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Perceived Protection: Tariff Spillovers to Product Substitutes in the Used Car Market*

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Abstract

We study the spillover effects of the 2025 "Liberation Day" automotive tariffs on the untaxed U.S. used-car market. Using over eight million weekly listings and a VIN-based crosswalk identifying each vehicle's country of assembly, we document an immediate and persistent 0.2–0.6% increase in the prices of foreign-brand used vehicles relative to domestic-brand vehicles. The effect is concentrated among the newest vehicles—the closest substitutes for new cars—consistent with demand-side substitution. We also find that foreign-brand vehicles produced in the U.S. appreciate as much as those assembled abroad, suggesting that the perceived foreignness of used vehicles may be largely independent of true production location. Neglecting tariff pass-through to untaxed product substitutes understates overall consumer incidence.

JEL Classification Codes: F13, F14, L62

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1 Introduction

Who bears the cost of tariffs, and how far do price effects extend beyond the directly taxed goods? Tariffs are levied on specific products crossing the border, but their economic incidence may be channeled (e.g., through substitution, expectations, and pricing decisions) into markets where tariffs are not levied directly. Measuring this propagation is important for evaluating the true cost of protection, yet it is difficult precisely because the affected markets are, by definition, outside the direct reach of the policy. In fact, we are aware of only two recent efforts that show that tariffs spill over to *bundled and complementary* goods (Flaaen et al., 2020; Hankins et al., 2026). Against this backdrop, we analyze the spillover effects of tariffs on the prices of *substitute* goods. Specifically, we quantify the impact of U.S. automotive tariffs on the prices of *used* cars—a market that serves as a close substitute for new vehicle purchases—albeit before any such vehicles could have been directly subject to tariffs.

Effective April 3, 2025, the Trump Administration issued a proclamation imposing a 25% tariff on all automobile imports into the United States, justified on national-security grounds and as part of a broad agenda to reshore industrial production.[1] While the success of the policy in encouraging domestic automobile production will only become clear over the long run, its short-run incidence can be measured immediately, and the used-car market is a great environment to study the spillover effects of tariffs on product substitutes.

Americans purchased roughly 38 million used vehicles in 2025, more than twice the volume of new-car sales.[2] The average used vehicle listed for $26,043 in December 2025, just over half the average new-vehicle transaction price of $50,326, implying a total market value

[1] "Automobiles and certain automobile parts are being imported into the United States in such quantities and under such circumstances as to threaten to impair the national security of the United States." See `whitehouse.gov/presidential-actions/2025/03/adjusting-imports-of-automobiles-and-autombile-parts-into-the-united-states/`. Related measures targeted steel and aluminum, copper, and medium- and heavy-duty vehicles.

[2] Cox Automotive (Jan. 2026), `https://www.coxautoinc.com/insights/cox-automotive-2026-outlook/`.

approaching $1 trillion annually.[3] Used vehicles are a critical source of affordable transportation for millions of workers, particularly in areas with limited public transportation. Thus, increased used-car prices may have important consequences, e.g., making cars less affordable to poorer households and limiting access to employment.

In addition to being very important for many U.S. households, the used-car market offers a clean environment for measuring tariff spillovers. Unlike the new-vehicle market, where manufacturers have some control over pricing (e.g., through Manufacturer Suggested Retail Prices and dealer incentives), the used-car market is subject to fewer pricing constraints, so prices respond freely to changes in market conditions. Moreover, regardless of their country of origin, used cars are subject to similar demand and supply/cost conditions in the absence of tariffs, e.g., demand follows some predictable patterns (the spring spike, tax-refund season), while dealers face similar operating expenses—labor, rent, financing, transportation, and reconditioning—irrespective of a vehicle's import status. Crucially, the stock of used vehicles was produced and sold before the tariffs took effect, so supply is essentially fixed in the short run. Thus, any differential price movements between vehicles of domestic and foreign origin following tariff adoption may plausibly be attributed to the tariff changes.

To quantify tariff spillover effects on the prices of used cars, we construct a rich, repeated cross-sectional dataset of web-scraped used-vehicle listings collected weekly between April 1, 2025 and October 30, 2025, thus covering the period immediately before and roughly six months after the imposition of the automotive tariffs.[4] The final sample consists of over eight million listings of clean-title SUVs and sedans. Because make and model alone do not identify where a vehicle was produced, we build a crosswalk that maps unique vehicle *titles* (i.e., model year × make × model × trim) to the country of actual production, which we recover from vehicle identification numbers (VINs). This allows us to separate the vehicle's

[3]Kelley Blue Book (2026), `https://www.kbb.com/car-news/average-used-car-price-tops-26000/` and `https://www.coxautoinc.com/insights/dec-2025-atp-report/`.

[4]Our scraping strategy yields a comprehensive record of the stock of used vehicle listings starting two days before the automotive tariffs took effect (and just five days after the tariffs were announced). Insofar as any portion of the April 3 tariffs were incorporated into prices prior to April 1, our estimates will tend to understate the full pricing response in the used vehicle market.

brand (foreign versus domestic) and *production origin* (abroad versus in the U.S.).

Our empirical strategy relies on an event-study design with high-dimensional fixed effects beginning with the period immediately before the April 3 imposition of automotive tariffs. Specifically, we regress the log of listing prices on week indicators interacted with treatment group indicators defined by brand × production location (i.e., foreign-brand import, foreign-brand domestically produced, and domestic-brand import, with domestic-brand domestically produced vehicles as the omitted reference group). In addition, we control for mileage, ownership history, accident history, vehicle title and dealership fixed effects, and we allow for flexible depreciation paths using week-by-model-year fixed effects.

Two main results stand out from our analysis. First, we find that the 'Liberation Day' automotive tariffs spilled over into the used market immediately: prices of foreign-brand used cars rose by approximately 0.4% relative to the control group within the first two weeks after April 3, reached a peak of roughly 0.6% by early July, and remained 0.2–0.6% above the control group throughout the post-tariff period. Second, and most strikingly, we find that the price response was governed by *brand* rather than by *actual production origin*: foreign-brand vehicles assembled in the U.S. appreciated as much as—and in the first months even more than—foreign-brand vehicles assembled abroad, while imported *domestic*-brand vehicles exhibited a much weaker and more gradual response; e.g., the policy raised the price of used Toyotas built in Kentucky while leaving the price of used Fords built in Mexico largely unaffected. A simple unconditional comparison of price dynamics for two types of popular SUVs with the same make, model year, and trim level illustrates this result. Specifically, the 2022 Toyota Highlander XLE, assembled in the U.S., and the 2022 Toyota RAV4 XLE, assembled in Canada, experienced nearly identical price increases of about 3% following the tariff announcement. We elaborate on this example in the Data section below.

We reinforce our main results with two additional findings. First, the spillover tariff effects are driven overwhelmingly by 2024 model-year vehicles, whose relative prices climbed steadily to more than 2% by the end of the sample, even as the effects for older vintages faded. We find this result intuitive and reassuring because the 2024 model-year vehicles are the newest cohort in the used market and the closest substitute for new cars. Second, among imported vehicles, those assembled in Canada and Mexico display the most persistent price increases, while responses for vehicles from Germany, Japan, and Korea are noisy and generally insignificant. This result is also consistent with our main findings because Canada and Mexico were among the countries mentioned most often as targets of the U.S. tariffs.

We do not believe that supply-side behaviors at the dealership level can explain our results for the following reasons: dealers' operating costs do not vary systematically with the brand origin of the vehicles they sell; the available stock of used vehicles over the short run is largely fixed; and cost-driven pricing would affect all vehicles similarly. We believe that the price changes that we observe are consistent with demand-side substitution patterns, whereby (anticipated) price increases for new imported vehicles should raise consumers' willingness to pay for those vehicles' closest perceived substitutes: namely, foreign-*branded* new and late-model used vehicles. The fact that tariff incidence is based on *brand* rather than *production origin* further suggests that consumers are either unaware of or indifferent to specific models' production location. For example, consumers do not realize that BMW and Mercedes SUVs are assembled in the U.S., or it is irrelevant because their closest perceived substitutes—Porsche SUVs—are still assembled abroad. It is outside the scope of this paper to distinguish between these two possibilities.

The 'Liberation Day' tariffs have triggered a fast-growing literature, with recent contributions studying the relationship between import tariffs and trade deficits (Costinot and Werning, 2025; Itskhoki and Mukhin, 2025), the design and magnitude of reciprocal tariffs (Kee et al., 2026; Anderson and Yotov, 2025), and their welfare implications (Ignatenko et al., 2025; Felbermayr et al., 2025). Closest to our study are two papers showing that tariffs spill over to *bundled and complementary* goods. Specifically, Flaaen et al. (2020) document that the 2018 washing-machine tariffs raised the prices of untaxed clothes dryers, while Hankins et al. (2026) show that auto manufacturers passed a portion of the 2018 metal tariffs on to consumers through the interest rates charged by their captive lenders.

We contribute to this literature by showing that tariffs spill over to *substitute* goods as well. Specifically, we find that (i) the U.S. automotive tariffs raised prices in the large untaxed used-car market, and (ii) incidence within that market depends on *perceived* foreignness rather than actual import status. Consistent with Flaaen et al. (2020) and Hankins et al. (2026), the implications of both of our findings are that analyses confined to directly taxed products understate the burden of tariffs on consumers.

The remainder of the paper is organized as follows. Section 2 describes the construction of our dataset and presents descriptive evidence that motivates the analysis. Section 3 lays out the econometric methodology and reports the main results. Section 4 investigates mechanisms and presents robustness checks. Section 5 concludes.

2 Data: Construction and Sources

This section proceeds in three steps. Section 2.1 describes the construction of our web-scraped dataset of used-vehicle listings, the VIN-based crosswalk that identifies each vehicle's country of assembly, and two stylized features of the data that shape our empirical design. Section 2.2 presents descriptive evidence that motivates the analysis, contrasting price dynamics by brand affiliation with price dynamics by production origin. Section 2.3 benchmarks our scraped prices against external price indices to demonstrate that they are representative of the broader U.S. car market.

2.1 Web-Scraped Listings and Sample Construction

Our data come from web-scraped used-vehicle listings. To obtain the data, we program a dynamic web scraper that mimics human behavior, systematically scouring the pages of a large online used-car sales platform to extract rich listing information for the universe of available East Coast listings. At any given point in time, this amounts to approximately

350,000 unique listings. We execute this procedure on a weekly basis starting on April 1, 2025—two days before the "Liberation Day" tariffs took effect—which gives us a repeated weekly snapshot of the used-vehicle stock over a period of substantial tariff-policy variation. For each listing, we observe the vehicle's listing price, mileage, accident history (whether the vehicle was in a reported accident), ownership history (whether the vehicle had a single owner), and title—a standardized string recording model year, manufacturer, model, and trim, if applicable.[5] We additionally observe the listing dealership's name, location, and overall buyer rating.

Make and model alone do not uniquely identify a vehicle's production location. For example, the Toyota RAV4 Prime (plug-in hybrid) is manufactured exclusively in Japan, whereas other RAV4 trims are assembled in North America. Therefore, we create a title-level crosswalk to the country of origin. Specifically, we use a second dynamic scraper that expands individual listing information and extracts their exact vehicle identification numbers (VINs), which encode the country of assembly. While extracting VINs from all eight-million-plus listings in our dataset would be infeasible, we apply the procedure to as many unique titles as possible. Because identically titled vehicles share a production location, this yields a crosswalk covering 4,098 distinct titles that maps every listing to a country of assembly, and accounting for around 60 percent of our total sample. The crosswalk allows us to measure tariff exposure along the two separate dimensions that are central to our research design—*brand affiliation* and *production origin*.

We ultimately restrict our sample to clean-title SUVs and sedans listed within an 800-mile radius of Woodland, North Carolina (i.e., the U.S. East Coast), with odometer readings between 30,000 and 130,000 miles and listing prices below $200,000.[6] The final sample consists of 8,180,982 listings, of which 73.7% are SUVs.

[5] For the same model year, make, and model, trim serves to distinguish standard vehicle option packages, including differences in various performance, comfort, and safety features.

[6] We exclude pick-up trucks from our analysis on the grounds that all pick-ups sold in the U.S. are produced exclusively in North America, and the vast majority—77 percent—are assembled in the U.S. Only a handful of unique models account for the remaining 23 percent.

Two stylized features of the data are worth emphasizing. First, listing prices change frequently. Each week, prices fall for roughly 35% of listed vehicles and rise for roughly 4%. Because a car loses value quickly through depreciation, many dealers follow strict inventory-turnover policies, cutting prices every two to three weeks and eventually sending unsold stock to wholesale auction. This high repricing frequency implies that the universe of listed vehicles closely tracks market conditions in near-real time, so we treat the full set of scraped listings as an accurate snapshot of the available stock. Doing so has two additional advantages: we avoid defining a "new" listing arbitrarily (for instance, whether a repriced vehicle counts as new), and we avoid mismeasurement from unobserved posting dates when policy changes occur mid-week. Second, price levels are highly heterogeneous across manufacturers, models, and trims. This heterogeneity motivates and underscores the importance of the vehicle-title and dealership fixed effects in our model as well as the controls for mileage and vehicle condition that we employ in the empirical analysis below.

2.2 Descriptive Evidence: Brand versus Production Origin

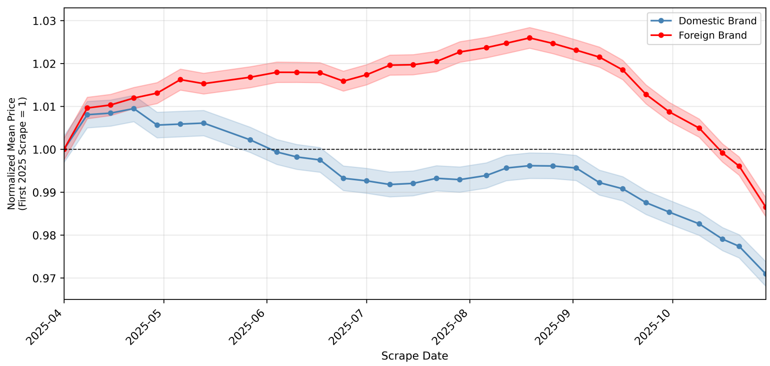
To motivate our formal analysis, we begin by examining raw prices across vehicle categories. Figure 1 plots normalized mean prices of recent-vintage (model year $\geq$ 2021) SUVs and sedans, relative to our first scrape on April 1, 2025, splitting the sample first by brand affiliation (Panel A), followed by VIN-based production origin (Panel B).[7]

The two panels paint strikingly different pictures. In Panel A, unconditional prices of foreign-brand vehicles jump by roughly 1% within the first two weeks after the tariff takes effect and continue to climb, peaking about 2.6% above their pre-tariff level in late August and remaining elevated until well into the fall. Prices of domestic-brand vehicles, by contrast, rise only briefly—by about 1% in April—and then decline steadily for the remainder of the sample period. The gap between the two series opens immediately after the tariff went into

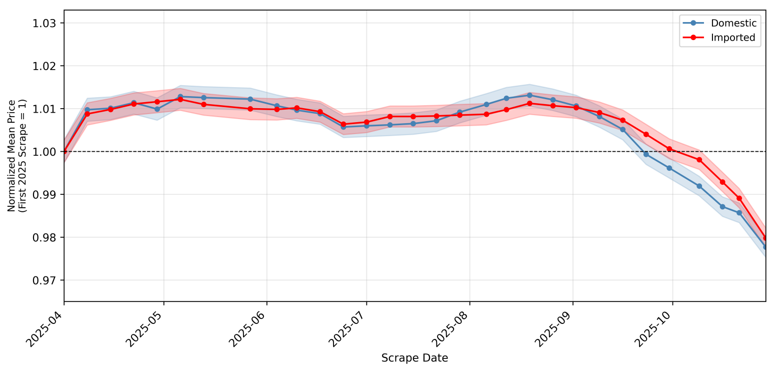
[7]For most vehicle makes, we define the country of brand affiliation based on the parent company's headquarters location. We make an exception to this rule for Chrysler, Jeep, and Dodge vehicles, which we classify as domestic notwithstanding their acquisition by the Italian group Fiat SpA in 2014.

Figure 1: Normalized Used-Vehicle Prices by Brand Affiliation and Production Origin

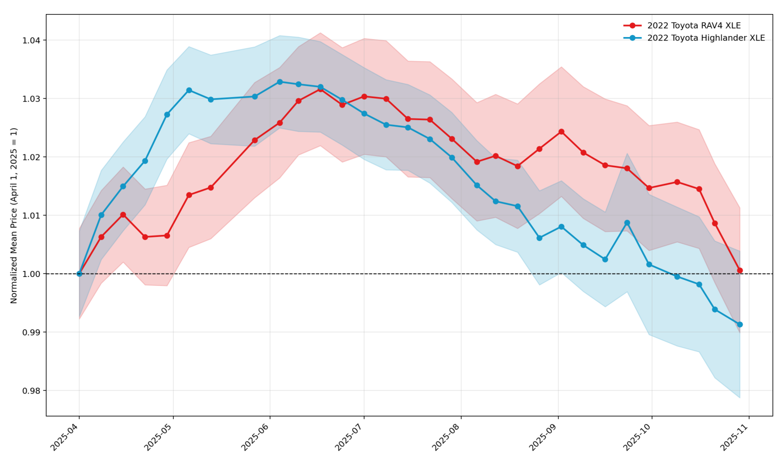
(a) Price by Brand Affiliation



(b) Price by Production Origin (VIN-Based)



(c) 2022 Toyota Highlander vs. RAV4 (XLE)



Notes: This figure plots normalized mean listing prices of used SUVs and sedans (model year $\geq$ 2021), relative to the first weekly scrape on April 1, 2025. Data: authors' weekly web-scraped listings of clean-title used vehicles on the U.S. East Coast (odometer 30,000–130,000 miles; price below \$200,000), April 1–October 30, 2025. Panel (a) splits the sample by brand affiliation: foreign vs. domestic; Panel (b) by production origin: produced in the U.S. vs. abroad; Panel (c) compares two Toyota SUVs of the same trim level that differ in production location. Shaded regions denote 95% confidence intervals. See text for further details.

effect and reaches roughly 2.5–3 percentage points at its widest.

In Panel B, we split vehicles based on where they were actually produced. The two series are indistinguishable. Prices for domestically produced and imported vehicles each rise by about 1% in April, move together through the summer, and decline together from September onward. The common late-sample decline in both panels probably reflects seasonal forces (including the staggered arrival of new model-year inventory across makes). Most importantly, the two series are indeed indistinguishable. In combination, the results from Panels A and B suggest that it is the brand affiliation rather than the origin of production that is correlated with the evolution of post-tariff prices of used cars. This conclusion is reinforced with a specific example in Panel C.

Panel C compares the evolution of prices for two popular SUVs from the same model year, make, and trim level: the 2022 Toyota RAV4 XLE and the 2022 Toyota Highlander XLE. Assuming no differential shocks to demand for 2-row versus 3-row SUVs, demand for both vehicles should be subject to nearly identical forces. The difference between the two series from the standpoint of tariff incidence is that the Highlander is produced in the U.S. whereas the RAV4 is produced in Canada. Thus, (new) RAV4s are directly exposed to automotive tariffs. Despite this asymmetry in policy exposure, both vehicles appreciate by roughly 3% between April and June, before depreciating over the remainder of the year.[8]

Together, the three panels of Figure 1 suggest that tariff spillovers in the used market may be priced by *brand affiliation* rather than by actual *production location*. Tariff spillovers to used products may hence depend primarily on perceptions of tariff exposure. The formal event-study econometric analysis in Section 3 confirms these patterns. Before turning to the formal analysis, we verify that our web-scraped prices are representative of the broader market.

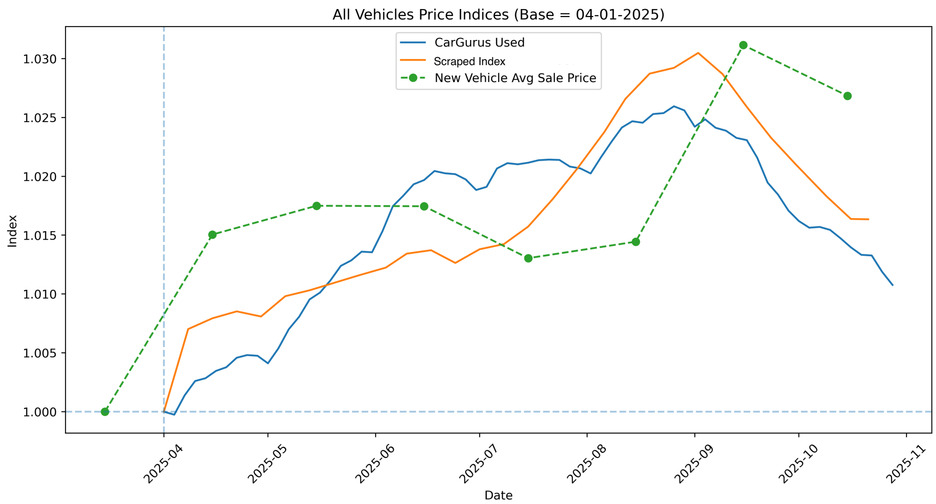
2.3 Comparison with External Price Indices

Figure 2 plots an aggregate price index constructed from our scraped listings against two external benchmarks: (i) the CarGurus used-vehicle price index; and (ii) the average monthly

[8] In fact, prices for the domestically produced Highlander rose somewhat faster during the initial tariff aftermath, as evidenced by the divergent confidence bands in May 2025.

sales price of new vehicles from Cox Automotive (starting in March to capture the pre-tariff period). All three series are normalized to one in the first period of the sample.

Figure 2: Evolution of Used- and New-Vehicle Price Indices, April-November, 2025



Notes: This figure reports three average price indices, each normalized to one at the beginning of the sample period. The 'Scraped Index' is the mean listing price across all used vehicles in our sample; the 'CarGurus Used' index is an independent, publicly available index of U.S. used-vehicle prices; the 'New Vehicle Average Sale Price' series tracks new-vehicle transaction prices and is monthly. (March 2025 is included to capture the April increase). The vertical dashed line marks April 3, 2025, the effective date of the 25% automotive tariff. See text for further details.

Two observations stand out from Figure 2. First, our scraped index co-moves closely with the CarGurus used vehicle index over the entire sample period: both series rise steadily after the tariff announcement, peak at roughly 2.5–3% above baseline around late August, and decline thereafter. Our prices are therefore not outliers; they track an independent, widely used measure of the U.S. used-car market. Second, the new-vehicle transaction prices also rose following the tariff—by roughly 1.5% in April and about 3% by September. The concurrent increase in new-vehicle prices is precisely the impulse that a substitution mechanism requires: as tariffs push up the prices of new cars, demand shifts toward their closest (used) substitutes.

3 Methodology and Main Results

Our benchmark specification regresses the log listing used-vehicle price, $\ln(\text{price}_{it})$, on weekly indicator variables D_t for all but the first week, which capture aggregate price dynamics relative to the initial pre-treatment week, interacted with treatment indicators that partition the sample into four groups by brand affiliation and import status: (1) foreign-brand import, (2) foreign-brand domestic production, (3) domestic-brand import, and (4)—the omitted category—domestic-brand domestic production:

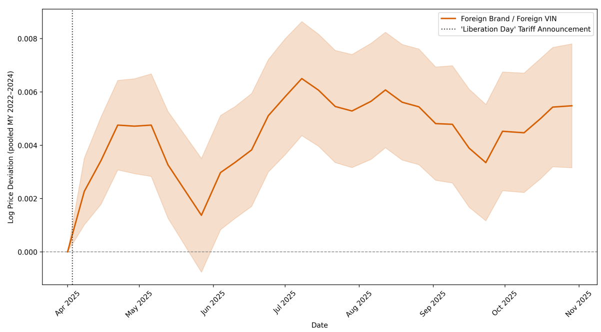
$$\begin{aligned}\ln(\text{price}_{it}) = \gamma_{\text{title}} + \gamma_{\text{dealership}} + \gamma_{\text{model\_year}\times t} + \beta_1 \ln(\text{mileage}_{it}) + \beta_2 \text{one\_owner}_{it} \\ + \beta_3 \text{no\_accident}_{it} + \sum_{t=2}^{W} \gamma_t D_t + \sum_{t=2}^{W} \delta_t \big(D_t \times \text{Treat}_i\big) + \varepsilon_{it}.\end{aligned} \tag{1}$$

The covariates in specification (1) include three sets of fixed effects. First, the vehicle title fixed effects, γ_{title}, account for persistent price differences that vary by model year, brand, model, and trim combination. Second, the dealership fixed effects, $\gamma_{\text{dealership}}$, are intended to absorb price differences arising from variation in local market and seller conditions (e.g., dealer costs and market power). Third, because used vehicles depreciate rapidly, we further interact the weekly indicators with model-year fixed effects, $\gamma_{\text{model\_year}\times t}$, allowing fully flexible depreciation paths across vintages; a 2024 model-year vehicle may depreciate at a different rate than a 2023 model-year vehicle, without any functional-form restriction on the depreciation process. We also control for a series of vehicle condition/characteristics using mileage, ownership status, and accident history. Standard errors are clustered at the dealership level.

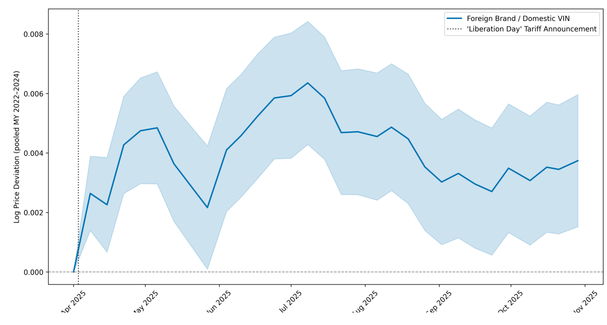
To interpret our results, we note that the estimated δ_t coefficients capture deviations from the common price trend for each treatment group relative to domestically produced domestic-brand vehicles. Figure 3 plots them, together with 95% confidence intervals, for the pooled sample of model years 2022–2024: Panels A–C display each treatment group separately, and Panel D overlays all three.

Figure 3: Price Responses by Brand Affiliation and Production Origin: Event-Study Estimates

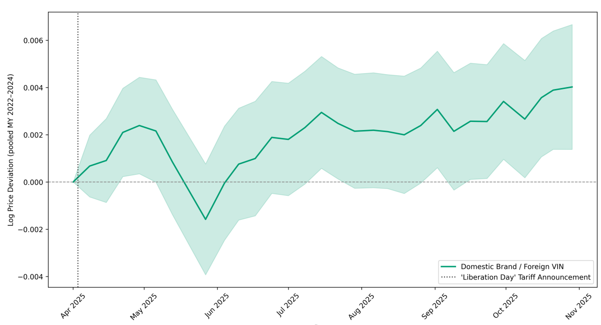
(a) Foreign Brand / Foreign VIN



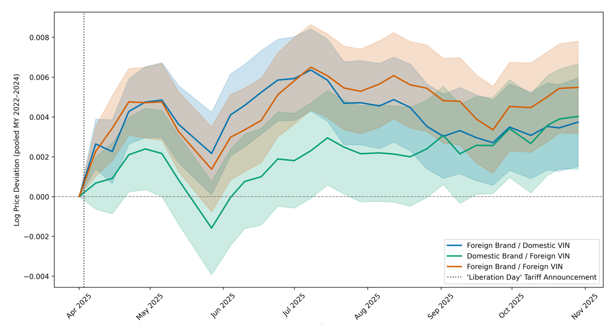
(b) Foreign Brand / Domestic VIN



(c) Domestic Brand / Foreign VIN



(d) All Groups



Notes: This figure visualizes the estimated coefficients δ_t from equation (1), which capture the weekly log-price deviations of each brand–origin group relative to domestically produced domestic-brand vehicles, pooled across model years 2022–2024; Panel (a) reports estimates for the foreign-brand vehicles that are also produced abroad. Panel (b) reports estimates for the foreign-brand vehicles that are produced domestically. Panel (c) reports estimates for the domestic-brand vehicles that are produced abroad. Finally, panel (d) overlays panels (a)–(c). The specification includes vehicle-title and dealership fixed effects, controls for log mileage, single-owner status, and accident history, and week-by-model-year fixed effects. Standard errors are clustered at the dealership level; shaded regions denote 95% confidence intervals. The vertical dotted line marks April 3, 2025. See text for further details.

Three findings emerge from the estimates in Figure 3. First, all three groups exhibit positive price deviations following the tariff announcement, but the responses of the two foreign-brand groups are more pronounced. For foreign-brand imports (Panel A), δ_t reaches approximately 0.004 within the first two weeks, implying a 0.4% price increase relative to the control group, climbs to roughly 0.005 by the end of April, and peaks at approximately 0.006–0.0065 in early July. The coefficients remain positive and statistically significant throughout the sample period.[9] Overall, the estimates indicate a persistent relative price increase of

[9]The sole insignificant coefficient in Panel A appears in the last week of May. More generally, all three

approximately 0.2–0.6% for foreign-brand imports compared with domestically produced domestic-brand vehicles throughout the post-tariff period. Based on this, we conclude that the automotive 'Liberation Day' tariffs spill over to the prices of used cars in a non-negligible manner. This is our first main finding.

Second, Panel B of Figure 3 reveals that domestically produced foreign-brand vehicles appreciate by nearly the same amount as foreign-brand imports. In fact, in the months before July, the point estimates in Panel B are, if anything, slightly larger than those in Panel A, although, as can be seen from Panel D, the difference between the two foreign-brand groups never appears to be statistically significant. The evolution of the price deviations of domestically produced foreign-brand vehicles follows the same profile as the foreign-brand imports: a rapid rise to roughly 0.005 in late April, the late-May dip, a peak of approximately 0.006 in early July, and a persistent positive gap of 0.003–0.005 thereafter. Based on the results in Panel B, we conclude that the price response for domestically produced foreign-brand used cars was governed by brand foreignness rather than by direct tariff exposure of the vehicles' imported (new) counterparts.

Finally, the estimates in Panel C of Figure 3 reveal that the price response of imported domestic-brand vehicles is much more modest. The estimated δ_t hover around 0.002 in the first weeks, dip slightly below zero in late May, and sit beneath their foreign-brand counterparts at virtually every point before September, with wide confidence intervals that often render these estimates insignificantly different from zero. The point estimates then increase gradually over the remainder of the sample, reaching roughly 0.003–0.004 by late October—suggesting a slower, delayed adjustment rather than the immediate repricing observed for foreign brands. The finding that the price response for imported domestic-brand vehicles is much more modest reinforces our second main finding that consumers are guided by brand

groups exhibit a short-lived but pronounced price dip at this time. This dip coincides with the Trump Administration's anti-stacking order, which reduced effective tariff rates by preventing overlapping tariffs (e.g., on steel and aluminum) from cumulatively applying to the same imported products. It established a hierarchy among five major tariff categories, ensuring that importers would only pay the highest applicable tariff rate rather than multiple stacked duties.

foreignness rather than by the new model's tariff exposure.

Taken together, our results suggest that the initial price response to the tariffs was stronger for foreign-brand vehicles regardless of where they were produced, while imported domestic-brand vehicles were more insulated from price increases.

4 Mechanisms and Robustness Checks

This section investigates possible mechanisms behind the price responses documented above and offers some robustness analysis. Section 4.1 argues that cost-side explanations are difficult to reconcile with our findings and lays out a demand-side substitution mechanism. Sections 4.2 and 4.3 present two pieces of corroborating evidence: (i) decomposing the price response of foreign-brand vehicles by model-year, and (ii) decomposing the price response of imported vehicles by country of assembly, respectively.

4.1 Demand-Side Substitution versus Cost-Side Explanations

We do not believe that systematic changes in costs can explain the patterns documented above. Used vehicles in our sample are sold through dealerships whose operating costs—labor, rent, and financing—are unlikely to differ for foreign versus domestic brands. Moreover, any supply-side response is necessarily limited: all vehicles in our sample were produced and first sold before the tariffs took effect, such that without changes in household driving habits and reduced car ownership rates, the available stock of used vehicles is largely fixed in the short term.

On the demand side, however, a natural mechanism presents itself. If tariffs raise the prices of imported new vehicles, this will naturally increase demand for untaxed vehicles via their cross-price elasticities of demand, thereby raising prices by a larger margin for those cars and SUVs that are perceived to be closer substitutes. In practice, brand preferences are likely to dominate preferences over country of origin. Consumers may hence more readily associate foreign brands with imported (taxed) vehicles, whereas for domestic brands, consumers may be less attentive to where vehicles are actually produced, such that tariff spillovers into the market for domestic-branded used vehicles operate more sluggishly and gradually—exactly the pattern in Panel C of Figure 3.

4.2 Price Responses by Model-Year Vintage

While the substitution mechanism cannot be tested directly, it delivers a sharp auxiliary prediction: used vehicles that are closer substitutes for new cars should exhibit larger price increases. To test this hypothesis, we decompose the price response of foreign-brand vehicles by model-year vintage, as reflected in the following specification:

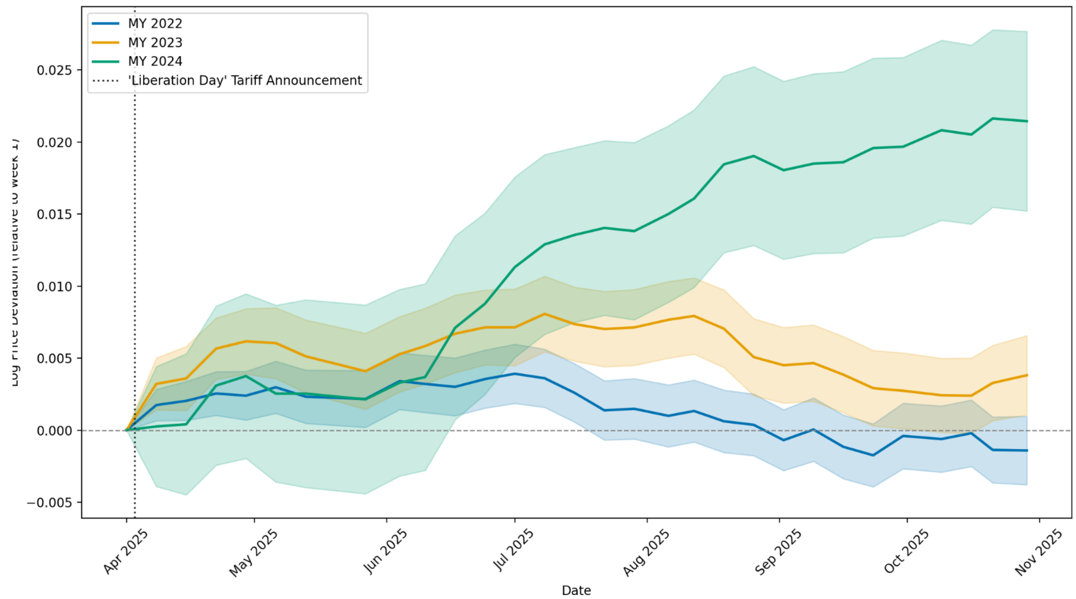
$$\begin{aligned}\ln(\text{price}_{it}) &= \gamma_{\text{title}} + \gamma_{\text{dealership}} + \gamma_{\text{model\_year}\times t} + \beta_1 \ln(\text{mileage}_{it}) + \beta_2 \text{one\_owner}_{it} \\ &+ \beta_3 \text{no\_accident}_{it} + \sum_{j=2022}^{2024} \sum_{t=2}^{W} \delta_{jt} \big(D_t \times \text{Foreign brand}_i \times \mathbf{1}\{\text{model\_year}_i = j\}\big) + \varepsilon_{it}.\end{aligned} \tag{2}$$

where we combine imported and domestically assembled foreign-brand vehicles into a single foreign-brand category, since Section 3 shows that their prices move closely together. We expect the price response to be stronger for newer vintages.

The estimates in Figure 4 confirm this prediction. Although initially noisy, the price increase among foreign-brand vehicles is driven primarily by 2024 model-year vehicles, the newest cohort in the used-car market.[10] The 2024 model-year deviation is close to zero through May, climbs steeply from June onward—passing 1.3% in early July and 1.9% by late August—and continues rising to roughly 2.1% by the end of October, despite the rapid depreciation that normally characterizes used vehicles. By contrast, the responses of the older vintages are considerably more modest: the 2023 model-year deviation peaks at roughly 0.7–

[10]Our sample excludes listings with odometer readings below 30,000 miles. As a result, the number of 2024 model-year observations increases over time as more vehicles cross this threshold, which likely explains the large variance of the 2024 model-year estimates early in the sample and suggests that these estimates are, if anything, attenuated relative to the true effect.

Figure 4: Price Responses of Foreign-Brand Vehicles by Model-Year Vintage



Notes: This figure visualizes the estimated coefficients δ_{jt} from equation (2), which capture the weekly log price deviations of foreign-brand used vehicles (imported and domestically assembled combined) of model years 2022–2024, relative to domestic-brand vehicles. The specification includes vehicle-title and dealership fixed effects and controls for log mileage, single-owner status, and accident history. Standard errors are clustered at the dealership level; shaded regions denote 95% confidence intervals. The vertical dotted line marks April 3, 2025. See text for further details.

0.8% in mid-summer before fading to 0.3–0.4%, while the 2022 model-year deviation never exceeds 0.4%, returns to its pre-tariff level by September, and becomes slightly negative thereafter.

The analysis in this section supports two of our earlier conclusions. First, it reinforces the substitution mechanism given that 2024 model-year vehicles ought to be the closest substitutes for new cars and, therefore, the 2024 model-year vehicles should be the most exposed to tariff-induced increases in new-car prices. Second, the analysis in this section helps rule out possible supply-side explanations. Specifically, if the observed price increases reflected higher costs of selling used cars, we would expect similar price trajectories across model years; instead, the effect is concentrated precisely where the substitution mechanism predicts.

4.3 Incidence by Country of Import

We next investigate the incidence of the automotive tariff by country of production. This experiment is motivated by our findings that consumers' decisions are driven by perceived rather than actual tariff exposure. Accordingly, even if the tariff were formally uniform across trading partners, its effective incidence may vary with the perceived substitutability between a country's used vehicles and U.S.-produced new cars. To test this hypothesis, we estimate a version of equation (1) in which the treatment indicator is replaced with a set of indicators for the vehicle's country of origin/production interacted with the weekly dummies, retaining the full set of fixed effects and other controls.

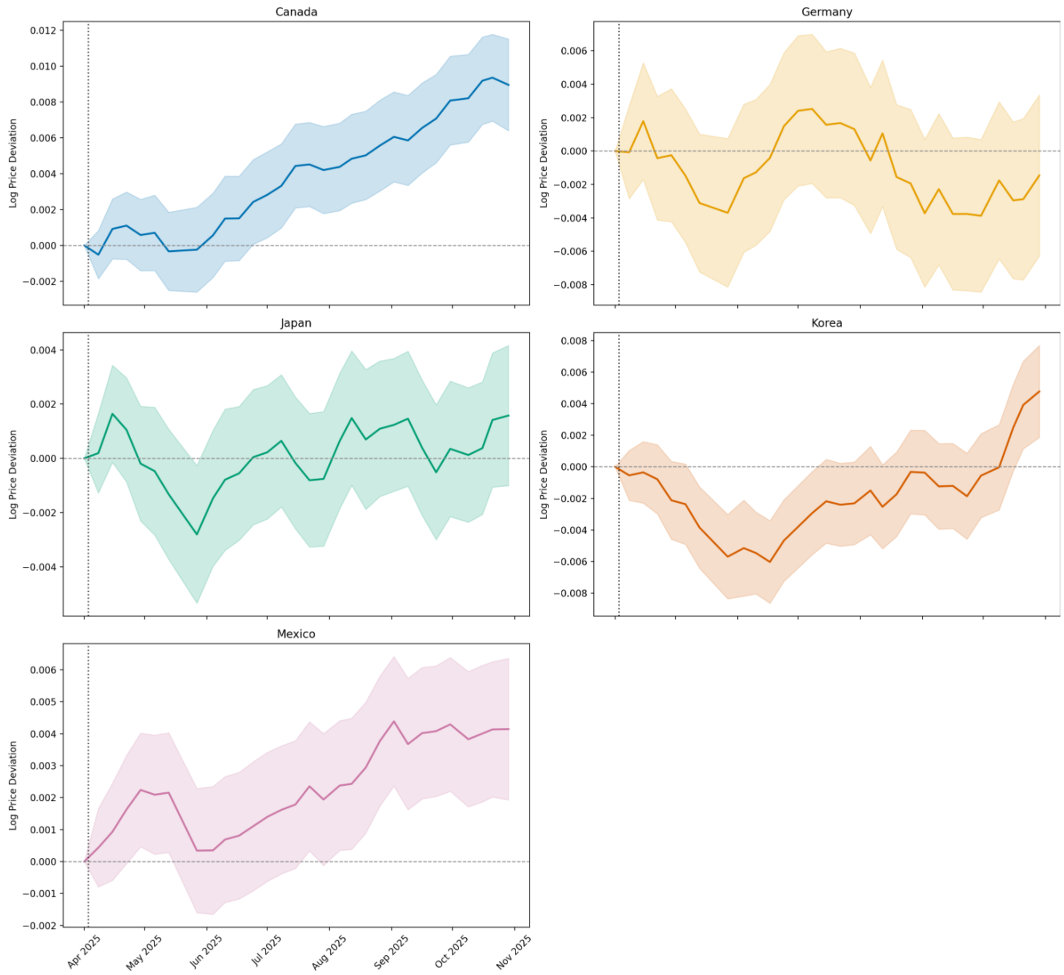
Figure 5 shows that used vehicles imported from Canada and Mexico exhibit the clearest and most persistent price increases. The Canadian series rises almost monotonically over the entire post-tariff period, reaching roughly 0.9% by late October, while the Mexican series climbs to approximately 0.4% by September and remains there. In contrast, the responses for vehicles assembled in Germany and Japan fluctuate around zero and are statistically insignificant, and the Korean series is, if anything, negative through the summer before turning positive only at the very end of the sample.[11]

5 Conclusion

This paper provides evidence on the spillover effects of the 2025 automotive tariffs into the U.S. used-car market—a market that the policy does not tax, but that supplies close substitutes for the goods that it does. Using over eight million web-scraped listings observed weekly around the April 3, 2025, implementation of the 25% automobile tariffs, together with a VIN-based crosswalk separating brand affiliation from production origin, we document an

[11] Certain vehicles imported from Canada and Mexico may have qualified for preferential treatment provided that they met USMCA rules of origin (i.e., at least 75% North American content by value, with 40-45% produced by workers earning at least $16 per hour, and at least 70% of steel and aluminum sourced from North America), thereby lowering their tariff exposure. Nevertheless, demand spillovers are likely to have been strongest for Canadian and Mexican vehicles generally (hence vehicle manufacturers' choices of North American production locations and integration of production networks).

Figure 5: Price Responses by Country of Assembly



Notes: This figure visualizes the estimates of the weekly log-price deviations of imported used vehicles by country of origin/production relative to domestically assembled vehicles, pooled across model years 2022–2024, from a version of equation (1) with country-of-origin indicators interacted with the weekly dummies and the same fixed effects and controls. Standard errors are clustered at the dealership level; shaded regions denote 95% confidence intervals. The vertical dotted line marks April 3, 2025. Note the differing vertical scales across panels. See text for further details.

immediate and persistent relative price increase of 0.2–0.6% for foreign-brand used vehicles. More interestingly, our results suggest that the incidence of the tariff follows *perceived* rather than actual exposure: foreign-brand vehicles that are produced in the U.S. appreciate as much as those assembled abroad. The response is concentrated among the newest model-year vehicles, consistent with demand substitution away from (imported) new cars, and is most persistent for vehicles imported from Canada and Mexico, whose economies are most tightly integrated into North American automotive production.

These findings carry two broader messages. First, assessments of tariff incidence that focus only on directly taxed goods understate the burden on consumers; the effects documented here operate in a market twice the size of the new-car market and central to the transportation of lower-income households. Second, the finding that prices respond to brand perception rather than actual exposure suggests that the allocative effects of tariffs depend not only on their legal design but also on how consumers internalize these effects via their cross-price elasticities of demand—a consideration that is mostly absent from standard incidence analysis.

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