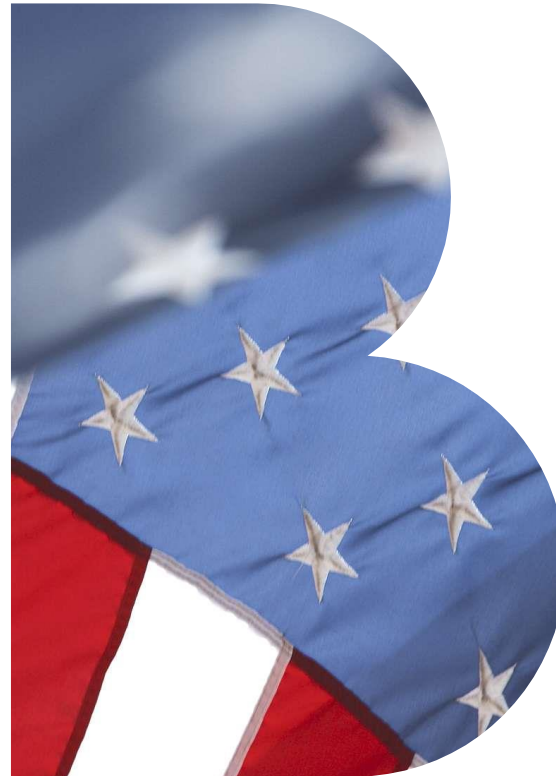


New US tax/tariff proposals and their impact on the US automotive industry

Study



Executive summary

- » The border tax proposals introduced by the new US administration would add significant costs for vehicles sold in the US – both for imported vehicles and vehicles produced in the US due to foreign part content – up to USD 60 bn or USD 3,300 per vehicle in the case of the border-adjusted tax proposal
- » A closer look on OEM level shows that the Detroit 3 on average would be hit by a USD 1,500 cost increase, followed by the Asian manufacturers with around USD 2,000. The European OEMs would be hit by USD 5,300 on average or as much as USD 6,400 for the pure play importers
- » Taking 2015 as an example, the cost increases would erase OEM profits in the US market almost completely, with the exception of Ford and GM – but even for them the high dependency on US profits would turn them loss making on a global level
- » Moving production from abroad to the US does not solve the cost problem. Producing a mid-size sedan in the US is already loss making, moving production e.g. from Mexico adds USD 1,200 in costs, not even counting the billions of dollars in investment costs to rebuild the capacity domestically
- » As a consequence, the border tax proposals may achieve the exact opposite of the intended effect – US companies and US consumers will have to bear the extra costs, leading to weaker vehicle sales, lower margins and eventually even less jobs than today
- » Even in a broader context, taking the planned income tax reductions into account, the cost increases due to the border-adjusted tax would erase the tax benefits for the average US household almost completely

Aside from significant price increases for the US consumer, the consequences for profits and job creation could be disappointing

Automotive Manufacturers

Automotive Suppliers

Impact

- > Short/long term: Price increases to cover tax burden and later, in case of production relocation, additional manufacturing costs
- > Mid term: Reduction of foreign content (US sourcing and reallocation of foreign production capacity)
- > Long-term: US capacity investments with high automation/productivity level



- > Short term: Margin pressure due to OEMs trying to offset the cost increases through procurement savings
- > Mid/long term: Pressure by OEMs to invest in US production



Profits

- > Without countermeasures, US OEM profits will shrink between USD 1,100 and USD 7,200 per vehicle due to tax alone
- > All but Ford and GM would make losses in the US market
- > Potential reduction of foreign content would still result in lower profits due to investment needed and higher domestic cost levels
- > Vehicle sales reduction due to higher prices leads to profit reduction



- > Declining revenues due to OEM cost saving measures (price reduction, loss of contracts)
- > Increasing costs due to import tax for parts and increased cost levels in case of increased US production



US Jobs

- > Short term: No significant change due to existing manufacturing footprint, which takes years to adapt
- > Mid term: Few new manufacturing jobs, due high level of automation required to limit cost increases
- > Price increases will impact vehicle sales negatively, which ultimately leads to lay-offs



- > Short term: Potential lay-offs to cope with margin pressure
- > Mid term: Moderate job creation through reallocation of production to US (high automation)
- > Long term: Job reduction due to decreasing vehicle sales



The border tax proposal will be a zero-sum game at best. For automotive manufacturers, the outcome will be intense margin pressure and reduced vehicle sales – possibly resulting in further job losses.

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A. Some important facts & figures: North American automotive industry

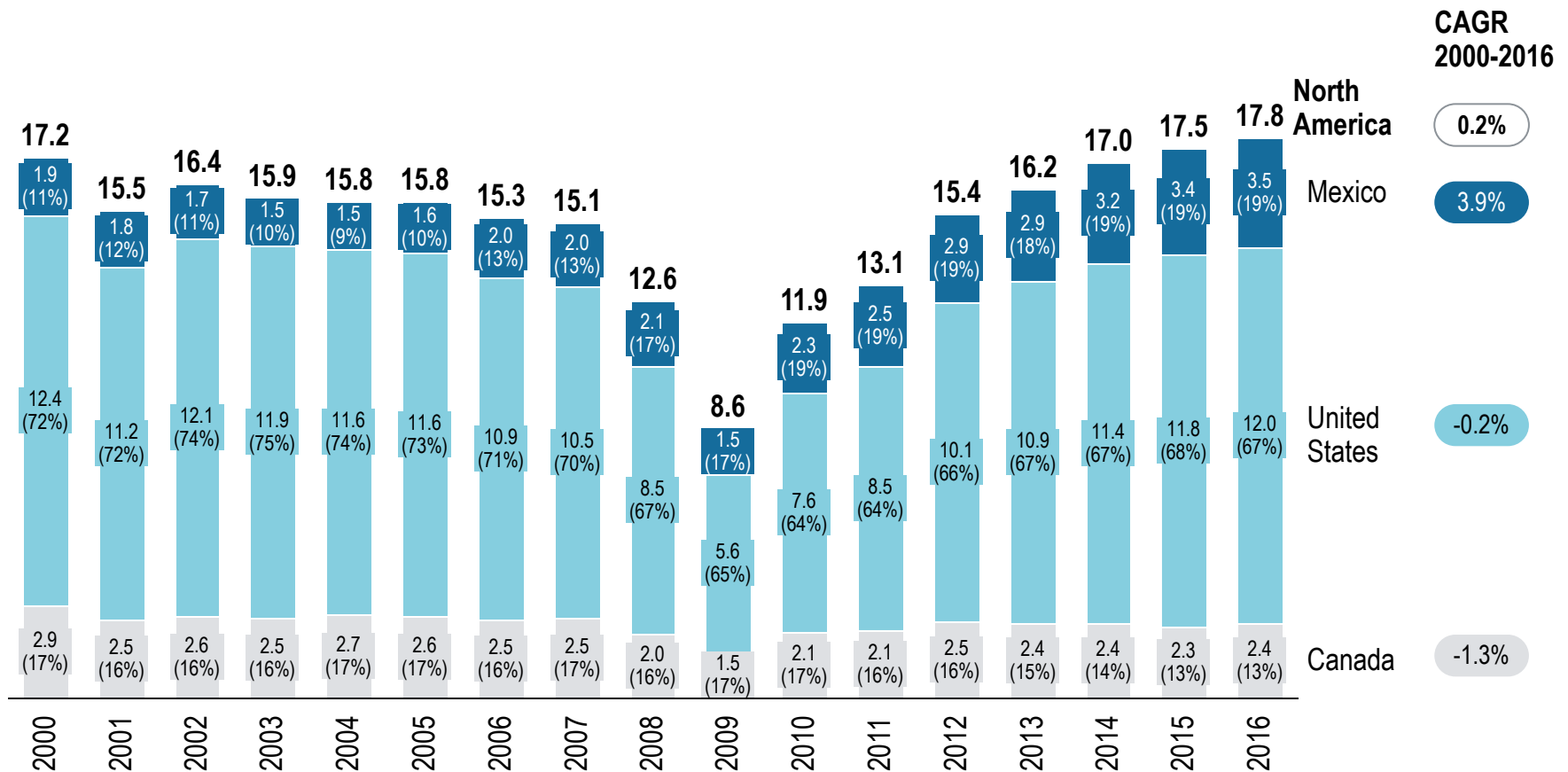


US production is back on very high level – the main driver of job losses is not the move to Mexico, but productivity increase

- » US vehicle production volume has grown back to a high of around 12m vehicles per year – about the same level it was at in the early 2000s. At the same time Mexican production has grown even stronger with a 3.9% CAGR
- » Since 2000, the automotive manufacturers alone have invested \$110bn in the US, the majority of it, almost \$75bn, since the crisis in 2009. Mexico investments totaled \$28bn whereas Canada only received \$12bn
- » All of the seven major automotive manufacturers in North America have the vast majority of their production in the US, and plan further US investments, in parallel expanding their Mexico operations
- » In 2016 one automotive manufacturer, BMW, exported more vehicles (311,000) from its US plant than it imported (268,000)
- » On average, net vehicle imports into the US are around 30% of the total domestic sales, while Mexico is exporting about 55% of its production and Canada has more or less an even trade balance
- » In many cases moving production to Mexico is simply a necessity in today's market environment – producing cars, especially small cars, in the US is a money-losing business
- » The main driver behind the loss of automotive manufacturing jobs is not the move to Mexico, but the productivity increase driven by automation – from 2000 to 2009 automotive industry jobs in the US declined from 1.3m to as low as 700k, at the same time as jobs in Mexico grew only from 300k to 400k
- » Since the crisis in 2009 both US and Mexican automotive industry jobs have grown strongly with a CAGR of 5.4% and 12.6% respectively

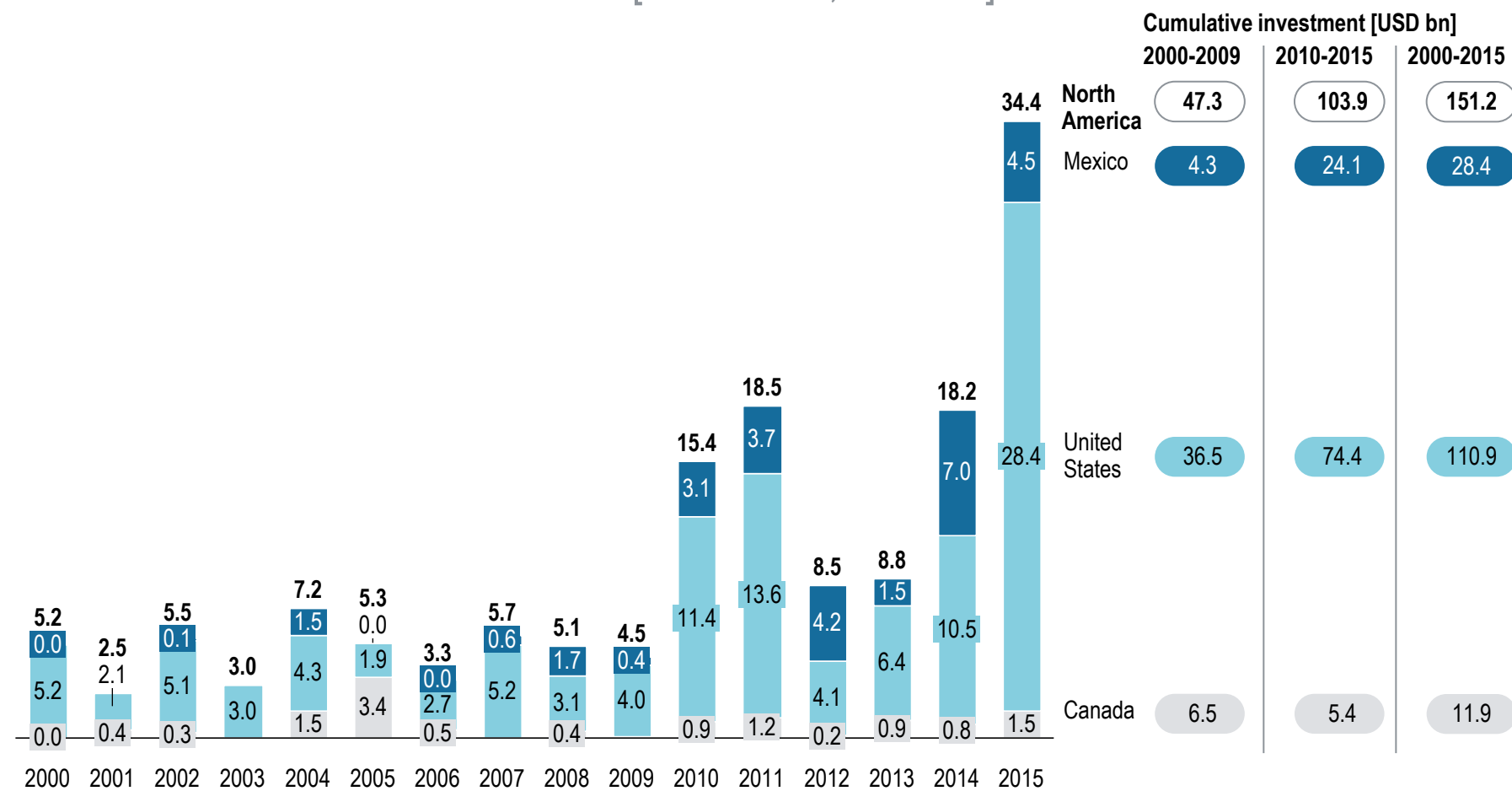
US production volume grew back to a high of around 12m vehicles per year – about the same level it was at in the early 2000s

North America light vehicle production [2000-2016, units m]



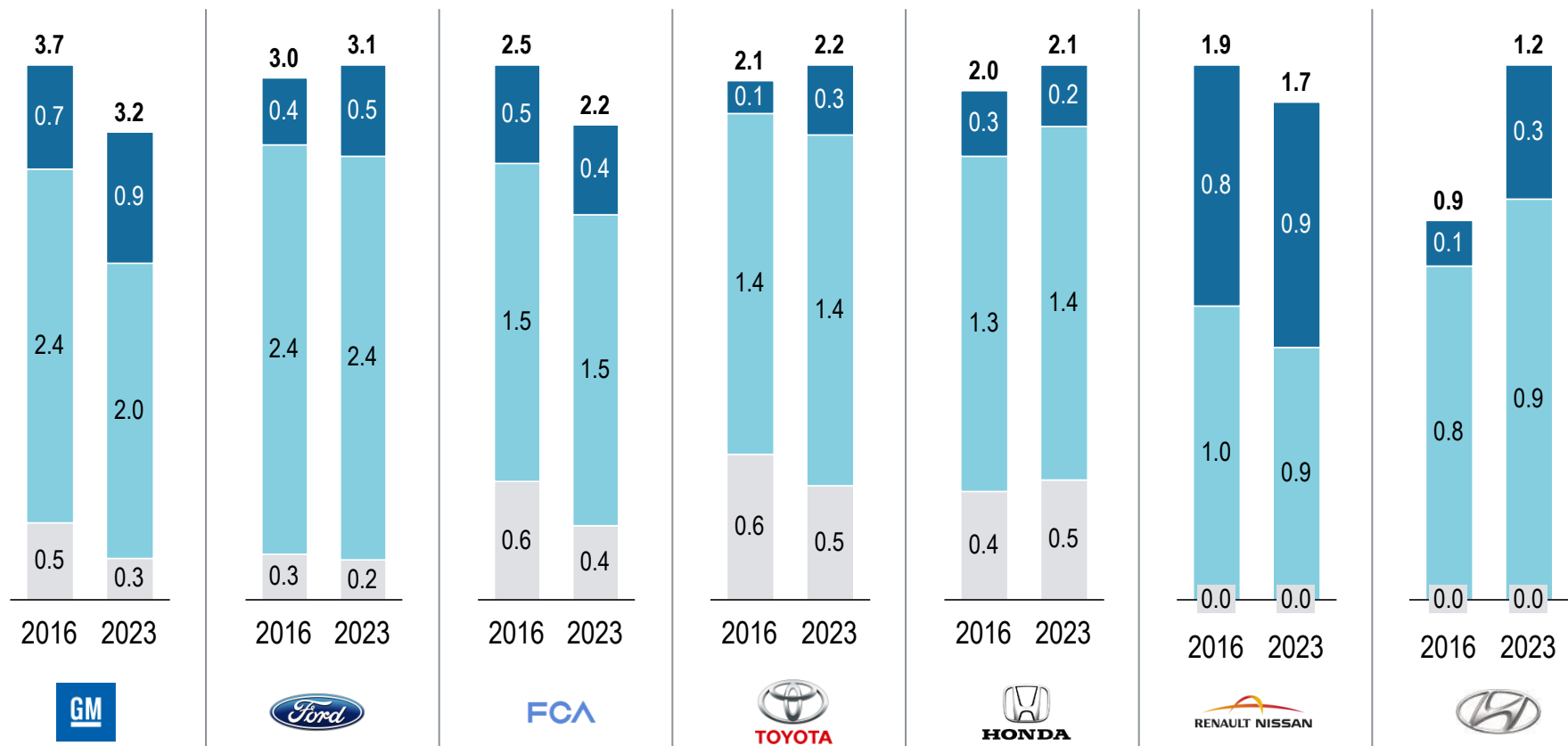
From 2000 to 2015, USD 111 bn in OEM investments have been made in the US, USD 28 bn in Mexico and USD 12 bn in Canada

Announced automaker investments [2000-2015, USD bn]



All of the seven major OEMs have the majority of their production in the US but some also plan to continue expanding Mexican operations

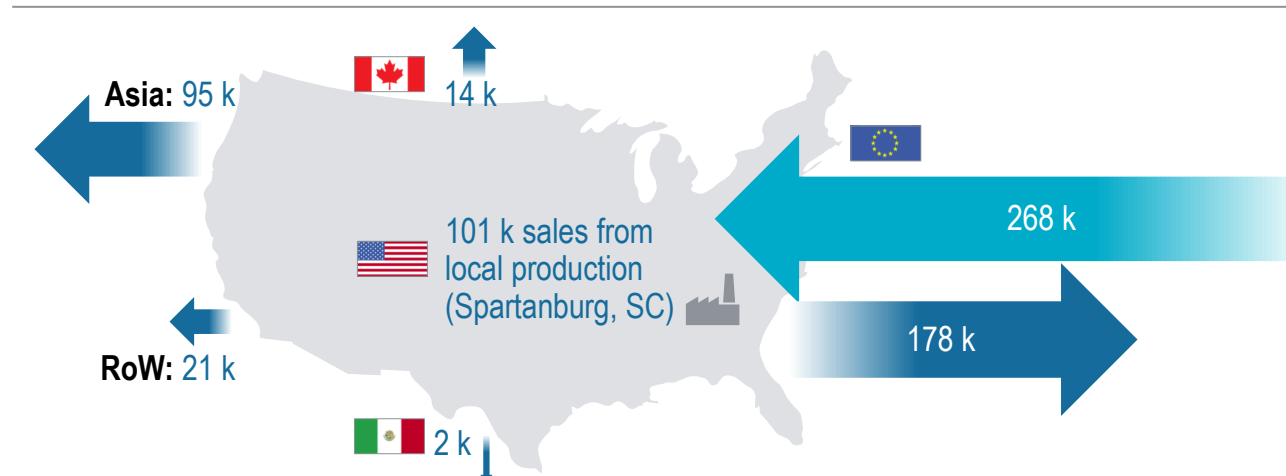
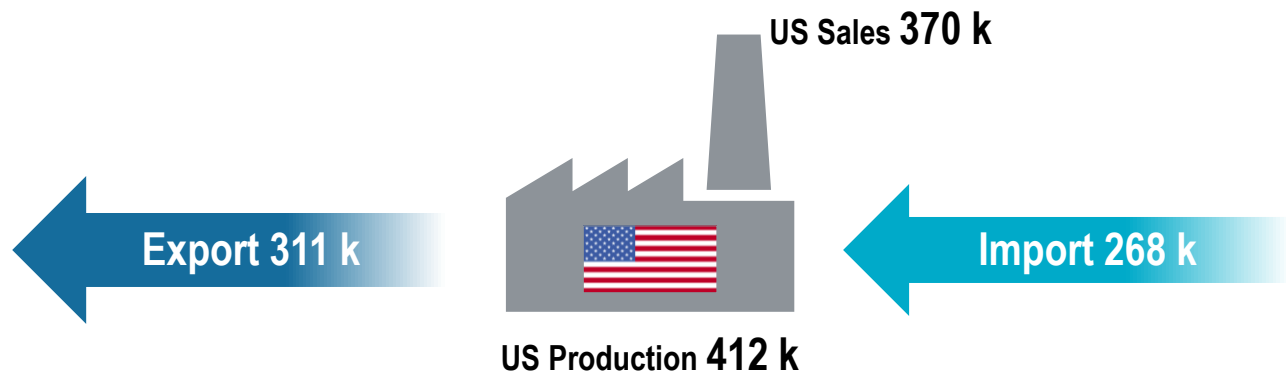
North America light vehicle production split by sales group, 2016 and 2023 [units m]



■ Mexico ■ United States ■ Canada

BMW uses the USA as a global production hub and exports more vehicles from Spartanburg than it imports from its EU production sites

BMW's US production and trade balance [2016]

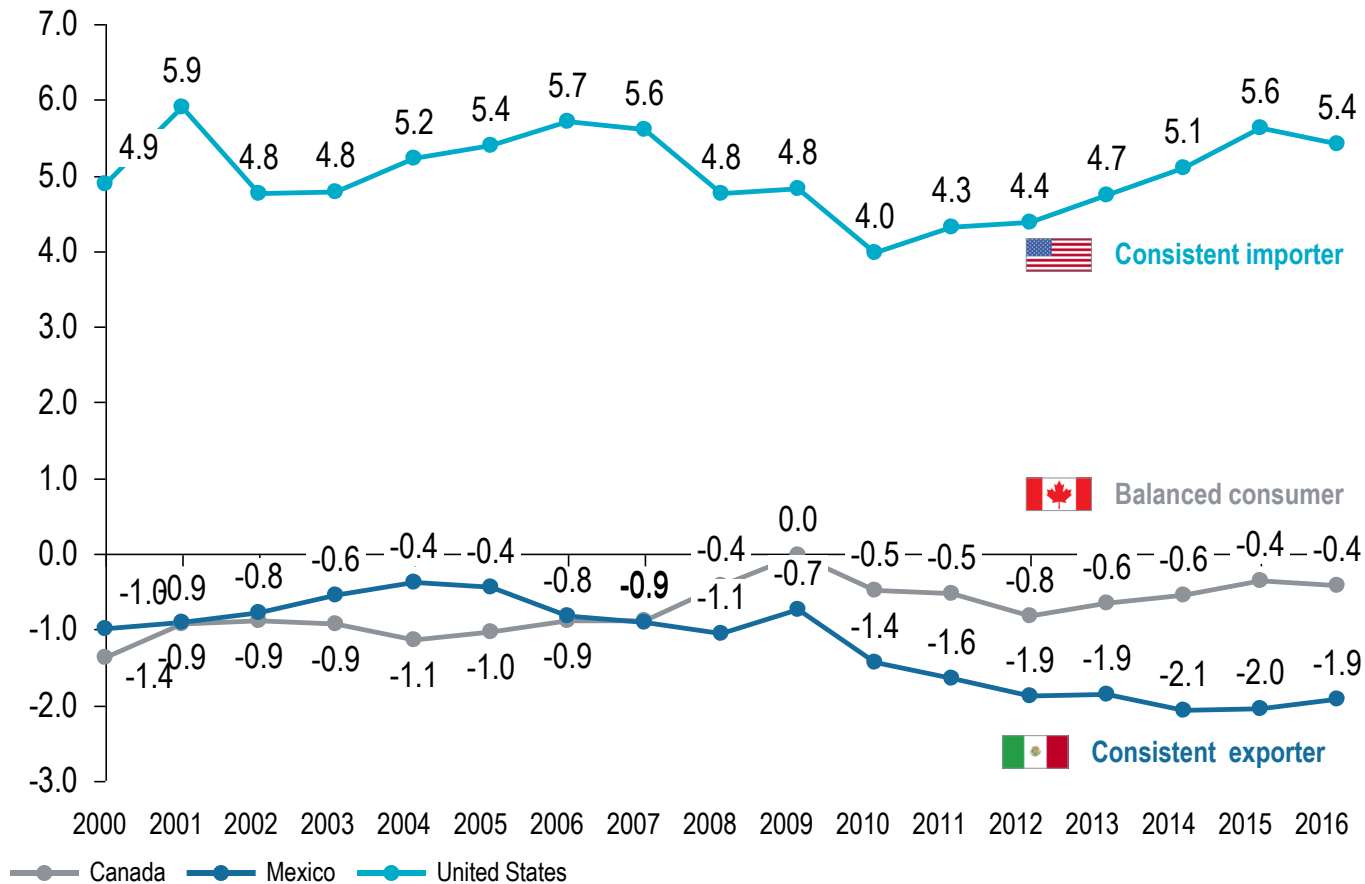


- > Spartanburg in South Carolina started production in 1994
- > Production: 412 k
Capacity: 450 k
- > Nowadays, the X-Series vehicles (X3-X6) are being produced there
- > Characteristics:
 - Number of jobs: 8,800
 - North American suppliers: 270
 - South Carolina suppliers: 40
- > Trade balance:
 - 75% of its output is exported
 - 71% leaves NAFTA, mainly to Europe

Out of the three NAFTA countries, only the US consistently imports light vehicles to meet local demand

North America light vehicle import dependency by country, 2000-2016 [units m]

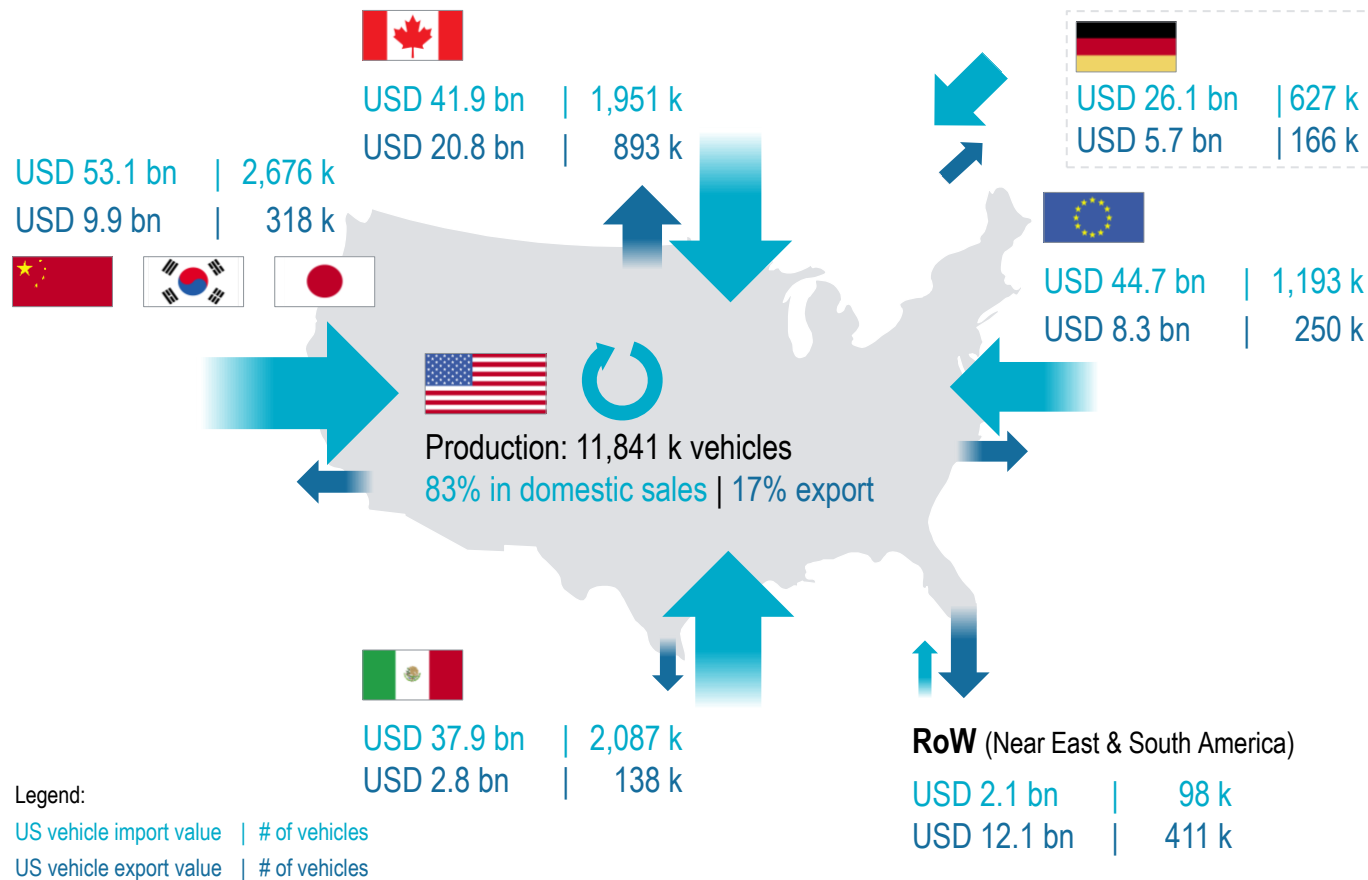
Import dependency = Sales – Local production



- > US is a consistent importer of light vehicles with the highest imports by a fair margin versus Mexico and Canada
- > Mexico is a net exporter with ~ 55% of its light vehicle production currently being exported
- > US currently meets almost 30% of its local light vehicle demand through imports
- > Canada has been a net exporter in the past but is transitioning towards imports at a minimal level

To meet domestic demand, the US imports not only from Mexico and Canada, but also heavily from Asia and Europe

US trade with selected countries, 2015



Global Statistics

> Imports

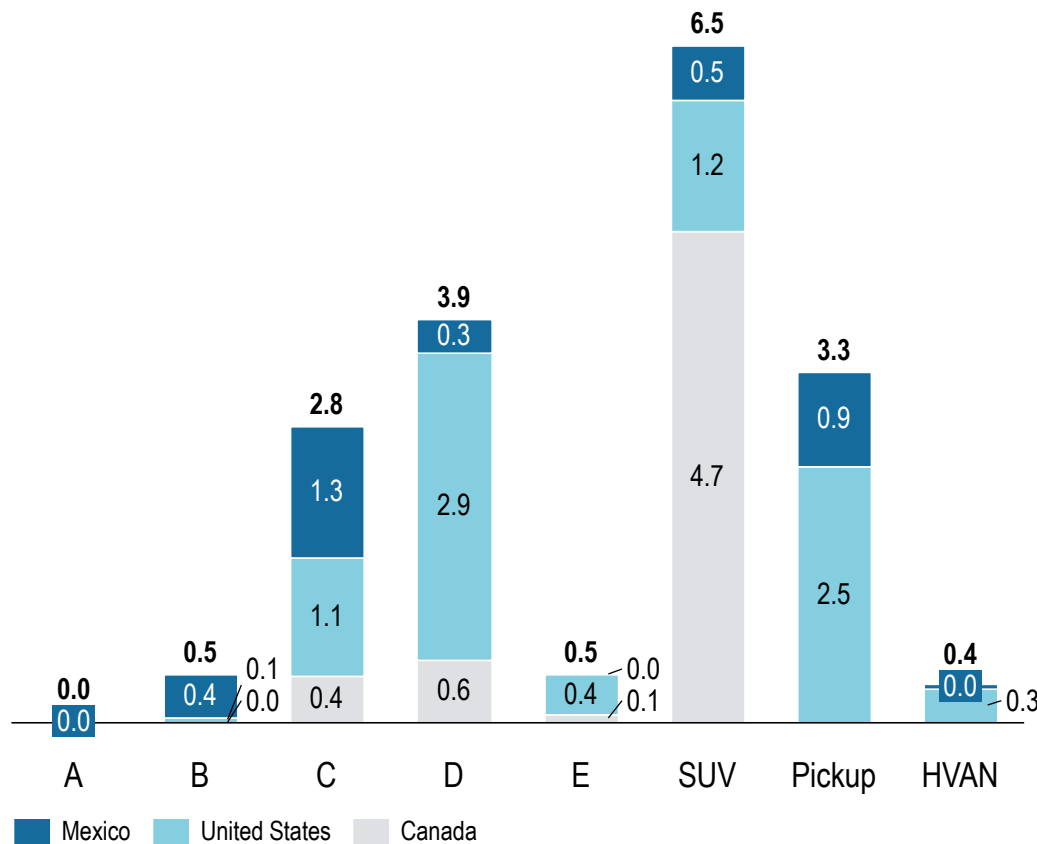
- Total vehicle import value: USD 180 bn
- Total # of vehicles imported: 8 m
- Average value of imported car: USD 22,500
- Average value of imported car from Germany: USD 41,600
- Total value of auto parts imports: USD 144 bn

> Exports

- Total vehicle export value: USD 54 bn
- Total # of vehicles exported: 2 m
- Average value of exported car from the US: USD 26,900
- Total value of auto parts exports: USD 81 bn

The shift to Mexican production is a sheer business necessity – producing the cars below in the US is a money-losing business

North America light vehicle segment split and profitability, 2016 [units m]



Profitability per segment [USD per vehicle]

	Ford	GM
Fixed cost	6,953	7,228
Truck/SUV		
Contribution margin	11,614	14,521
Net profit	4,661	7,293
Crossover		
Contribution margin	8,603	6,833
Net profit	1,650	(395)
Car		
Contribution margin	4,302	2,563
Net profit	(2,651)	(4,665)

F-segment – only 26 vehicles

Source: Deutsche Bank, IHS, Roland Berger

A USD 1,200 cost advantage of e.g. producing the Ford Fusion in Mexico helps reduce losses in the car segment

Cost advantages of production in Mexico vs. US



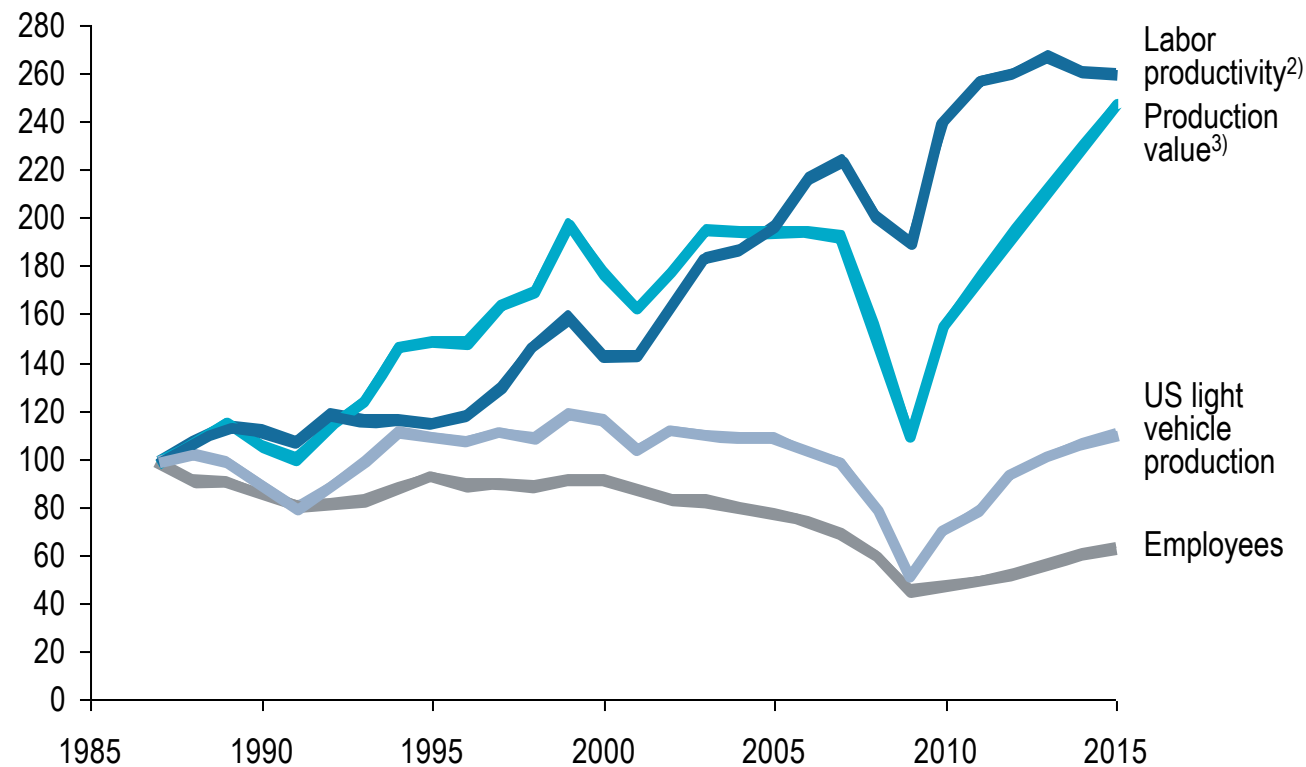
- > Ford Fusion – produced in
 - Flat Rock, Michigan, US
 - Hermosillo, Mexico
- > USD 1,200 is the cost advantage of production in Mexico for sale in the US
- > Mexico production is necessary to reduce negative profitability of car segment

Mexico vs. US cost advantage

Assembly plant labor	USD 600
Parts	USD 1,500
Transportation to US	(USD 900)
FTA tariff advantages	USD 0
Total cost advantage	USD 1,200

There is a widening gap between vehicle production and job growth due to increase in worker productivity achieved through automation

US motor vehicle manufacturing statistics¹⁾ [1987-2015, indexed at 1987]



- > Recession period around 2008 saw a drop in both employees and production volume
- > In the 2009-2015 period, employment grew annually at 5% but production volume grew at 13%
- > This large gap between production and employees is widening and can be attributed to the increasing use of automation and technological implements that have increased worker productivity

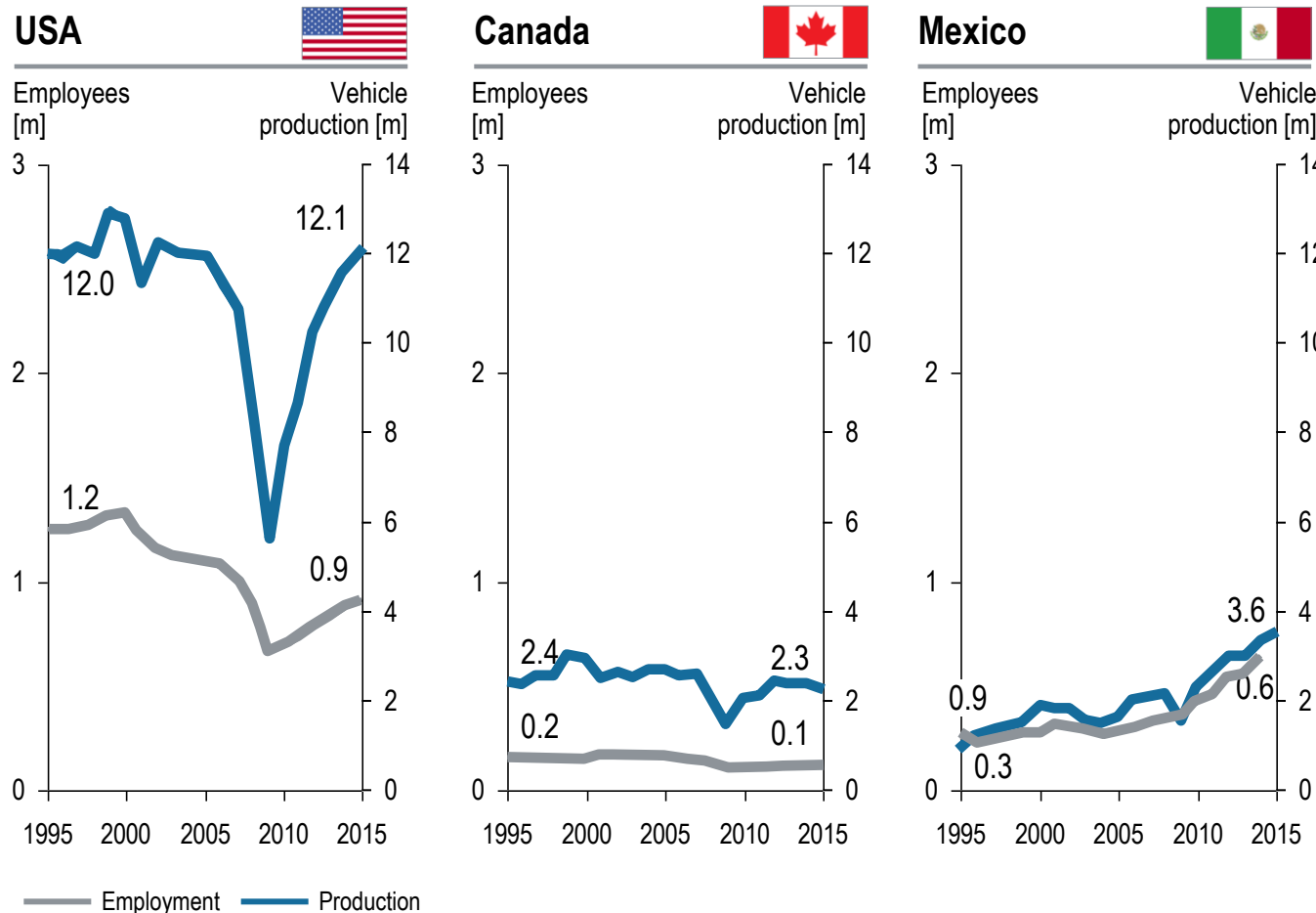
1) Motor vehicle – NAICS code 3361

2) Labor productivity – Measures the rate at which labor is used to produce output of goods and services, typically expressed as output/hour of labor

3) Production value – Value of production is a measure that represents the difference between the total output of goods and services produced and both the subtotal of goods and services shipped among related establishments (intra-industry shipments, intra-sectoral shipments, and re-sales) and the net changes in inventory levels

Investments made after the crisis increased worker productivity in US and Canada, requiring fewer jobs for the same vehicle output

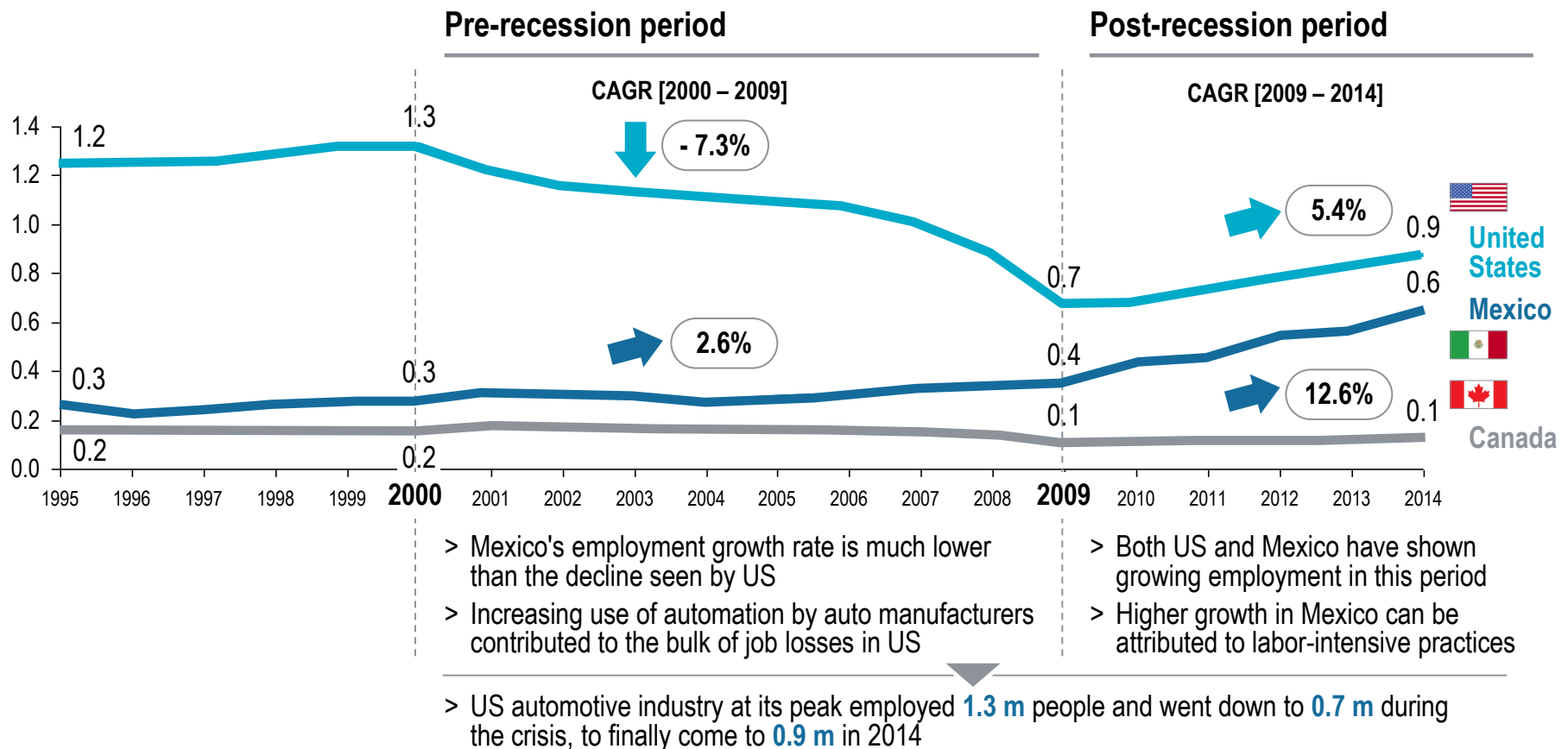
North America automotive industry employment [1995-2015]



- > Vehicles produced per employee changed in the 1995 to 2015 period and show regional variations as well
- > In 1995, the ratio of vehicles produced per employee was
 - USA 10:1
 - Canada 15:1
 - Mexico 4:1
- > In 2014, the ratio of vehicles produced per employee was
 - USA 13:1
 - Canada 20:1
 - Mexico 5:1
- > Higher productivity in US and Mexico can be attributed to the advent of automation, with Mexico being more labor intensive

Consequently, the loss of US automotive jobs in the pre-recession period is primarily a result of advances in automation

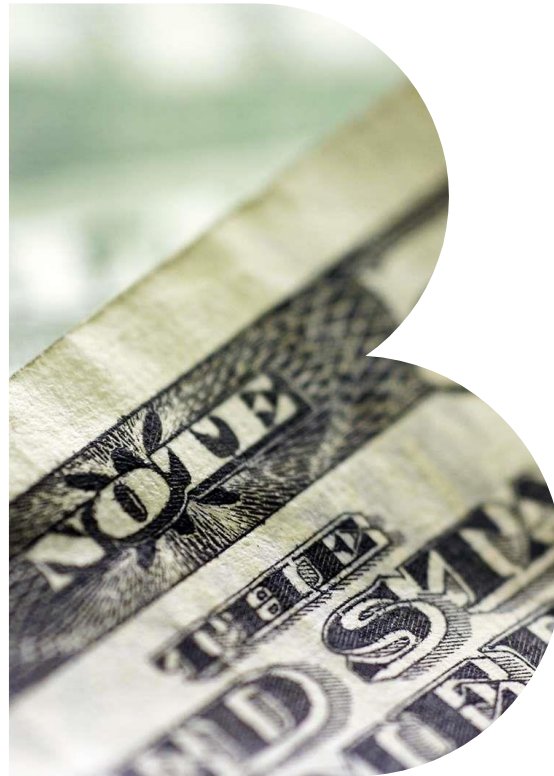
North America automotive employment¹⁾ shifts, 1995-2014 [employees m]



1) Automotive employment includes:

Motor vehicle manufacturing – NAICS code 3361; Motor vehicle body and trailers manufacturing – NAICS code 3362; Motor vehicle parts manufacturing – NAICS code 3363

B. Potential US trade and tax policy changes and their economic impact



The Trump and the GOP border tax plans would lead to price rises, which will decrease the benefits of the planned tax reductions

- » The Trump and GOP proposals to impose import taxes are significantly different and have to be reviewed in a broader context, also considering the offsetting mechanisms of the plans
- » President Trump has proposed border taxes specially for Mexico (20%-35%)¹⁾ and China (45%) as well as corporate income tax and individual income tax reductions
- » The GOP is favoring a border-adjusted tax system (destination based cash flow tax method, DBCFT) that only taxes profits from imports and domestic sales at a reduced corporate tax rate of 20% and doesn't allow deduction of imports, also combined with individual tax reductions
- » Given the US's high dependency on imports, if implemented, either plan would significantly impact nearly every sector of the US economy – motor vehicles, bodies & parts have 57% import share, apparel as much as 93% import share
- » Without considering offsetting mechanisms, both plans will significantly reduce corporate profits, forcing companies to pass along the extra costs to the consumer
- » For the average US consumer, annual expenditures will increase under Trump/GOP plans by USD 1,300 and USD 2,100 respectively
- » Factoring in the planned reductions in individual income taxes as an offsetting mechanism, the border taxes will decrease the benefit for the individual, but households would still retain a small improvement in annual savings

1) Different percentages communicated, 35% initially, 20% to finance the border wall at a later point

The Trump and GOP proposals to impose import taxes are significantly different and have to be reviewed in a broader context

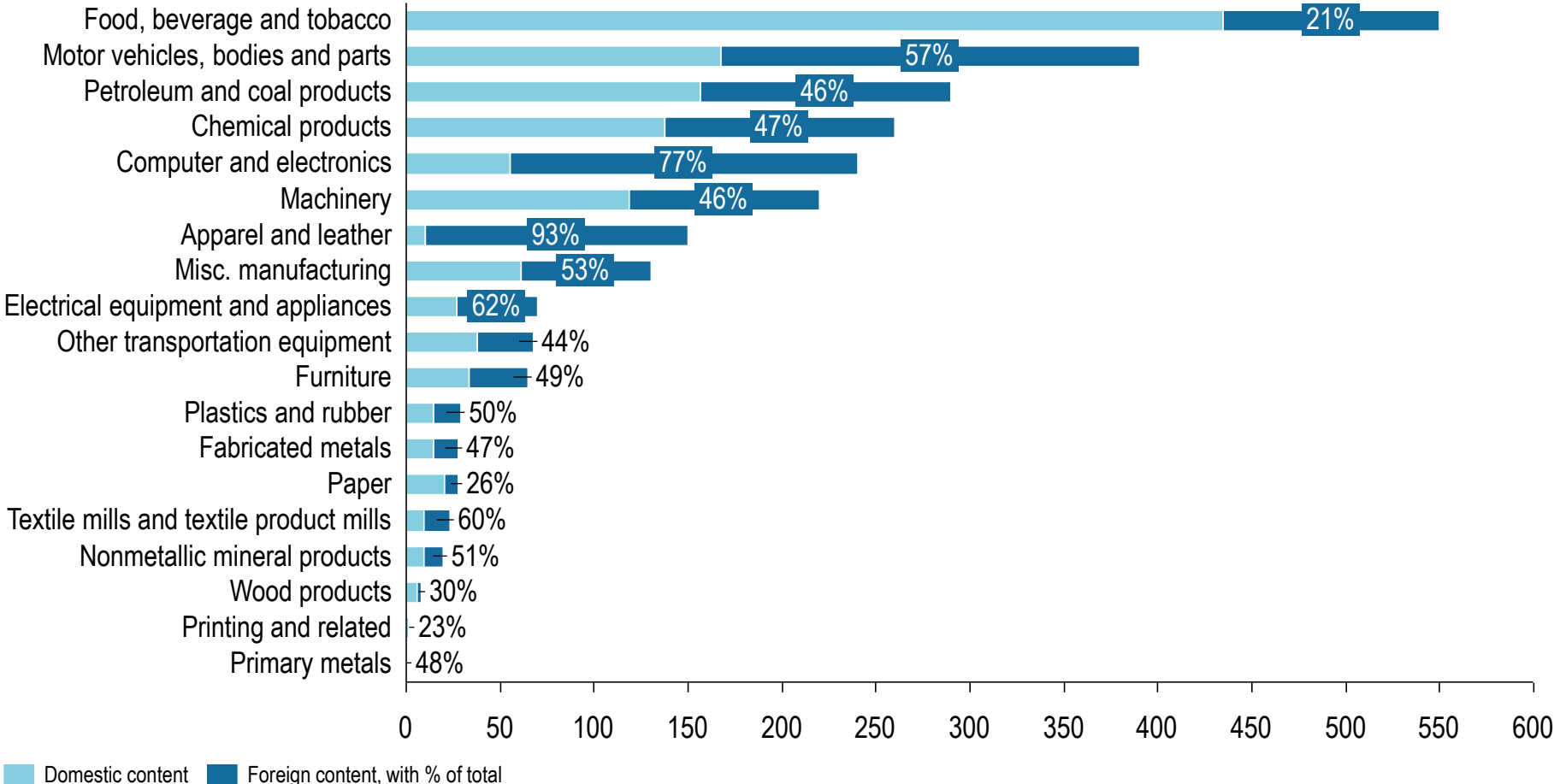
Proposed tax and trade policy changes

	Taxes	Trump	GOP
Taxes	Import tax on all Mexican products at 20%-35%	Yes	No
	Import tax on all Chinese products at 45%	Yes	No
	Border-adjusted tax (DBCFT): Imports taxed at 20% and exports exempted from taxes	No	Yes
Tax rates	Establish a new corporate tax rate:	15%	20%
	Establish a new small business tax rate:	15%	25%
	Top individual income tax rate:	33%	33%
Deductions, credits & others	Allow repatriation of foreign profits at a rate of:	10%	8.75%
	Eliminate the alternative minimum tax	Yes	Yes
	Eliminate the estate tax	Yes	Yes
	Allow expensing of capital investments for manufacturing companies	Yes	Yes
	Increase the standard deduction	Yes	Yes
	Eliminate special interest loopholes	Yes	No mention
	Eliminate Obamacare tax on investments	Yes	No mention
	Create a childcare deduction	Yes	No mention
	Improve the earned income tax credit	No mention	Yes

- > President Trump's plan will keep the current income tax method of calculating taxes
- > The GOP plan will effectively eliminate the current income tax method in favor of a border-adjusted tax (destination based cash flow tax method, DBCFT)

If implemented, either plan would significantly impact nearly every sector of the US economy due to high import shares

Domestic demand for manufactured goods [USD bn]



Source: Department of Commerce, Bureau of Economic Analysis, JP Morgan, Roland Berger

Under the Trump proposal, company profits would fall unless the additional costs are passed along to the consumer as price rises

Corporate profit impact of the Trump plan – Income tax method¹⁾ [USD]

Illustrative

**P&L statement:
Importer example**

Item	Base case scenario – No Trump tax	Tax on Mexican inputs		
		Company can't pass Trump tax on to consumer	Company splits Trump tax with consumers 50/50	Consumer pays 100% of Trump tax
Revenues				
Domestic sales	1,000	1,000	1,053	1,105
Foreign sales	0	0	0	0
Costs				
Domestic inputs	300	300	300	300
Mexican inputs	300	300	300	300
Trump tax @ 35%	0	105	105	105
Pre-income tax profit	400	295	348	400
Income tax @ 15%	60	44	52	60
After-tax income	340	251	296	340

- > If companies can't pass costs on to the customer, profits would erode significantly – in this example by about 26%
- > The most likely result is price increases for the consumer – in this example more than 10%

1) This simplified example ignores factors such as depreciation, interest expense, etc.

Under the GOP proposal, the same profit erosion occurs unless the dollar appreciates 25% or prices are increased by more than 10%

Corporate profit impact of the GOP plan – DBCFT method¹⁾ [USD]

Illustrative

**P&L statement:
Importer example**

Tax with border adjustment

Item	Tax with no border adjustment	No economic response	25% dollar appreciation	10% domestic price level increase
Revenues				
Domestic sales	1,000	1,000	1,000	1,100
Foreign sales	0	0	0	0
Costs				
Domestic inputs	300	300	300	330
Foreign inputs	300	300	240	300
Pre-tax income	400	400	460	470
Taxable income	400	700	700	770
Tax @ 20%	80	140	140	154
After-tax income	320	260	320	316

- > If companies can't pass costs on to the customer, profits would erode significantly – in this example by about 19%
- > A dollar appreciation of 25% – on top of an already very strong dollar – would neutralize the effect
- > Alternatively, prices would have to increase by more than 10%

1) This simplified example ignores factors such as depreciation, interest expense, etc.

The average US consumer's annual expenditures will increase under Trump/GOP plans by USD 1,300 and USD 2,100 respectively

Impact of Trump and border-adjusted tax plans on US household annual expenditures¹⁾

2015 annual household expenditures [USD]	Current system	Trump plan ²⁾	Δ to current	GOP plan ³⁾	Δ to current
Housing	18,409	18,719	1.7%	18,773	2.0%
Transportation	9,503	9,809	3.2%	10,199	7.3%
Food	7,023	7,134	1.6%	7,318	4.2%
Personal insurance and pensions	6,349	6,349	0.0%	6,349	0.0%
Healthcare	4,342	4,366	0.5%	4,399	1.3%
Entertainment	2,842	3,040	7.0%	3,092	8.8%
Apparel and services	1,846	2,139	15.8%	2,189	18.6%
Cash contributions	1,819	1,819	0.0%	1,819	0.0%
Education	1,315	1,315	0.0%	1,315	0.0%
Miscellaneous	871	891	2.3%	904	3.8%
Personal care products and services	683	695	1.7%	747	9.4%
Alcoholic beverages	515	523	1.6%	537	4.2%
Tobacco products and smoking supplies	349	355	1.6%	364	4.2%
Reading	114	120	5.4%	119	4.6%
Total annual expenditures	55,980	57,273	2.3%	58,123	3.8%
Average household expenditure increase		≈ 1,300		≈ 2,100	

> Under the assumption that companies pass additional costs from border taxes through to the consumer, average yearly household expenditures will rise by ~USD 1,300 and ~USD 2,100 respectively

1) Based on 2015 government data on average household income and expenditure, 2) the Trump plan assumes 35% tariffs on Mexican imports, 45% tariffs on Chinese imports, and no additional tariffs on other countries, 3) the GOP DBCFT plan assumes a blanked 20% tax on all imports, 4) it is assumed that corporations share 50% of their tax benefit with consumers

However, the increase in household expenditures would be offset by a significant reduction in personal income taxes

Impact of the Trump and GOP tax plans on household savings¹⁾

2015 annual household income [USD]	Current system	Trump plan	Δ to current	GOP plan	Δ to current
Income before taxes	69,627	69,627	0%	69,627	0%
Standard tax deductible	12,600	30,000	138%	30,000	138%
Taxable income	57,027	39,627	-31%	39,627	-31%
Federal taxes (effective fed. tax rate %) ²⁾	7,111 (11%)	4,755 (7%)	-33%	4,755 (7%)	-33%
State, local and other taxes	2,067	2,067	0%	2,067	0%
Income after taxes	60,449	62,805	4%	62,805	4%
Total annual expenditures ^{3),4)}	55,980	57,273	2.3%	58,123	3.8%
Free cash flow per household	4,469	5,532	23.8%	4,682	4.8%

- > The proposed reduction in personal federal income tax would increase income after taxes by ~USD 2,400 in both plans
- > Factoring in expenditure increases, households would still have additional cash of ~USD 1,100 or ~USD 200 per year under the Trump and GOP plans, respectively
- > In essence the border taxes would eliminate 54% of the expected tax benefit for households under the Trump proposal and about 92% under the GOP proposal

1) Based on 2015 government data on average household income and expenditure, 2) effective federal tax rate is federal taxes divided by income before taxes, 3) the Trump plan assumes 35% tariffs on Mexican imports, 45% tariffs on Chinese imports, and no additional tariffs on other countries, 4) the DBCFT plan assumes a blanked 20% tax on all imports

C. Impact on automotive industry and manufacturers





Taking 2015 figures as an example, the Trump/GOP plans would lead to a significant cost increase – from USD 1,100 to USD 7,200 per car

- » Taking 2015 trade figures as a base, the Trump/GOP border tax plans would lead to cost increases for OEM vehicle imports in the range of USD 7.6 bn to 36.0 bn
- » Translated into added costs per average imported vehicle, the Trump border tax results in between USD 3,600 and USD 6,400 of additional cost burden
- » Focusing on the GOP border-adjusted tax plan, vehicle imports from Mexico would become USD 3,600 more expensive on average, while imports from other countries would increase by as much as around USD 4,800¹⁾
- » In addition, US parts imports for domestic production would see a total cost increase of between USD 15.2 bn and 23.8 bn
- » As a result on average, costs for a vehicle produced in the US would go up between USD 1,300 and USD 2,000
- » Under the GOP plan, the combined additional vehicle and parts imports cost impact varies across OEMs by between USD 1,100 (small car) and USD 7,200 per vehicle (large premium), with pure play importer OEMs affected the hardest
- » As a result, without price increases, the vast majority of OEM profits from their US operations would be wiped out
- » Counter-effects like a strengthening dollar might reduce the additional cost burden but will not eliminate it

1) Due to higher average car value

With 2015 figures as an example, the total costs for imported vehicles in the US would lead to cost increases of USD 7.6 bn to 36.0 bn



Total impact of imported vehicle cost increase [USD bn, 2015 as example year]

	Original 2015 imports		Trump plan		GOP plan	
	Total [USD bn]	By car [USD]	Total [USD bn]	By car [USD]	Total [USD bn]	By car [USD]
Mexico 	37.9	18,177	45.5 – 51.2 + 20 – 35%	21,812 to 24,539	45.5 + 20%	21,812
China 	0.1	25,491	0.2 + 45%	36,961	0.1 + 20%	30,589
ROW	141.8	23,973	141.8	23,973	170.1 + 20%	28,767
Total	179.8	22,462	187.4 – 193.1	23,416 to 24,127	215.8 + 20%	26,955
Additional cost burden			7.6 – 13.3 bn		36.0 bn	

 Expected tax rate




Costs for vehicle imports would increase by USD 3,600 up to USD 6,400 per average vehicle

Imported vehicle cost increase for Trump and GOP plan

	<u>2015 benchmark cost [USD]</u>	<u>Tax rate Trump plan</u>	<u>Additional cost Trump plan [USD]</u>	<u>Tax rate GOP plan</u>	<u>Additional cost GOP plan [USD]</u>
Mexico import 	18,177	+ 20 – 35%	+ 3,635 – 6,362	+ 20%	+ 3,635
ROW import 	23,973	0%	0	+ 20%	+ 4,795

In addition, US parts imports for domestic production would see an increase in costs of between USD 15.2 bn and 23.8 bn

Total impact of imported vehicle parts cost increase [USD bn, 2015 as example year]





	Original 2015 imports		Trump plan		GOP plan	
	OE use	AM use	Δ	Total	Δ	Total
 Mexico 	42.2	8.6	+ 8.4 – 14.8	50.6 – 56.9 + 20 – 35%	+ 8.4	50.6 + 20%
China 	15.1	3.1	+ 3.0	21.9 + 45%	+ 3.0	18.1 + 20%
ROW	61.9	12.7	+ 12.4	61.9 +/- 0%	+ 12.4	74.3 + 20%
Total	119.2	24.4		134.4 – 140.7		155.8 + 20%
Additional cost burden			+ 15.2 – 21.6		+ 23.8	

 Expected tax rate

As a result on average, a vehicle produced in the US would cost between USD 1,300 and USD 2,000 more

US vehicles¹⁾ with imported parts cost increase

Exemplary calculation

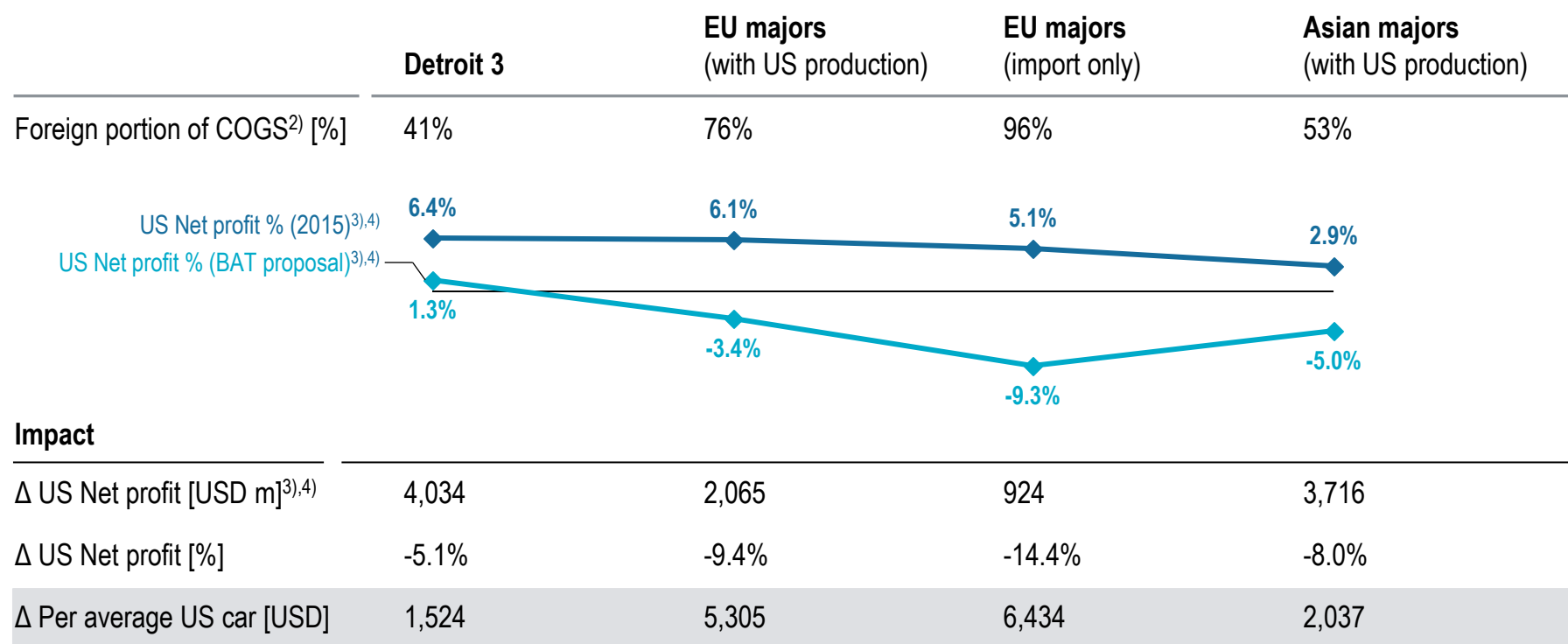
 Content origin	Average US vehicle		Trump plan		GOP plan	
	Content share [%]	Cost share [USD]³⁾	Tax rate	Additional costs [USD]	Tax rate	Additional costs [USD]
US 	46% ⁴⁾	8,634	0%	-	0%	-
Mexico 	19%	3,561	+ 20 – 35%	+712 – 1,246	+ 20%	+ 712
China 	7%	1,276	+ 45%	+ 574	+ 20%	+ 255
ROW	28%	5,229	0%	-	+ 20%	+1,046
Total	100%	18,700		+1,286 – 1,820		+2,013

1) US vehicles refers to cars produced and sold domestically in the US and excludes exported vehicles 2) Excludes corporate tax charges 3) Ø US car price USD 34,000

4) US domestic content varies significantly by car model, e.g. 5% for BMW X5 and up to 75% for Toyota Camry

The GOP plan would pretty much wipe out all profits of OEMs' US operations and turn all but Ford and GM into loss-making businesses

Impact of GOP border-adjusted tax on automotive OEMs¹⁾ (based on 2015 financials)



1) This analysis considers Audi, BMW, Daimler, FCA, Ford, GM, Honda, Hyundai, JLR, and Toyota 2) Foreign portion accounts for imported content, local labor and warehousing in US-assembled cars, and re-imported content in imported cars 3) Estimates based on publicly available revenues, avg. price of vehicles and US sales volumes 4) Does not include any exemptions or company-specific tax accounting practices which may apply

Roland
Berger

