

18-16 Vehicular Assault: Proposed Auto Tariffs Will Hit American Car Buyers' Wallets

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President Donald Trump's proposal in May 2018 to impose 25 percent tariffs on imported automobiles, SUVs, vans, and trucks—as well as all auto parts—prompted warnings from the industry that such a step would reverse the industry's recent robust job growth.¹ An analysis by the Peterson

1. Some news reports suggest that the expected levy is now a 20 percent tariff. See Jacob M. Schlesinger, Emre Peker, and Christina Rogers, "Trump Threatens 20% Tariff on European Cars, Seeks More U.S. Production," *Wall Street Journal*, June 22, 2018, <https://www.wsj.com/articles/trump-threatens-20-tariff-on-european-cars-seeks-more-u-s-production-1529680653>. However, since the tariff rate will ultimately be the recommendation of an ongoing investigation and subject to presidential approval, this analysis relies on Trump's stated preference of a 25 percent tariff.

Institute for International Economics echoed that view, calculating a 5 percent drop in auto sector employment if trading partners retaliate.² This Policy Brief goes further by examining the effects of such tariffs on consumers. Coming on top of the tariffs imposed in June on steel and aluminum imports, which automakers say raise auto production costs by 1 percent,³ the newly proposed auto tariffs will raise car prices significantly, suppressing sales and pushing some buyers with modest incomes out of the new car market entirely.

More specifically, analysis using industry data, consumer information, and the record of previous tariff hikes indicates that the average price of an entry-level compact car will increase between \$1,409 and \$2,057. Similarly, the price of a new compact SUV/crossover, the most popular vehicle in America, will rise by \$2,092 to \$3,066. More upscale versions of the compact SUV/crossover will rise by significantly more, \$4,708 to \$6,971, because of higher imported foreign content, and hence higher taxes paid, for the typical luxury vehicle.

Often overlooked when auto tariffs are considered is that, because of border-crossing manufacturing supply chains, there are in fact no 100 percent "made in the USA" cars. Indeed, many so-called "foreign cars" are assembled in the United States—and some contain more domestic content than similar vehicles bearing American name badges.⁴ The percentages vary across discrete market segments, however.

2. See Sherman Robinson, Karen Thierfelder, Jeffrey J. Schott, Euijin Jung, Zhiyao (Lucy) Lu, and Melina Kolb, "Trump's Proposed Auto Tariffs Would Throw US Automakers and Workers Under the Bus," *PIIE Trade and Investment Policy Watch*, May 31, 2018, <https://piie.com/blogs/trade-investment-policy-watch/trumps-proposed-auto-tariffs-would-throw-us-automakers-and>.

3. Morningstar analysts predict the price of a car will rise 1 percent overall because of the steel and aluminum tariffs, based on its conversations with Ford Motor Co. and General Motors. John D. Stoll and Mike Colias, "Steel, Aluminum Tariffs Could Raise Car Prices by \$300," *Wall Street Journal*, March 12, 2018, <https://www.wsj.com/articles/steel-aluminum-tariffs-could-raise-car-prices-by-300-1520867757>.

4. For example, National Highway Traffic Safety Administration (NHTSA) data, discussed further below, shows that the combined US/Canadian content of a Honda CR-V is 65 percent of total content, while the corresponding share for the Ford Escape is 60 percent US/Canadian content.

Table 1 Top-selling vehicles in the United States, 2017, included in the analysis

Rank	Compact cars		Compact SUVs/crossovers		Luxury compact SUVs/crossovers	
	Model	Units sold	Model	Units sold	Model	Units sold
1	Honda Civic	377,286	Toyota RAV4	407,594	Lexus NX	59,341
2	Toyota Corolla	329,196	Nissan Rogue	403,465	Audi Q5	57,640
3	Nissan Sentra	218,451	Honda CR-V	377,895	Acura RDX	51,295
4	Hyundai Elantra	198,210	Ford Escape	308,296	Mercedes-Benz GLC-Class	48,643
5	Chevrolet Cruze	184,751	Chevrolet Equinox	290,458	Buick Envision	41,040
	Top-selling subtotal	1,307,894	Top-selling subtotal	1,787,708	Top-selling subtotal	257,959
	Top-selling subtotal (percent)	57	Top-selling subtotal (percent)	61	Top-selling subtotal (percent)	49
	Market segment total	2,291,272	Market segment total	2,921,014	Market segment total	529,199

Source: GoodCarBadCar (<http://www.goodcarbadcar.net/2018/01/december-2017-year-end-u-s-vehicle-sales-rankings-top-296-best-selling-vehicles-in-america-every-vehicle-ranked/>).

In general, best-selling autos have more domestic content (partly because many are assembled in the United States), while less affordable luxury vehicles have less.

The tariff's impact is also determined by another important factor: Buyers within each market segment substitute different car models in the same class in response to cost. Someone considering the purchase of a Ford Escape, for example, is also likely to consider a Honda CR-V or Toyota RAV4. As a result, manufacturers who face high import tax bills and who try to pass these costs to buyers will push shoppers away from their models and toward models with lower foreign content.

This substitution across models allows all manufacturers to raise prices when tariffs are imposed, regardless of how much foreign content any one of them is using. Sales revenue, net of import taxes paid, will rise for manufacturers using fewer imported parts but will fall for those using high foreign content (because although retail auto prices will also rise, they may not rise enough to offset fully the manufacturer's tariff costs). The key insight is that normal shopping behavior, not the imported content of any one model, is what makes showroom prices reflect the average cost of higher taxes among similar vehicles.

This Policy Brief takes these factors into account while investigating three different segments of the American automobile market. For each segment, the value of imported parts in the top-selling models is estimated, along with the taxes manufacturers will have to pay on imports used in these models. The Policy Brief averages these price impacts over the top-selling models in each segment.

A key parameter in estimating how tariffs will affect retail prices is the willingness of manufacturers to "pass through" higher costs to consumers. A careful analysis of the historical record provides the basis for understanding under what circumstances manufacturers pass tariff costs on to

consumers. That record is not extensive because the United States has not recently raised tariffs on automobiles. In the 1980s, however, the United States raised tariffs on Japanese trucks from 4 to 25 percent and levied a 45 percent tariff on Japanese heavy motorcycles. An important study from that period demonstrates that the cost of tariffs was substantially passed to retail consumers, as explained below.

THE VEHICLES ANALYZED

Three auto market segments are analyzed in this paper: compact cars, compact SUVs/crossovers, and luxury SUVs/crossovers. Table 1 lists the top-selling models in each segment, along with their 2017 sales.

Compact cars are relatively less expensive vehicles and account for 13 percent of overall sales of new cars and trucks. The median income of buyers in this segment is reportedly \$74,387, higher than the median income of all American households and an indication of the attraction of compact cars to lower income as well as to higher income households seeking a second or third car.⁵

With almost three million vehicles sold in 2017, compact SUVs/crossovers account for 17 percent of new car and truck sales. The median household income for this market segment in 2017 is reportedly \$88,094. Their upscale cousins, compact luxury SUVs/crossovers, account for only 3 percent of 2017 US car and truck sales. For these

5. Information on the average income of buyers is reported in individual auto reviews published by J.D. Powers. US median household income was \$59,039 in 2016 according to the US Census Bureau. The Bureau will release median income figures for 2017 in December 2018. See Kimberly Amadeo, "Average Income in the USA by Family and Household," *The Balance*, May 23, 2018, <https://www.thebalance.com/what-is-average-income-in-usa-family-household-history-3306189>.

luxury vehicles, the median household income of buyers is reportedly \$157,767.

To get a representative picture of these different market segments, the top five best-selling vehicles in each segment are used. For compact cars, the top five best-sellers account for 57 percent of total sales in the segment; for compact SUVs/crossovers, 61 percent; and for luxury SUVs/crossovers, 49 percent.⁶

DETERMINING THE AMOUNT OF FOREIGN CONTENT IN AUTOS

With today's integrated production patterns, a nameplate does not indicate how much of the vehicle is produced in the United States. Fortunately, detailed information from the National Highway Traffic Safety Administration (NHTSA), updated in June 2018, provides the foreign content of each of the 15 vehicles in this analysis.⁷

The NHTSA reports statistics for US and Canadian (joint) content for all vehicles sold in the United States, as well as information on where final assembly occurs. Since the enactment of the American Automobile Labeling Act (AALA) in 1994, automakers are required to provide the NHTSA with information on each vehicle's US and Canadian parts content, the country of assembly, and the country of origin of the engine and transmission.

The AALA data have one major limitation: US and Canadian content are reported as a combined number that cannot be separated. As such, analysis based on these data (the best available) reveal the price impact of an auto tariff as it would be only if Canadian imports were exempted. Hence, the foreign content for vehicles using Canadian parts is understated. Despite this limitation, AALA data are sufficient to establish the main orders of magnitude of content. The foreign content of the top five best-selling compact cars is a sales-weighted average share of 51 percent; for compact SUVs/crossovers, 56 percent; and for luxury SUVs/crossovers, 84 percent.

6. For compact cars, the top five best-selling models are the Honda Civic, the Toyota Corolla, the Nissan Sentra, the Hyundai Elantra, and the Chevrolet Cruze. For compact SUVs/crossovers, these are the Toyota RAV4, the Nissan Rogue, the Honda CR-V, the Ford Escape, and the Chevrolet Equinox. For the luxury SUVs/crossovers, these are the Lexus NX, the Audi Q5, the Acura RDX, the Mercedes-Benz GLC-Class, and the Buick Envision.

7. Data are available at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/2018_aala_alpha_06262018.pdf.

BASIS FOR PASS-THROUGH ASSUMPTIONS: JAPANESE IMPORT TARIFFS IN THE 1980S

Economists rely on statistical models to estimate how much of a tariff is absorbed by producers and how much is passed through to consumers in the form of higher prices. While it is relatively easy to observe prices before and after a tariff is imposed, intervening factors, such as general price inflation, hikes in key input costs unrelated to the tariff, or quality improvements, mean that care must be taken in attributing observed price changes to import taxes. Regression-based models exploit historical changes in tariff policies to estimate the pass-through of tariffs to consumer prices, while allowing the researcher to control for these other relevant features of the economic environment.

A key advantage of this approach compared to more structural approaches is that there is no need to make explicit behavioral and equilibrium assumptions.⁸ The disadvantage is that the results are only valid if current circumstances are reasonably similar to the historical variation underlying the model estimates. For this reason, it would be ideal to use pass-through estimates obtained from variations in US car tariffs in a market with a similar structure to that of the US automobile market today and at a time when the economy enjoyed robust economic growth and low unemployment.

This ideal does not exist.⁹ Yet a study by Robert C. Feenstra (1989), which exploits an increase in tariffs on Japanese trucks from 4 to 25 percent and the imposition of a 45 percent tariff on Japanese heavy motorcycles in the 1980s, is informative. Using this variation, Feenstra finds that 60 cents of every dollar of import tax was passed to

8. In particular, alternative structural approaches require assumptions about the extent to which consumers are willing to substitute domestic for foreign cars and to substitute used cars for new cars. They also require assumptions about the extent to which domestic producers can substitute domestic for foreign parts and the marginal cost of increasing production to replace imports. A good example of this approach for the auto industry is Goldberg (1995).

9. The last major trade action by the United States over autos occurred about 40 years ago. When faced with almost certain imposition of US import restrictions in the early 1980s, the Japanese government announced it would "voluntarily" limit Japan's exports of autos to the United States. Careful study of this voluntary export restraint (VER) by Robert C. Feenstra (1989) found that the average price of American-made cars sold in the United States rose very rapidly, by 41 percent from 1979 to 1981. The average price of Japanese cars sold in the United States rose by 25.6 percent over the same period. Most of the price increase for American cars was due to the greater market power US producers exercised after the VER sheltered them from competition. Adding further injury, the VER also permitted European auto producers to raise prices in the American market by nearly one-third. Estimates and extended discussion are contained in Feenstra (2004, p. 271-81).

foreign truck import prices—in other words, a 60 percent pass-through—and between 90 cents and \$1.40 of every import tax dollar was passed to foreign motorcycle import prices.¹⁰

Why was the pass-through relatively low for trucks and high for motorcycles? What does it tell us about the pass-through for cars today? Differences in the coverage of the tariffs, in market structures, and in the state of the economy help explain these differences.

The tariff on heavy motorcycles covered 90 percent of all US sales of motorcycles (Feenstra 1989). That is because the tariff did not only cover imports from Japan but also motorcycles produced by Honda and Kawasaki in the United States.¹¹ As Harley-Davidson was the only US competitor to the Japanese companies, price competition remained subdued. In this environment, it is not surprising that Japanese exporters did not absorb the increase in costs and instead chose to pass it on to consumers.¹² In contrast, US producers rapidly introduced compact truck models with characteristics very similar to those of existing Japanese models after the tariff on Japanese trucks was increased in August 1980. Price competition with domestic producers was thus intense, and exporters were reluctant to pass through the full amount of the increase in tariffs.

Today's passenger car market has clearly more substitutes than the motorcycle market of the 1980s, thereby suggesting sellers who wish to pass costs on to customers today will have to do so at a rate lower than the upper bound of 140 percent that Feenstra found for motorcycles. Whether today's passenger car market is more or less competitive than the market for compact trucks in the 1980s is uncertain. But given that Trump's proposed tariff is also on auto parts, which are difficult to substitute with domestic goods, foreign auto parts exporters have less reason to absorb the tariff. It is also less likely now that US auto manufacturers will absorb the tariff to maintain or expand market shares, given that modern supply chains make transferring production capa-

bility back to the home country more difficult compared to earlier periods.¹³ For this reason, the pass-through for cars today should be higher than that of trucks in the 1980s.

The higher pass-through for motorcycles and lower pass-through for trucks are also consistent with the state of the economy when these two tariffs were implemented. Real GDP grew at an annual rate of 6 percent in the 24 months after the tariff levy on motorcycles was introduced in April 1983. In contrast, the 1980 recession had just ended when the tariff on trucks became effective in August, and a new recession started less than a year after, keeping demand weak. As in 1983, today's macroeconomic environment of tight labor markets suggests that producers of relatively high domestic content models would face rising costs if they increased production rapidly.

Altogether, these contemporary demand- and supply-side factors suggest that the pass-through for today's US passenger car market is above the lowest pass-through estimates for the truck market (60 percent) and below the highest pass-through estimates for the motorcycle market (140 percent) of the 1980s. In fact, this ordering is consistent with what Feenstra (1989) finds for how producers pass on to buyers cost increases related to movements in the exchange rate. To be conservative in the estimates in this Policy Brief, pass-throughs of more than 100 percent are not considered. Instead, a 66 to 100 percent range is considered. Note that the data underlying this analysis are available and free to download, allowing anyone to choose more or less conservative estimates if desired.

FINDINGS: PRICE INCREASES FROM AUTO TARIFF LIKELY TO BE SIGNIFICANT

The first step in estimating the consumer price increase of a 25 percent auto tariff is to find the value of imported materials in each vehicle and the taxes each producer would pay to import these materials (see box 1 for calculation details). Applying the assumed pass-through rates (66 and 100 percent) provides a prediction of how much of these new costs are passed to auto buyers. Since buyers frequently substitute one model with another in a given market segment, the average of the cost increases of the top five models in each segment is calculated, knowing that the prices of all models will adjust as consumers and producers adjust to changed market conditions.

As shown in table 2, the final price increases from an auto tariff are likely to be significant. With only two-thirds of the new tax passed on to consumers, the average price

10. Retailers insert an additional wedge between imported costs and retail prices. It is assumed that this dimension involving retailer-manufacturer interactions is similar enough in today's car market to what it was in yesterday's truck and motorcycle markets to make Feenstra (1998)'s results informative.

11. These companies operated plants in foreign trade zones (FTZ) and should have had the choice to either pay the US tariff on the final goods or on imported parts, whichever was less. But the US Trade Representative directed that Honda and Kawasaki pay the final tariff on their US sales from the FTZ (see Feenstra 1989 for further reference).

12. While sales of Japanese motorcycles with engines in the 700-1099 cc range declined, sales of Japanese motorcycles with 699 cc engines or smaller, which were not subject to the tariff, jumped after the tariff (Kitano and Ohashi 2009).

13. Theodore H. Moran, "Trump's trade war to be costlier than feared," *China Daily*, July 11, 2018, <http://www.chinadaily.com.cn/a/201807/11/WS5b4540f6a3103349141e1fc9.html>.

Box 1 How the 25 percent tariff-inclusive auto price is estimated

First, the five best-selling models in the three market segments—compact car, compact SUV/crossover, and luxury compact SUV/crossover—are identified. The production cost of each model is calculated by deducting the destination fee and dealer holdback from the invoice price of the vehicle, and then deducting the manufacturer's operating margin. Foreign content values are calculated as production cost multiplied by foreign content share. Domestic content values are calculated as production cost minus foreign content value. The auto tariff levy is measured as 0.25 multiplied by foreign content value. Applying two pass-through rates (100 and 66 percent), as explained in the main text, two tariff inclusive foreign content values are produced. The indirect cost of the 2018 steel tariff is assumed to be 1 percent of initial production cost. Pulling it all together, each vehicle's tariff inclusive production cost is the sum of foreign content value, the 25 percent tariff cost on foreign content value, domestic content value, and the steel tariff cost. To compare with actual current dealer's price, the tariff-inclusive production cost, manufacturer's margin, and destination fee are summed up. Finally, the estimated tariff-inclusive auto prices over the top five vehicles in a market segment are averaged by weight of sales share.

This method produces estimates that are similar to those reported by automakers. Toyota's senior vice president for vehicle manufacturing, Brian Krinock, for example, reports expected price increases for the Camry sedan, Sienna minivan, and Tundra pickup of \$1,800, \$3,000, and \$2,800, respectively.¹ The methodology used in this Policy Brief predicts the respective price increases as \$1,638 to \$2,381 for the Camry sedan, \$1,955 to \$2,830 for the Sienna minivan, and \$1,937 to \$2,787 for the Tundra pickup.² Thus, the methodology arrives at estimate ranges that either contain or are slightly below the value reported by Toyota.

1. Eric Kulisch, "Automakers unite to oppose tariffs but worry administration has mind made up," *Automotive News*, July 17, 2018, <http://www.autonews.com/article/20180717/RETAIL01/180719797/automakers-unite-to-oppose-tariffs-but-worry-administration-has-mind>.

2. Sources for this calculation are: Sales units from GoodCarBadCar, <http://www.goodcarbadcar.net/2018/01/december-2017-year-end-u-s-vehicle-sales-rankings-top-296-best-selling-vehicles-in-america-every-vehicle-ranked/>; domestic content from National Highway Traffic Safety Administration, https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/2018_aala_alpha_06262018.pdf; invoice price, dealer price, destination fee, and holdback from Car Buying Strategies, <https://www.car-buying-strategies.com/dealer-invoice/buick-envision-prices.html>; operating margin data for each manufacturer from Bloomberg Finance L.P.; Bloomberg Intelligence; 1 percent increase of price by steel tariff from John D. Stoll and Mike Colias, "Steel, Aluminum Tariffs Could Raise Car Prices by \$300," *Wall Street Journal*, March 12, 2018, <https://www.wsj.com/articles/steel-aluminum-tariffs-could-raise-car-prices-by-300-1520867757>.

Table 2 Average foreign content shares and tariff-induced price increases

	Compact cars	Compact SUVs/ crossovers	Luxury compact SUVs/crossovers
Estimated current dealer price	\$16,852	\$22,516	\$35,020
Foreign content share (2018)	51	56	84
Steel tariff cost increase	\$150	\$204	\$315
Tax under 25 percent Section 232 auto tariff	\$1,907	\$2,985	\$6,798
Tariff pass-through at 66 percent			
Estimated dealer price with steel and Section 232 tariffs	\$18,260	\$24,609	\$39,728
Price increase due to tariffs	\$1,409	\$2,092	\$4,708
Price increase as percent of current dealer price	8.36	9.30	13.44
Tariff pass-through at 100 percent			
Estimated dealer price with steel and Section 232 tariffs	\$18,909	\$25,582	\$41,992
Price increase due to tariffs	\$2,057	\$3,066	\$6,971
Price increase as percent of current dealer price	12.21	13.62	19.91

Notes: Estimated current dealer price is dealer invoice, including destination fee, minus dealer holdback. Steel tariff assumed to add 1 percent to dealer price net of destination fee and operating profit. Section 232 tariff calculated as 25 percent tax on foreign share of dealer cost, which is dealer price net of destination fee and profit. All figures shown are weighted averages for segment, with the weights corresponding to segment market shares.

Sources: Domestic content from National Highway Traffic Safety Administration (https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/2018_aala_alpha_06262018.pdf); invoice price, dealer price, destination fee, and holdback from Car Buying Strategies (<https://www.car-buying-strategies.com/new-car-prices.html>); operating margin for each manufacturer data from Bloomberg Finance L.P.; Bloomberg Intelligence; 1 percent increase of price by steel tariff from John D. Stoll and Mike Colias, "Steel, Aluminum Tariffs Could Raise Car Prices by \$300," *Wall Street Journal*, March 12, 2018 (<https://www.wsj.com/articles/steel-aluminum-tariffs-could-raise-car-prices-by-300-1520867757>).

Table 3 Tariff-induced auto price increases in perspective

	Compact cars	Compact SUVs/ crossovers	Luxury compact SUVs/ crossovers
Average tariff-induced price increase, amortized over five years	\$411	\$613	\$1,394
Median annual household income of category buyers (2017)	\$74,387	\$88,094	\$157,767
Average annual tax cut from TCJA	\$2,119	\$2,511	\$6,042
Tariff-induced auto price increase as a share of annual tax cut	19	24	23

TCJA = Tax Cuts and Jobs Act

Notes: The average tariff-induced price increases shown in table 2 are amortized over five years, assuming a 100 percent pass-through of the Section 232 and steel tariffs. Calculation of average annual tax cut assumes the household contains a married couple with two children who take the standard deduction and file jointly.

Sources: J.D. Power (household income); Tax Foundation Tax Calculator (<https://taxfoundation.org/2018-tax-reform-calculator/>).

increases are: 8.4 percent for a compact car, 9.3 percent for a compact SUV, and 13.4 percent for a luxury compact SUV. If producers pass the tax forward to auto buyers one-for-one, the average price increases are: 12.2 percent for a compact car, 13.6 percent for a compact SUV, and 19.9 percent for a luxury compact SUV. Given that general price inflation has been tame for many years, such discrete price jumps are sure to make car buyers take notice.

The variation of price increases across car segments reflects different foreign content shares. While the foreign content of compact cars and compact SUVs is about 50 percent, it increases to 84 percent for luxury SUVs. As a result of these differences as well as the higher cost of inputs used in luxury vehicles, the increase in the luxury compact SUV segment is estimated to be \$4,708 to \$6,971, much higher than the estimated \$2,092 to \$3,066 for its nonluxury SUV cousins.

It should be noted that the estimation method used here assumes that the US Customs Service is able to tax foreign content only once. However, the complexity of today's manufacturing processes means that materials and parts may cross national borders many times during vehicle production. For this reason, the predicted price increases are lower-bound estimates. In particular, given the deep integration of auto operations across the North American region, if tariffs are imposed on Canadian and Mexican content, administrative complexity rises substantially as does the possibility that foreign content will be taxed multiple times, further affecting buyers' wallets.

TARIFF COSTS COMPARED TO TAX CUTS FOR AVERAGE BUYERS

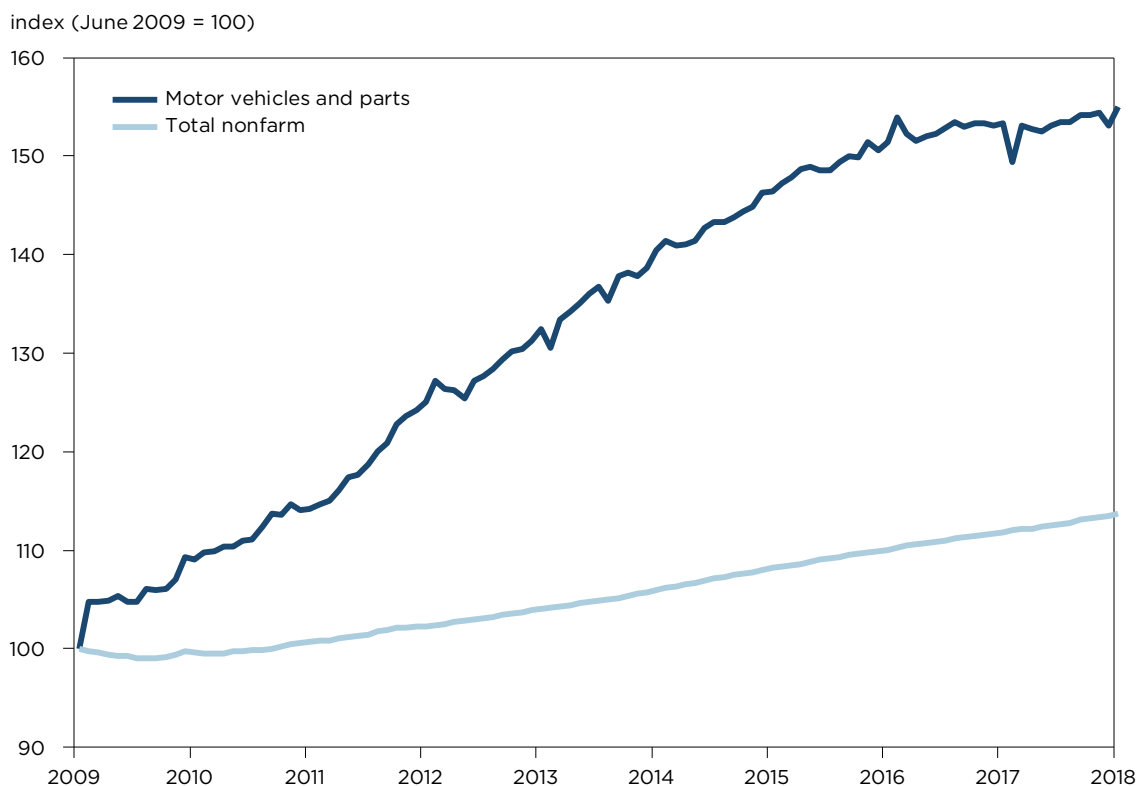
Despite larger estimated price increases for luxury vehicles, less affluent buyers are likely to suffer more from an auto

tariff because they spend a larger share of income on a new car purchase. In fact, vehicle purchases account for 12 percent of total income for households in the bottom fifth of the income distribution, while they absorb only 3 percent of income among the top fifth.¹⁴

These higher costs can be placed in perspective by comparing the estimated increase in auto prices to the annual tax cut households can expect under the Tax Cuts and Jobs Act (TCJA). First, the increase in auto prices is divided by five, to reflect the increase in loan costs each year of a standard 60-month auto loan. Using a pass-through rate of 100 percent, the resulting increase in annual principal loan payments due to the tariff ranges from \$411 more for the average compact car to \$1,394 for the average luxury SUV. The higher loan payments are then benchmarked against the likely tax cut flowing from the TCJA to a household with the median income of buyers in each market segment. Reliable tax cut estimates can be obtained from the Tax Foundation's 2018 Tax Reform Calculator. With these in hand, the higher yearly vehicle expenses from the proposed auto tariffs can be compared to the tax cuts that the median buyer in each market segment can expect.

As seen in the last row of table 3, new auto tariffs, combined with existing steel tariffs, will eat up a substantial portion of the 2018 tax cuts for new car buyers over the next five years. About one-fifth of the tax cut for buyers of compact cars will be eaten up by the tariffs. A larger share, one-quarter, will be removed from the wallets of compact SUV and luxury compact SUV buyers.

14. US Bureau of Labor Statistics, "Table 1101: Quintiles of income before taxes: Annual expenditure means, shares, standard errors, and coefficients of variation, Consumer Expenditure Survey, 2016," available at <https://www.bls.gov/cex/2016/combined/quintile.pdf>.

Figure 1 US auto industry and nonfarm employment growth compared

Source: Federal Reserve Economic Data (FRED) Graph Observations for: Motor Vehicles and Parts, Index June 2009=100 of (Thousands of Persons), Monthly, Seasonally Adjusted; and Total Nonfarm Payrolls, Index June 2009=100 of (Thousands of Persons), Monthly, Seasonally Adjusted. Available at <https://fred.stlouisfed.org>.

BUYERS CANNOT AVOID PRICE INCREASES FROM TARIFFS

Choosing a used car instead of a new one is no escape from an auto tariff. When new car prices rise, used vehicles become more valuable because some households no longer can afford to buy a new car. Holding suddenly more desirable inventory, used car dealers raise prices to meet the now higher demand for previously owned vehicles. People who need to buy a car have no choice but to pony up.

Delaying new car purchases is certainly another way that American households can respond to higher prices. Once President Trump levies auto tariffs, however, the American public will not know when they will be removed. Trump has chosen to use Section 232 of the Trade Expansion Act of 1962 as the mechanism for protecting the auto industry. This law provides the president with wide discretion,¹⁵ including the authority to arbitrarily add or subtract trading partners, raise or lower the tariffs, change the scope of targeted prod-

ucts, or even move from tariffs to quotas to restrict trade. More importantly for deciding when to purchase a vehicle, there is no timeline or explicit criterion for removal of tariffs imposed under this law. Unlike other forms of trade restrictions, such as antidumping duties, Section 232 tariffs can last a very long time or suddenly be whisked away by presidential decree. These features of the law add another layer of uncertainty for consumers as well as producers making investment decisions.

THE NEGATIVE FALLOUT FOR THE US AUTOMOBILE INDUSTRY

The strong employment growth in the US auto industry over the past decade does not portray the kind of troubled industry that erecting protectionist tariffs seems to imply. Although auto sector employment fell sharply with the onset of the Great Recession, it has risen more rapidly since 2009 than nonfarm payrolls as a whole, as shown in figure 1. The integrated North American auto industry produces competitive and innovative models, flush with new technology. In fact, in 2017 the United States exported over \$10 billion worth of automobiles to China, its largest outside customer.

15. Chad P. Bown, "Trump's Long Awaited Steel and Aluminum Tariffs are Just the Beginning," *PIIE Trade and Investment Policy Watch*, March 26, 2018, <https://piie.com/blogs/trade-investment-policy-watch/trumps-long-awaited-steel-and-aluminum-tariffs-are-just>.

Neither the automakers nor autoworker unions called for a tariff on imported autos and auto parts.¹⁶ Strikingly, a new PIIIE analysis shows that if the tariffs were implemented without exemptions and in the absence of retaliation by trading partners, production in the motor vehicle industries would fall 1.5 percent, and the US auto and parts industries would shed 1.9 percent of its labor force.¹⁷

CONCLUSION

Such negative outcomes from an auto tariff for consumers and workers reflect the realities of 21st century manufacturing. Development of cross-border value chains has changed the

way auto and auto parts respond to tariffs. Unlike forty years ago, all cars sold in the United States have significant foreign content (primarily Canadian and Mexican). Unlike forty years ago, most “foreign” manufacturers assemble popular models sold in the United States inside the North American region. Very high shares of Canadian and Mexican auto and auto part exports go to the United States, and tariffs on this trade will simply raise the costs of auto production in the United States. Mexico and Canada export very little of these goods to other regions, while the United States is the end of this supply chain, selling autos and auto parts to the rest of the world. If the United States taxes trade in auto and auto parts, it reduces the competitiveness of the supply chains that have allowed the industry to grow and prosper.

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