturing industries, including vehicle producers.[22] These upstream cost shocks can propagate through supply chains and amplify the overall cost pressures faced by vehicle manufacturers. Given its economic significance and trade exposure, understanding the effects of the 2025–2026 tariff expansions on the vehicle sector is crucial for assessing the broader

[18] U.S. Bureau of Economic Analysis (BEA), *Gross Output by Industry*, Industry Economic Accounts, https://www.bea.gov/data/industries/gdp-by-industry.

[19] U.S. Bureau of Labor Statistics (BLS), *Employment, Hours, and Earnings from the Current Employment Statistics Survey*, Motor Vehicles and Parts Manufacturing (NAICS 3361–3363), https://www.bls.gov/ces/.

[20] Ward's Intelligence, *U.S. Light Vehicle Sales and Production Statistics*, various releases.

[21] U.S. International Trade Commission (USITC), *Automotive Products and Supply Chains*, and U.S. import statistics from USITC DataWeb, https://dataweb.usitc.gov.

[22] U.S. Department of Commerce, *The Effect of Imports of Steel on the National Security*, Section 232 Investigation Report, January 2018; U.S. Department of Commerce, *The Effect of Imports of Aluminum on the National Security*, January 2018.

economic implications of sustained trade policy shifts.

Changes in tariffs targeting auto part components are particularly important because they can have significant downstream effects on the entire vehicle supply chain. Tariffs on auto parts can increase production costs for vehicle manufacturers, which may lead to higher prices for consumers and reduced demand for vehicles. This can also affect the competitiveness of U.S. automakers in both domestic and international markets, potentially leading to job losses and reduced investment in the sector. Additionally, since many auto parts are sourced globally, tariffs can disrupt supply chains, leading to delays and increased costs for manufacturers. Empirical research on recent tariff episodes suggests that tariffs can generate substantial cost increases for U.S. manufacturers and may result in trade diversion, supply-chain restructuring, and changes in sourcing patterns.[23]

This paper documents the economic context in which recent tariff expansions occur and provides the data infrastructure needed to measure tariff exposure across the vehicle supply chain. The combination of policy documentation and stylized facts establishes a foundation for analyzing how tariff shocks interact with production, prices, and supply-chain dynamics. The vehicle sector provides a particularly informative setting for studying tariff effects due to its deep integration into global value chains, its reliance on steel and aluminum inputs, and its exposure to both Section 232 and Section 301 measures. By extending the analysis to this new policy episode, the proposed research will contribute to the literature by examining whether tariff pass-through, trade diversion, and employment effects persist, intensify, or evolve in an environment characterized by elevated freight costs, supply chain restructuring, and prolonged policy uncertainty.[24]

The primary contribution of this paper is the construction of a structured dataset that measures tariff exposure across the commercial and light vehicle supply chain. The dataset is built at a monthly frequency and integrates product-level tariff schedules, trade weights, and supply-chain classifications. By combining these elements, the data provide a consistent framework for measuring how tariff policy changes affect production networks.

[23] See, for example, Amiti, Mary, Stephen J. Redding, and David Weinstein (2019), "The Impact of the 2018 Tariffs on Prices and Welfare," *Journal of Economic Perspectives* 33(4): 187–210; Fajgelbaum, Pablo D., Pinelopi Goldberg, Patrick Kennedy, and Amit Khandelwal (2020), "The Return to Protectionism," *Quarterly Journal of Economics* 135(1): 1–55.

[24] For recent discussions of supply chain restructuring and post-pandemic trade dynamics, see Baldwin, Richard, and Rebecca Freeman (2022), *Supply Chain Contagion Waves: Thinking Ahead on Manufacturing 'Contagion and Reinfection'*, CEPR Policy Insight; and Freund, Caroline, and Melina Kolb (2023), "Supply Chains and Global Trade After the Pandemic," Peterson Institute for International Economics.

4 Literature Review

A growing literature examines the economic consequences of tariff increases and trade policy shocks. Recent empirical work analyzing the 2018–2019 U.S.–China trade conflict finds that tariffs had measurable effects on domestic prices, production costs, and trade flows. For example, Amiti et al. (2019) show that a large share of the tariff burden imposed during the trade war was borne by U.S. importers through higher prices. Similarly, Fajgelbaum et al. (2020) estimate substantial welfare losses associated with the tariff increases, highlighting how protectionist policies can distort production and consumption decisions across sectors. Evidence on tariff pass-through further suggests that tariffs often translate into higher prices both at the border and in retail markets (Cavallo et al. 2021).

Another strand of the literature focuses on the effects of trade policy shocks on manufacturing activity and production networks. Using detailed industry-level data, Flaaen and Pierce (2019) document that the 2018–2019 tariffs raised input costs for U.S. manufacturers that rely heavily on imported intermediate goods. Earlier work by Pierce and Schott (2016) demonstrates that changes in trade policy regimes can generate significant adjustments in U.S. manufacturing employment and production patterns. These findings underscore the importance of examining tariff policies within the broader context of globally integrated supply chains.

The present study is also related to the literature on the economic effects of import competition from China. The influential work of Autor et al. (2013) shows that rising Chinese import penetration had large and persistent impacts on U.S. labor markets and regional manufacturing outcomes. Although that literature focuses primarily on long-run structural trade shocks, it provides important context for understanding how trade policy changes can reshape domestic industrial activity.

More broadly, recent research emphasizes the role of trade policy uncertainty in shaping firm behavior and investment decisions. Handley and Limão (2017) show that reductions in trade policy uncertainty can stimulate export growth and investment, while increases in uncertainty may discourage firms from entering export markets. Complementary evidence by Caldara et al. (2020) documents that spikes in trade policy uncertainty can have significant macroeconomic effects, including declines in investment and economic activity. The broader macroeconomic literature on uncertainty shocks, including the influential work of Bloom (2009), also suggests that heightened uncertainty can reduce investment and delay hiring decisions.

Finally, several studies examine the interaction between trade policy and macroeconomic fluctuations. For example, Barattieri et al. (2021) show that trade policy shocks can propagate through macroeconomic channels and influence business cycle dynamics. These insights are particularly relevant for understanding the potential effects of the recent wave of tariff measures implemented in the United States.

The present research contributes to this literature by focusing on the commercial and light vehicle supply chain, a sector characterized by highly fragmented international production networks and substantial reliance on imported intermediate inputs. While previous studies have examined the aggregate effects of the 2018–2019 trade war, relatively little empirical work has analyzed how tariff exposure propagates through specific industrial supply chains at high frequency. By constructing a new monthly dataset of tariff exposure across vehicle-related sectors, this paper complements the existing literature by providing a structured dataset of recent tariff policy changes and documenting the economic environment in which these policies operate. This data infrastructure enables future empirical work examining how tariff exposure propagates through industrial supply chains.

5 Supply Chain Context and Stylized Facts

The purpose of this section is descriptive. It documents key economic outcomes that evolve alongside major tariff policy changes, without imposing a causal interpretation. This section documents several stylized facts about the U.S. vehicle sector and its broader supply chain during the period surrounding the major tariff policy interventions beginning in 2018 and continuing through the tariff expansions of 2025–2026. The goal is not to establish causal relationships but to illustrate the economic environment in which tariff exposure occurs.

Together, the figures and tables highlight how production, demand, prices, employment, and logistics costs evolved during a period characterized by trade policy shifts, pandemic disruptions, and supply-chain restructuring. These outcomes represent key economic margins through which tariff policies may affect the commercial and light vehicle industries.

5.1 Industrial Production

Figure 1, Figure 2, and Figure 3 provide a macroeconomic benchmark for evaluating tariff exposure in the vehicle sector. The figures show that motor vehicle production exhibits substantially larger cyclical swings than overall industrial production. This pattern reflects the vehicle industry's high exposure to global supply chains and its sensitivity to disruptions affecting imported intermediate inputs.

For trade policy analysis, this distinction is important. Tariffs applied to vehicle components or upstream inputs may generate stronger production responses in the vehicle sector than in the broader industrial economy. The figures therefore establish that vehicle production represents a particularly responsive margin through which tariff shocks may affect domestic manufacturing activity.

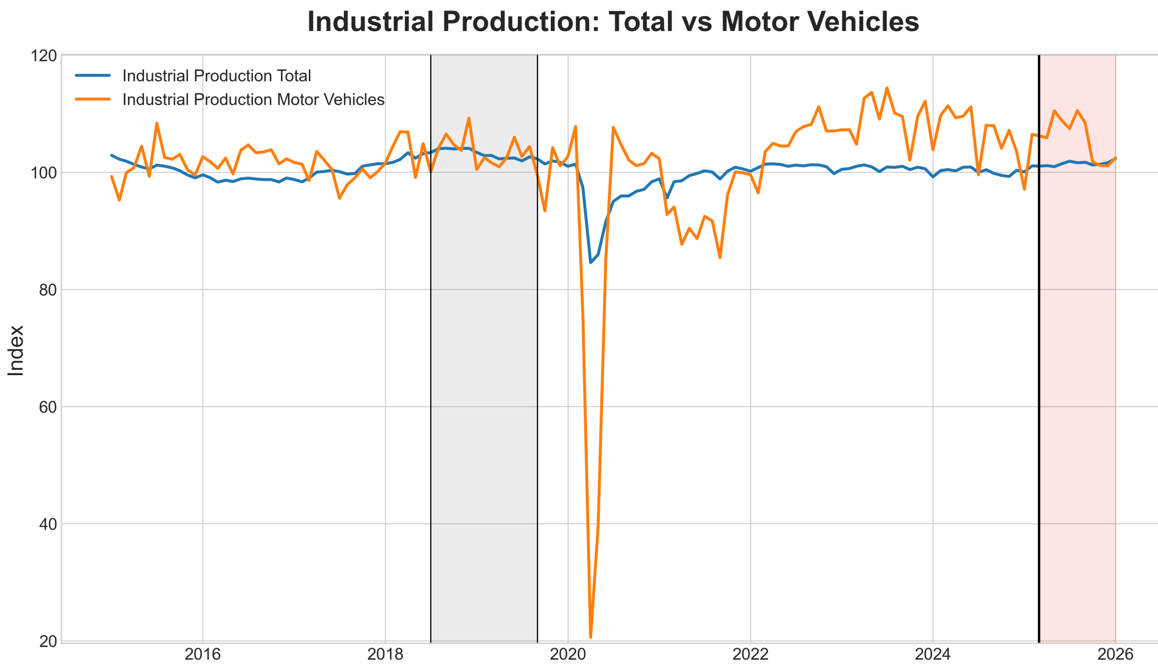

Figure 1

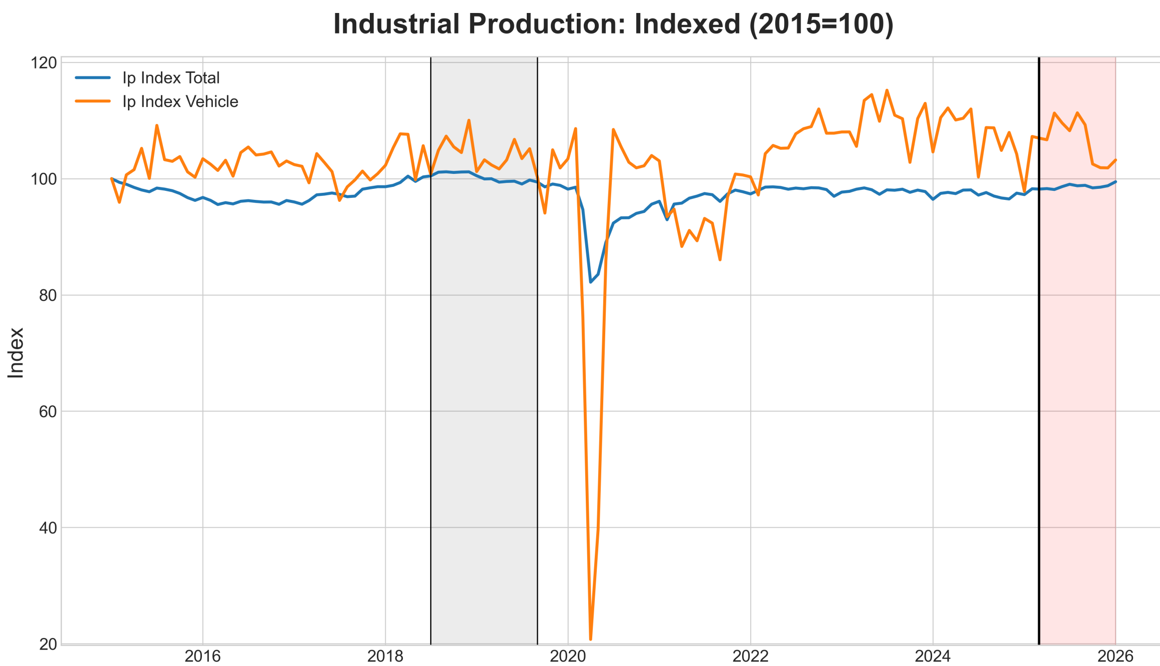

Figure 2

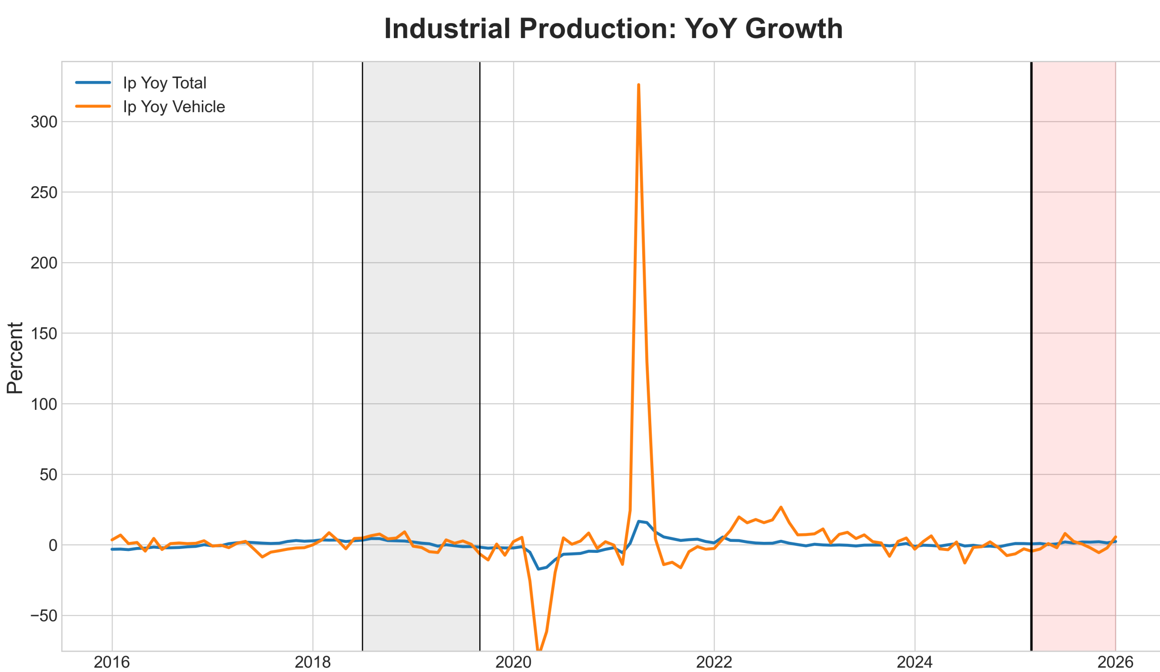

Figure 3

Table 1 summarizes industrial production across three policy periods that correspond to major phases of U.S. trade policy intervention. The table shows that motor vehicle production experienced far greater volatility than aggregate industrial production during the extended 2018–2025 period. This period includes both the initial Section 301 tariff implementation and the large supply-chain disruptions associated with the pandemic. The policy relevance of this result is that vehicle manufacturing appears particularly sensitive to shocks affecting international supply chains. Because the sector relies heavily on imported components and materials, tariff changes that alter input costs may propagate strongly into production outcomes.

Table 1: Summary Statistics for Industrial Production

Variable / Statistic	2015-01 to 2018-06	2018-07 to 2025-02	2025-03 onward
Total Industrial Production			
Mean	100.28	100.10	101.49
Std. Dev.	1.46	3.21	0.41
Min	98.31	84.56	100.97
Max	103.33	104.10	102.34
Motor Vehicles & Parts			
Mean	101.65	101.05	105.85
Std. Dev.	2.76	13.55	3.66
Min	95.24	20.58	101.12
Max	108.37	114.38	110.52
Observations (Months)	42	80	11

Table 2 highlights changes in production across the same policy regimes. The modest decline in industrial production during the 2018–2025 period contrasts with the larger decline in vehicle production, reinforcing the view that the vehicle sector is disproportionately affected by shocks affecting supply chains and input markets. The recovery observed after 2025 is also stronger in the vehicle sector than in aggregate industry. This pattern suggests that the sector may respond rapidly to improvements in supply-chain conditions or changes in trade policy, reinforcing the importance of studying tariff exposure within this industry.

Table 2: Percentage Change in Industrial Production Across Policy Regimes

Variable	% Change: (15-18) to (18-25)	% Change: (18-25) to (25+)
Total Industrial Production	-0.18%	1.40%
Motor Vehicles & Parts	-0.59%	4.75%

5.2 Sales

Figure 4, Figure 5, and Figure 6 illustrate the evolution of demand for light vehicles and heavy trucks. These outcomes are important because tariffs affecting vehicle components or upstream inputs may ultimately influence final vehicle demand through price adjustments and cost pass-through. The figures show that heavy truck sales display substantially greater cyclicality than light vehicle sales. This difference reflects the fact that commercial vehicle purchases are closely linked to business investment and freight demand, both of which are sensitive to economic conditions and logistics costs. For policy analysis, these dynamics suggest that tariffs affecting commercial vehicle supply chains may influence investment-related demand more strongly than consumer vehicle demand.

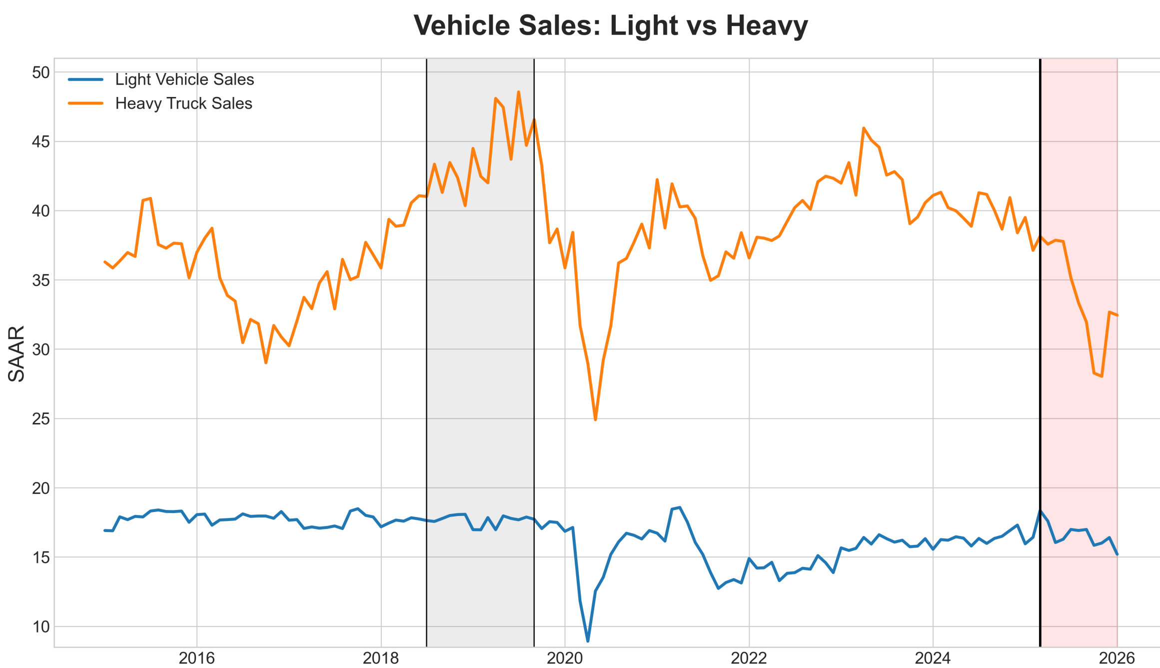

Figure 4

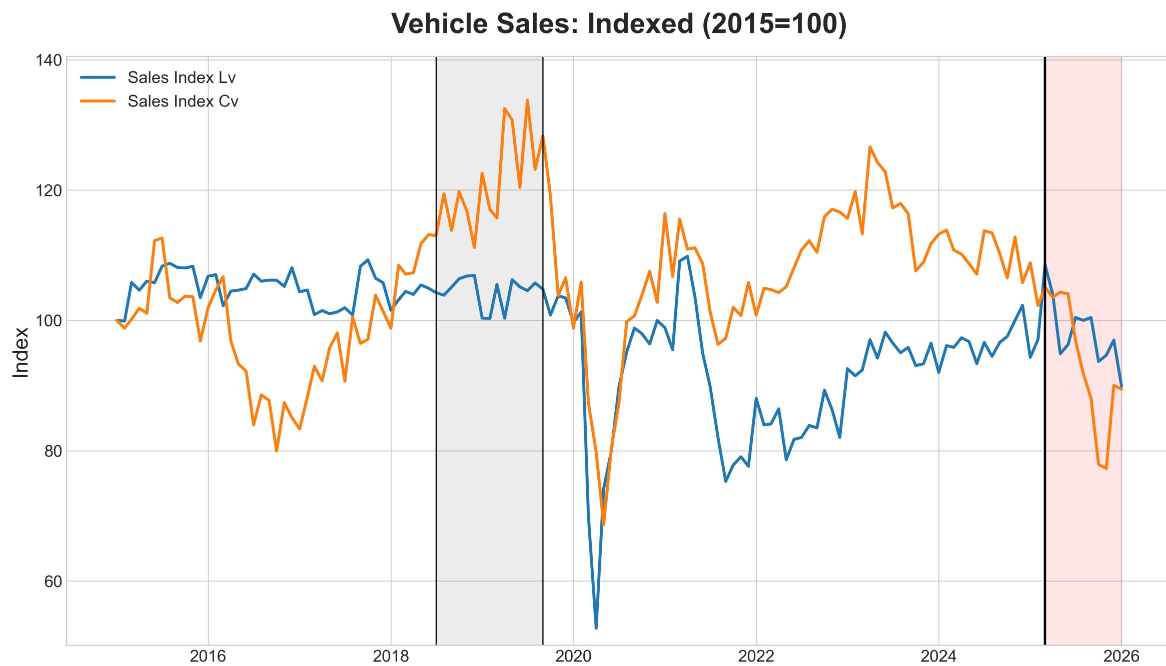

Figure 5

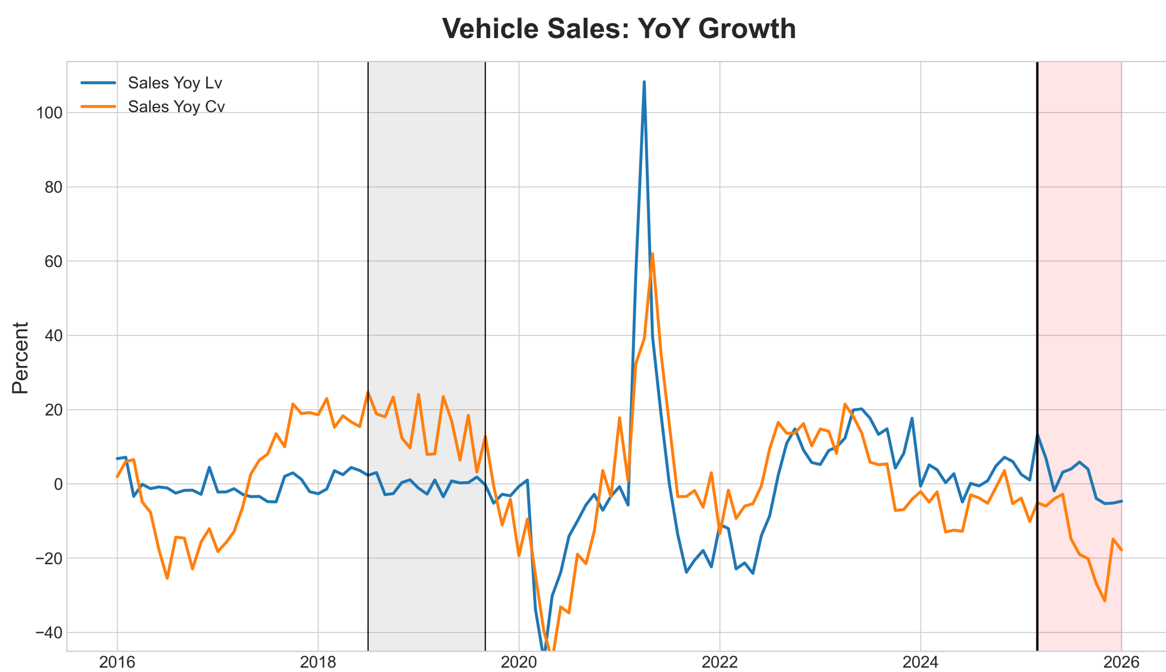

Figure 6

Table 3 and Table 4 confirm these differences across policy regimes. Light vehicle sales decline substantially during the 2018–2025 period and only partially recover thereafter. Heavy truck sales display a different pattern, initially expanding and later contracting. These differences highlight the heterogeneous responses that tariff policies may generate across segments of the vehicle market. Tariffs affecting intermediate inputs may influence the cost structure of vehicle production, but the final impact on demand can vary depending on the underlying economic drivers of each market segment.

Table 3: Summary Statistics for Vehicle Sales across Policy Regimes

Variable / Statistic	2015-01 to 2018-06	2018-07 to 2025-02	2025-03 onward
Light Vehicle Sales (Millions)			
Mean	17.74	15.90	16.60
Std. Dev.	0.44	1.74	0.88
Min	16.89	8.92	15.20
Max	18.48	18.57	18.35
Heavy Truck Sales (Thousands)			
Mean	35.70	39.89	33.93
Std. Dev.	3.08	4.05	3.71
Min	29.01	24.91	28.04
Max	41.07	48.56	38.14
Observations (Months)	42	80	11

Note. Light vehicle sales are reported in millions of units (SAAR), while heavy truck sales are in thousands of units (SAAR).

Table 4: Percentage Change in Vehicle Sales Across Policy Regimes

Variable	% Change: (15-18) to (18-25)	% Change: (18-25) to (25+)
Light Vehicle Sales	-10.39%	4.42%
Heavy Truck Sales	11.76%	-14.95%

5.3 Vehicle Pricing and Input Costs

Figure 7, Figure 8, and Figure 9 illustrate the price dynamics that link upstream commodity markets with downstream vehicle production. These price movements are particularly relevant in the context of tariffs because tariffs directly affect import prices and may propagate through production networks. The figures show sustained increases in both vehicle output prices and upstream input prices. In particular, steel and aluminum prices exhibit sharp spikes during periods associated with trade policy tightening and supply-chain disruptions. Because these materials represent core inputs in vehicle manufacturing, price movements in upstream metals markets may transmit directly into vehicle production costs. For the purposes of this study, these figures highlight an important mechanism through which tariffs may influence the vehicle sector: input-cost pass-through.

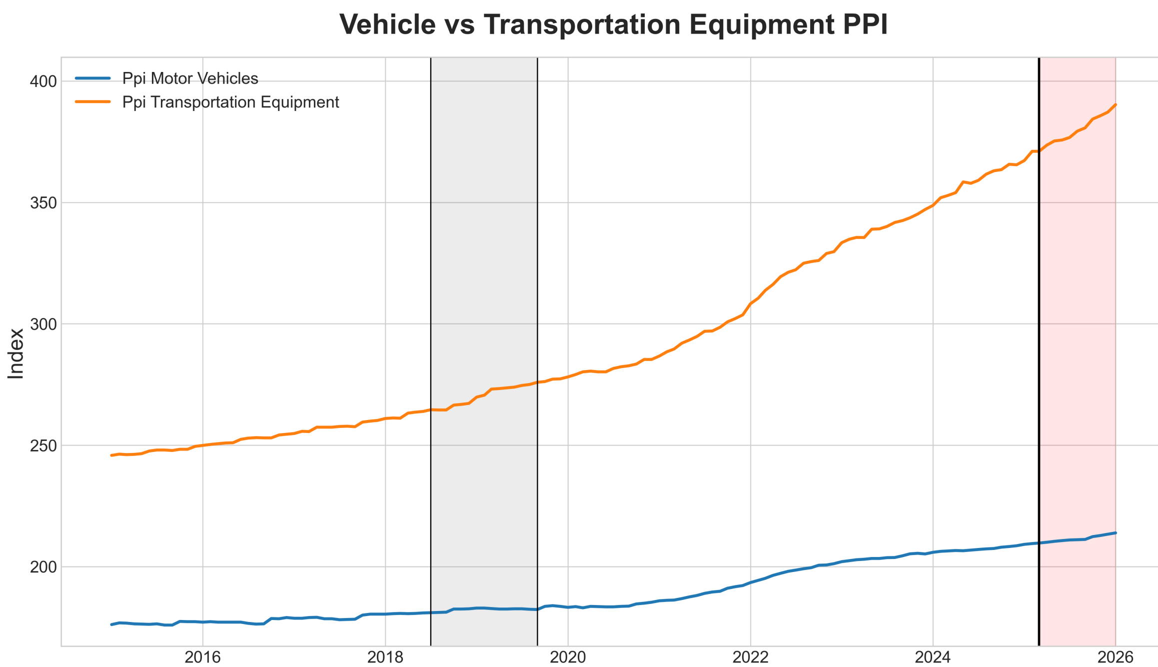

Figure 7

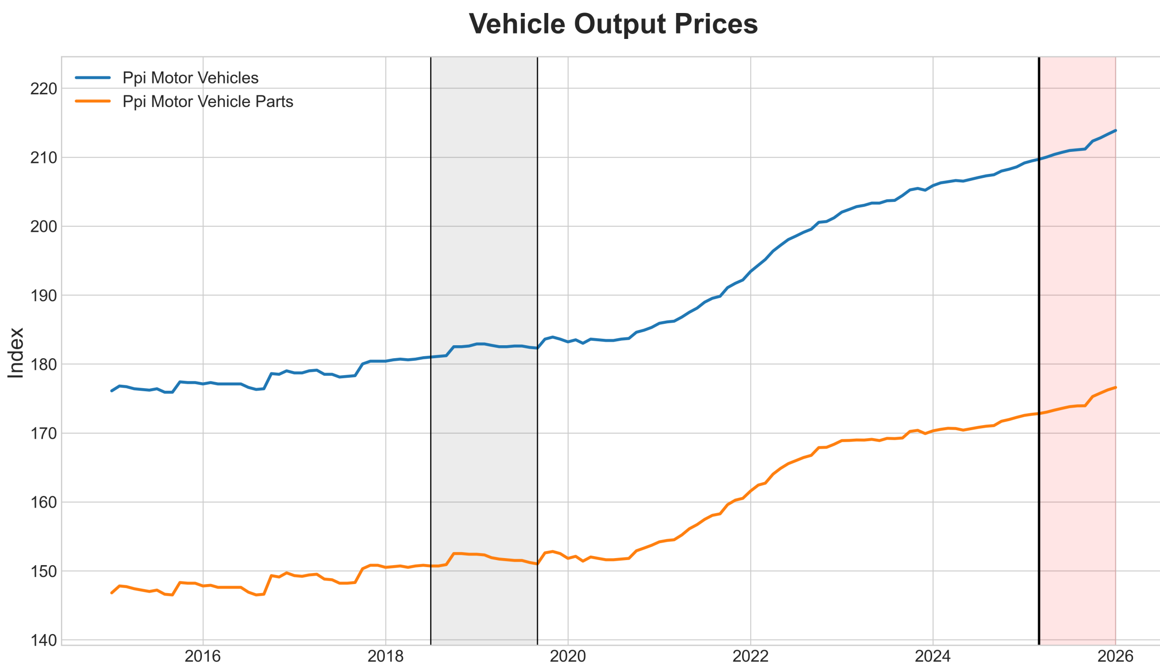

Figure 8

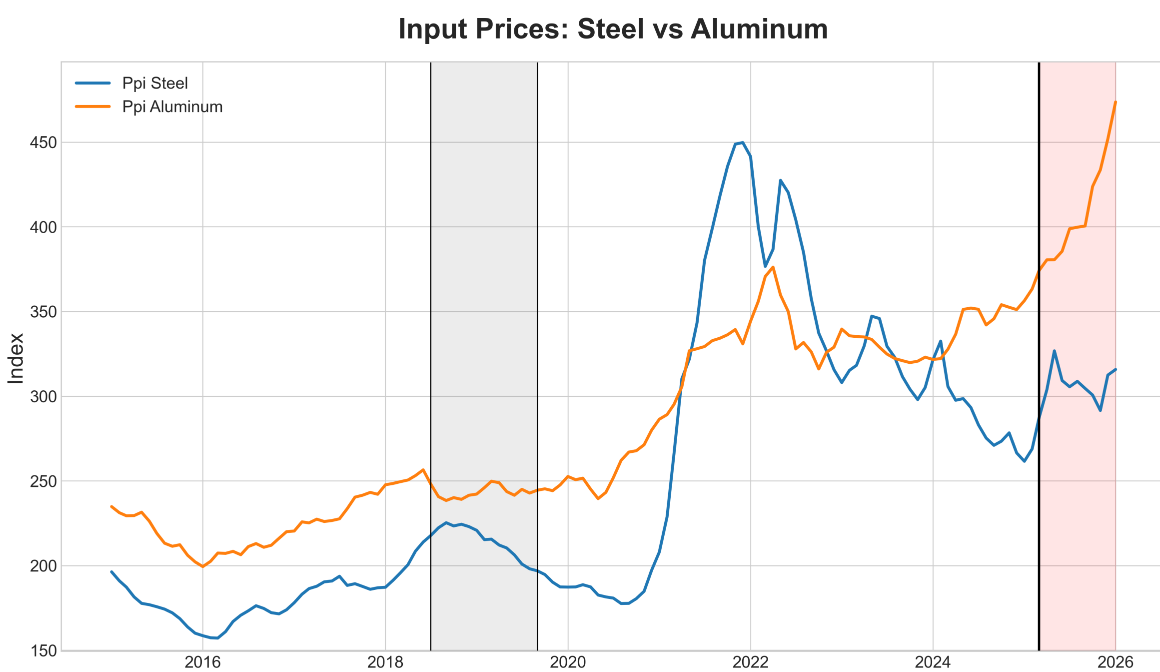

Figure 9

Table 5 and Table 6 document persistent increases in vehicle producer prices across policy regimes. The data show that vehicle prices rose steadily during both the 2018–2025 period and the post-2025 period. This pattern is consistent with the possibility that rising input costs, including those associated with tariff policies affecting metals and components, contributed to sustained price increases in the vehicle sector.

Table 5: Summary Statistics for Vehicle Output and Equipment Prices across Policy Regimes

Variable / Statistic	2015-01 to 2018-06	2018-07 to 2025-02	2025-03 onward
Motor Vehicles PPI			
Mean	178.06	193.47	211.48
Std. Dev.	1.59	10.02	1.39
Min	175.90	181.00	209.69
Max	180.90	209.46	213.86
Motor Vehicle Parts PPI			
Mean	148.53	160.71	174.38
Std. Dev.	1.40	8.19	1.34
Min	146.50	150.70	172.81
Max	150.80	172.71	176.59
Transportation Equipment PPI			
Mean	253.79	309.66	379.98
Std. Dev.	5.45	33.42	6.17
Min	245.80	264.50	371.04
Max	263.90	371.04	390.25
Observations (Months)	42	80	11

Notes: Producer Price Indices (PPI) reflect output prices for vehicles, parts, and broader transportation equipment sectors.

Table 6: Percentage Change in Vehicle and Equipment Prices Across Policy Regimes

Variable	% Change: (15-18) to (18-25)	% Change: (18-25) to (25+)
Motor Vehicles PPI	8.65%	9.31%
Motor Vehicle Parts PPI	8.20%	8.51%
Transportation Equipment PPI	22.01%	22.71%

Table 7 and Table 8 show even larger movements in upstream input prices. Steel and aluminum prices increase sharply during the 2018–2025 period and continue rising afterward.

These results highlight the importance of considering upstream supply-chain sectors when analyzing tariff exposure in vehicle manufacturing. Tariffs applied to metals or industrial inputs may influence vehicle production indirectly by increasing costs throughout the supply chain.

Table 7: Summary Statistics for Input Prices (Steel and Aluminum) across Policy Regimes

Variable / Statistic	2015-01 to 2018-06	2018-07 to 2025-02	2025-03 onward
Steel PPI			
Mean	180.59	283.12	306.04
Std. Dev.	13.38	80.27	10.85
Min	157.20	177.60	287.36
Max	213.90	449.71	326.74
Aluminum PPI			
Mean	224.92	302.32	409.33
Std. Dev.	15.76	44.43	32.39
Min	199.40	238.40	374.21
Max	256.50	376.17	473.66
Observations (Months)	42	80	11

Notes: Producer Price Indices (PPI) for steel and aluminum represent the primary commodity input costs for the vehicle manufacturing sector.

Table 8: Percentage Change in Input Prices Across Policy Regimes

Variable	% Change: (15-18) to (18-25)	% Change: (18-25) to (25+)
Steel PPI	56.77%	8.10%
Aluminum PPI	34.41%	35.39%

5.4 Employment

Manufacturing employment represents another key margin through which trade policy changes may affect the domestic economy. Figure 10 and Figure 11 illustrate that employment experienced a sharp but temporary contraction during the pandemic period before stabilizing. From a policy perspective, the relative stability of employment compared with the volatility observed in production and prices suggests that firms may adjust production and supply-chain strategies before making large employment adjustments. This pattern is consistent with the idea that supply-chain disruptions and tariff changes initially affect production costs and output decisions rather than employment levels.

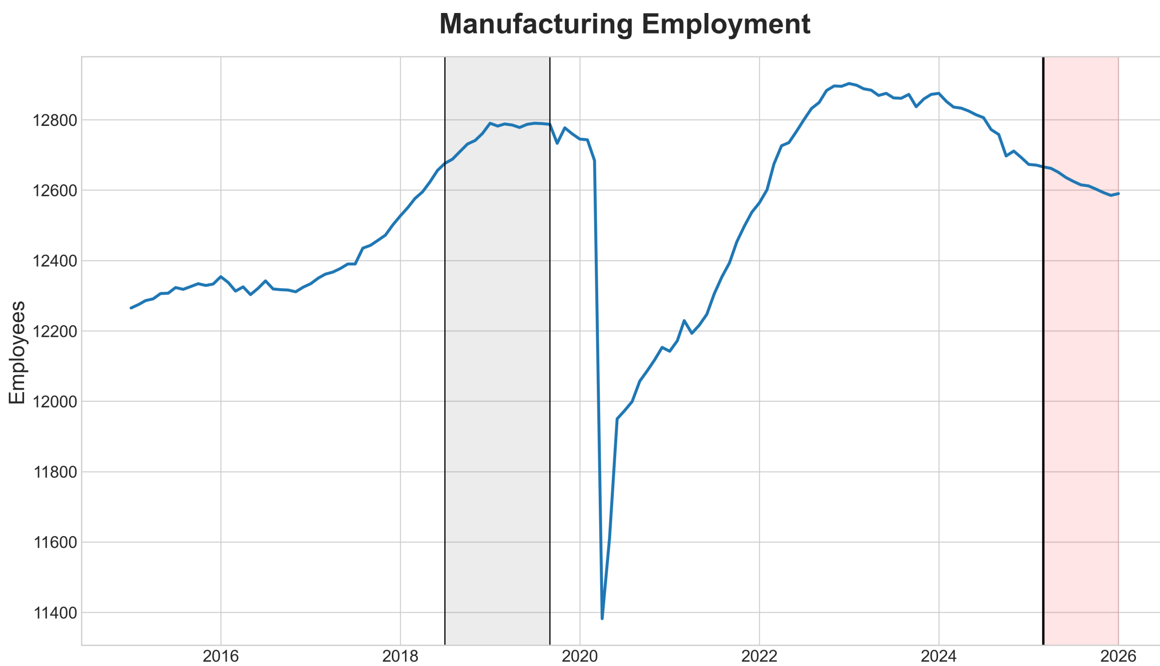

Figure 10

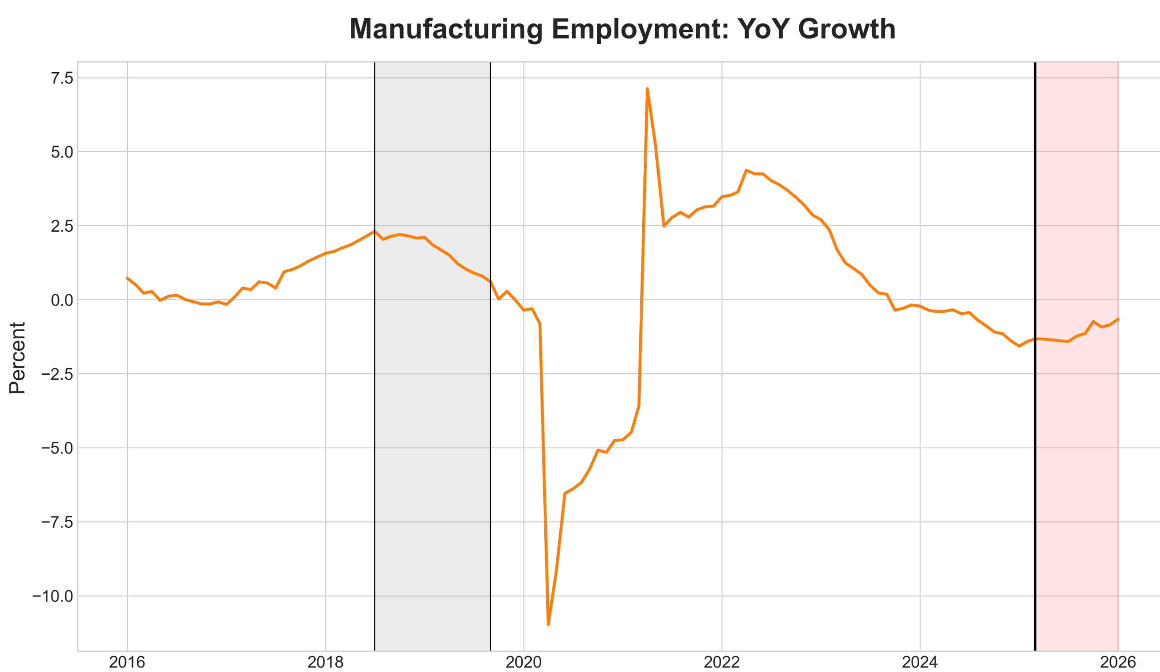

Figure 11

The summary statistics at Table 9 and Table 10 confirm that long-run employment levels remained relatively stable across policy regimes. However, short-run volatility increased substantially during the 2018–2025 period, reflecting the large macroeconomic disruptions experienced during that interval.

Table 9: Summary Statistics for Manufacturing Employment across Policy Regimes

Statistic	2015-01 to 2018-06	2018-07 to 2025-02	2025-03 onward
Mean Employment	12,380.48	12,617.61	12,621.64
Std. Deviation	101.19	321.95	28.85
Minimum	12,265.00	11,382.00	12,585.00
Maximum	12,656.00	12,903.00	12,666.00
Observations (Months)	42	80	11

Notes: Employment figures are expressed in thousands of persons, seasonally adjusted.

Table 10: Percentage Change in Manufacturing Employment Across Policy Regimes

Variable	% Change: (15-18) to (18-25)	% Change: (18-25) to (25+)
Manufacturing Employment	1.92%	0.03%

5.5 Ocean Freight

Global shipping costs play an important role in the transmission of tariff shocks because they affect the cost of transporting imported intermediate goods and final products. Figure 12 and Figure 13 document dramatic increases in maritime freight prices during the pandemic period followed by partial normalization. These fluctuations illustrate that tariff exposure occurs within a broader environment of supply-chain cost shocks. Changes in freight costs may amplify or offset the effects of tariffs on import prices and production costs.

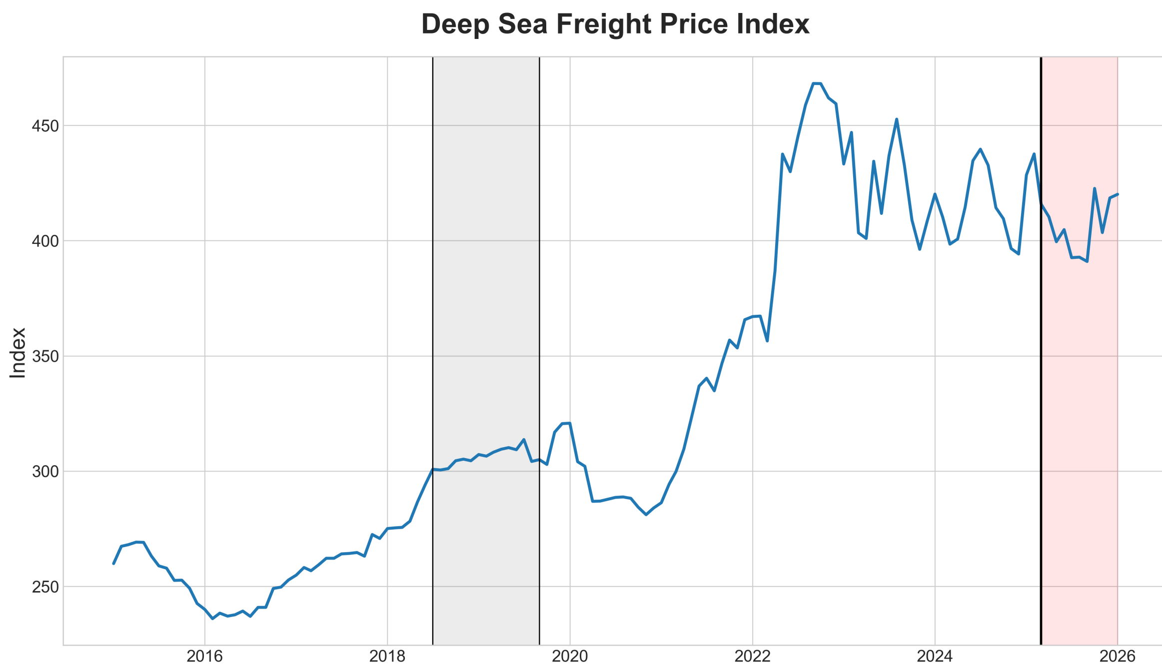

Figure 12

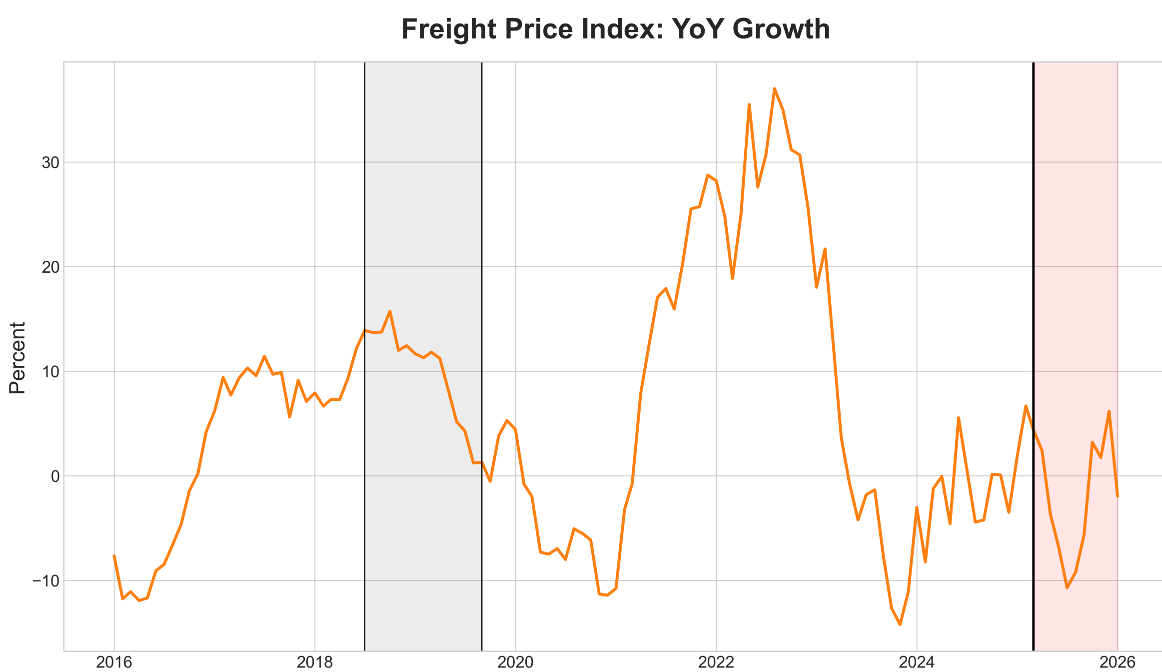

Figure 13

Table 11 and Table 12 show that freight prices experienced a large structural increase during the 2018–2025 period and remain elevated afterward. These changes imply that transportation costs may represent an additional channel through which global supply-chain disruptions affect vehicle manufacturing.

Table 11: Summary Statistics for Deep Sea Freight Price Index across Policy Regimes

Statistic	2015-01 to 2018-06	2018-07 to 2025-02	2025-03 onward
Mean Price Index	258.29	362.33	406.51
Std. Deviation	14.35	61.32	11.72
Minimum	236.00	281.10	390.95
Maximum	294.10	468.16	422.64
Observations (Months)	42	80	11

Notes: The Deep Sea Freight Price Index serves as a proxy for maritime shipping costs associated with imported inputs and final goods.

Table 12: Percentage Change in Deep Sea Freight Costs Across Policy Regimes

Variable	% Change: (15-18) to (18-25)	% Change: (18-25) to (25+)
Deep Sea Freight Price Index	40.28%	12.19%

5.6 Warehousing

Warehousing costs represent another dimension of supply-chain adjustment during periods of disruption. Figure 14 and Figure 15 show that storage costs increased sharply during the pandemic and remained elevated afterward. These developments are relevant for the analysis of tariff exposure because firms facing trade policy uncertainty may alter inventory management strategies, potentially increasing demand for warehousing services.

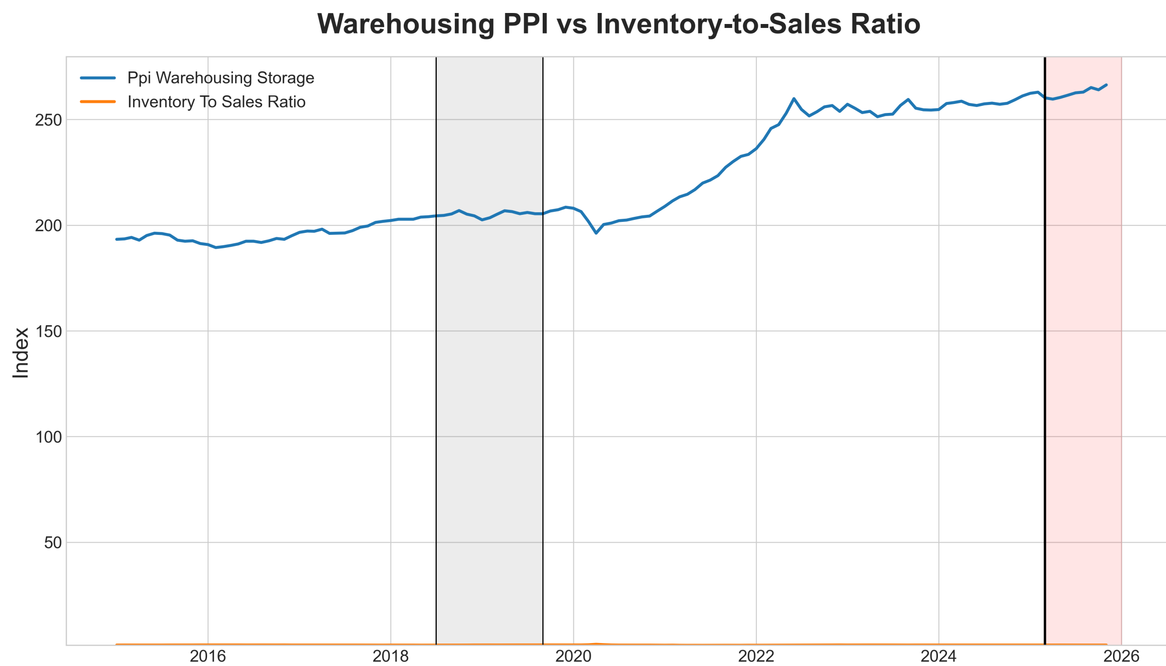

Figure 14

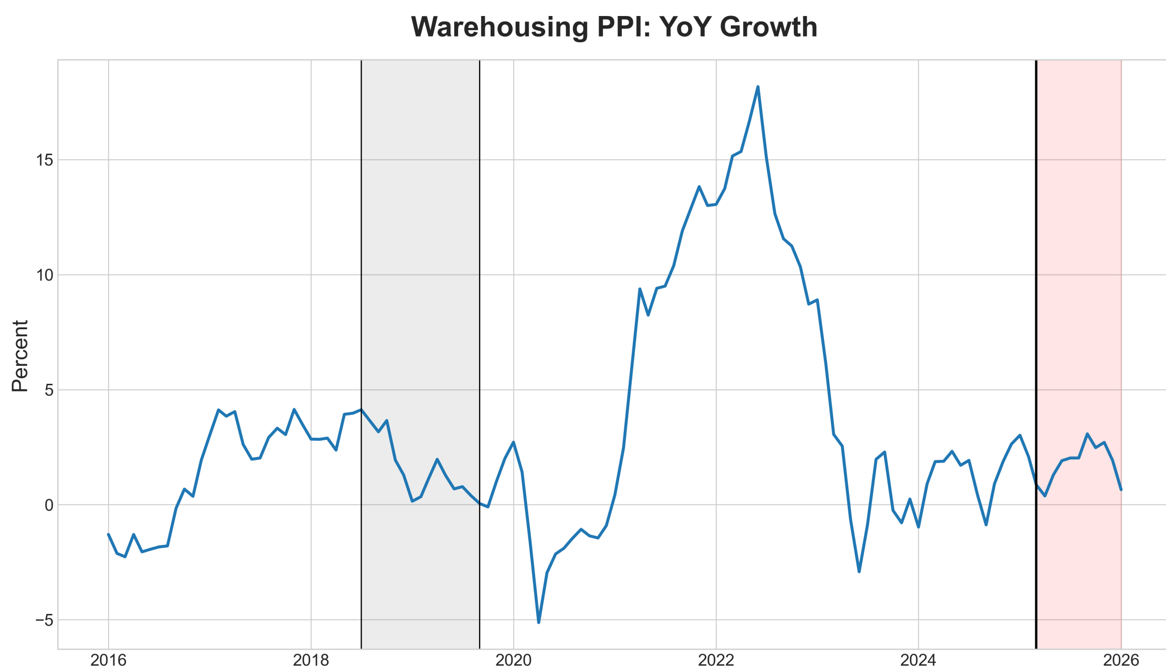

Figure 15

Table 13 and Table 14 indicate that warehousing prices increased substantially across policy regimes even though inventory-to-sales ratios remained relatively stable. This suggests that higher storage costs primarily reflect increased supply-chain congestion rather than structural increases in inventory accumulation. Overall, the stylized facts presented in this section illustrate the broader economic environment in which the tariff expansions of 2025–2026 occur. The evidence highlights substantial volatility in production, prices, logistics costs, and supply-chain conditions, all of which may influence how tariff shocks propagate through the commercial and light vehicle industries.

Table 13: Summary Statistics for Warehousing Costs and Inventory Ratios across Policy Regimes

Variable / Statistic	2015-01 to 2018-06	2018-07 to 2025-02	2025-03 onward
Warehousing & Storage PPI			
Mean	195.80	230.91	263.00
Std. Dev.	4.16	24.07	2.37
Min	189.40	196.20	259.61
Max	204.00	262.90	266.34
Inventory-to-Sales Ratio			
Mean	1.39	1.38	1.38
Std. Dev.	0.02	0.07	0.01
Min	1.34	1.26	1.37
Max	1.43	1.74	1.39
Observations (Months)	42	80	11 / 9[1]

Notes: Observations for the final period consist of 11 months for PPI data and 9 months for the inventory-to-sales ratio due to reporting lags.

Table 14: Percentage Change in Warehousing Costs and Inventory Ratios Across Policy Regimes

Variable	% Change: (15-18) to (18-25)	% Change: (18-25) to (25+)
Warehousing & Storage PPI	17.93%	13.90%
Inventory-to-Sales Ratio	-0.69%	-0.51%

6 Imports from China into the United States

Figure 16 and Figure 17 illustrate the evolution of China's share in light and commercial vehicle import baskets. Both series show meaningful variation over time, with noticeable shifts around major trade policy changes. In general, the China import share declines following tariff escalations, consistent with trade diversion or supplier substitution effects. The magnitude and persistence of this decline differ between light and commercial vehicle baskets, reflecting heterogeneous exposure across product categories.

Figure 18 and Figure 19 document the total import value of the respective vehicle baskets. These figures show fluctuations aligned with broader macroeconomic conditions, including pandemic-related disruptions and subsequent recovery phases. Import values fall sharply during global trade contractions and rebound as supply chains normalize. Taken together, the four figures suggest that tariff measures were associated with compositional shifts in sourcing away from China, while overall import volumes were also influenced by macroeconomic shocks and cyclical demand conditions.

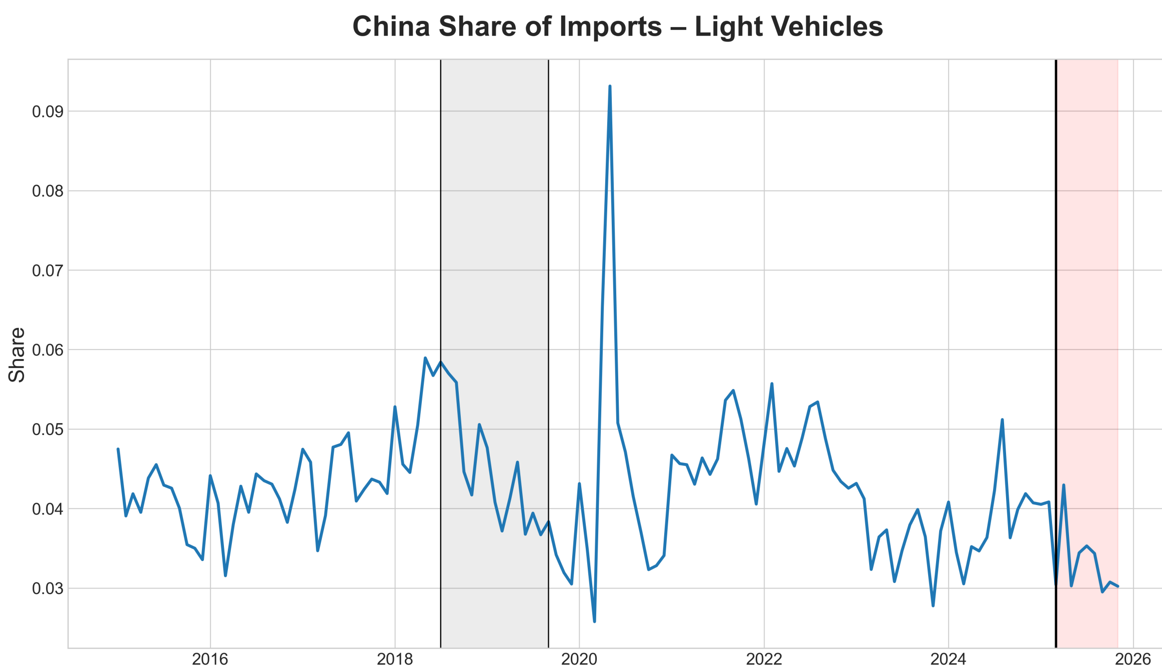

Figure 16

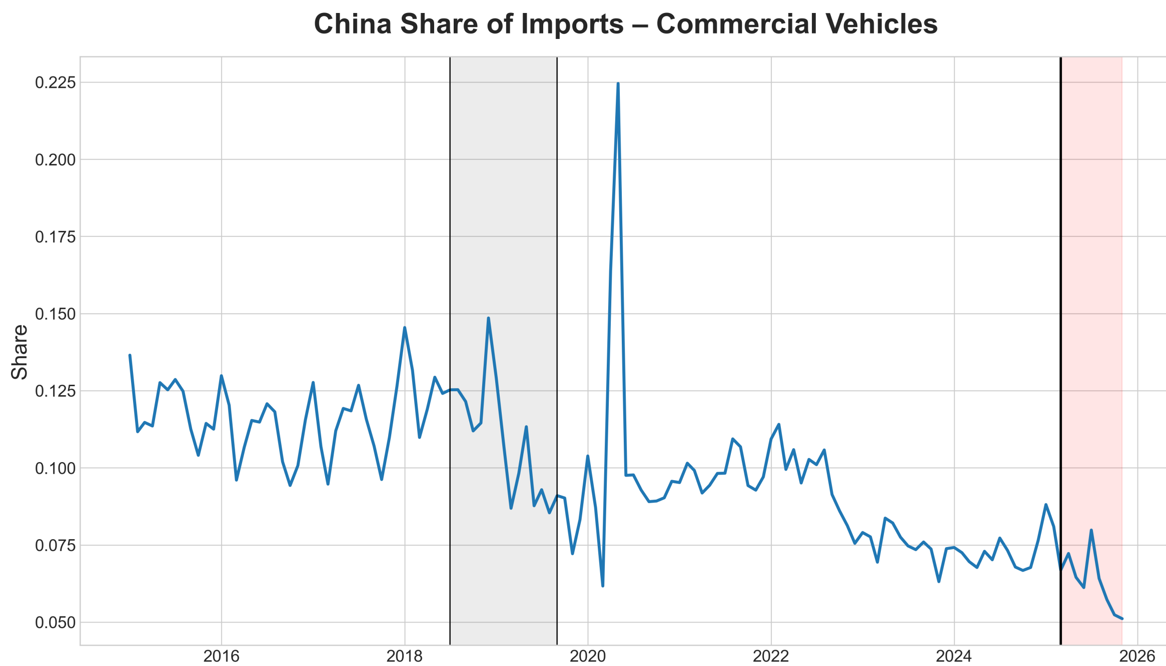

Figure 17

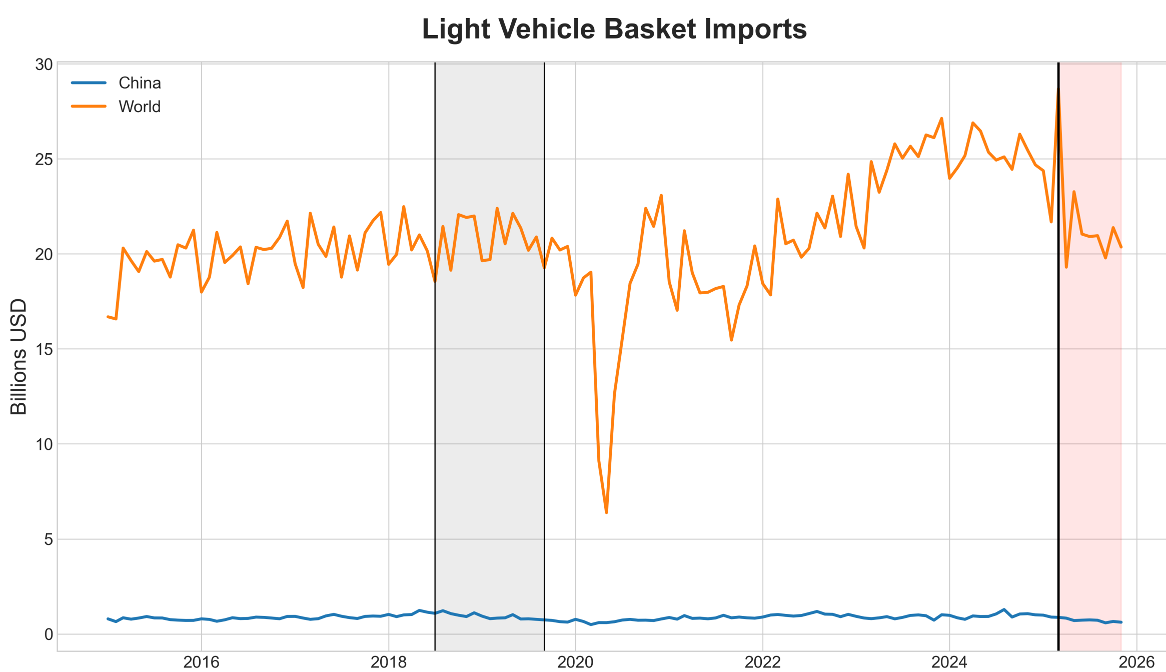

Figure 18

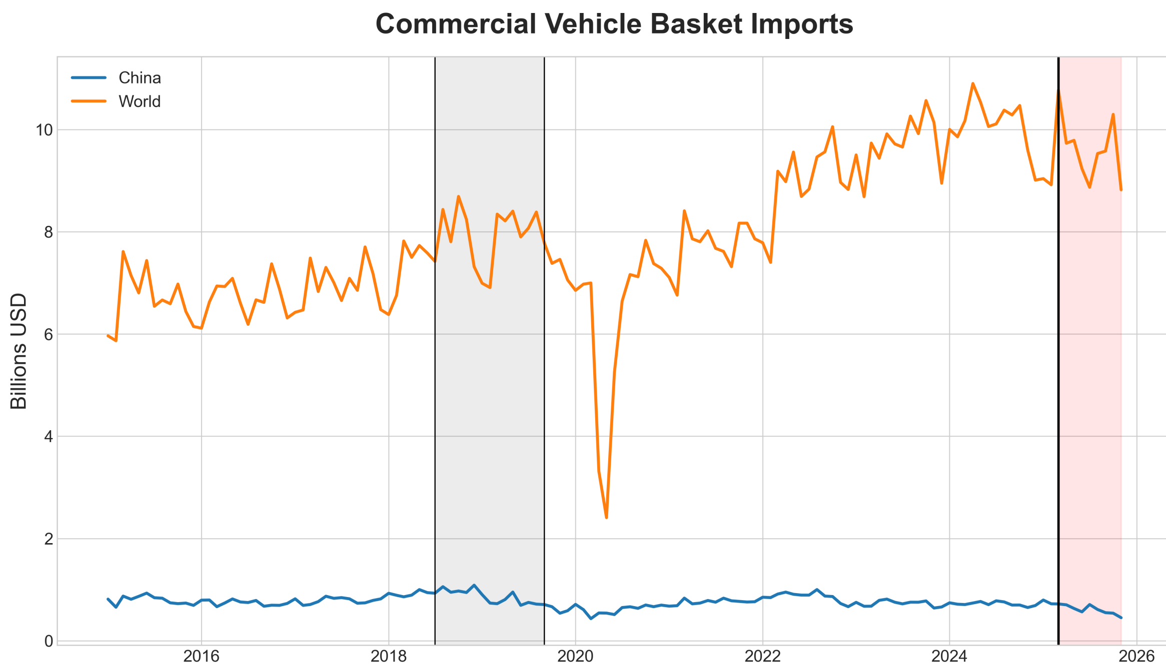

Figure 19

Table 15: Commercial and Light Vehicle Import Exposure Across Policy Periods

Policy Period	CV Imports (Billions $)	CV China Share (%)	LV Imports (Billions $)	LV China Share (%)
2015-01 to 2018-06	0.79	11.62	0.86	4.31
2018-07 to 2025-02	0.76	9.32	0.88	4.29
2025-03 onward	0.61	6.33	0.72	3.31

Notes: CV denotes Commercial Vehicles; LV denotes Light Vehicles. Import values are monthly averages for the specified period.

Table 15 documents a clear decline in both overall import values and China's share of imports for commercial (CV) and light vehicles (LV) across policy periods. For commercial vehicles, average monthly imports fall from $0.79 billion in 2015–2018 to $0.76 billion in 2018–2025, and decline more sharply to $0.61 billion in the post-2025 period. At the same time, China's share of commercial vehicle imports decreases steadily from 11.62 percent to 9.32 percent and then to 6.33 percent.

A similar, though more moderate, pattern is observed for light vehicles. Average monthly imports rise slightly from $0.86 billion in 2015–2018 to $0.88 billion in 2018–2025, before falling to \$0.72 billion after 2025. China's share of light vehicle imports remains relatively stable between the first two periods, at just over 4 percent, but declines to 3.31 percent in the most recent regime. Overall, the table suggests a sustained reduction in reliance on Chinese sourcing for both vehicle categories, with a more pronounced contraction in commercial vehicle exposure, consistent with trade diversion or supplier reallocation following tariff expansions.

7 Data Infrastructure and Tariff Exposure Measurement

A central contribution of this paper is the construction of a structured dataset that measures tariff exposure across the U.S. commercial and light vehicle supply chain during the 2025–2026 tariff expansions. Policy actions are typically released as unstructured regulatory documents that are difficult to integrate with economic data. This paper converts those policy changes into a consistent, product-level panel dataset that can be directly linked to production, prices, trade flows, and other economic outcomes.

The resulting dataset integrates tariff policy information with trade weights and sectoral supply-chain mappings in order to construct exposure measures for strategically important segments of the U.S. manufacturing economy. In doing so, the project provides a reproducible measurement framework that can support both academic research and policy analysis of recent trade interventions.

7.1 Product-Level Tariff Panel

The first component of the data infrastructure is a monthly product-level tariff panel covering the tariff expansions implemented during 2025 and 2026. The dataset records tariff measures associated with Section 232 actions, Section 301 expansions, and related trade remedies affecting the automotive sector.

Tariff schedules are harmonized to the HS6 level in order to ensure compatibility with publicly available trade statistics. For each HS6 product and month, the dataset records the statutory tariff rate, the date of policy implementation, and the policy authority under which the tariff was imposed.

Transforming these policy actions into a consistent monthly panel allows tariff exposure to be aligned with industrial production data, price indices, employment series, and firm-level information. This structure makes it possible to analyze the evolution of tariff exposure at a frequency comparable to macroeconomic and industry indicators.

7.2 Supply Chain Mapping

To capture how tariff changes propagate through the vehicle production network, the dataset maps product-level tariff exposure to the commercial and light vehicle supply chain. Rather than focusing only on final vehicle products, the analysis adopts a broad supply-chain perspective that includes upstream inputs and intermediate goods essential to vehicle production.

The supply-chain mapping combines information from input-output relationships, industry classifications, and expert curation of automotive production networks. HS6 products are assigned to supply-chain categories according to their economic role within vehicle manufacturing.

Four layers of economic activity are distinguished:

- Final vehicle assembly
- Tier-1 vehicle components and major parts
- Upstream intermediate inputs used in vehicle manufacturing
- Strategic materials and metals such as steel and aluminum

This layered structure allows tariff exposure to be traced from raw materials and intermediate inputs through final vehicle production.

7.3 Construction of Tariff Exposure Indices

Using the supply-chain classification, the project constructs sector-specific tariff exposure measures. Let i index HS6 products and t index months. Let τ_{it} denote the tariff rate applied to product i in month t, and let s_i^{pre} denote the pre-period share of U.S. imports of product i sourced from China.

Sector-specific tariff exposure is defined as

$$Exposure_{s,t} = \sum_{i \in I_s} s_i^{pre} \tau_{it}$$

where I_s represents the set of products associated with sector s.

Holding pre-period weights fixed ensures that variation in the exposure index is driven by policy changes rather than endogenous adjustments in trade flows. Separate exposure indices are constructed for commercial vehicles and light vehicles, as well as for different layers of the vehicle supply chain.

Using this framework, the dataset generates three exposure measures that capture distinct transmission channels within the vehicle production network:

- Direct exposure through vehicle components and parts
- Intermediate input exposure through manufacturing inputs used in vehicle assembly
- Upstream exposure through metals, strategic materials, and industrial inputs

These layered exposure measures allow the analysis to distinguish whether tariff shocks affect vehicle production primarily through direct component costs, intermediate manufacturing inputs, or upstream material markets.

7.4 Public Data Release

The dataset constructed in this paper is designed to be reproducible and extensible. It includes product-level tariff rates, implementation dates, supply-chain classifications, and exposure indices. While the version presented here focuses on publicly available policy information and trade data, the framework is flexible and can be extended to incorporate additional data sources in future research.

8 Industry and policy implications

The automotive and commercial vehicle industries play a central role in U.S. manufacturing employment, infrastructure investment, and supply-chain resilience. By constructing new exposure measures and integrating proprietary industry data, this paper provides a structured framework for measuring tariff exposure and documenting how trade policy changes relate to production, prices, and supply-chain dynamics.

The resulting dataset and empirical analysis offer insights that are relevant to policymakers evaluating the long-run costs and benefits of trade interventions, as well as to researchers studying the interaction between trade policy and industrial supply chains.

From the policy standpoint, the findings of this research have direct implications for ongoing debates about the use of tariffs as a tool for industrial policy, national security, and trade enforcement. The evidence on how tariffs affect vehicle production, prices, and supply-chain dynamics can inform cost-benefit analyses of current and future trade measures. Additionally, the research sheds light on the potential unintended consequences of tariffs, such as increased input costs, supply-chain disruptions, and shifts in sourcing patterns. By quantifying these effects, the research contributes to a more informed policy discourse on the design and implementation of trade interventions in the automotive sector and beyond.

9 Conclusion

This paper documents the recent expansion of U.S. tariff policy and constructs a structured dataset measuring tariff exposure across the commercial and light vehicle supply chain. By transforming regulatory policy documents into a consistent product-level panel, the paper provides a transparent and reproducible framework for analyzing trade policy interventions.

The stylized facts presented in the paper highlight substantial variation in production, sales, prices, employment, and trade patterns during periods of tariff expansion. These patterns underscore the importance of considering supply-chain linkages and input-cost channels when evaluating the economic effects of trade policy.

The dataset introduced in this paper represents a foundational contribution for future empirical analysis. By combining tariff schedules, trade weights, and supply-chain mappings, it enables the measurement of tariff exposure across multiple layers of the production network. This framework can be used to study how trade policy shocks propagate through manufacturing sectors and influence economic outcomes.

More broadly, improving the measurement of tariff exposure is essential for understanding how modern trade policy affects industrial supply chains. The vehicle sector, with its extensive global integration and reliance on intermediate inputs, provides a particularly informative setting for this analysis. The data infrastructure developed in this paper contributes to a clearer understanding of how tariff policies interact with production networks in the contemporary global economy.

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