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# Estimating the Impact of the US-China Trade War

## Comparison of estimates from DIR and international organizations

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### Summary

- Using the DIR macro model, estimated impact on the real economy of additional tariff measures scheduled to be implemented or now being considered by the US and China is expected to be limited, with China at -0.14%, US -0.15%, and Japan at -0.01%.
- On the other hand, the IMF, as well as other international organizations, has also issued an estimate, which sees a -2% decline in the global economy if the cost of global trade rises by 10%. The deviation between the two estimates is due to the difference in assumptions. The growth rate in the cost of global trade associated with US-China tariff measures is more likely to be no more than 0.26%. Hence, using the IMF estimate, the impact on global GDP would be -0.05%. Even when we include additional tariffs on steel and aluminum, as well as retaliatory tariffs, the impact on global GDP would still be only -0.07%.
- In conclusion, the main risk to Japan's economy is not the US-China trade war. For Japan, what comes later is a life or death question – whether or not additional tariffs will be levied on automobiles. Additional tariffs of 20% would cause global GDP to decline by -0.1%, but the cost to Japanese corporations due to tariffs on automobiles and automobile parts would grow by more than 1.7 tril yen. Hence the upcoming trade negotiations on automobiles will be Japan's moment of truth.

## ***Rumors of Trade War Exceed Reality***

Trump's theatrics continue. As was reported last month, 818 items had additional tariffs of 25% imposed starting on July 6, or the equivalent of 34 billion dollars in tariff measures against China. The remaining items (the equivalent of 16 billion dollars) are being considered for further investigation or public comment in the future, with additional tariffs apparently planned to be implemented in August. In response to the US announcement of these tariffs, the Chinese government immediately implemented retaliatory tariffs. These will also be effected by additional tariffs starting on July 6, the equivalent of 34 billion dollars in American products imported by China. Meanwhile, another 16 billion dollars in tariffs against US imports is being considered. In response to China's retaliatory tariffs, President Trump announced additional tariffs of 10% on 200 billion dollars' worth of Chinese products.

## ***Estimate of -2% decline in global GDP tends to be repeated without reference to its original assumptions***

In our June report, "Is the US-China Trade War Really All that Bad?"<sup>1</sup>, we provided an in-depth analysis of the impact of US and Chinese trade policies which are currently planned on Japan's economy and on Japanese corporate earnings, and concluded that as of this point impact on both the US and the Chinese economy is limited. Influence on Japan's economy is also expected to be small. But the degree of attention placed on this question remains extremely high, and it is casting a long shadow over business confidence and the financial markets<sup>2</sup>.

The reason for this may be the expression itself – the words "trade war" elicit a whole series of frightening associations starting with the effects of worldwide protectionism in the 1930s, including the Smoot-Hawley Tariff Act, resulting in The Great Depression, followed by the Second World War. International organizations such as the OECD and the IMF have also raised the alarm against the rise of protectionism. According to the OECD's estimates, if the cost of global trade rises by 10% as a result of the US, the EU, and China raising tariffs, global trade will decline by 6%, and global GDP will decline by 1.4%<sup>3</sup>. Meanwhile, the IMF estimates that if trade prices rise by 10% due to tariffs and other costs, international trade will fall by 15% in five years, and in the long-term it will be forced downwards by 16%. Global production will decline by 1.75% in five years, and in the long-term will decline by 2%<sup>4</sup>.

<sup>1</sup> For details see the DIR report by Shunsuke Kobayashi entitled "Is the US-China Trade War Really All that Bad? Thorough examination of impact on Japan's economy and corporate earnings," dated 22 June, 2018.

<sup>2</sup> This conclusion actually differs from the opinion of the writer of this report. The deterioration of business confidence and adjustments in the financial markets have their source in completely different factors. These include (1) a downward revision of economic outlooks due to overly high expectations regarding the growth rate of the global economy, (2) exit strategies of central banks (the decline in liquidity supply), and (3) uncertainty regarding the direction of government policy (what are the real motives of the White House?). Therefore, the most likely catalysts leading to the return of risk appetite would be (1) the removal of uncertainty regarding US politics, (2) downward revisions of outlooks for the global economy becoming more scarce, and (3) the doing away of fears that interest rates will rise after October, 2018. For details see the DIR report by Shunsuke Kobayashi and Yota Hirono entitled "Japan's Economy: Monthly Outlook (April 2018): How will Japan's economy and corporate performance fare in US-China tariff dispute? Root cause of turmoil in the financial markets." (April 20, 2018.) [https://www.dir.co.jp/english/research/report/jmonthly/20180420\\_020060.html](https://www.dir.co.jp/english/research/report/jmonthly/20180420_020060.html)

<sup>3</sup> OECD, "Making Trade Work for All", May 2017. <http://www.oecd.org/tad/making-trade-work-for-all.pdf> And in the OECD July 2018 report, "The Long View: Scenarios for the World Economy to 2060," it states that if the global medium tariff rate rises by 3.5%pt, global per capita GDP will suffer long-term decline of 0.5%pt. The results of this estimate are in agreement with those of the IMF. [https://www.oecd-ilibrary.org/economics/the-long-view\\_b4f4e03e-en](https://www.oecd-ilibrary.org/economics/the-long-view_b4f4e03e-en)

<sup>4</sup> IMF, "World Economic Outlook, Subdued Demand: Symptoms and Remedies", October 2016. [https://www.imf.org/~media/Websites/IMF/imported-flagship-issues/external/pubs/ft/weo/2016/02/pdf/\\_c1pdf.ashx](https://www.imf.org/~media/Websites/IMF/imported-flagship-issues/external/pubs/ft/weo/2016/02/pdf/_c1pdf.ashx)

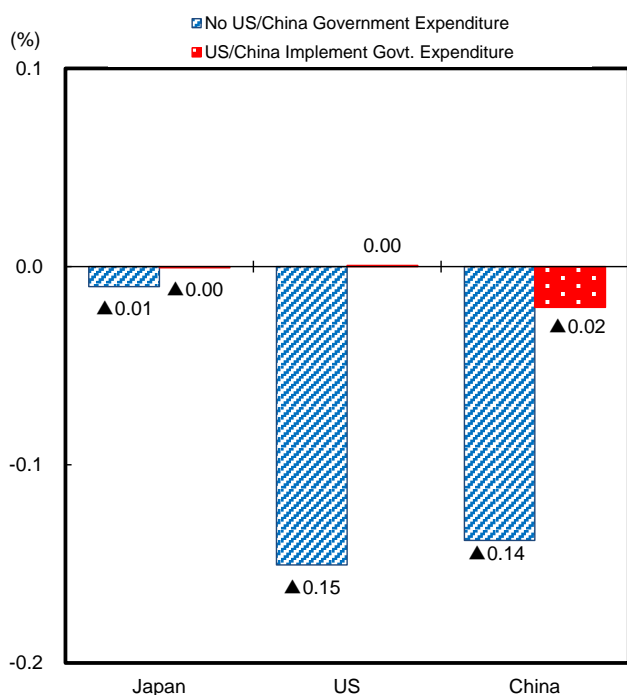
**Daiwa Institute of Research (DIR) Estimate: China -0.14%, US -0.15%, Japan -0.01%**

However, using the DIR macro model to estimate the impact on the Japanese, US, and Chinese economies of additional tariff measures which have been announced as of this time, we arrive at a much smaller number than estimated by international organizations. If the US places tariffs on the equivalent of \$250 billion in goods imported from China (a tariff of 25% on \$50 billion worth of Chinese goods and another 10% on \$200 billion worth of goods), and at the same time China places a tariff of 25% on \$50 billion worth of goods imported from the US, the estimate would be as shown in Chart 1 (details in Chart 2).<sup>5</sup>

Based on these assumptions, in the case where growth in government revenue due to the increase in tariffs does not lead to increased government expenditure, downward pressure on GDP would be -0.14% for China, -0.15% for the US, and -0.01% for Japan. If the government helps out by increasing expenditure the effects will be even smaller, with China at -0.02%, the US at +0.00%, and Japan at -0.00%.

The impact on the real economy due to the US-China trade war will not necessarily be that large.

**Estimated Effects of Tariffs (Summary)**  
Chart 1



Source: Estimates produced using the DIR macro model.  
Note: All figures are real. Rate of deviation from actual value.

**Effects of Tariffs on Japan, US, and China Economies (Detailed Version)**  
Chart 2

Effects on Chinese Economy		Real GDP	Personal Consumption	Capex	Government Expenditure	Exports	Imports
No US/China Govt. Expenditure	Deviation Rate	▲0.14	▲0.25	▲0.05	0.00	▲0.30	▲0.25
	Contribution Rate		▲0.10	▲0.02	0.00	▲0.06	0.04
US/China Implement Govt. Expenditure	Deviation Rate	▲0.02	▲0.25	▲0.01	0.69	▲0.22	▲0.16
	Contribution Rate		▲0.10	▲0.00	0.10	▲0.04	0.03
Effects on US Economy		Real GDP	Personal Consumption	Capex	Government Expenditure	Exports	Imports
No US/China Govt. Expenditure	Deviation Rate	▲0.15	▲0.26	▲0.20	0.00	▲0.07	▲0.46
	Contribution Rate		▲0.18	▲0.03	0.00	▲0.01	0.08
US/China Implement Govt. Expenditure	Deviation Rate	0.00	▲0.26	0.00	1.08	▲0.05	▲0.04
	Contribution Rate		▲0.18	0.00	0.18	▲0.01	0.01
Effects on Japan's Economy		Real GDP	Personal Consumption	Capex	Government Expenditure	Exports	Imports
No US/China Govt. Expenditure	Deviation Rate	▲0.01	▲0.00	▲0.00	▲0.07	▲0.11	▲0.10
	Contribution Rate		▲0.00	▲0.00	▲0.01	▲0.02	0.02
US/China Implement Govt. Expenditure	Deviation Rate	▲0.00	▲0.00	▲0.00	▲0.00	▲0.01	▲0.01
	Contribution Rate		▲0.00	▲0.00	▲0.00	▲0.00	0.00

Source: Estimates produced using the DIR macro model.  
Notes: 1) Estimated effects assuming US imposes tariff of 25% on 50 billion dollars' worth of Chinese imports and 10% on an additional 20 billion dollars, and China imposes tariff of 25% on 50 billion dollars' worth of imports from the US.  
2) All figures are real. Rate of deviation from actual value (%) and rate of contribution to GDP (%pt).

<sup>5</sup> To explain how the model works in simple terms, first we assume that the increase in the tariff rate causes international competitiveness to fluctuate somewhat, and as a result, imports and exports are also caused to fluctuate. At the same time, real disposable income declines due to the rise in import prices bringing downward pressure on personal consumption. As a result of the downturn in domestic production, capex is also restrained. With these as our basic assumptions, we look at two cases – first where growth in government revenue due to the increase in tariffs does not lead to a resolution of the economic problems through increased government expenditure, and a second case where it does. Of course, we are only looking at the immediate effects on the Japanese, US, and Chinese economies here. There is still a possibility that there could be long-term effects, or that there could be a multiplier effect that becomes larger than our estimates suggest. However, if we consider the fact that while US-China trade could stagnate, Japan could increase substitution exports, thereby gaining the benefits of playing both ends of the game. We cannot ignore the possibility that the negative long-term multiplier effect could be offset by positives such as the substitution effect. For further detail, see the report mentioned in Note 1.

### ***Assumptions used in estimates by international organizations are unrealistic***

Judging by the arguments in the previous section it may appear that there is a major discrepancy between the DIR estimates and the results of the IMF and the OECD. However, the reason for the deviation between the estimates is quite clear. The assumptions used are completely different.

Chart 3 summarizes the available data, and estimates that the growth rate in the cost of global trade in association with the increases in US and Chinese tariffs is 0.26% (see ① in the chart). In other words, the assumption used in the estimates of international organizations that the cost of global trade will rise by 10% is 40 times more than the one found in Chart 3. This is such a large figure that it is completely unrealistic.

### ***According to the IMF model, impact of US-China trade war on the global economy is -0.05%pt***

Using the result of the IMF estimate, we perform a linear calculation of the impact of an 0.26% increase in the cost of trade on the global economy. This gives us a result of -0.05%pt. This value is pretty much the same as the one calculated by DIR in the previous section. When we multiply the actual portion of the global economy which the US and Chinese economies each account for, we obtain the figure -0.06%pt. If we also include the negative effects of other countries in the calculation, the ultimate effect would be somewhat larger than this. Therefore, we can say that the estimated value proposed by DIR is a more rigorous outlook than the estimate value produced by the IMF.

Of course, we cannot ignore the possibility that tariffs will not stop at the point currently decided upon. It is quite possible that China could implement additional retaliatory tariffs, and the US could raise tariffs on countries other than China, with retaliatory tariffs then being implemented by said countries.

### ***Impact on global economy of tariffs on steel and aluminum seen at -0.02%pt***

Next, as a thought experiment, let's take a look at the extent to which these factors will increase the cost of global trade. First, we look at the increase in the tariff on steel and aluminum, which has already been decided on. This is expected to increase the cost of global trade by 0.04%. If the various countries affected by this tariff implement retaliatory tariffs, this would again increase the cost of global trade by another 0.09%. Using the IMF's estimated value to calculate the effect on the global economy of these hypothetical tariffs, we arrive at -0.02%pt. (See ② in Chart 3.)

### ***Tariff hike on automobiles would trigger decline of -0.10%pt in global economy***

What will happen if a 20% tariff is levied on automobiles imported to the US as is now being considered? This would increase the cost of global trade by 0.24%. If the various countries affected by this tariff implement retaliatory tariffs, this would again increase the cost of global trade by another 0.49%. Using the IMF's estimated value to calculate the effect on the global economy of these tariffs, we arrive at -0.10%pt. This is twice the affect of the US-China trade war. Hence it is to be feared more than any other of the currently planned measures. (See ③ in Chart 3.)

### ***Even when we add up all of the negative effects it still comes to only -0.17%***

However, even when we add all of these items up, the cost of global trade is estimated to be pushed up by only 0.83%, while the global GDP would decline by -0.17%pt (Chart 3, ①+②+③).

## *If Europe abolishes its automobile tariff, global economy will be pushed up by +0.01%pt*

Another possibility is what if Europe refuses to play this game of chicken that the US has thrust upon other nations? If this happens, there may be hope that Europe would abolish its tariff on automobiles, currently at 10%. If Europe abolishes its automobile tariff, the global cost of trade would decline by 0.02%, and the global economy would be pushed up by +0.00%pt (Chart 3, ⑤).

If this possibility becomes reality, the influence of tariff measures currently planned or being implemented would temporarily be limited, and it would be possible to keep the problem within the range of “damage being unevenly distributed in the industry and country in question”, and “secondary damage.”

### Estimates of Effects of All Tariff Measures on Cost of Trade and Global Economy Chart 3

① Tariffs Totaling \$250 bil for US, and \$50 bil for China				Effect on Global Economy		
	US	China	Total	OECD	IMF In 5-Yrs	IMF Long-Term
Amount of Change in Tariff (Bil Dlr)	325.0	125.0	450.0	Rate of Change in Cost of Trade (%)	0.26	0.26
Rate of Change in Global Import Prices (%)	0.2	0.1	0.3	Change in Global Trade Volume (%pt)	-0.15	-0.39
				Change in Global GDP (%pt)	-0.04	-0.04
						-0.41

② US Tariff Hike on Steel and Aluminum				Effect on Global Economy		
	Steel	Aluminum	Total	OECD	IMF In 5-Yrs	IMF Long-Term
Amount of Change in Tariff (Bil Dlr)	58.4	16.4	74.8	Rate of Change in Cost of Trade (%)	0.04	0.04
Rate of Change in Global Import Prices (%)	0.0	0.0	0.0	Change in Global Trade Volume (%pt)	-0.03	-0.06
				Change in Global GDP (%pt)	-0.01	-0.01
						-0.07
<b>Case in Which Equal Amount in Retaliatory Tariffs is Implemented</b>						
				Rate of Change in Cost of Trade (%)	0.09	0.09
				Change in Global Trade Volume (%pt)	-0.05	-0.13
				Change in Global GDP (%pt)	-0.01	-0.01
						-0.14

③ US Tariff Hike on Automobiles				Effect on Global Economy		
	Passenger Vehicles	Automobile Parts	Total	OECD	IMF In 5-Yrs	IMF Long-Term
Amount of Change in Tariff (Bil Dlr)	310.0	115.3	425.3	Rate of Change in Cost of Trade (%)	0.24	0.24
Rate of Change in Global Import Prices (%)	0.2	0.1	0.2	Change in Global Trade Volume (%pt)	-0.15	-0.36
				Change in Global GDP (%pt)	-0.03	-0.04
						-0.05
<b>Case in Which Equal Amount in Retaliatory Tariffs is Implemented</b>						
				Rate of Change in Cost of Trade (%)	0.49	0.49
				Change in Global Trade Volume (%pt)	-0.29	-0.73
				Change in Global GDP (%pt)	-0.07	-0.08
						-0.10

Total Negative Effect (①+②+③)				Effect on Global Economy		
				OECD	IMF In 5-Yrs	IMF Long-Term
				Rate of Change in Cost of Trade (%)	0.83	0.83
				Change in Global Trade Volume (%pt)	-0.50	-1.24
				Change in Global GDP (%pt)	-0.12	-0.14
						-1.32

④ China Lowers Tariffs on Sundries and Automobiles				Effect on Global Economy		
	Sundries	Automobiles	Total	OECD	IMF In 5-Yrs	IMF Long-Term
Amount of Change in Tariff (Bil Dlr)	-52.4	-45.9	-98.4	Rate of Change in Cost of Trade (%)	-0.06	-0.06
Rate of Change in Global Import Prices (%)	0.0	0.0	-0.1	Change in Global Trade Volume (%pt)	0.04	0.09
				Change in Global GDP (%pt)	0.01	0.01
						0.10

⑤ EU Lowers Tariffs on Automobiles				Effect on Global Economy		
		Automobiles		OECD	IMF In 5-Yrs	IMF Long-Term
Amount of Change in Tariff (Bil Dlr)		-43.5		Rate of Change in Cost of Trade (%)	-0.02	-0.02
Rate of Change in Global Import Prices (%)		0.0		Change in Global Trade Volume (%pt)	0.01	0.04
				Change in Global GDP (%pt)	0.00	0.00
						0.04

Total Positive Effect (④+⑤)				Effect on Global Economy		
				OECD	IMF In 5-Yrs	IMF Long-Term
				Rate of Change in Cost of Trade (%)	-0.09	-0.09
				Change in Global Trade Volume (%pt)	0.05	0.13
				Change in Global GDP (%pt)	0.01	0.02
						0.02

Grand Total				Effect on Global Economy		
				OECD	IMF In 5-Yrs	IMF Long-Term
				Rate of Change in Cost of Trade (%)	0.74	0.74
				Change in Global Trade Volume (%pt)	-0.44	-1.11
				Change in Global GDP (%pt)	-0.10	-0.13
						-0.15

Total of Tariffs Already Decided (①+②+④)				Effect on Global Economy		
				OECD	IMF In 5-Yrs	IMF Long-Term
				Rate of Change in Cost of Trade (%)	0.24	0.24
				Change in Global Trade Volume (%pt)	-0.14	-0.36
				Change in Global GDP (%pt)	-0.03	-0.04
						-0.05

Source: US Census Bureau, General Administration of Customs of the People's Republic of China, Eurostat, Ministry of Finance, FRB, OECD, IMF, World Bank, UN Comtrade, various news sources; compiled by DIR.

Notes: 1) US import content deducted from ④ and ⑤.

2) Data from China consists of 2016 performance values. Data from all other countries consists of 2017 performance values.

***The IMF's recent estimate comes to the same conclusion (it has reduced the extent of influence)***

Furthermore, the IMF report issued on July 18 (G-20 Surveillance Note<sup>6</sup>), offers a revised estimate of the influence the trade war is expected to have on the global economy.

In addition to considering existing tariff policies in its estimate (US and China both increase tariffs on steel and aluminum to 25%, each on 50 bil dlrs in goods, and US places an additional tariff of 10% on 200 bil dlrs in imported Chinese goods. Chart 3 ①+②.), another case was added in which it is assumed that the US places a 25% tariff on automobiles, and at the same time there are retaliatory tariffs imposed by other countries (Chart 3, ③). However, the estimate's assumptions are more severe than Chart 3 in that tariffs are seen at 20%). And the extent to which global GDP is pushed downwards is expected to be -0.1%pt at most. In other words, the results of the new IMF estimate avoid producing a smaller result on its estimates shown in Chart 3 than was seen on its 2016 report (-0.17%pt on cases ①+②+③).

On the other hand, the media frequently quotes the estimate that global GDP may be pushed downwards by -0.5%pt. When we look at the assumptions behind this estimate, we see that the factor of confidence shock has been added to the assumptions shown above. Confidence shock is the tendency of corporations to estimate a higher risk premium as the risk of a trade war increases, and this has the effect of suppressing investment and consumption.

To interpret these assumptions and the results of the estimate in plain language, it is a self-fulfilling prophecy in which negative effects are brought on by corporations and investors themselves in the process of attempting to avoid risk. These damages are 4-times as bad as the actual, direct effect of higher tariffs. As for the question of whether a psychological shock that is this major could occur, this is of course debatable<sup>7</sup>. The essence of the problem is more than simply the question of increasing tariffs. There is quite a bit of political uncertainty regarding the inability to guess what it is that President Trump is really trying to do here, and there are suspicions regarding this point. A detailed explanation related to this was given in the DIR report "Japan's Economy: Monthly Outlook (Apr 2018<sup>8</sup>)".

***The main risk to Japan's economy is the automobile tariff***

For Japan, the matter of greatest concern is the tariff now being considered by the US and which it may place on automobiles. President Trump ordered an investigation on May 23 regarding imports of automobiles and automobile parts based on Article 232 of the Trade Expansion Act of 1962. A concrete tariff rate and list of items affected will be revealed after the investigation is complete, but it has been reported that the tariff rate of 2.5% currently applied to passenger vehicles could increase to as much as a maximum of 20%.

Items which may be affected by an additional tariff and amounts in exports to the US are shown in Chart 4. Passenger vehicles, with a current tariff rate of 2.5%, have an export value of 4.5 tril yen, while automobile parts total 961.4 bil yen (figures based on 2017 performance). Together this totals 5.5 tril yen worth of Japanese exports which may be subject to additional tariffs. Assuming that all of these items are hit with an across-the-board tariff of 20%, the amount of increase in tariffs is estimated at 0.95 tril yen.

<sup>6</sup> <http://www.imf.org/external/np/g20/pdf/2018/071818.pdf>

<sup>7</sup> The IMF assumes growth of 0.3%pt in risk premiums in arriving at its proxy variable for confidence shock (about half that of the "Taper Tantrum". The appropriateness of this figure of 0.3%pt requires more working out. Moreover, what index is actually being used in calculating risk premium? Nothing is mentioned about this in the IMF report.

<sup>8</sup> For details see the DIR report by Shunsuke Kobayashi and Yota Hirono entitled "Japan's Economy: Monthly Outlook (April 2018): How will Japan's economy and corporate performance fare in US-China tariff dispute? Root cause of turmoil in the financial markets." (April 20, 2018.)

Meanwhile, the export value of passenger vehicles produced by Japanese automobile manufacturers in third countries, including Mexico and Canada, is also great. According to estimates produced by DIR, exports of Japanese passenger vehicles from third countries total 4.0 tril yen, an amount comparable to the 4.5 tril yen in autos exported directly from Japan. If exports from third countries, all NAFTA member countries, have tariffs increased from the current 0% to 20%, the amount of increase in tariffs will come to 0.8 tril yen. Add this to the amount of increase in tariffs on direct exports from Japan and you get 1.6 tril yen. The impact would literally be several orders of magnitude above what we currently experience. If we include the cost of increase in tariffs on automobile parts exported directly from Japan the amount comes to 1.75 tril yen, and Japan gets an even bigger hit when we include parts exported from third countries.

Hence the upcoming trade negotiations on automobiles will be Japan's moment of truth.

Effects of US Automobile Tariffs on Japanese Automobile Sales		Chart 4		
		Volume (Units)	Amount (¥100 Mil)	Amount of Tariff Hike (¥100 Mil)
①	Japanese cars sold in domestic US	6,641,216		
②	Japanese cars produced in domestic US	3,773,993		
③	Japanese cars exported from factories in domestic US	423,415		
④	Direct exports from Japan (excluding parts)	1,743,695	45,431	7,839
①-[②-③]-④=⑤	Exports from third countries	1,546,943	40,305	8,061
④+⑤	<b>Total automobile exports to the US by Japanese manufacturers</b>	<b>3,290,638</b>	<b>85,736</b>	<b>15,900</b>
⑥	Exports Automobile Parts from Japan		9,614	1,682
④+⑤+⑥	<b>Total Automobile Related Exports of Japanese Corporations to US</b>		<b>95,350</b>	<b>17,582</b>

Source: Automotive News, Haver Analytics, JAMA, Ministry of Finance; compiled by DIR.

Notes: 1) Volume and amount based on 2017 results. However, export amount from third countries estimated by multiplying unit price of direct exports with number of units.

2) Amount of tariff hike assumes (4): 2.5% ⇒ 25% and (5): 0% ⇒ 25%, (6): 2.5% ⇒ 20%.