Section 3 Negative impacts caused by trade restrictive measures

In the previous section, we examined the history and background of trade-restrictive measures. In this section, we consider the impact of trade-restrictive measures on the economies of a country that imposed the measures, target countries, and other countries. As already seen, trade-restrictive measures take various ways, and in this section, we analyze the impact of the increase in tariffs to trade deficits and the global economy.

1. Impact on trade deficits from an economic perspective

First we will check how trade balance and impact of an increases in tariffs are understood and analyzed in economics and leading empirical research.

(1) Savings-investment (IS) balance

According to macroeconomics, trade balance is determined by balance of savings and investment. See below for details (Figure II-2-3-1-1). From a perspective of supply, gross domestic product (GDP) is the total earnings from items produced domestically. On the flip slip, from a perspective of demand, GDP is the sum of domestic expenditure. GDP (Y) can be broken down into its demand components—consumption (C), investment (I), government spending (G), and net export (EX - IM) (identity (A)). In addition, if one includes taxes (T) and combine private savings (gross domestic product (Y) - taxes (T) - consumption (C)) and government savings (taxes (T) - government spending (G)) into savings (S), net exports (in other words, the balance of trade) equals the balance of savings and investment (identity (B)).

In other words, if investment exceeds savings (private and government), it will inevitably be a trade deficit. It is impossible to judge if trade balance is good or bad for a country by looking only at that element. In regard to this point, although “deficit” generally has a negative impression, it is debatable to apply to an economic trade deficit.

Figure II-2-3-1-1 GDP and demand items, savings-investment (IS) balance, and net export identity

$$Y = C + I + G + (EX - IM) \quad \cdots (1)$$

GDP: Y | Consumption: C | Investment: I | Government spending: G | Exports: EX | Imports: IM | Net exports: $EX - IM$

$$(Y - T - C) + (T - G) - I = (EX - IM)$$

Private savings: $Y - T - C$ | Fiscal balance (government savings): $T - G$ | Investment: I | Net exports: $EX - IM$

$$S - I = (EX - IM) \quad \cdots (2)$$

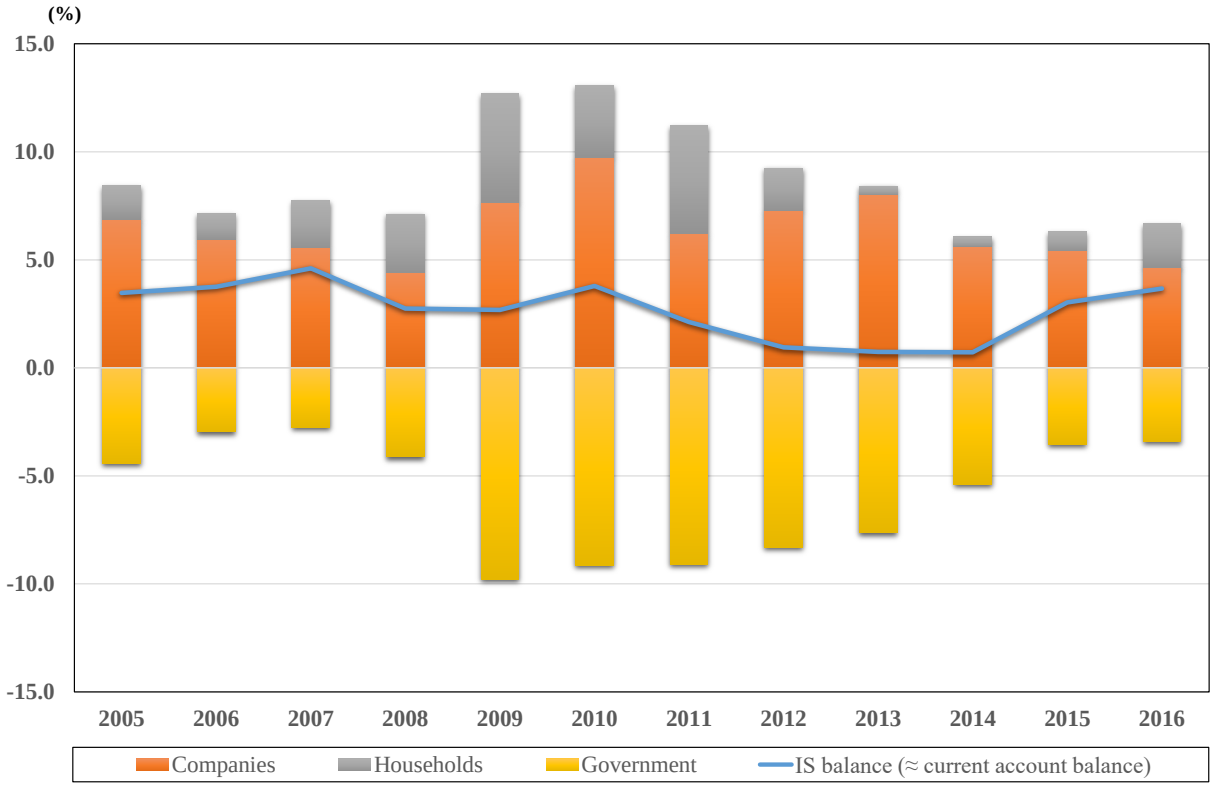
Savings: S | Investment: I | Net exports: $EX - IM$

Source: Ministry of Economy, Trade and Industry.

Excluding errors, etc., a savings-investment balance equals a current account. Considering a case of the U.S. and Japan, the U.S. runs a substantial budget deficit, and this exceeds private savings (total for households and corporations), resulting in a current account deficit. Although recording budget deficits, Japan has a current account surplus because its corporate savings are high (Figure II-2-3-1-2).

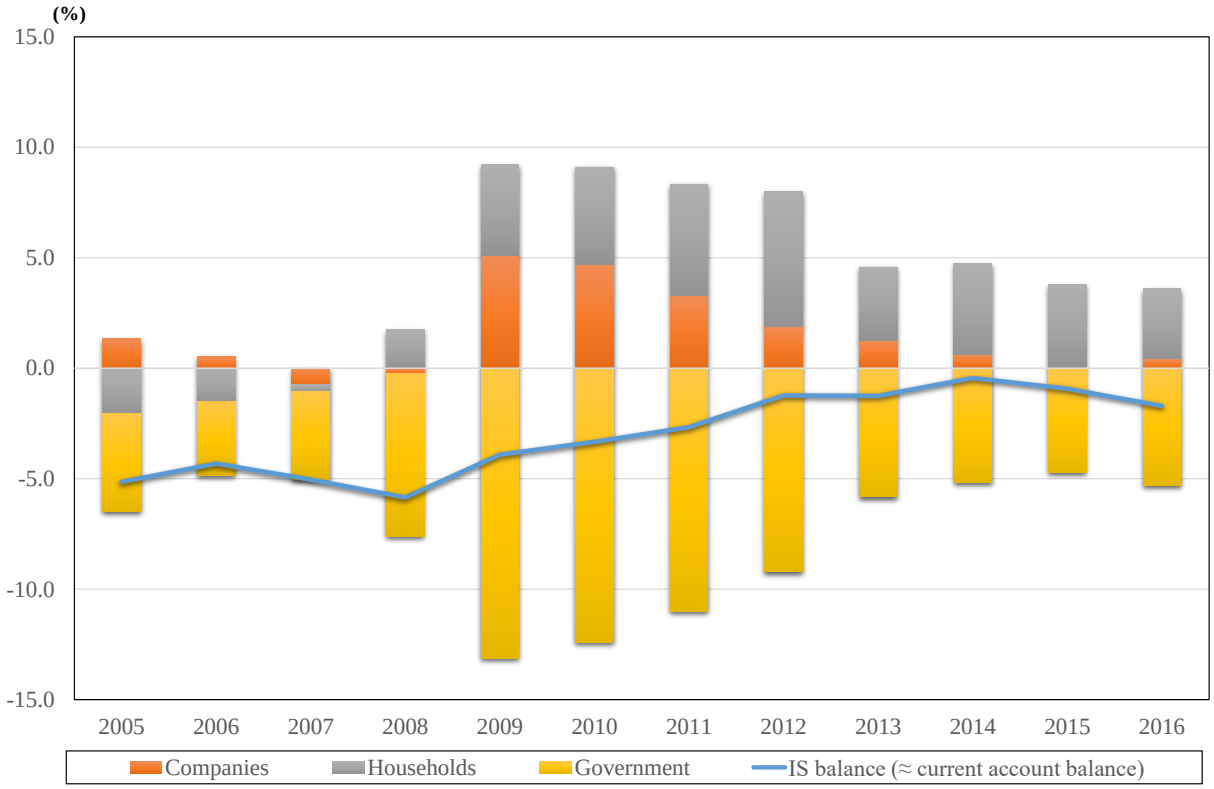
In this way, the economic activity of government, households, and companies determine the current account. Raising tariffs in order to balance the current account is only a partial answer.

Figure II-2-3-1-2　Japan's savings-investment balance (as % of GDP)



Source: OECD, Net Lending / Borrowing by Sector.

Figure II-2-3-1-3　U.S.'s savings-investment balance (as % of GDP)



Source: OECD, Net Lending / Borrowing by Sector.

(2) Demand curve under free trade and reduction in total social surplus due to tariffs increase

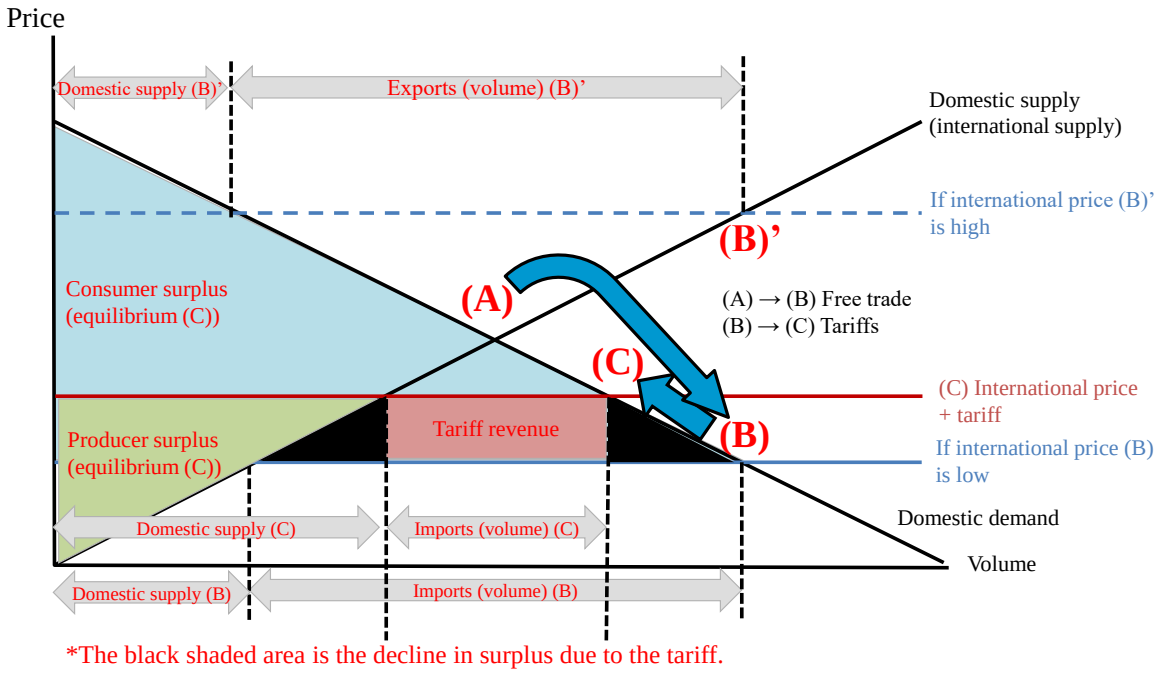
Next, let's look at free trade and the impact of raising tariffs from a microeconomic perspective.

In microeconomics, social surplus is determined by the intersection of demand and supply curves. In countries that do not trade at all, the two lines intersect at point (A) in Figure II-2-3-1-4. On the other hand, under free trade, if the international price is less than the equilibrium price (A), that item is imported, and there is a new equilibrium point, (B). As a result, consumers are able to purchase imports at the cheaper international price, although the consumer surplus increases, but the domestic producer surplus shrinks because imports replace domestic products. Looking at the change in surplus for the whole country, however, the increase in the consumer surplus exceeds the decline in the producer surplus, and the total surplus for society (sum of producer surplus, consumers surplus, and tariff revenue) increases under free trade. In addition, if the equilibrium price (A), where supply equals demand, is greater than the international price, domestic producers increase supply and export the product, leading to a new equilibrium point (B)'. In this case, producer surplus increases, but consumer surplus declines as the domestic price increases. In this case, too, there is an increase in the total surplus for society, the whole country.

Next, if the country importing the items increases its import tariff, the price of imports increases, leading to a new equilibrium point (C), where domestic demand, domestic supply, and import volume are in equilibrium. This new equilibrium point is different from that under free trade. For the new equilibrium point (C), the domestic producer surplus increases (because of protection), but the consumer surplus decline, and the total social surplus shrink.

As seen, from a microeconomics perspective, the tariff increase reduces the total surplus for the country that levied the tariff (the importing country) compared to the situation of free trade, when the total surplus for both importing country and exporting country increases.

Figure II-2-3-1-4 Demand curve under free trade and decrease in total surplus due to tariff increase



Source: Ministry of Economy, Trade and Industry using various sources.

(3) Spread of technology through trade

In contrast to David Ricardo's theory of comparative advantage under free trade,[79] there is a theory that during the process of industrialization, it is generally accepted to temporarily restrict imports and foster industries that possess growth potential (infant industry theory). Raul Prebisch, UNCTAD secretary general in the 1960s, was a strong proponent of the argument, and this idea was adopted in various Latin American countries. However, increased tariffs based on an infant-industry policy reduce the inflow of vital overseas technology through trade with and direct foreign investment in the country, and this decline in the spread of technology may undermine economic growth. Trade fundamentally provides people with the opportunity to come into contact with foreigners who possess knowledge not available in their own country.[80] Exporters strive to learn and capture the technology of foreign

79 According to Ricardo, free trade makes it possible for countries to specialize in producing and exporting goods that they have a relative advantage in while importing products that they do not have a comparative advantage in. This makes it possible not only for producers to efficiently produce items due to economies of scale but also for consumers to obtain inexpensive products.

80 In "Globalization of Knowledge (2) Spread of Technology to Developing Countries" of Subsection 3, Section 1, Chapter 1, Part II, there is a detailed look at the impact that the spread of technology to emerging countries through trade and foreign direct investment has on the economic growth of those countries.

countries in order to meet quality and safety standards demanded overseas.[81] Under an infant-industry policy, there are fewer opportunities to come into contact with foreigners, and while exporters still try to do what they always do, there is probably a decline in the benefits from the spread of technology.

Let's look at two examples. There is demonstration research shows that the various Latin American countries that adopted infant-industry policies in the 1960s through 1980s recorded per capita economic growth was less than that of Singapore and Republic of Korea, open countries with low tariffs.[82] Compared to the success story of strong economic growth in Singapore and East Asia, such as Republic of Korea, the economies of Latin American countries, with high tariff rates, stagnated.

Furthermore, Brazil adopted protective trade measures to shield its personal computer (PCs) industry in the 1980s, and during that period, Brazilian PCs fell dramatically behind international technological progress. Consumers disliked the poorly performing but expensive Brazilian PCs, and the protective measures were withdrawn.[83] In this case, there was almost an embargo on foreign-made computers, and the lively inflow of overseas technology through exports and direct foreign investment in the country declined. This can be viewed as a case in which the spread of technology came to a standstill.

In this way, adopting protectionists measures, such as raising tariffs, probably reduces the inflow of overseas technology and hinders economic growth.[84]

(4) Empirical analysis (United States International Trade Commission (2017), etc.)

Several empirical analyses and economic model analyses have been used to answer the question of what impact greater tariffs have on the balance of trade. In response to debate about whether the greater tariffs imposed in 1992 reduced the U.S. trade deficit, Ostry and others[85] analyzed whether there was a statistically significant impact using U.S. trade data. They created five data sets, including the value of trade between the U.S. and its major trading partners over the past twenty years. The analysis indicated that tariffs did not have a statistically significant impact on the balance of trade. However, UNCTAD[86] released the results of an analysis in 1999 and Santos-Paulino and others[87] released an analysis of data in 2004 using data from developing countries that indicated free trade negatively impacted the balance of trade. In response to this previous research, in 2008,[88] the IMF used data for a longer time and for more developing countries than previous research and confirmed that although free trade increases imports and exports, the impact on the current account depends on how trade is liberalized. There was

81 Yasuyuki Todou (2015).
82 According to Yasuyuki Todou (2015), Chile levied high tariffs (effective rate of protection of 217% on industrial products) in the 1960s but recorded per-capita economic growth of only 1.69% in the 1960s–1980s. On the other hand, Singapore (effective rate of protection of 0% on industrial products) and Korea (effective rate of protection of -17% on industrial products) achieved per capita economic growth of 6.58% and 7.19%, respectively.
83 Quoting Luzio and Greenstain (1995), Yasuyuki Todou (2015) notes that if one compares the price of PCs in Brazil and the U.S., Brazilian computers were not internationally competitive.
84 According to Yasuyuki Todou (2015), while it cannot be denied that protective trade measures can theoretically promote economic growth, research has verified that free trade promotes greater economic growth. In particular, post-World War II data shows that this is a prominent trend as technology diffusion has come to have a major impact.
85 Jonathan D. Ostry and Andrew K. Rose (1992).
86 UNCTAD (1999).
87 Amelia Santos-Paulino and A.P. Thirlwall (2004).
88 IMF (2008).

no strong evidence either way. In this way, one cannot generalize the results of empirical research, and there is no consensus on the impact tariffs have on the balance of trade (Table II-2-3-1-5).

Table II-2-3-1-5 Previous research on the impact of raising tariffs

Ostry and Rose (1992)	- Jonathan D. Ostry is Deputy Director of the Research Department at the IMF. - The analysis is of the impact that changes in tariffs have on the balance of trade using primarily OECD data. - The conclusion of the analysis is that tariffs do not have a statistically insignificant impact.
UNCTAD (1999)	- The analysis is of the impact that free trade has on the balance of trade using 1970–1995 data for fifteen developing countries. - The conclusion of the analysis is that while free trade resulted in a deterioration in the balance of trade, it was statistically insignificant.
Santos-Paulino and Thirlwall (2004)	- Santos-Paulino is an UNCTAD economist. - The analysis is of the impact that free trade has on exports, imports, and balance of trade using 1972–1997 data for twenty-two developing countries. The conclusion is that free trade increased both exports and imports and resulted in an overall deterioration in the balance of trade.
IMF Staff Paper (2008)	- The analysis is of the impact that free trade has on exports, imports, and balance of trade using data for a larger number of developing countries over a longer period. - The conclusion is that while free trade resulted in an increase in exports and imports, whether the current account deteriorated depended on the method, and no robust evidence was found.

Source: Prepared by the Ministry of Economy, Trade and Industry based on IMF (2008).

Here, we will look at a model analysis conduct by the United States International Trade Commission (USITC) and announced[89] in October 2017 after the inauguration of the Trump administration. The model combines a long-term equilibrium analysis and 30-year process analysis in the case that the U.S. raises tariffs 10% on only imports from China and on imports from all countries.

First of all, the long-term equilibrium analysis of China (Table II-2-3-1-6) indicates a decline in U.S. imports from China, and this impacts producer prices in the U.S., China, and the rest of the world (ROW). In particular, there is a dramatic decline in China's producer prices (-1.4%), the relative international competitiveness of Chinese exports increases, and the volume of China's imports of ROW and U.S. products, which grow relatively expensive, decreases. In addition, there is a net decrease in exports from ROW because although exports to the U.S. increase, those to China decline as they are relatively less competitive. As a result, the imposition of tariffs has a negative impact on both exports and imports of

89 USITC (2017).

all countries, and only the U.S. balance of trade is negatively impacted.

Next, let's look at a process analysis over thirty years for the world. The conclusion of the analysis is that while there is initially a temporary improvement in the balance of trade, thirteen or more years after the imposition of tariffs, there is a sustained reduction in the balance of trade of about 0.02%. In addition, even during the initial period when the expected improvement is the greatest, the balance of trade as a percentage of GDP improves about 0.05%. In 2018, the U.S. ran a trade deficit of 4.3% of nominal GDP, and this shows that it will take a long time for the U.S. to record a trade surplus.[90] When the tariffs are imposed only on China, the impact is only one-tenth of that when the tariffs are imposed on all imports, and there is a sustained negative impact of about 0.003%.

Table II-2-3-1-6 Model analysis of U.S. imposing an additional 10% tariff on imports from China

	Volume of imports from China (consumption)	Producer price (U.S., China, and ROW price difference)	Volume of imports from U.S. (consumption)	Volume of imports from ROW (consumption)	Exports Imports Balance of trade
U.S. (market)	10% tariff -4.9%	+0.1 vs. China: +1.5% vs. ROW: +0.5%	(+0.1%)	+0.7%	-1.2% -1.1% BoT -0.003%
China (market)	(+0.0%)	-1.4% vs. U.S.: -1.5% vs. ROW: -0.9%	-1.8%	-1.2%	-1.7% -1.7% BoT +0.0006%
ROW (market)	+1.2%	-0.5% vs. U.S.: -0.5% vs. China: +0.9%	-0.7%	(-0.0%)	-0.5% -0.5% BoT +0.0002%

Notes: The arrows indicate the main path of the impact. The orange arrows indicate the change in producer price and import volume of each country due to an additional 10% tariff. The yellow arrow is the decline in each country's volume of imports from the U.S. due to the relative increase in producer prices. Similarly, the green arrow is that for ROW, and the blue arrow indicates the change in China's imports of products. The gray arrow is the decline in producer price due to a contraction in the total volume of imports from ROW (-0.5%).

Source: USITC (2017) "Can Protectionism Improve Trade Balance?"

90 The figure was arrived at by dividing the 2018 U.S. trade deficit of 879.0 billion dollars by nominal GDP (estimate) of 20,513.0 billion dollars.

(5) Analysis of the impact of greater tariffs by international institutions

Several international institutions, including the IMF, OECD, and World Bank, have released trial calculations of the impact that 2018 trade disputes have on the global economy.[91] The various analyses indicate that there is negative impact on not only the country that imposed the tariffs and the targeted country but also countries throughout the world. Here, we would like to look at a more detailed scenario analysis conducted by the IMF and released in October 2018 (Table II-2-3-1-7).[92] The report assumes that the U.S. imposes all additional tariffs that it was examining at the time the report was released and that the targeted countries implement retaliatory measures. This is a trial calculation of the impact on the global economy that takes into account corporate activities and market response. The conclusion of the analysis is that not only the country that levied the tariffs and targeted countries but the whole global economy is negatively impacted. Similar to the previously looked at economic theory and Column 7, this clearly shows that no countries win when they impose tariffs on each other and a trade war results.

Table II-2-3-1-7 IMF scenario analysis of trade dispute impact (divergence from 2017) (Oct. 9, 2018)

- In October 2018, the IMF revised its "Global Trade Tensions" analysis (initially released in July 2018). It looked at eight regions (world, U.S., China, Japan, Europe, NAFTA (Canada and Mexico), G20 advanced countries, and G20 emerging countries) and made a trial calculation of the impact of five scenarios on GDP growth (over the next five years, long term).

  Scenario 1: The U.S. imposes tariffs based on Section 232 of the Trade Expansion Act of 1962 (steel and aluminum) and Section 301 of the US Trade Act of 1974, and in response, U.S. trading partners and China implement retaliatory measures. (includes all round 3 measures taken by the U.S. and China.)

  Scenario 2: The U.S. levies additional tariffs on 267.0 billion dollars' worth of imports from China, and China imposes retaliatory tariffs on all imports from the U.S. (130.0 billion dollars).

  Scenario 3: The U.S. imposes a 25% tariff on cars and car parts, and in response, U.S. trading partners introduce equivalent retaliatory measure.

  Scenario 4: Companies change their investment plans due to concerns about the trade war. (Trial calculation indicates that the negative impact on investment is 1/6th that following the collapse of Lehman Brothers.)

  Scenario 5: Trial calculation of various factors, including the impact on the market of a 15% decline in corporate earnings in the worst case scenario for a U.S.-China trade war.

91 In addition to the IMF trial calculation discussed in this white paper, the OECD released a trial calculation of the impact in November 2018. The calculation assumes that both the U.S. and China levy an additional tariff of 25% on all imports and that this negatively impacts the investment plans of companies. In this case, the U.S. experiences a negative impact of 1.1 points; China, a negative impact of 1.3 points; and the world, a negative impact of 0.8 points.

92 World Economic Outlook, IMF (Oct. 2018).

Country/region			World	U.S.	China	Japan	Europe	NAFTA (Canada and Mexico)	G20 Advanced countries	G20 Emerging countries
Impact on GDP (%)	Max. after 5 years	Total for scenarios (1)–(3)	-0.4%	-0.7%	-1.0%	-0.2%	+.0.1%	-1.2%	-0.3%	-0.4%
		Total for scenarios (4)–(5)	-0.5%	-0.3%	-0.6%	-0.5%	-0.5%	-0.4%	-0.4%	-0.7%
		Short term	-0.8%	-0.9%	-1.6%	-0.7%	-0.5%	-1.6%	-0.7%	-1.1%
	Long term		-0.4%	-0.9%	-0.6%	-0.2%	-0.1%	-1.4%	-0.5%	-0.4%

Notes: This is an analysis as of October 2018. It is important to keep in mind that the details of the U.S.-Mexico-Canada Agreement (new NAFTA) concluded in September 2018 are not reflected in this scenario, and this will have a major impact on NAFTA.

Source: World Economic Outlook, IMF (Oct. 2018).

(6) Summary

As shown above, from an economics perspective, it is meaningless to consider only the balance of trade and debate whether it is good or bad. In addition, in terms of microeconomics, although higher tariffs result in a greater surplus for some producers, it reduces the consumer surplus and the total surplus for society. If one also considers the benefits of the spread of technology due to trade, there are indications that imposing trade-restrictive measures, such as higher tariffs, can reduce the spread of technology from overseas and hinder economic growth. Furthermore, an empirical analysis confirms the following. Although one cannot generalize about the impact of raising tariffs on the balance of trade, it has been confirmed that raising tariffs has a negative impact on the country that raised the tariffs, and if the dispute grows into a trade war involving the world, the whole world is negatively impacted, and a negative spiral forms in which no country wins.

Column 7 Misconceptions regarding the trade deficit (U.S. think tank report)

In 2018, the Peterson Institute for International Economics, a U.S. think tank, released a report[93] that pointed out general misconceptions regarding the trade deficit (Column Table 7-1). The report was written to correct those misconceptions. First of all, the report points out that a trade deficit is borrowing and lending of money between countries and stressed that a trade surplus (trade deficit) is not simply winning (losing). The report also notes that the group of countries with the lowest trade barriers, including tariffs (Singapore and Switzerland), have the largest trade surpluses as a percentage of GDP. The report stressed the following. Even when considering past cases when countries raised tariffs, the tariffs did not reduce the trade deficit because although imports of targeted items declined, this was offset by an increase in imports of non-targeted items and decline in exports to non-targeted countries (balance of trade returns to its original level). In addition, it was stressed that there are no winners in global trade wars as they reduce overall trade, lead to inflation and declines in production, and make all countries poorer.

Colum Table 7-1 Five Misconceptions regarding the trade deficit

1. A trade deficit is not "losing."	○ Trade deficits and surpluses are borrowing and lending of money between countries. If an analogy were made with individuals, a trade deficit is the same as borrowing money to purchase a house. ○ If there were no trade deficits (they were forcefully eliminated), inflation would increase during economic expansions, and direct investment from overseas would decline, which would undermine long-term economic growth, quickly killing economic growth.
2. A trade deficit is not harmless.	○ Like many advanced countries with trade deficits, the U.S. borrows money from overseas to pay for government deficits, not build factories and infrastructure, which lead to economic growth. U.S. debt held by foreign countries is growing at a faster pace than the economy is growing. The quicker the U.S. can free itself from this vicious cycle, the better it will be for its economy. ○ Policy makers in more and more countries, particularly those in Asia, are recognizing that a trade surplus serves as a lifeline when economic growth stalls and are devaluing their currencies to give their exports an advantage. Former FRB president Ben Bernanke pointed out that the U.S.'s economic recovery has been delayed by this type of foreign exchange policy adopted by other countries.

93 Joseph E. Gagnon, PIIE (2018).

3. Tariffs do not reduce the trade deficit.	○ Tariffs and other trade barriers are fundamentally unrelated to trade deficits, and Singapore and Switzerland, which have the lowest trade barriers, are two of the countries with the largest trade surpluses. On the flip side, Brazil and India, which have the highest trade barriers, are two of the countries with the largest trade deficits. ○ If tariffs increase, imports decrease, and a country's balance of trade temporarily improves. However, the supply of a country's currency in the foreign exchange market falls the same amount that imports decline, which raises the exchange rate for the country. This makes imports cheaper and exports more expensive, driving the balance of trade back to its original state. In fact, in almost all cases when a country levies tariffs, there is a decline in exports and increase in imports of non-targeted items, the balance of trade with non-targeted countries deteriorates, and the country's balance of trade does not change as its productivity declines and prices increase. If a global trade war erupts, all countries are made poorer and no country wins as overall trade declines, inflation increases, and productivity declines.
4. The U.S. does not have no exports.	○ Many Americans think that all globally well-known consumer goods are produced overseas, and that the U.S. does not have any exports. However, actually, the U.S. is the second largest exporter in the world, and in 2017, U.S. exports of goods and services totaled 2.3 trillion dollars, only slightly less than the 2.4 trillion dollars of exports by China, the largest exporter in the world. If exports increase 10% and imports fall 10%, exports will exceed imports resulting in a trade surplus.
5. A trade war is not the only way for the U.S. to reduce its trade deficit.	○ All countries can implement measures permitted by international law that impact the balance of trade. For example, there is fiscal policy, foreign exchange market interventions, and foreign capital taxation and controls. Compared to the size of their economies, Singapore and Norway, which have huge trade surpluses, conduct massive foreign exchange interventions. ○ The 2017 U.S. fiscal deficit is one of the major reasons the U.S. saw its trade deficit grow, but it was also impacted by the inflow of overseas capital into its attractive financial markets and the mercantile policies of several of its trading partners. Instead of starting the current trade war, the U.S. should resolutely respond to all measures of countries to devalue their currencies and appropriately respond with monetary measures, such as foreign exchange market intervention and taxation of foreign capital flowing into the country.

Source: PIIE (2018), "The Debate of Trade Deficits is Littered with Misconceptions."

2. Impact of trade-restrictive measures (case study analysis)

In this section,[94] we conduct a case study analysis of the impact that past hikes in tariffs have had on trade, prices, employment, the economies of related countries, and the ripple effect on the world. In order to analyze the impact of greater tariffs, we look at cases that the WTO Appellate Body ruled were violations of the WTO Agreement and cases listed as unfair measures in Japan's Report on Compliance by Major Trading Partners with Trade Agreements. In particular, we look at two cases—the U.S. levying safeguard measures on steel in 2002, imposing anti-dumping (AD) measures and countervailing duties (CVDs) on photovoltaic cells and modules in 2012 and 2015, and introducing related safeguard (SG) measures in 2018.

(1) 2002 U.S. steel safeguard measures

(A) Outline of measures

In June 2001, shortly after the inauguration of the Bush administration, the U.S. government launched an investigation into steel SG measures and announced the Multilateral Initiative on Steel[95] in response to growing calls for comprehensive relief for the U.S. steel industry, which was struggling under a structural recession. After that, in March 2002, the Bush administration imposed additional tariffs of 8%-30% on fourteen steel products for three years on account of excess steel production throughout the world and its serious impact on the U.S. steel industry. The levying of these measures resulted in a series of request for deliberation at the WTO and countermeasures (compensation). In November 2003, the WTO Appellate Body ruled that the measures violated the WTO Agreement as there was insufficient explanation of the need to impose the tariffs as required. In response, the Bush administration withdrew the measures in December of the same year (Table II-2-3-2-1).

94 This section is based on "HEISEI 30 NENDO NAIGAIITTAI NO KEIZAISEICHOUSENRYAKUKOUCHIKU NI KAKARU KOKUSAIKEIZAICHOUSAJIGYOU (JIGYOUKANKYOU • SHIJOUDOUKOU NADO NO CHOUSA (AD NADO NO BOEKISEIGENTEKISOCHI GA SEKAIKEIZAI NI ATAERU EIKYOU NI KANSURU CHOUSA))," commissioned research by the Ministry of Economy, Trade and Industry. In addition, the source shows the original.

95 The initiative involved (A) working to resolve the problem of excess global supply, (B) creating international rules related to steel trade and domestic subsidies, and (C) examining temporary safeguard measures for the domestic steel industry.

Table II-2-3-2-1 Summary of 2002 U.S. steel SG measures

Background	On June 28, 2001, the United States International Trade Commission (USITC) launched an investigation based on Section 201 of the U.S. Trade Act of 1974 as there was a rapid increase in imports of steel, which there was an excess supply of, and this was having a serious impact on the U.S. steel industry. The Bush administration announced the introduction of steel SG measures on March 5, 2002, the following year, and they came into effect on March 20. The measures were initially for three years, but the U.S. did not wait for that deadline and withdrew them in December of 2003 because they had invited various countries to impose countermeasures, and the measures were ruled violations of the WTO Agreement in November 2003. The Bush administration explained that it had withdrawn them because earnings in the U.S. steel industry had recovered due to the measures. **Applicant:** Industry (USWA) requested support from the U.S. government. President Bush mentioned his support for the steel industry during the 2000 presidential election.
Summary	**Targeted item:** 169 items based on the HS code, including steel and steel products that the U.S. government registered with the WTO. The main items were hot-rolled products, cold-rolled products, flat-rolled steel alloy products, steel rods and beams, seamless pipe, steel pipes. **Safeguard details:** For 14 items, an additional tariff of 8%-30% (it lowered to 7%-24% the following year and to 6%-18% in the final year) was imposed on imports that exceeded 4.90 million tons in the first year (5.35 million tons the following year and 5.81 million tons in the final year). **List of exempted items:** Lists of exempted items (round 1–round 5) were announced between June and July 2002, when the measures were implemented, The measures had applied to about 29% of U.S. steel and steel product imports, but that fell to 25% when they came into effect. (Hufbauer and Goodrich (2003)) **Targeted and exempted countries:** Four countries were exempted—in addition to Canada and Mexico, who are NAFTA member countries, Jordan and Israel were exempted. Furthermore, developing countries who accounted for less than 3% of imports, etc., were also exempted. The safeguards applied to all other countries.

Source: U.S. public information, etc.

(B) Steel industry at that time

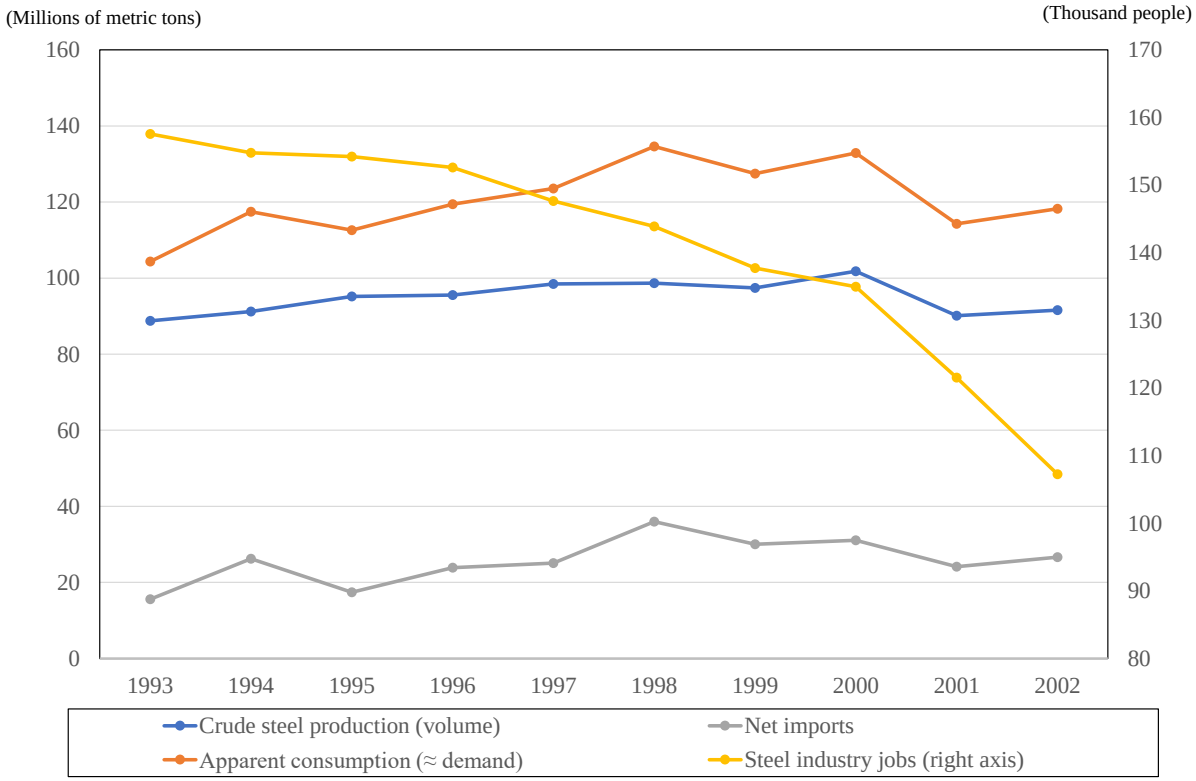
The U.S. steel industry had been a world leader in the first half of the 20th century, but its dominance gradually waned starting in the 1970s as its international competitiveness declined.[96] At that time, the U.S. steel industry was struggling because of not only a decline in its international competitiveness but also fiercer domestic competition between blast-furnace steel manufacturers and new electric arc furnace steel manufacturers. Furthermore, demand had fallen as a result of weak domestic business conditions following the bursting of the IT bubble in 2001.[97] Looking at domestic demand and supply for steel before the introduction of the SG measures reveals that although there had been a temporary decline due to the 1997 Asian financial crisis, demand had been supported by an increase in apparent consumption,[98] and production volume of crude steel had trended upward, even if only slightly until the bursting of the IT bubble in 2001 (Figure II-2-3-2-2). Due to the bursting of the IT bubble, however, U.S. business conditions deteriorated in 2001, and both production volume and imports of crude steel fell. Therefore, there was an even greater contraction in employment, which fell about 20% over two years from 2000. Under these conditions, the U.S. steel industry association requested relief, and the U.S. government implemented various measures based on the WTO Agreement. In 2001, when the peak number of measures were in effect, the U.S. have implemented thirty-one relief measures in one year. These steel SG measures were implemented in March of the following year, 2002, based on an investigation under its own authority (Figure II-2-3-2-3).

96 The U.S. is both a major producer and consumer of steel. In 2001, it produced around 90 million tons of steel, 10.6% of global production, making it the third largest producer of steel after China and Japan. In the same year, it consumed about 114 million tons of steel, 13.4% of global consumption, making it the second largest consumer of steel, after China. Figures are from the World Steel Association.

97 According to Gary Clyde Hufbauer and Ben Goodrich (2003a), the main reason for the decline in employment was the advent of new electric arc furnace steel manufacturers (Nucor Corporation, Steel Dynamics, etc.). These new electric arc furnace steel manufacturers employ small-scale electric arc furnaces that use inexpensive waste steel, making it possible to produce steel at a low cost with relatively few workers. These steel manufacturers stole market share from existing blast-furnace steel manufacturers (U.S. Steel, AK Steel, etc.).

98 "Apparent consumption," the sum of crude steel production volume and volume of net imports (volume of imports - volume of exports), indicates a country's demand (volume) for steel.

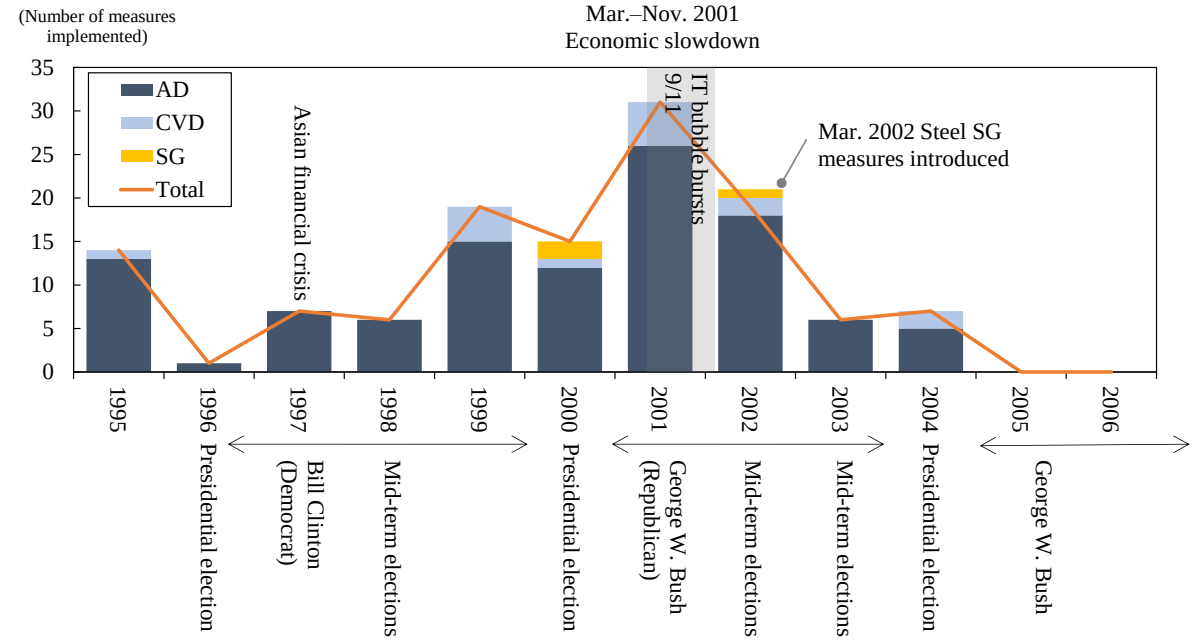
Figure II-2-3-2-2 U.S. crude steel production, consumption, net imports, and employment



Note: "Apparent consumption" is the sum of crude steel production volume and net imports. Employment figures are from U.S. Department of Labor's iron and steel mills and ferroalloy production.

Source: World Steel Association and U.S. Department of Labor.

Figure II-2-3-2-3 Number of relief measures implemented for U.S. steel and steel products



Source: WTO database, United States Trade Representative (USTR), etc.

(C) Impact on trade for the country that introduced the measures (U.S.)

First of all, we would like to summarize the impact of imports of targeted items by the U.S., which implemented these measures, by country.[99] In 2001, the U.S. imported 12.8 billion dollars' worth of targeted items. A breakdown of that figure by country reveals that a large percentage of imports came from Canada and Mexico, which were exempt from the SG measures (Table II-2-3-2-4).

A comparison of the year-on-year change in imports of targeted items from targeted countries and exempted countries reveals that imports from targeted countries contracted by half immediately after the measures were implemented, but imports from exempted countries rose, a clear difference between the two groups of countries (Figure II-2-3-2-5).

Next, let's examine the change in the price of imports of targeted items from targeted countries.[100] Compared to non-targeted items (non-targeted steel and steel products, etc.), the import price rose dramatically after the tariffs were imposed, increasing up to 20% when the tariffs were levied. Even for non-targeted items, prices started to rise in the second half of 2003, increasing almost 10% from when the tariffs were imposed (Figure II-2-3-2-6).

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99 The following are conditions on conducting the analysis of these measures. (A) Targeted items are identified using the six-digit HS codes that the U.S. recorded with the WTO. Some items were exempted in June and July 2002, and a numerical analysis was also conducted after the exemption. (B) Targeted countries are all countries other than exempted countries (Canada, Mexico, Israel, and Jordan). In addition, developing countries that accounted for less than 3% of imports were also exempted, but in this analysis they are uniformly treated as targeted countries because of the difficulty of conducting a comprehensive analysis. (C) As for trade volume, the import CIF price (price that includes the product price, insurance, and freight but not tariffs) for the country that imposed the measures was uniformly used.

100 The targeted items based on the six-digit HS code that the U.S. recorded with the WTO belong to one of three two-digit HS code groups—72 (steel), 73 (steel products), and 89 (base metal products). For this analysis, six-digit products that belong to these three groups are divided into targeted items and non-targeted items. The import unit price Fisher index was calculated using 1999 figures as the reference figure. When calculating the unit price, data for HS730820, HS720690, and HS843143 targeted items; December 1999 data for HS732421 non-targeted items; and data for HS732620 non-targeted items were excluded as there were large changes in the price index and they were viewed as outliers. Furthermore, in order to analyze the targeted items of targeted countries, data for the exempted countries Canada and Mexico was removed from global totals for targeted and non-targeted items.

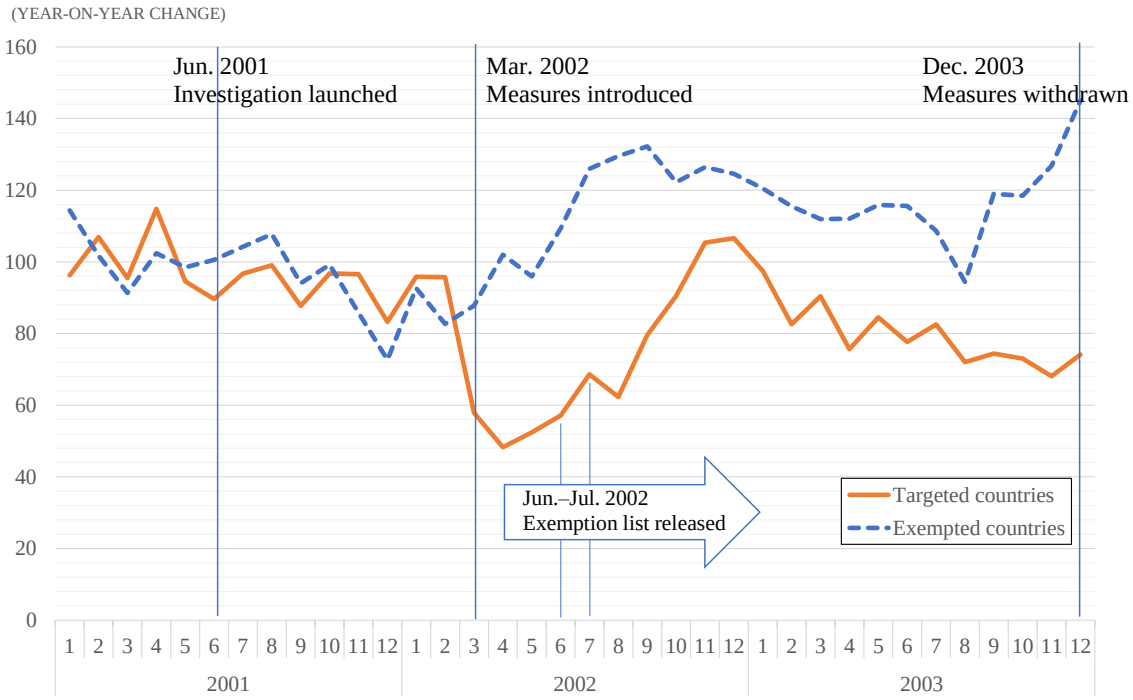
Table II-2-3-2-4 Ranking of countries from which U.S. imported targeted items 2001

	Rank	Country	Amount (millions of dollars)	Share (%)
Exempt	1	Canada	2,718	21.3
	2	Japan	1,166	9.1
	3	Germany	1,042	8.2
	4	Republic of Korea	1,003	7.9
Exempt	5	Mexico	959	7.5
	6	Brazil	601	4.7
	7	China	476	3.7
	8	France	472	3.7
	9	UK	399	3.1
	10	Italy	365	2.9
Exempt	41	Israel	22	0.2
Exempt	160	Jordan	0	0.0
	–	Other	3,534	27.7
	–	World	12,756	100.0

Note: As for targeted items and countries, see conditions given in footnote 188.

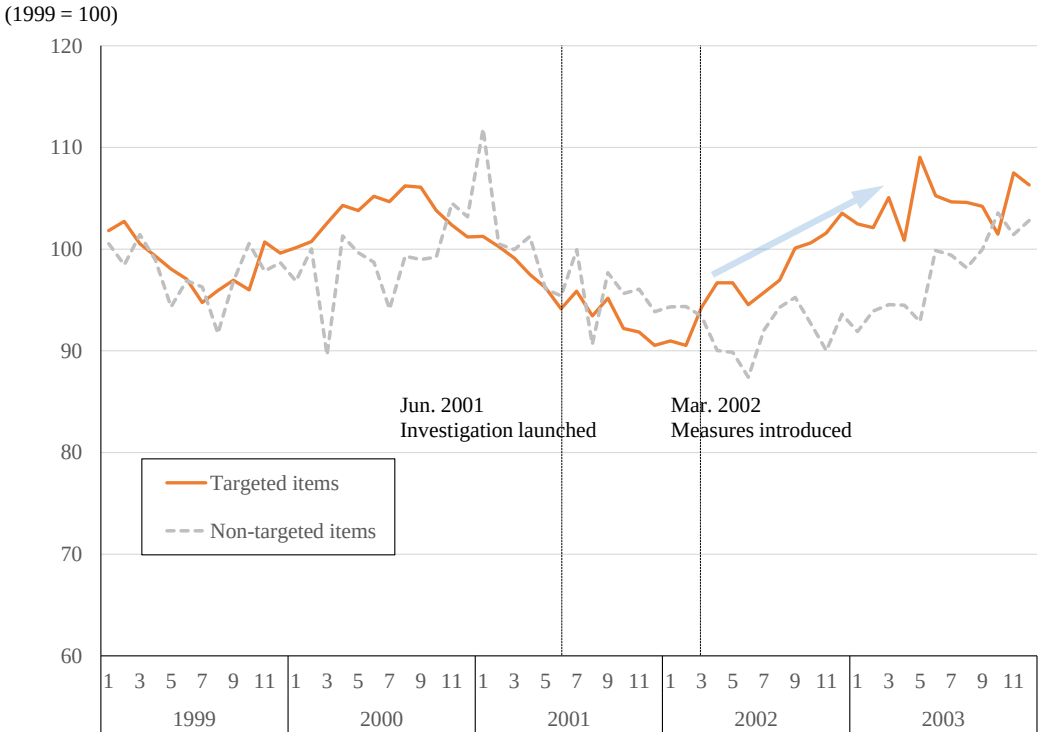
Source: Global Trade Atlas.

Figure II-2-3-2-5 Imports (value) of targeted items by targeted and exempted countries (year-on-year change)



Source: Global Trade Atlas.

Figure II-2-3-2-6 Import price index of targeted and non-targeted items for targeted countries (Fisher index)



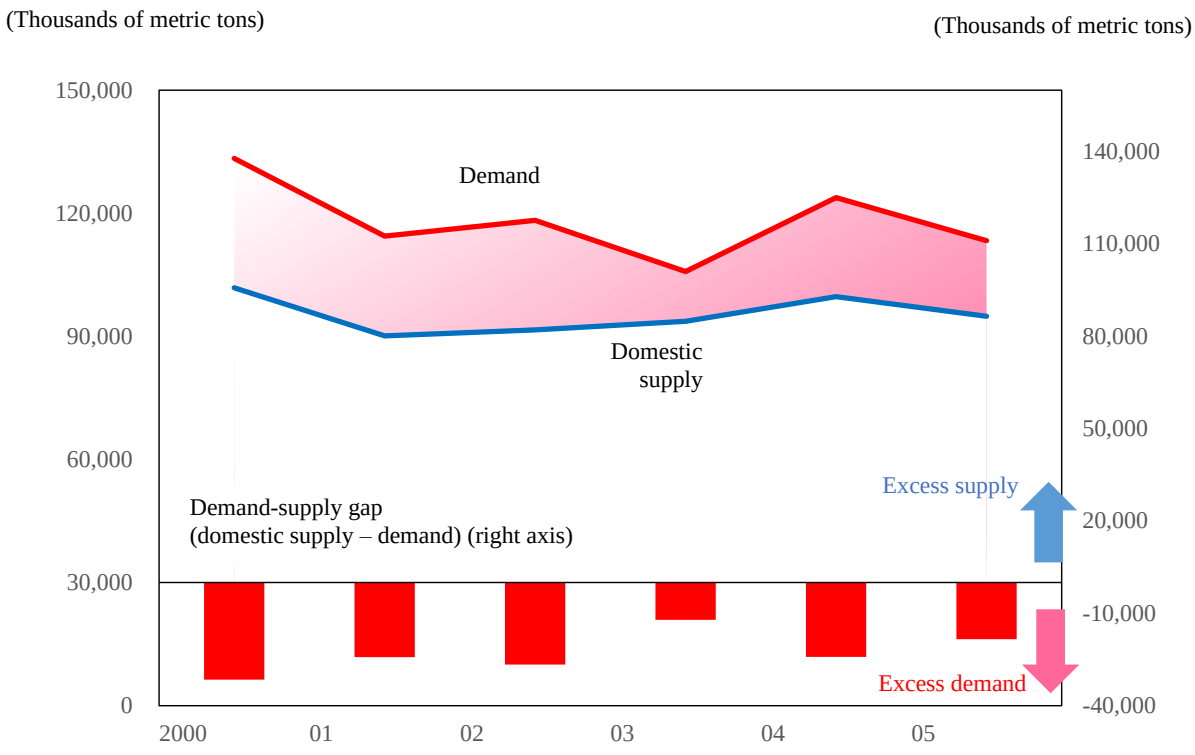
Notes: See footnote 185.

Source: Global Trade Atlas.

(D) Impact on prices, employment, and stock prices in the steel industry of the country that levied the tariffs (U.S.)

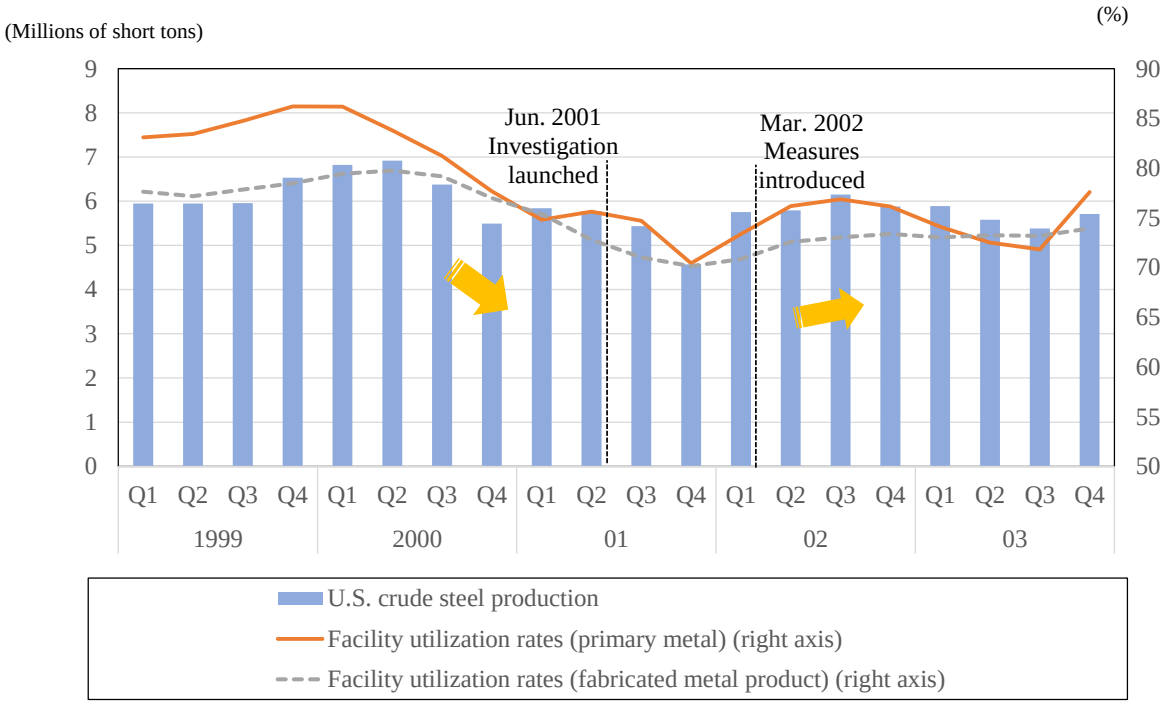
Let's next look at the impact of tariffs on domestic prices, markets, etc. While there have been slight changes in annual U.S. steel demand and supply since the second half of the 2000s, demand has continued to exceed supply. Domestic demand leveled off, but domestic supply gradually increased starting in 2001 because of a decline in imports due to these measures and other developments (Figure II-2-3-2-7). After both U.S. steel production and utilization rates bottomed out in the fourth quarter of 2001, they began to rise, and it appears that production started to improve on account of the March 2002 measure (Figure II-2-3-2-8). The firm production can also be seen in the wholesale price index. The price index for hot-rolled coil (HRC), a leading benchmark index, had been trending downward until the imposition of the measures, but it quickly rose as a result of the measures (Figure II-2-3-2-9). The same trend can be seen for the market price. The market price for HRC continued to increase after the measures were introduced, almost doubling by July, several months after the measures were implemented (Figure II-2-3-2-10). However, the increase in both the wholesale price index and market price was only temporary, and by the end of 2002, they had returned to their original levels.

Figure II-2-3-2-7 U.S. domestic demand



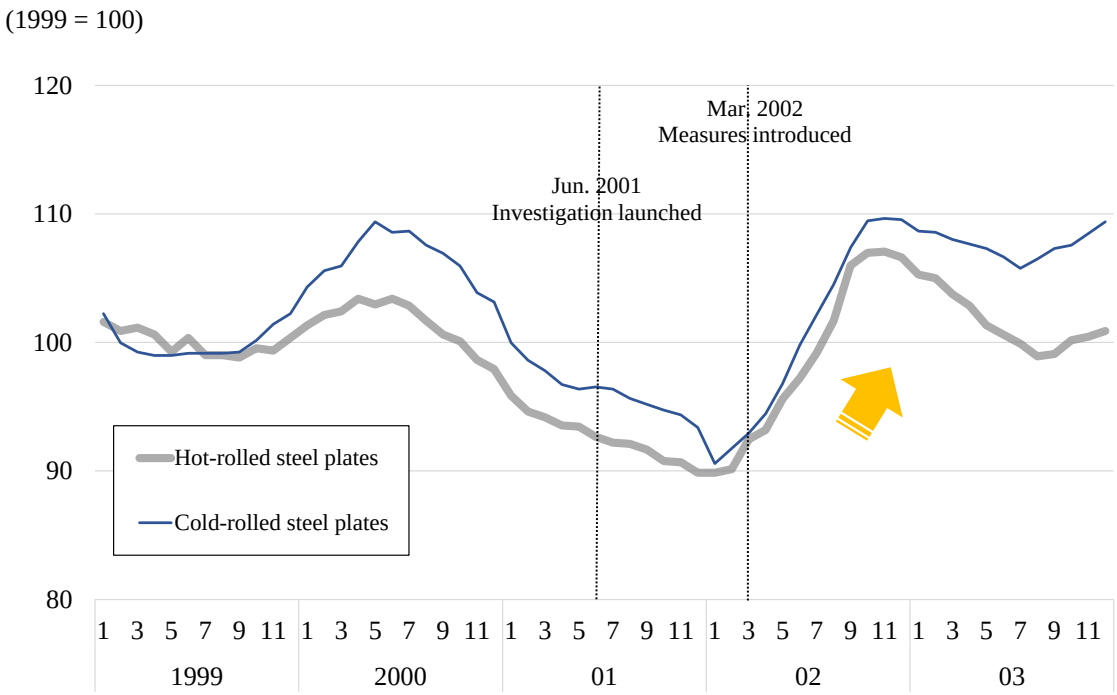
Source: World Steel Association.

Figure II-2-3-2-8　U.S. crude steel production volume and utilization rate



Source: American Iron and Steel Institute, etc.

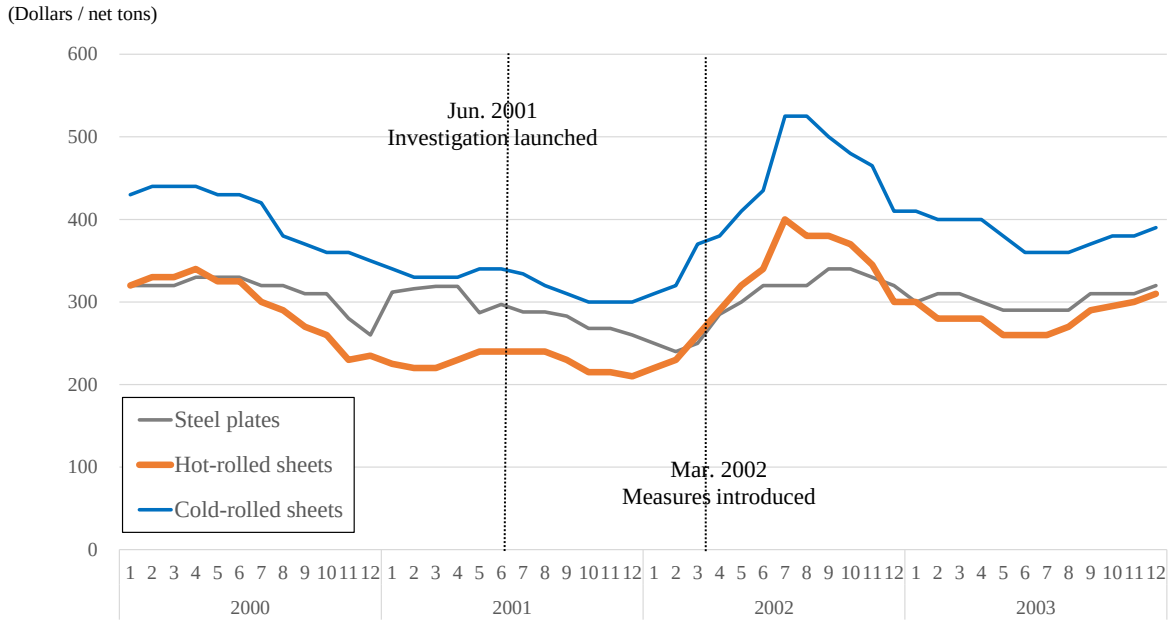
Figure II-2-3-2-9　U.S. steel producer price index



Notes: The following are the IDs for the various indices designated by the U.S. Department of Labor: hot rolled steel sheet and strip (WPU101703) and cold rolled steel sheet and strip (WPU101707).

Source: U.S. Department of Labor (Bureau of Labor Statistics).

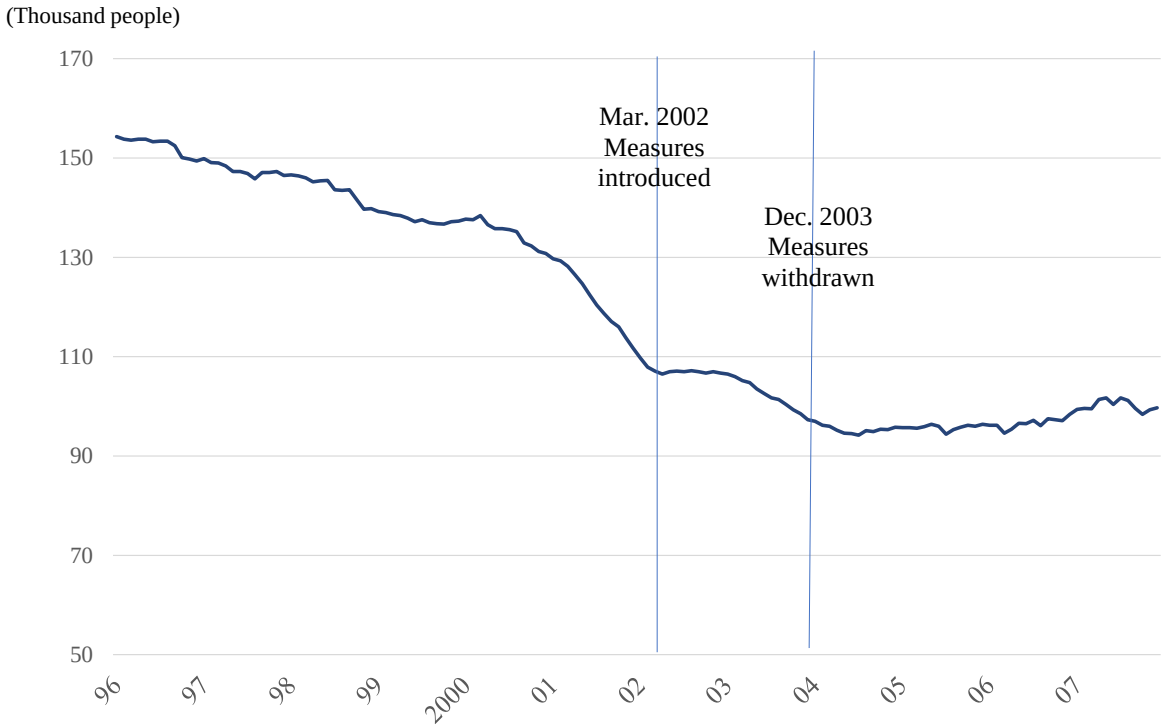
Figure II-2-3-2-10　U.S. steel market price



Source: Japan Iron and Steel Federation's KAIGAITEKKOUSHIJOU NO UGOKI.

Looking at employment within the steel industry, it reveals that the number of jobs had continually been declining until March 2002, when the measures were implemented. The contraction in employment had been particularly prominent since around 2000, with employment dramatically falling 22.2% from 138,000 in January 2000 to 107,000 in February 2002, when the measures were implemented (Figure II-2-3-2-11). The measures did temporarily halt the decline in employment, but employment increased only slightly in 2002. However, employment once again began to gradually trend downward when steel prices returned to their initial level at the end of 2002 and after. Employment in the steel industry bottomed out at about 100,000 shortly after the measures were discontinued, and it is inferred that employment in the steel industry declined to its appropriate level. The measures implemented by the U.S. may have postponed the decline in steel industry employment.

Figure II-2-3-2-11 No. of jobs in the U.S. steel industry



Notes: Figures for the number of jobs are the U.S. Department of Labor's iron and steel mills and ferroalloy production.

Source: U.S. Department of Labor.

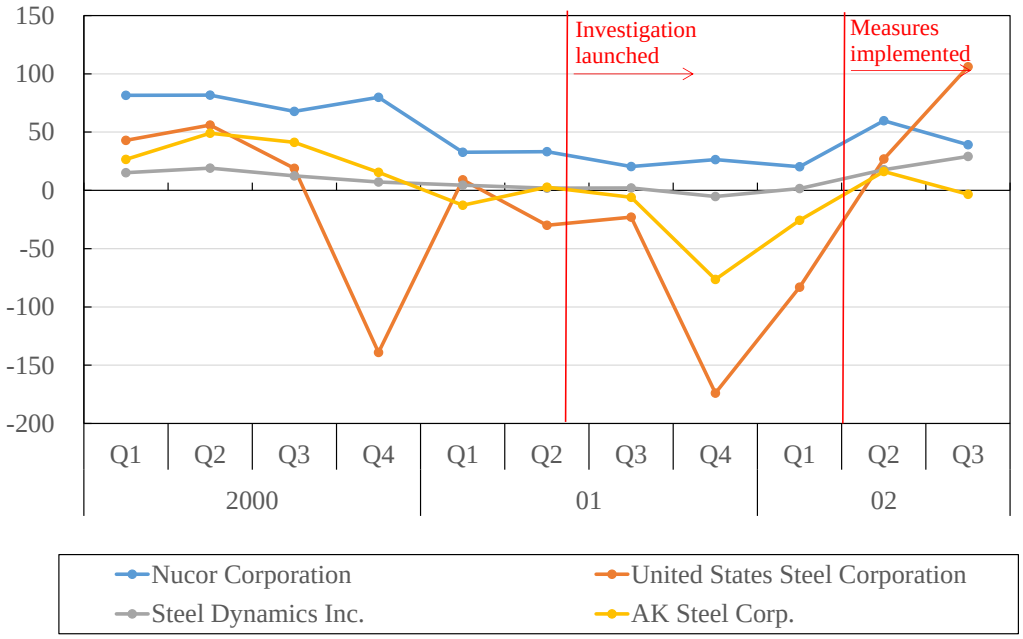
As for the earnings of individual companies, blast-furnace steel manufacturers, such as United States Steel Corporation and AK Steel, returned to profitability following the introduction of those measures. On the other hand, new electric arc furnace steel manufacturers such as Nucor Corporation and Steel Dynamics experienced only a minor improvement in earnings after the measures were introduced (Figure II-2-3-2-12).[101] As for stock prices, that of blast-furnace steel manufacturers underperformed the S&P Average except for a short time after the measures were implemented, but that of new electric arc furnace steel manufacturers substantially outperformed the S&P Average following the introduction of the measures (Figure II-2-3-2-13).

In this way, for the U.S. steel industry, earnings rose and the decline in employment was halted in the short term because the volume of imports fell due to the SG measures, leading to excess demand and greater prices. These impacts are consistent with an increase in producer surplus due to greater tariffs under the microeconomic theory discussed in Section 1.

101 See footnote 186 for details on the reason for the difference in earnings between blast-furnace steel manufacturers and new electric arc furnace steel manufacturers.

Figure II-2-3-2-12　Earnings of major U.S. steel manufacturers (net profit)

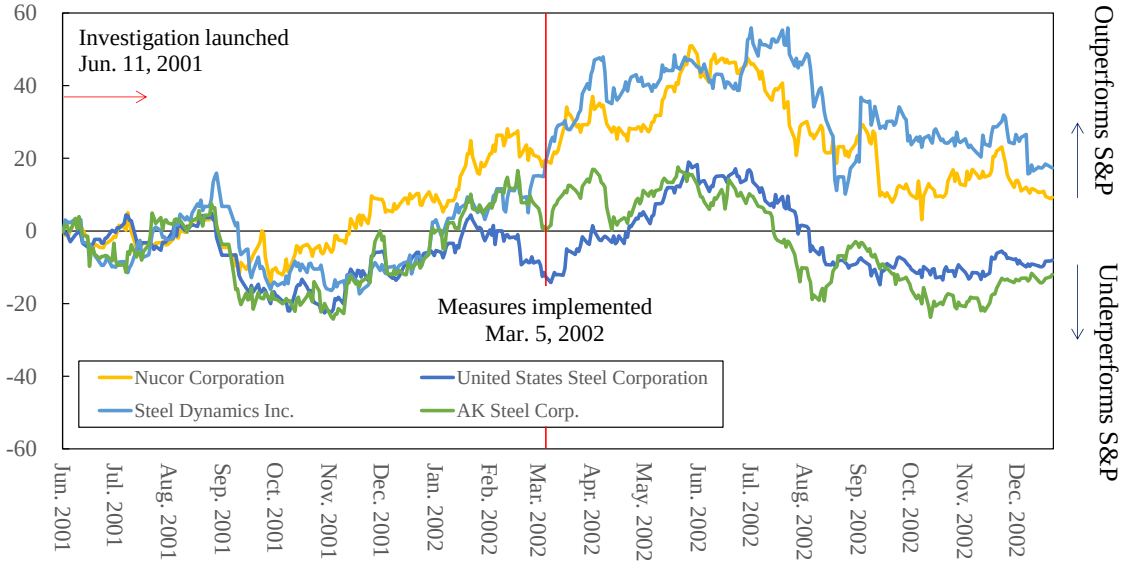
(Million dollars)



Source: Bloomberg.

Figure II-2-3-2-13　Stock price of major U.S. steel manufacturers

S&P500 Index and Spread



Notes: Indexed using the figure for the date the investigation was launched as 100.

Source: Bloomberg.

(E) Impact on downstream industries in the country that introduced the measures (U.S.)

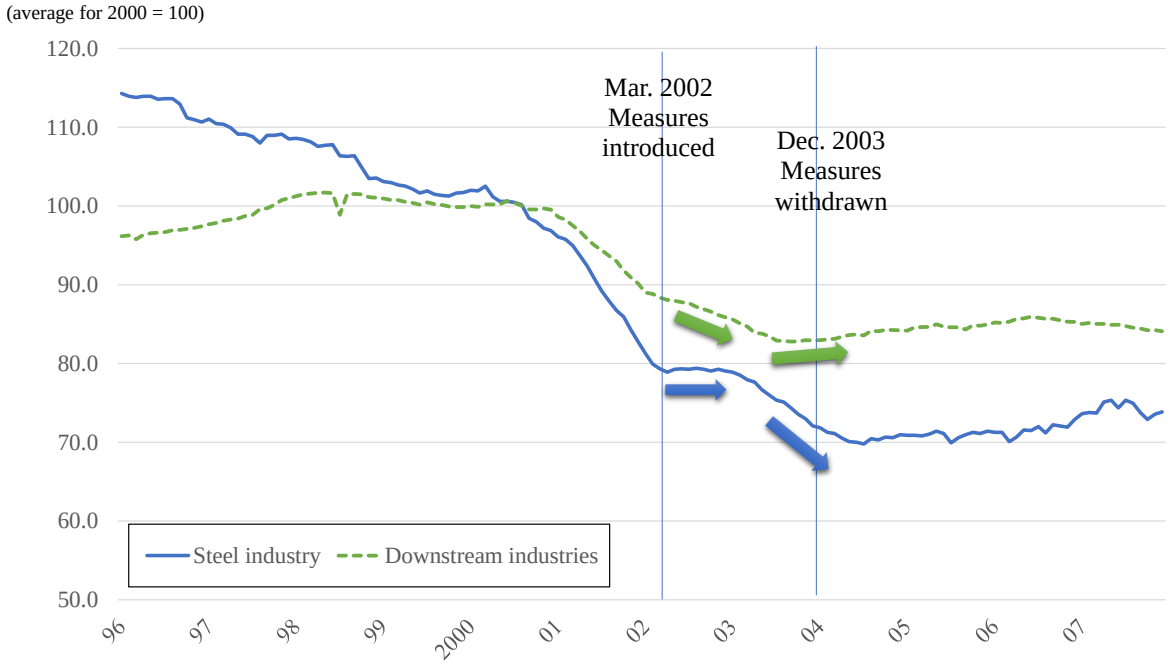
We would like to consider the impact on downstream industries in the U.S. Since these SG measures targeted the steel industry, which has a wide range of downstream industries, it is thought that the increase in the price of steel had a negative impact on many downstream industries as their costs rise (a decline in consumer surplus under the microeconomic theory discussed in Section 1).

A comparison of employment in downstream industries and that in the steel industry at that time reveals the following (Figure II-2-3-2-14). Although employment in both groups of industries started to shrink after the IT bubble burst in 2001, the steel industry stopped shedding jobs following the introduction of these measures, but employment in downstream industries continued to fall until the end of 2003, when the measures were withdrawn. Therefore, the imposition of these measures may have resulted in a decline in employment in downstream industries due to the increase in steel prices.

In the U.S., the country that introduced the measures, the producer surplus increased but the consumer surplus fell. As for the impact on the total surplus for the country, the sum of the producer surplus and consumer surplus, the U.S. government's USITC released a report on this in September 2003.[102] It includes an analysis of the impact on tariff income and households and businesses of these SG measures using a general equilibrium model, and the results indicate that for the U.S., there was a net negative impact of 30 million dollars (Table II-2-3-2-15). In particular, industries downstream of the steel industries, including car parts, steel tanks, weight gauges, and railway cars, experienced a major negative impact. A private-sector think tank also released a trial calculation that indicated 43,000 jobs[103] were lost annually, and 224,000 jobs were lost in the manufacturing industries related to metals, machinery, and transportation equipment (the decline was particularly large in the rust belt) in 2002.[104]

102 USITC (2003).
103 Gary Clyde Hufbauer and Ben Goodrich (2003b).
104 Dr. Joseph Francois and Laura M. Baughman (2003).

Figure II-2-3-2-14 Impact of 2002 SG measures on employment (steel and downstream industries)



Notes: The U.S. Department of Labor's Series title uses "all employees, thousands, seasonally adjusted." For the steel industry, "iron and steel mills and ferroalloy production" is used, and taking into consideration previous research, the total of fabricated metal products, machinery, and transportation equipment is used for downstream industries.

Source: U.S. Department of Labor.

Table II-2-3-2-15 Trial calculation based on general equilibrium model with steel safeguard measures

Change in income	(Million dollars)
Tariff revenue	649.9
Household income	-386.0
Corporate income	-294.3
Of which is from positively impacted industries	306.9
Of which is from steel industry	239.5
Of which is from negatively impacted industries	-601.2
GDP	-30.4

Source: USITC (2003).

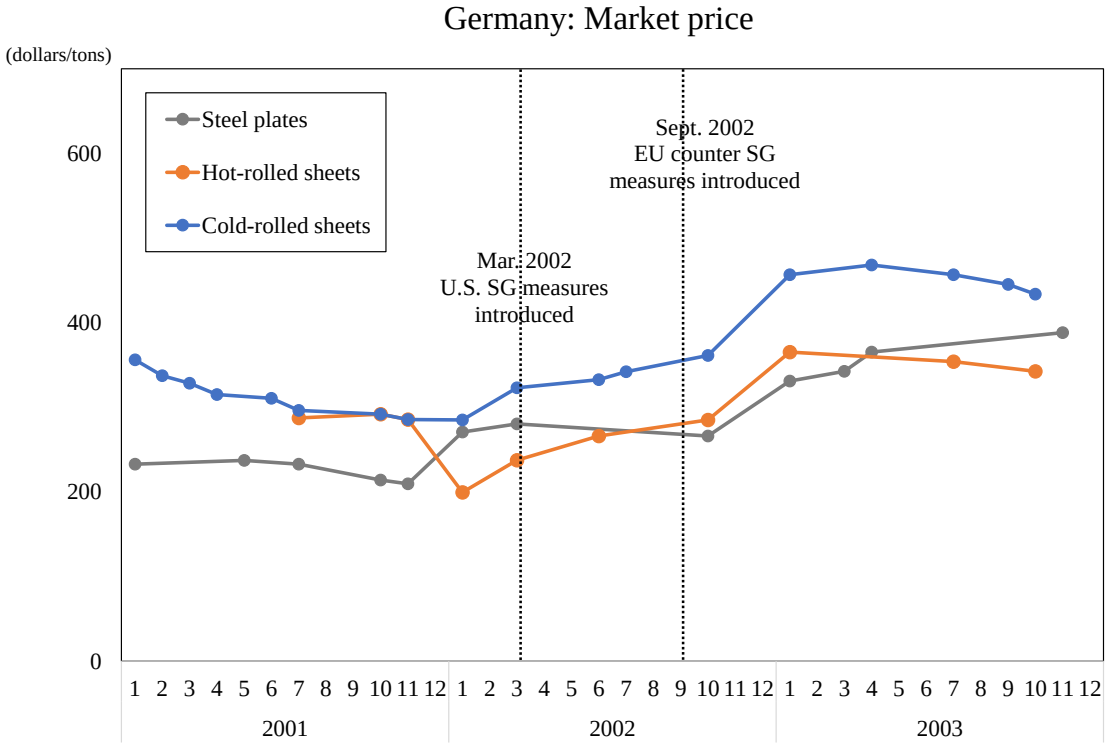
(F) Impact of the measures on other countries

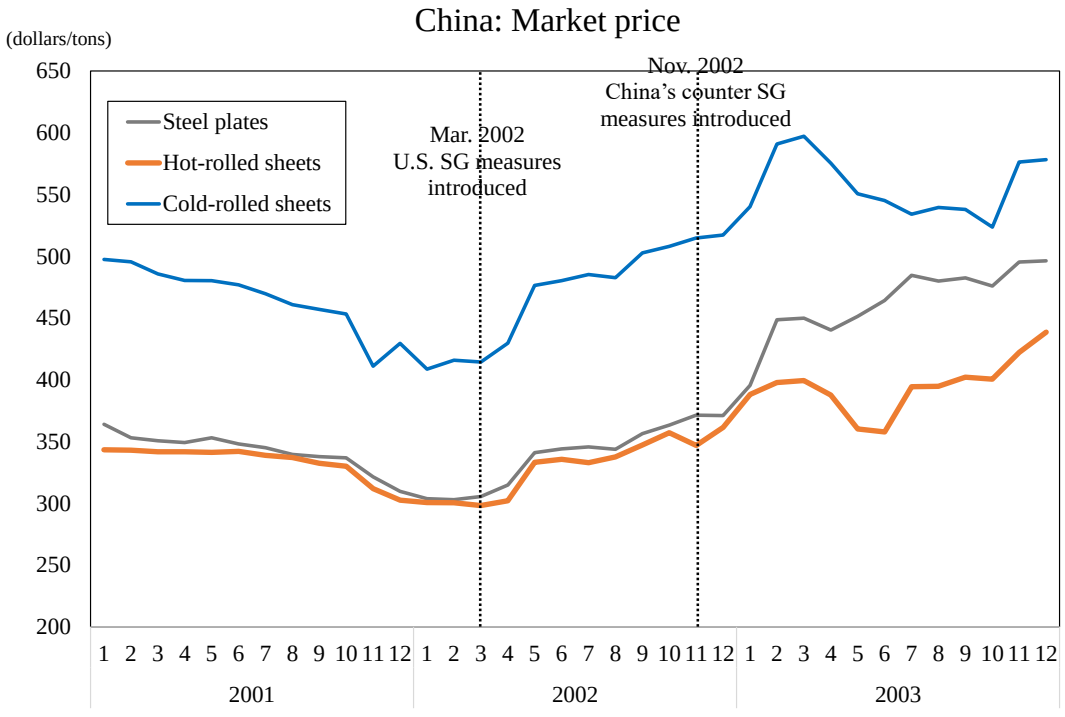
Finally, we would like to follow Germany and China as examples to see what impact these measures had on global steel prices (Figure II-2-3-2-16). In both Germany and China, one can see that steel prices halted their slide and started to rise in response to the U.S. implementing the March 2002 measures. Prices also subsequently rose even more for various reasons, including countermeasure taken in response to U.S. measures. In particular, in China, supply could not keep up with demand because of the country's rapid economic growth since 2001, and U.S. and China's SG measures had a major impact on the domestic market.

In addition, it has been pointed out that the U.S. SG measures caused a chain reaction of trade-restrictive measures throughout the world.[105] Because of the U.S. measures, EU, China, Hungary, Chile, and Poland introduced tentative SG measures, and regions that have implemented measures account for slightly less than 50% of global imports. In these regions, steel material prices rose as the cost of imports increased. In particular, in China, the supply of high-quality steel and steel products for particular uses tightened, resulting in a consumer surplus loss not only in the U.S. but the whole world. In addition, even for producers, these SG measures worked as an incentive to maintain inefficient production facilities, delaying structural reforms in the domestic steel industry and resulting in economic losses in the long term due to the decline in international competitiveness. In this way, one can argue that this is a case in which the SG measures not only impacted the country that introduced the measures but also spilt over throughout the world.

105 2003 Report on Compliance by Major Trading Partners with Trade Agreements.

Figure II-2-3-2-16　Market price of steel (Germany and China)





Notes: Yuan and mark prices translated to dollars.

Source: Japan Iron and Steel Federation's KAIGAITEKKOUSHIJOU NO UGOKI and Bloomberg.

(2) U.S. 2012/2015 AD measures and CVDs & 2018 SG measures on photovoltaic cells and modules[106]

(A) Outline of measures

In January 2018, the Trump administration introduced SG measures as the sudden increase in photovoltaic cell and module imports was causing serious damage to the U.S. domestic industry. Twice before, in 2012 and 2015, the U.S. government had imposed both anti-dumping (AD) measures and countervailing duties (CVDs) on photovoltaic cells and modules produced in China and other countries. The U.S. government pointed out that, Chinese companies had moved their production bases outside of China, to Malaysia, Vietnam, and other countries to avoid these measures. Therefore, a third round of measures was implemented.

The first round of measures consisted of AD measures and CVDs introduced in December 2012. The U.S. government concluded that Chinese government subsidies for solar power[107] distorted the market and were violations of the WTO Agreement and that the U.S. domestic industry was being harmed by the cheap imports from China, made possible by these subsidies. For these measures, however, "country of origin" when the measures were implemented was defined as "country where the photovoltaic cells were manufactured." By shifting cell processing, one part of the manufacturing process,[108] to a country such as Taiwan, Chinese manufacturers were able to avoid the measures for their modules (cells were processed in Taiwan or another country, and the modules were assembled in China). This resulted in a sudden increase in exports to the U.S.[109] For the second round of measures, AD measures and CVDs were imposed in February 2015. In order to target modules assembled in China using photovoltaic cells manufactured in Taiwan, imports of which were rapidly raising, "country of origin" was defined as "country where the module was manufactured" for China, and "country where the cells were produced" for Taiwan. After that, however, U.S. demand rapidly increased in response to tax incentives offered by the U.S. government to companies that introduced renewable energy. Therefore, Chinese companies and others gradually reduced exports from China,[110] moved some of their

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106 To be precise, these photovoltaic cells and modules are crystalline silicon photovoltaic cells and modules. Silicon photovoltaic cells are the most common ones, and there are two types—crystalline and thin film ones. These measures targeted crystalline ones.

107 According to Morihiro Yomogida (2015), The U.S. Department of Commerce viewed (A) loans to Chinese photovoltaic cell and module manufactures, (B) land leases, and (C) purchases of materials owned solely by state-owned enterprises at below fair price as government subsidies and deemed export credit by the Export–Import Bank of the Republic of China as an export subsidy.

108 The production of photovoltaic cells and modules consists of four processes. First, polysilicon, the raw material, is refined. Second, ingots of highly pure silicon are cut and processed into wafers (thin circular sheets of semiconductors). Third, the cells, the basic unit, are processed, and fourth, rows of cells are assembled into modules (panels). There is an international division of labor for this manufacturing process depending on the optimal location.

109 According to Morihiro Yomogida (2015), the USITC found that Chinese modules made from cells produced in Taiwan and similar countries increased their share of the U.S. photovoltaic module market from 4.6% to 76.2% while the market share of modules made using Chinese cells fell from 58.3% in 2011 to 8.1% in 2013. Furthermore, Taiwanese cell manufacturers saw orders from Chinese companies grew, and the percentage of Taiwanese wafers (raw material for photovoltaic cells) purchased by Chinese companies rose from 33.9% in 2011 to 46.5% in 2013.

110 The gradual decline in Chinese exports is probably one of the reasons that the tariff rate was lowered following a review. According to the USITC (2019), when the second round of measures were implemented in February 2015, the AD tariff and CVD rate on major Chinese companies was 80%–100%, but in July 2015, that was lowered to about 25%. For major Chinese companies, their products

production bases overseas, to countries such as Malaysia and Vietnam, and increased exports from those countries. The U.S. government introduced SG measures, the third round of measures, in February 2018 to counter this type of avoidance (Table II-2-3-2-17).

The measures resulted in a series of AD measures being imposed on Chinese photovoltaic cells and modules by other countries, which led China to introduce countermeasures. In particular, the EU, Canada, and Turkey imposed AD measures on imports from China, and China introduced countermeasures on the U.S. and EU.

These SG measures were also discussed in the 2018 Report on Compliance by Major Trading Partners with Trade Agreements - WTO, EPA/FTA and IIA -, and it was reported that they did not comply with the basic SG principle of "least necessary measure" and that there was insufficiently explanation of "unexpected developments," a requirement to implement SG measures.

maintained a certain level of competitiveness in the U.S. market even at a duty rate of about 25%.

Table II-2-3-2-17 Summary of measures imposed on photovoltaic cells and modules since 2012

Background	**Round 1 (2012 AD measures and CVDs on imports from China):** In November 2011, the USITC launched an investigation related to introducing AD measures and CVDs on products from China because Chinese photovoltaic cells and modules were being sold at an unfair price for various reasons, including Chinese government subsidies, and the U.S. domestic market was being damaged by the rapid increase in imports of such products. The investigation report was released in March 2012. Temporary AD duties and CVDs were introduced in May 2012. The final decision on AD measures and CVDs was announced in October 2012. In November 2012, damage was found to have occurred, and measures were implemented in December 2012. **Round 2 (2015 AD measures and CVDs on imports from China and Taiwan):** In January 2014, an investigation into the sudden increase in Chinese imports via Taiwan, a loophole in the first round of measures, was launched. Temporary CVDs were introduced in June 2014. Temporary AD measures were introduced in July 2014. The decision regarding AD measures and CVDs was announced in December 2014. In January 2015, the industry was found to have sustained damage, and measures were implemented in February 2015. **Round 3 (2018 SG measures):** In May 2017, an investigation related to continuing damage to the domestic industry from imports despite previous AD measures, etc., was launched. Results of the investigation were submitted to President Trump in November 2017. A presidential order on SG measures was issued in January 2018. Measures were implemented in February 2018. **Applicant:** For the 2012 and 2015 measures, the six-member Coalition for American Solar Manufacturing, a U.S. solar panel manufacturers association led by SolarWorld (the U.S. affiliate of a Germany company that went bankrupt and was then acquired by a U.S. company in October 2018). For the 2018 measures, both Suniva (the U.S. affiliate of Chinese company) and SolarWorld jointly submitted the application. The industry association was opposed to these measures. The U.S. Solar Energy Industries Association (SEIA) asserted the following regarding the third round of measures in February 2018. (A) Solar power competes against cheap energy sources, such as wind and natural gas, and an increase in solar power generation costs would be a lethal. (B) If limited to four years, no companies would invest in the U.S. and would continue to import 80%–90% of what they needed as they do now. (C) The price increase would undermine the competitiveness of U.S. solar power and lead to the loss of 23,000 jobs.

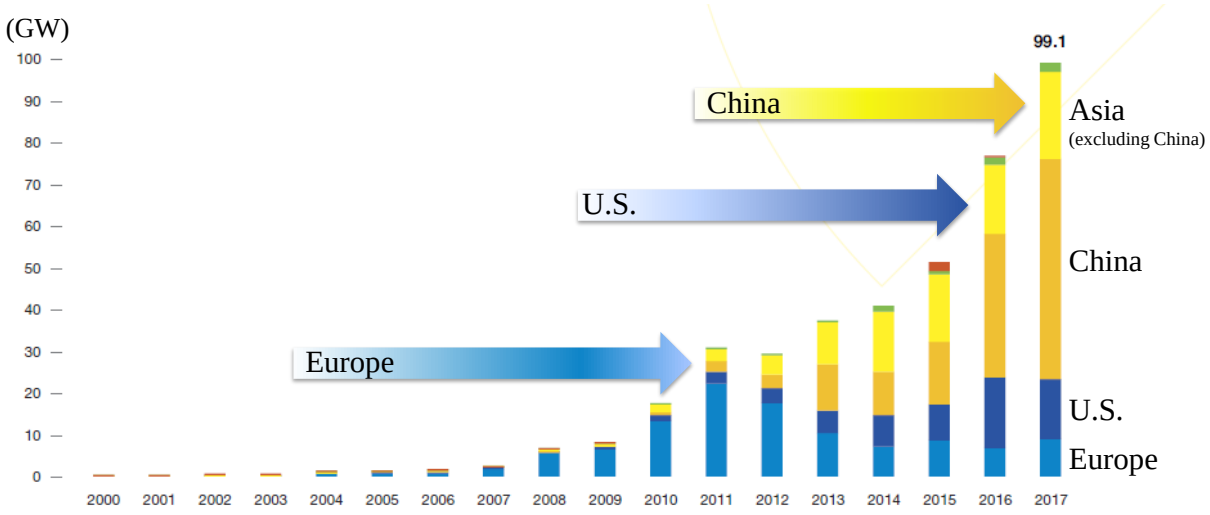
Summary	**Targeted items:** All measures targeted photovoltaic cells and modules and related generators, chargers, etc. The measures did not apply to thin film solar panels, small cells included in consumer electronics, and similar products. **Measures:** **The first round of measures** consisted of additional tariffs that took the form of AD duties of 18.29–249.96% and CVDs of 14.78%–15.97%. The overlapping portion of AD measures and CVDs were set at a uniform 10.54%, which was deducted from the actual duty amount. As for the country of origin, even if items were exported from a third country to the U.S., the duties were applicable if the cell manufacturing country was China. For **the second round of measures**, the country of origin was changed to the country where the module was manufactured because following the first round of measures, imports of items made from photovoltaic cells and other items produced in Taiwan and assembled into modules in China suddenly increased. For items produced in China, AD duty and CVD duty rates were changed to 26.71%–165.04% and 27.64%–49.21%, respectively. For items produced in Taiwan, an additional duty that took the form of an AD duty of 11.45%–27.55% (CVDs were not levied on Taiwanese products) was levied. For **the third round of measures**, an additional tariff of 30% in the first year was imposed on imports that exceed 2.5 GM (equivalent to about 25% of 2017 import volume). This tariff rate fell to 15% in the fourth year. The AD duty and CVD rates for the second round of measures were gradually revised, and as of March 2019, the (tentative) AD duty rate and CVD rate on products from China were changed to 15.74%–98.41 and 9.12%–11.59%, respectively, and the AD duty rate on products from Taiwan was 1.33%. In addition, a U.S. Trade Act of 1974 Section 301 tariff of 25% has been levied on products from China since July 2018 (therefore, targeted items from China face three additional tariffs—round 2 tariffs, round 3 tariffs, and Section 301 measures). **Targeted/exempted countries:** Developing countries were exempt from round 3 measures. Because products from Thailand the Philippines account for less than 3% of imports, these countries are also exempted. The measures apply to all countries except developing countries.

Source: U.S. government material, etc.

(B) Photovoltaic cell and module market

Let's now look at conditions in the global photovoltaic cell and module market by country/region. First of all, if one looks at the solar power market in terms of installed capacity, the EU market rapidly expanded starting in 2007 but then began to contract in 2011. On the other hand, the market in Asia and Oceania, including China, has expanded (Figure II-2-3-2-18). In addition, the U.S. market has also grown since 2016.[111] Next, let's examine changes in the main photovoltaic cell and module exporting countries. The total value of photovoltaic cell and module exports has fallen from its peak of about 90.0 billion dollars in 2011 and has recently hovered around 60.0–70.0 billion dollars. It is thought that the main reasons that exports have stagnated are the series of AD and other measures that not only the U.S. but other major countries have implemented[112] and the rapid growth of the domestic market in China, which is the largest producer and exporter of photovoltaic cells and modules. After rising to the fifth largest exporter of photovoltaic cells and models in terms of value in 1996, China become the top exporter in 2008 and has maintained that position.[113] Since then, Chinese companies have expanded production overseas, including in Malaysia and Vietnam, as discussed above (Figure II-2-3-2-19).

Figure II-2-3-2-18 Global installed solar power capacity (by region)



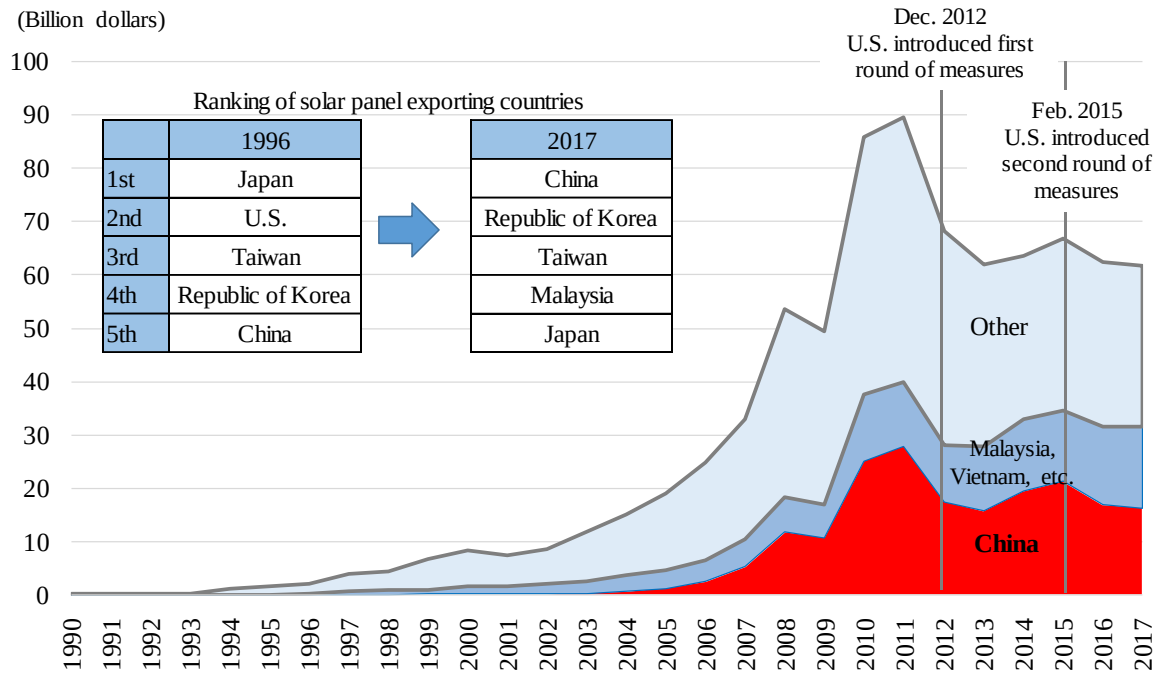
Source: Solar Power Europe (2018).

111 The photovoltaic cell and module market in countries throughout the world have grown because of government subsidies. In Europe, Germany introduced feed-in-tariffs for solar power in 2004. China also introduced feed-in-tariffs in 2011. In the U.S., a Green New Deal was proposed in 2009, and tax incentives for introducing renewable energy (including solar power) were introduced in 2015, and these were extended to the end of 2016.

112 As for photovoltaic cells and modules, the U.S. launched an AD measure and CVDs investigation targeting China in November 2011 and introduce the measures in December 2012. The EU launched a similar investigation against China in September and November 2012, introduced tentative measures in June 2013, and then finalized measures in December of that year. Canada and Turkey introduced AD measures targeting modules produced in China in July 2015 and February 2017, respectively. In response, China introduced tentative AD measures on the raw material polysilicon from the U.S. and Korea in January 2014 and tentative AD measures on items from the EU in May 2015.

113 As of the writing of this white paper, Malaysia has yet to release 2018 data, and China was still number one through 2017. For 2018, Malaysia may have overtaken China, relegating China to the number 2 position.

Figure II-2-3-2-19 Global photovoltaic cell and module exports (value) (by country, stacked graph)



Notes: "Malaysia, Vietnam, etc." refers to Malaysia, Vietnam, Taiwan, Thailand, and Hong Kong, where Chinese companies have expanded their overseas and joint production. The value of HS854140 imports is used for cells and modules.

Source: Global Trade Atlas.

(C) Impact on trade for the country that introduced the measures (U.S.)

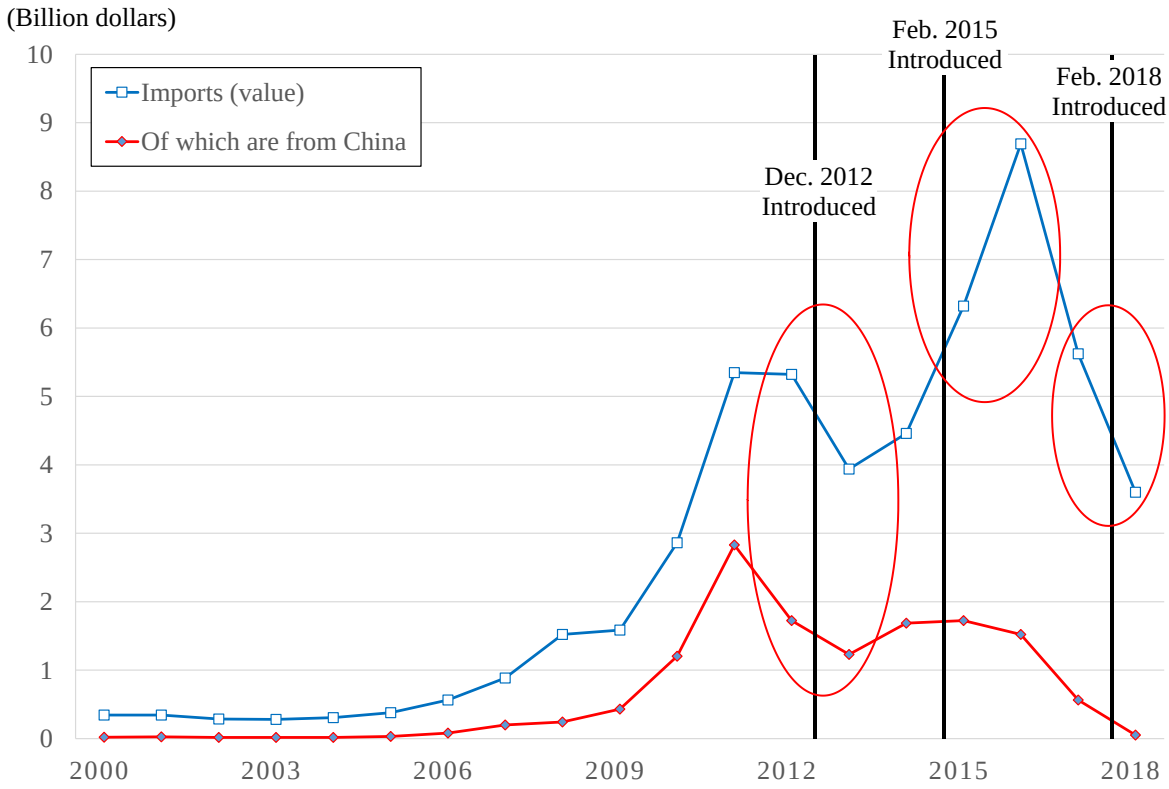
Looking at the value of U.S. photovoltaic cell and module imports[114] reveals that U.S. imports started to increase around 2007 and that imports from China, which accounted for about half of imports at that time, quickly rose beginning in 2010 (Figure II-2-3-2-20 and Figure II-2-3-2-21). In response, the U.S. government introduced its first round of measures in December 2012, and the value of Chinese and global imports declined in 2013. In 2014, however, Chinese companies and others started to use the loophole of exporting modules that were made of photovoltaic cells produced in Taiwan and other countries but assembled in China,[115] and the value of module imports once again began to increase. While the share of the domestic market accounted for by modules made in China fell to almost 10% after the first round of measures was implemented, their share subsequently rose to almost 50%. If one includes the market share of Taiwanese products, the figures exceed 60%. In February 2015, the U.S. government, therefore, changed the definition of country of origin from "country cell is manufactured

114 The import value is for HS code 854140.60.20 (modules) and 854140.60.30 (cells). The graph that gives a breakdown by country is limited to 854140.60.20, etc., in order to see the impact on modules. Starting in July 2018, the previous 854140.60.20 was divided into 854140.60.15 and 854140.60.35.

115 See footnote 198.

in" to "country module is manufactured in" and introduced the second round of measures that included Taiwan as a country of origin. At that time, the U.S. domestic market was rapidly expanding due to last-minute demand as 2016 was the last year of tax incentives for introducing renewable energy.[116] In 2016, imports from throughout the world rapidly grew, and their value hit about 8.7 billion dollars (on the other hand, there was a major fall-off in 2017) (Figure II-2-3-2-22). A breakdown by country reveals that while imports from China and Taiwan fell on a monthly basis, those from Malaysia, Republic of Korea, Vietnam, and Thailand, which were not targeted-expanded. This is consistent with relocation of the production factories of major companies, such as Chinese ones, were located, and imports probably expanded because of indirect imports from Chinese companies, etc. (Table II-2-3-2-23). After that, the third round of measures was implemented in February 2018. As a result, the value of 2018 imports fell to about 3.6 billion dollars, half the peak value in 2016. Looking at a breakdown by country reveals that imports from China almost completely disappeared while those from Malaysia, Republic of Korea, and Vietnam rose. On a value basis, there was a dramatic decline since the measures were implemented.

Figure II-2-3-2-20 U.S. imports (value) of targeted items (from China and rest of the world)

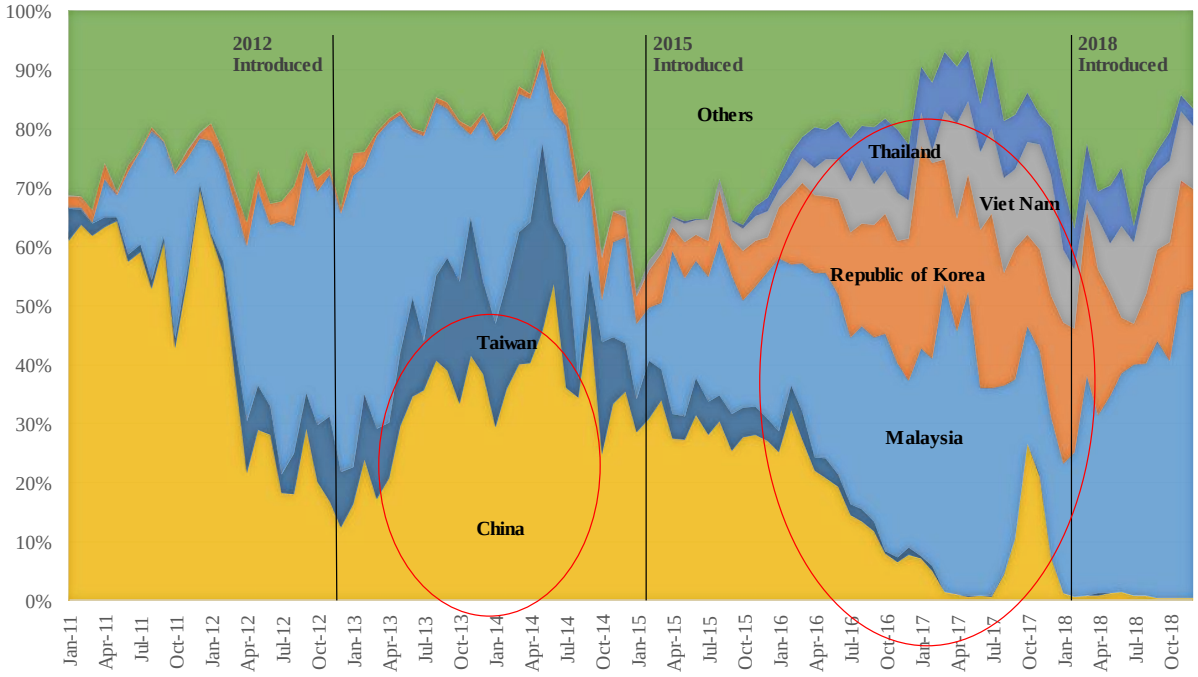


Note: Value of cell and module imports in footnote 199.

Source: Global Trade Atlas.

116 The expiration date of December 31, 2016 was extended to December 31, 2019, as of the writing of this report.

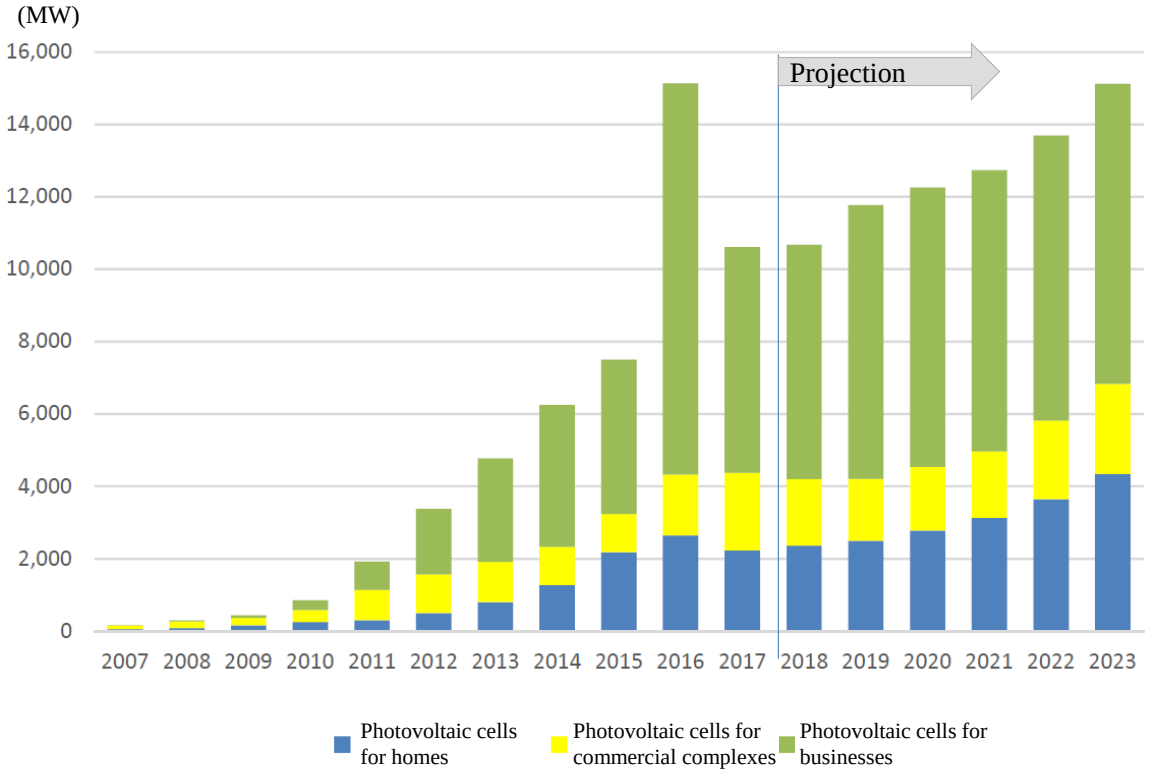
Figure II-2-3-2-21　U.S. imports (value) (by country, 100% stacked graph)



Note: Value of cell and module imports in footnote 199.

Source: Global Trade Atlas.

Figure II-2-3-2-22　U.S. installed solar power capacity



Source: USITC (Mar. 2019).

Table II-2-3-2-23 Expansion of production facilities of major companies

		U.S.	Canada	China	Malaysia	Philippines	Indonesia	Vietnam	Thailand	Germany	Portugal	Mexico	South Africa	India
JA Solar Co., Ltd.	China			○ Yangzhou (launched construction in 2009)	○ (2015)			○ Bắc Giang (launched construction in 2016)						
Tongwei	China			○ Hefei (2013), Chengdu (2015)				○ (2017)	○ (2016)					
Trina Solar Ltd.	China			○ Hefei (2016), Xiantao, Hubei (2015), Yancheng (2017), etc.	○ (2015) Collaboration with Malaysian affiliate								○	
Hanwha Q CELLS Co., Ltd.	Republic of Korea	○ Georgia plant Expect to be completed in 2019		○ Closed Jiangsu Province plant (2017)	○ (expected to build factory in 2014)									
Jinko Solar	China	○ Florida Factory under construction		○ Jiangxi Province, Zhejiang Province, Xinjiang	○ (2015)						○		○	
Longi Green Energy Technology Co., Ltd. LONGi	China			○ Yinchuan (2009), Wuxi (2010), Chuxiong (signed in 2015), Baoshan (signed in 2016), Lijiang (signed in 2016), etc.	○ Kuching (2018)									○ Andhra Pradesh
Canadian Solar Inc.	Canada/ China		○ Main Ontario factory	○ There are plans to add a total of 4.1 GW of capacity in China and increase overseas capacity 1.53 GM by the end of 2016.			○ (2016)	○ (2016)						
First Solar Inc.	U.S.	○ Ohio		○ Zhangjiagang (2015), Xuzhou, etc.	○ Kulim Hi-Tech Industrial Park (2008)			○ Ho Chi Minh City (2018)		○ Frankfurt (suspended operation in 2012)				
Risen Energy Inc.	China			○ Ningbo, Luoyang, Jiujiang, Jiangxi Province Wuhai (signed in 2015)								○		
Yingli Solar	China			○ Haikou, Hainan (2009), Tianjin (2011), Hengshui (2012), etc.										
SunPower Corporation	U.S.	○ Purchased SolarWorld			○ AUO joint photovoltaic cell plant (2010 under construction)	○ (closed 2016)								

Source: Various company's websites and media reports.

(D) Impact on price, jobs, share price, etc., for solar panel manufacturers in the country that introduced the measures (U.S.)

Let's now consider the impact on prices, jobs, share prices, etc., in the U.S. According to the U.S. Department of Energy's National Renewable Energy Laboratory, the price of U.S. photovoltaic modules were relatively high compared to international prices, but U.S. prices fell dramatically in 2016, when imports were at their peak, to 0.39 dollars/watt,[117] approaching the international price of 0.37 dollars/watt (Figure II-2-3-2-24). However, falling off after strong last-minute demand in 2016 before tax incentives ended, capacity installed declined in 2017, and imports fell in the first quarter of 2017. After that, U.S. prices started to rise. On the other hand, international prices collapsed, and the difference between U.S. and international prices grew to 1.5 fold, 0.17 dollars/watt in the first quarter of 2018. Let's look at the U.S. and EU markets in 2017–2018. We are only available to use similar prices because of data constraints, but the EU price for solar power fell even through the U.S. price was unchanged following the launch of the investigation related to the third round of tariffs. The U.S. price may have remained firm compared to global trends on account of these measures (Figure II-2-3-2-24[118] and Figure II-2-3-2-25).

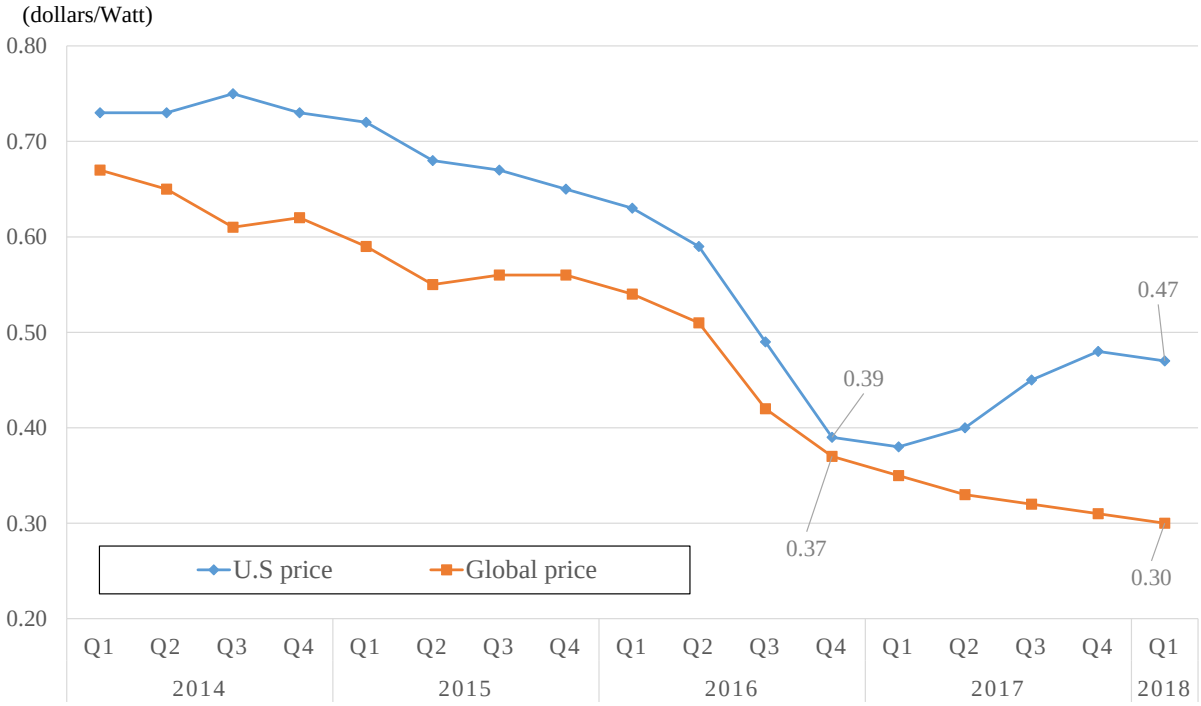
Next, we would like to focus on employment at and earnings of U.S. photovoltaic cell and module companies. According to a USITC report,[119] U.S. photovoltaic cell and module manufacturers experienced a devastating blow from the sudden increase in imports starting in 2011, and domestic production's share of total supply fell to 4.6% in 2016 (Figure II-2-3-2-26). The same report carried the results of a survey of forty companies, which showed U.S. domestic manufacturers suffered a major blow with 28 U.S. domestic plants being closed between 2012 and the first half of 2017.

Following the third round of measures, some companies announced an increase in production and new plants, but other companies did not see a recovery in earnings and went bankrupt despite the measures (Table II-2-3-2-27).

As for U.S. manufacturer's earnings in 2018, both First Solar Inc., which expanded domestic production, and SunPower Corporation, which has overseas production bases, recorded a decline in sales even though employment was no longer falling. Furthermore, First Solar Inc. saw almost no change in net profit, but SunPower Corporation recorded a loss (Figure II-2-3-2-28, Figure II-2-3-2-29, and Figure II-2-3-2-30). In this way, as of 2018, earnings of U.S. manufacturers failed to improve even though they were protected by SG measures.

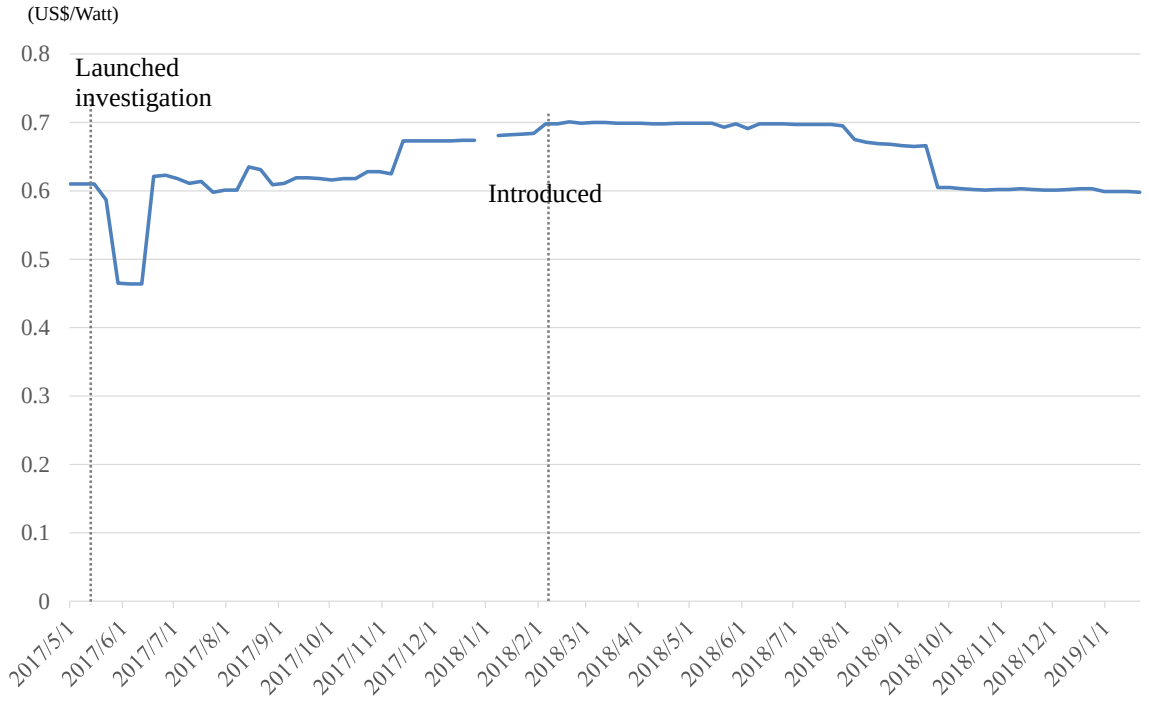
117 Unit price for photovoltaic module necessary to generate 1 watt.
118 National Renewable Energy Laboratory (2018).
119 USITC (2017).

Figure II-2-3-2-24 U.S. and international price of photovoltaic cells and modules

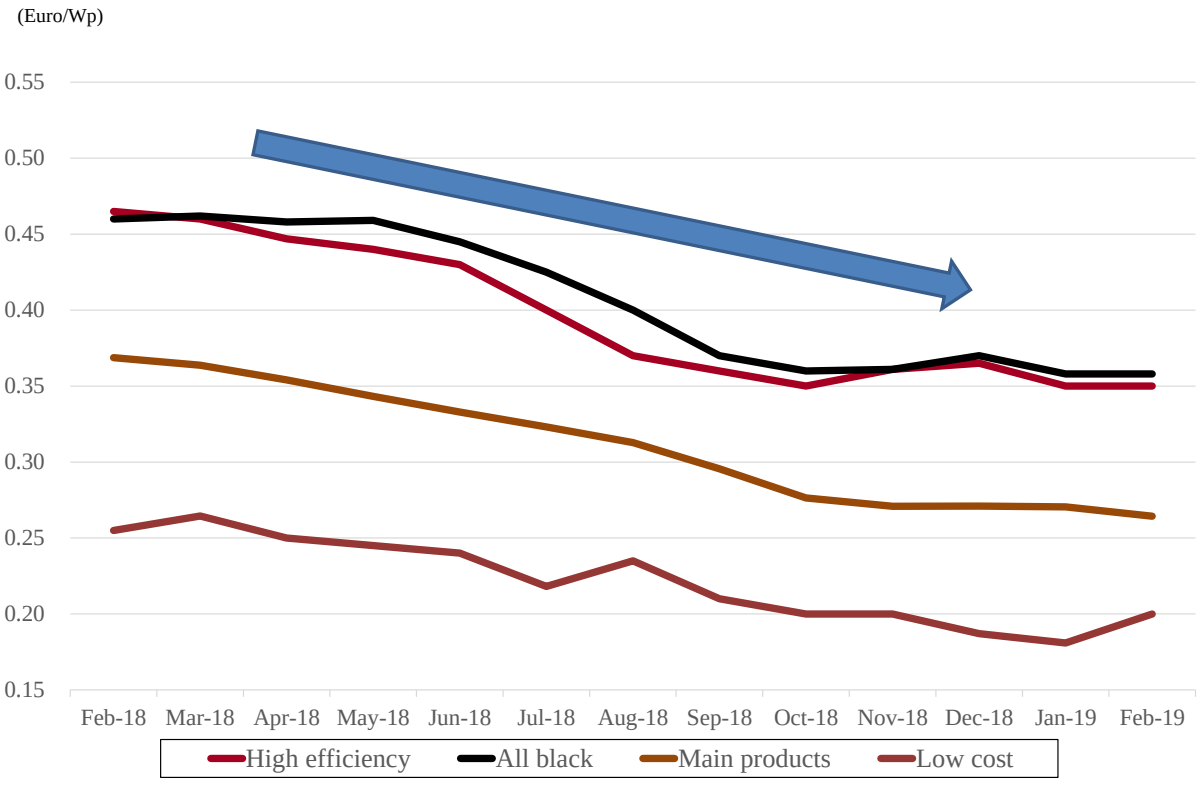


Source: National Renewable Energy Laboratory (2018).

Figure II-2-3-2-25 U.S. and EU photovoltaic module price (top, U.S.; bottom, EU)

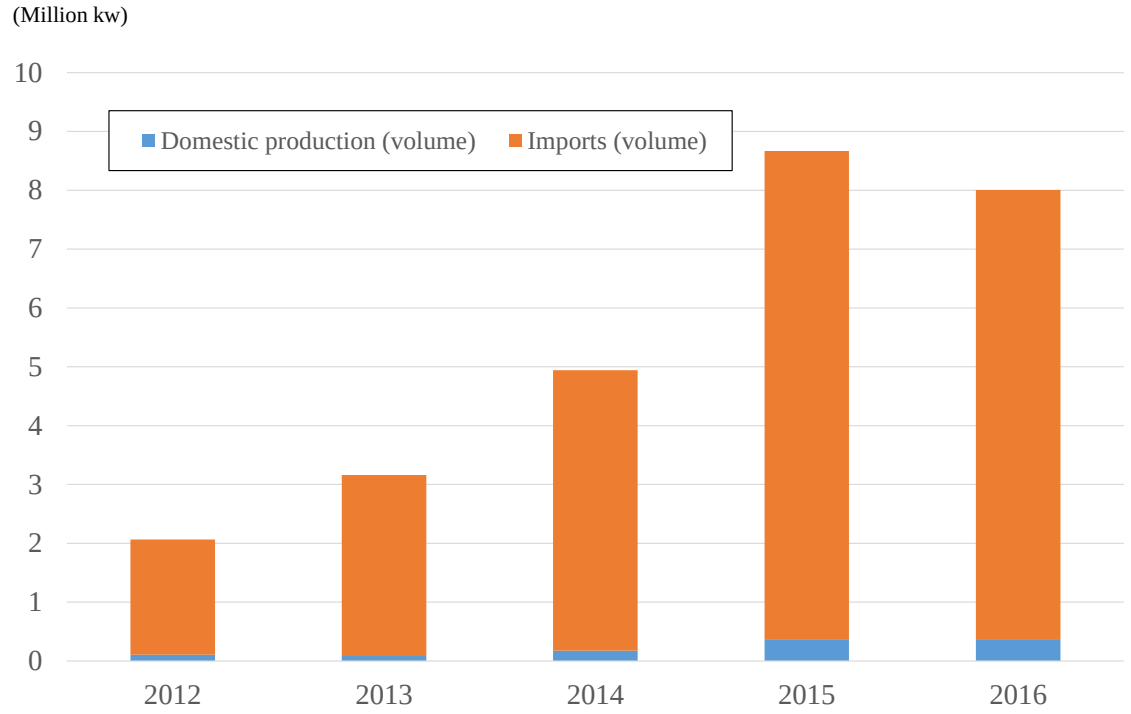


Source: Bloomberg.



Source: Index published by pvXchange.com.

Figure II-2-3-2-26 U.S. domestic production and imports (volume) of photovoltaic cells and modules



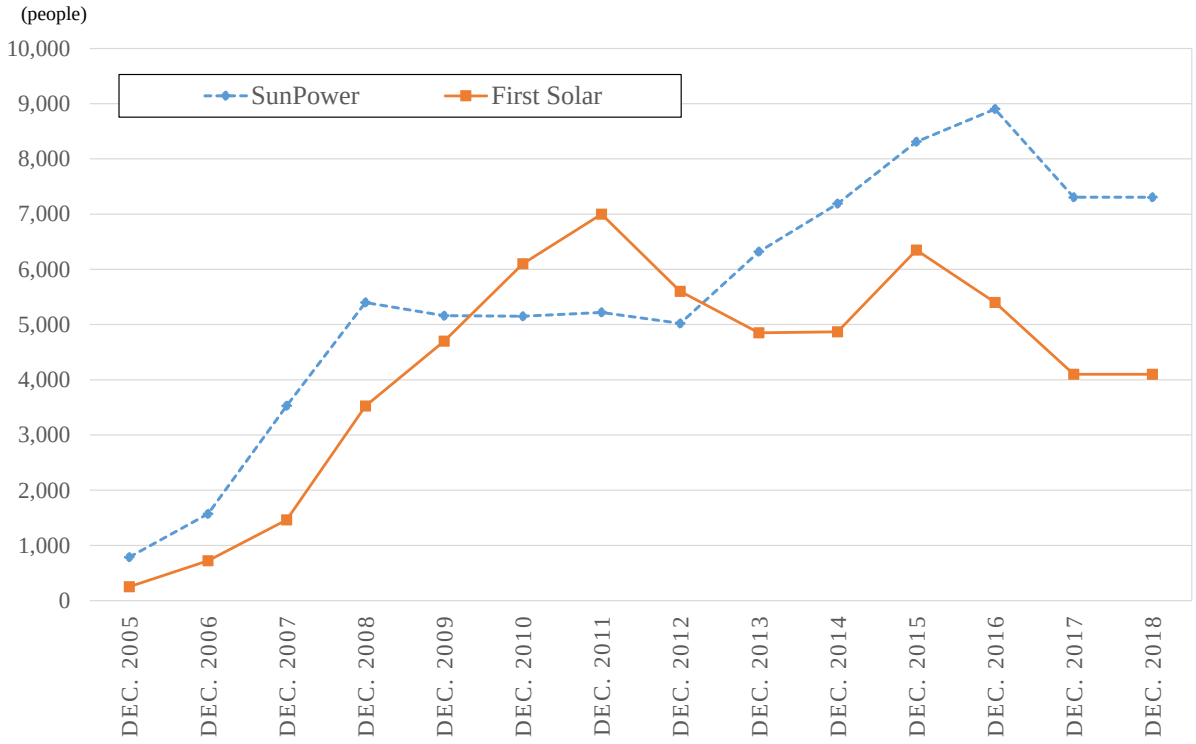
Source: USITC (2017).

Table II-2-3-2-27 Impact of SG measures on manufacturers

	Company	Date	Incident/response
Manufacturer	SunPower Corporation (U.S.)	Jan. 29, 2018	Because a majority of the company's solar panels are manufactured in the Philippines and Mexico, the company postponed plans to invest 200.0 billion dollars to expand its U.S. plants. The company is also considering cutting jobs in the U.S.
		May 3, 2018	The company acquired SolarWorld, which produces solar panels in the U.S. (SolarWorld filed for bankruptcy for the second time in 2017 as it was unable to compete against the prices of overseas manufacturers).
		May 30, 2018	The company announced an increase in production at Oregon plant.
	First Solar Inc. (U.S.)	May 30, 2018	The company announced an increase in production at its Ohio plant.
			The company decided to construct a new 400 million dollar domestic plant in Ohio. With the new factory, the company will expand its domestic production capacity more than three fold.
	Suniva Inc. (U.S. affiliate of Chinese company)	June 21, 2018	Although safeguards were implemented, the company failed to generate an increase in earnings and went bankrupt.

Source: Various media outlets.

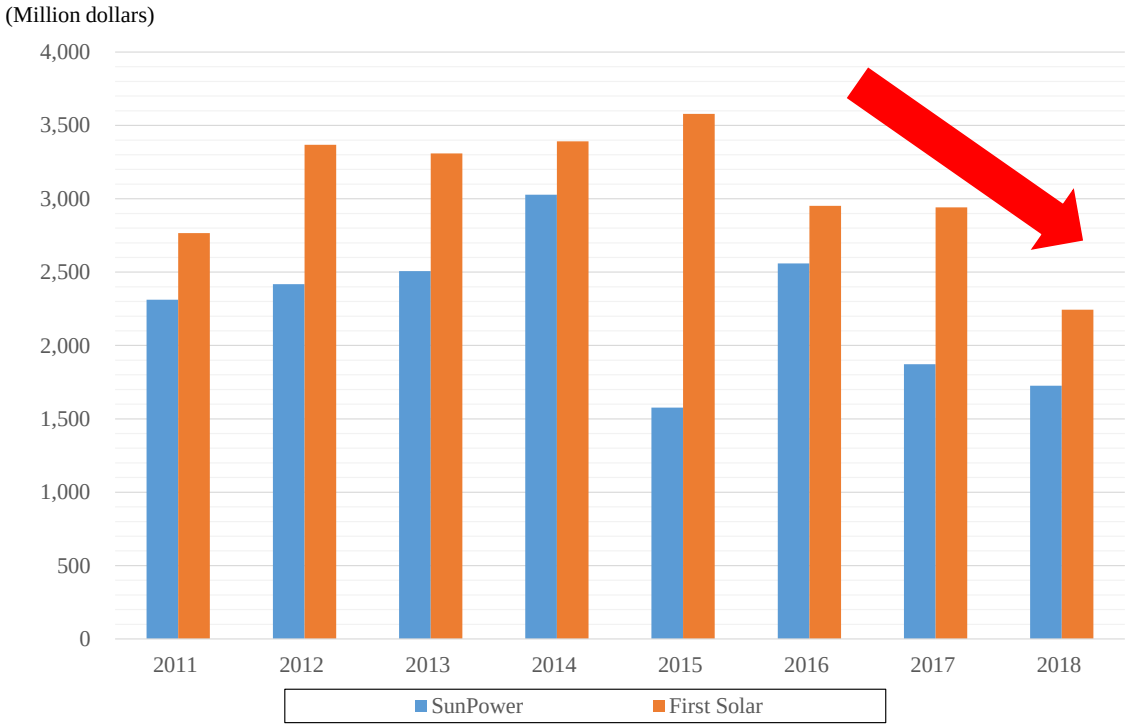
Figure II-2-3-2-28　Number of workers at U.S. module manufacturers



Notes: Employees as of the end of the year.

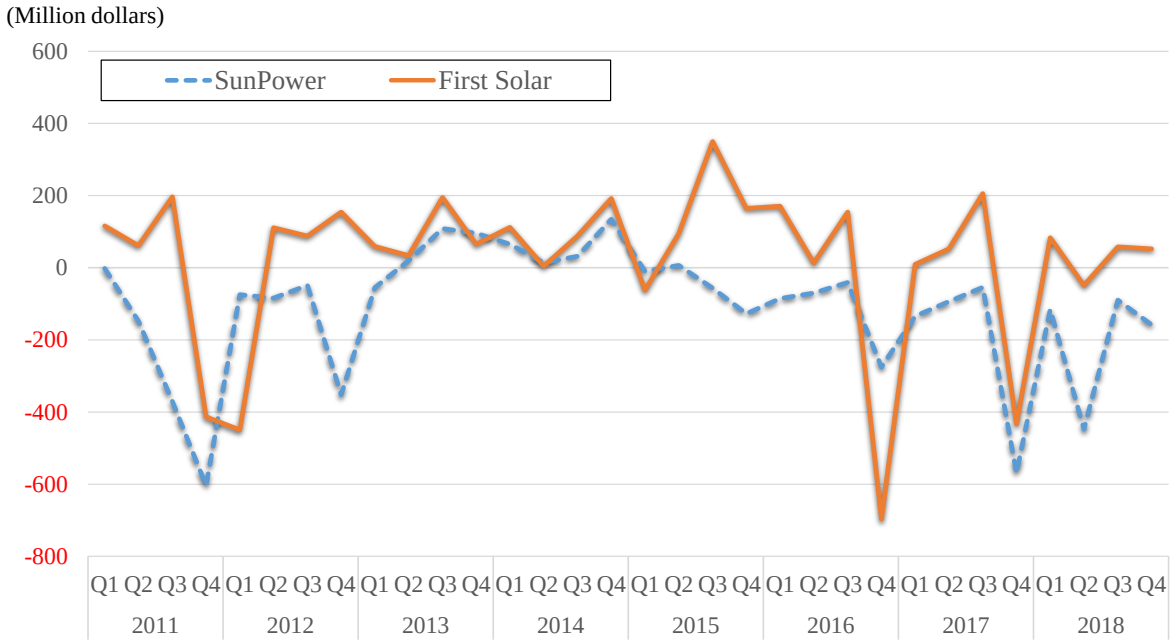
Source: Osiris.

Figure II-2-3-2-29　Sales of U.S. module manufacturers



Source: WIND.

Figure II-2-3-2-30　Net profits of U.S. module manufacturers



Source: WIND.

(E) Impact on downstream industries in the country that introduced the measures (U.S.)

The main industries downstream of photovoltaic cell and module manufacturers are solar panel installation and project management companies. Many of these companies reported suspending new hires and freezing projects because of greater costs as the originally expected decline in prices due to the measures did not materialize (Table II-2-3-2-31).

As for employment in downstream industries, according to the U.S. industry organization Solar Foundation, up to 10,000 jobs in the installation and project management industries were lost in 2018. Even manufacturers, who were expected to benefit from the measures discussed above, shed 3,000 jobs (-8.6% year on year), and the number of jobs in the overall industry declined 19,000 (-7.6% year on year) (Table II-2-3-2-32).

Table II-2-3-2-31 Impact of SG measures on installation and project management companies

	Company	Date	Incident/response
Installation and project management	McCarthy Building Companies Inc. (U.S.)	June 9, 2018	The company reduced its planned hires during the rest of the year (about 1,200) by half.
	Pine Gate Renewables LLC (U.S.)	June 9, 2018	The company, which currently employs 85, suspended plans to add 30 new positions because it was unable to secure sufficient inventories before the tariffs were imposed.
	Cypress Creek Renewables LLC (U.S.)	June 9, 2018	The company froze a 1.5 billion dollar project since it was no longer profitable as costs rose due to import restrictions.
	Southern Current LLC (U.S.)	June 9, 2018	The company froze projects worth approximately 1.0 billion dollars in South Carolina and several other states.

Source: Various media outlets.

Table II-2-3-2-32 Number of workers in various solar power fields[120]

(10 thousand people)

	2016	2017	2018	17-18 Difference	Year-on-year change		
					2016	2017	2018
Installation and project management	17.2	16.5	15.5	-1.0	20.5%	-3.7%	-6.1%
Manufacturing	3.8	3.7	3.4	-0.3	25.9%	-3.2%	-8.6%
Wholesale/transmission	3.2	3.1	2.9	-0.2	31.9%	-3.8%	-5.4%
Other	1.8	1.7	1.3	-0.4	54.7%	-5.3%	-24.5%
Total	26.0	25.0	23.1	-1.9	24.5%	-3.8%	-7.6%

Source: Employment survey by the Solar Foundation, a U.S. industry group.

Furthermore, according to media reports, etc.,[121] new capital expenditures by photovoltaic cell and module manufacturers is expected to not exceed 1.0 billion dollars. On the other hand, construction costs have risen 10% because of the introduction of these measures. Therefore, 2.5 billion dollars[122] in large-scale projects in the U.S. related to installing solar power equipment have been frozen. U.S. total social surplus directed to investments in solar power fell 1.5 billion dollars.[123]

120 The Solar Foundation (2018).
121 Reuters (June 2018) https://jp.reuters.com/article/us-trump-effect-solar-insight-idJPKCN1J40T1
122 According to the U.S. Solar Energy Industries Association (SEIA), large-scale projects in 2017 totaled 6.8 billion dollars, and 2.5 billion dollars is more than 1/3 of that.
123 On the other hand, according to the USITC (2019), six companies, after the enforcement of the measures with public information as the source, announced plans to build new plants, primarily related to the module production process, in November 2018, at the beginning of 2019, and during 2019. This will result in total production capacity reaching 3,100 MW. That is quite a large considering the 10,000 MW of new capacity in 2018. It is important to keep in mind that the producer surplus, particularly that for manufacturers, may increase.

(F) Impact of the measures on other countries

After the U.S. introduced these measures, numerous countries launched investigations related to AD measures, CVDs, and SG measures similar to what occurred when steel SG measures were implemented. When the U.S. launched its investigation in November 2011, various countries/regions launched investigations into photovoltaic cells and modules, including AD ones against China—the EU in September 2012, India in November 2012, Australia in May 2014, and Canada in December 2014. Furthermore, the EU concluded a private-sector export price undertaking with China in August 2013 (through Sept. 2018). Canada also introduced several measures, including AD-related ones, in July 2015, and Turkey followed suit in February 2017. In response, China implemented various measures targeting polysilicon used in producing photovoltaic cells, including AD-related ones, against the U.S., Republic of Korea, and the EU in 2013.

As shown above, although international prices were trending downward, the tit for tat introduction of tariffs by major exporters, China, U.S., and EU, may negatively impact downstream industries and consumer prices due to their impact on prices as the AD and CVD duty rate exceeds 100%.

3. Impact of recent trade-restrictive measures (those related to U.S. Trade Expansion Act of 1962 Section 232 and U.S. Trade Act of 1974 Section 301) on the global economy[124]

We looked at the impacts that past hikes in tariffs have had above, and here, we will get an overall view of the economic impact of the U.S. Trade Act of 1962 Section 232 measures and Trade Act of 1974 Section 301 measures that started to be activated in March 2018. Under the current complicated structure of GVCs, it is extremely difficult to grasp the overall economic impact caused by trade-restrictive measures. As argued above, however, raising tariffs result in possible for companies and consumers in not only the targeted countries but also the imposed countries. There are also concerns that the negative can spill over to the third countries and distort markets.

(1) Impact of Trade Expansion Act of 1962 Section 232 tariffs on steel and aluminum

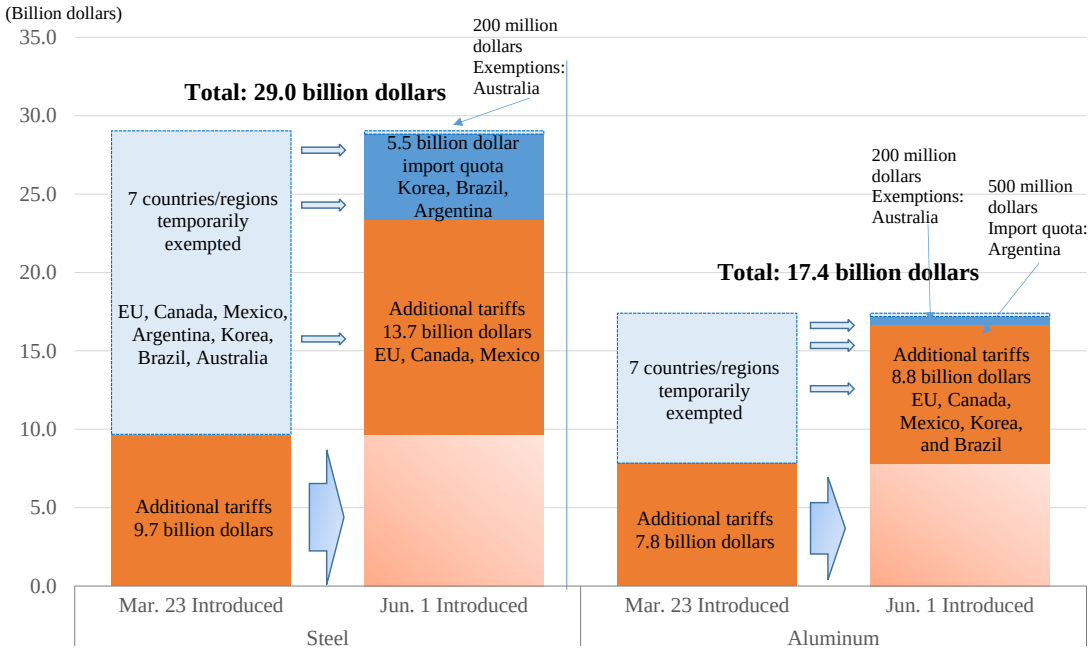
(A) Outline of measures

As the outline of the measures is provided above, details have been omitted here. Figure II-2-3-3-1 shows the flow of imposition of Section 232 measures by the U.S., and Figure II-2-3-3-2 provides a comparison of the scale of the measures imposed by the U.S. and the countermeasures imposed by the five major countries.[125]

124 The information is that available as of April 2019 (trade data as of March).

125 Six countries/regions—EU, Canada, Mexico, China, Russia, and Turkey—imposed countermeasures in response to the U.S. measures. In addition to these countermeasures, Turkey introduced other measures in order to protect its domestic industries and reduce its trade deficit, and therefore, the analysis here only covers the other five countries/regions. Public U.S. government material uses harmonized tariff schedule (HTS), and figures are compiled using the corresponding harmonized system (HS) code of the Global Trade Atlas.

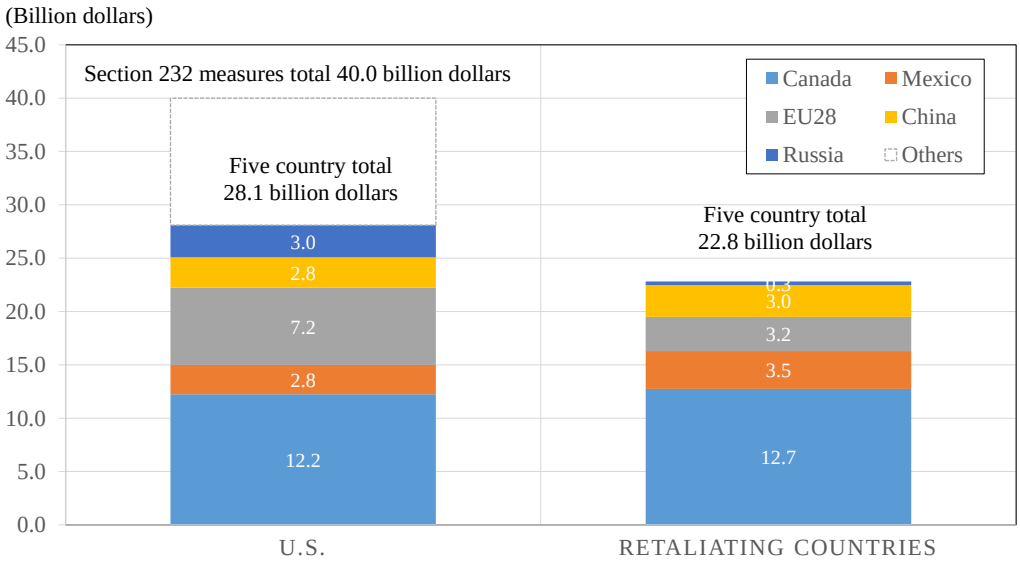
Figure II-2-3-3-1　Flow of imposition of Section 232 measures by the U.S. (2017)



Notes: The stacked bar graph is of U.S. imports of targeted items (2017) by steel/aluminum and date measures were implemented. The information is that available as of April 2019.

Source: U.S. government public information and Global Trade Atlas.

Figure II-2-3-3-2　Scale of Section 232 measures by the U.S. and countermeasure (2017, import value)



Notes: The stacked bar graph for the U.S. (left) is the value of imports from retaliating countries/regions (five main countries/regions) of targeted items, and that for retaliating countries (right) is of imports from the U.S. of items targeted by the retaliatory measures (2017). This excludes the EU Annex II (list of items covered by measures expected to be implemented in March 2021). The information is that available as of April 2019.

Source: Public information provided by various governments and Global Trade Atlas.

(B) Value of the U.S. imports of items targeted by the tariffs

The U.S. imports of items targeted by Section 232 tariffs contracted substantially—on a value basis, -6.3% year on year (price after measures implemented) and on a volume basis, -16.7% (Table II-2-3-3-3). Even looking at figures for the whole year, the volume of steel imports declined 11% year on year, and aluminum imports contracted 13% year on year in 2018. On the other hand, the value of imports declined since the measures were activated, but they slightly improved for the whole year. For both steel and aluminum, the decline in the value of imports was less than the decline in the volume of imports, which is probably because imports of high value added items with relatively high unit prices accounted for a larger percentage of imports after the tariffs were implemented (Table II-2-3-3-4).

Furthermore, looking at the impact that the countermeasures imposed by the related countries/regions had on the value of trade reveals that the value of U.S. exports of items targeted by countermeasure additional tariffs fell dramatically, declining on average -19.7% for the five countries/regions (Table II-2-3-3-5).

Table II-2-3-3-3 The U.S. imports of targeted items (volume and value)

	Imports of targeted items (volume and value)		
	2017 Same period as that to the right	2018 From month measures implemented to end of the year	For 2018 period Year-on-year change from 2018 period
Price basis (billions of dollars) Total for targeted countries	31.4	29.4	-6.3%
Volume basis (millions of tons) Total for targeted countries	28.3	23.5	-16.7%

Notes: Targeted countries' imports from U.S. through Dec. 31, 2018. Targeted countries are all countries except Australia, which was exempt from both additional tariffs and import quotas. The information is that available as of April 2019.

Source: Public information provided by various governments and Global Trade Atlas.

Table II-2-3-3-4 The U.S. imports of targeted items (steel and aluminum products)

Counterparty	Imports (value) (hundreds of millions of dollars) /imports (volume) (tens of thousands of tons)	Imports of targeted items						As percent of U.S. imports			
		Steel		Aluminum		Year-on-year change		Steel		Aluminum	
		2017	2018	2017	2018	Steel	Aluminum	2017	2018	2017	2018
World	Imports (value)	290.3	295.2	174.0	175.9	2%	1%	100%	100%	100%	100%
	Imports (volume)	3,455	3,080	696	608	-11%	-13%	100%	100%	100%	100%
EU28	Imports (value)	59.9	65.6	12.5	16.4	9%	32%	21%	22%	7%	9%
	Imports (volume)	-	-	-	-	-	-	-	-	-	-
Canada	Imports (value)	52.0	56.0	70.4	67.5	8%	-4%	18%	19%	40%	38%
	Imports (volume)	579	572	297	250	-1%	-16%	17%	19%	43%	41%
Mexico	Imports (value)	24.9	30.0	2.6	2.5	20%	-5%	9%	10%	2%	1%
	Imports (volume)	315	344	7	6	9%	-10%	9%	11%	1%	1%
Japan	Imports (value)	16.6	16.6	2.5	3.5	-0%	39%	6%	6%	1%	2%
	Imports (volume)	173	138	3	5	-20%	33%	5%	4%	0%	1%
Russia	Imports (value)	14.1	13.9	16.0	9.3	-2%	-42%	5%	5%	9%	5%
	Imports (volume)	281	230	76	39	-18%	-49%	8%	7%	11%	6%
China	Imports (value)	10.1	9.1	18.4	11.1	-10%	-40%	3%	3%	11%	6%
	Imports (volume)	76	64	63	33	-16%	-47%	2%	2%	9%	5%
Turkey	Imports (value)	11.9	7.8	0.5	1.6	-35%	213%	4%	3%	0%	1%
	Imports (volume)	199	106	2	5	-47%	207%	6%	3%	0%	1%
India	Imports (value)	7.6	3.9	3.8	6.0	-49%	58%	3%	1%	2%	3%
	Imports (volume)	75	28	17	24	-63%	40%	2%	1%	2%	4%
Australia	Imports (value)	2.1	2.4	2.1	3.4	14%	58%	1%	1%	1%	2%
	Imports (volume)	28	27	10	14	-6%	41%	1%	1%	1%	2%
Argentina	Imports (value)	2.2	2.2	5.5	4.4	-0%	-19%	1%	1%	3%	3%
	Imports (volume)	21	17	26	18	-19%	-33%	1%	1%	4%	3%
Brazil	Imports (value)	24.5	26.0	1.4	1.9	6%	37%	8%	9%	1%	1%
	Imports (volume)	69	101	3	2	45%	-7%	2%	3%	0%	0%
Republic of Korea	Imports (value)	27.9	23.6	1.1	2.5	-15%	121%	10%	8%	1%	1%
	Imports (volume)	341	251	3	7	-26%	92%	10%	8%	0%	1%

Notes: 1. Exemptions: Republic of Korea and Brazil: As for steel import quotas, both countries are exempt from additional tariffs. Argentina: The country is exempt from additional tariffs because of import quotas. Australia: The country is exempt from the additional tariffs.

2. EU28 import (volume): The Global Trade Atlas does not provide import volume totals for EU28 countries. This is indicated with a dash ("–").
3. Countries and items shaded gray are exempt from Section 232 measures.
4. The information is that available as of April 2019.

Source: Public information provided by various governments and Global Trade Atlas.

Table II-2-3-3-5 Import value from the U.S. of items targeted by countermeasures

	Imports (value) of targeted items (Billion dollars)		
	2017 Same period as that to the right	2018 From month implemented to end of the year	For 2018 period Year-on-year change from 2018 period
Five country total	12.8	10.3	-19.7
EU	1.9	1.4	-23.8%
Canada	6.2	5.2	-17.3
Mexico	2.1	2.0	-6.1
China	2.4	1.6	-33.3
Russia	0.2	0.1	-44.0%

Notes: The information is that available as of April 2019.

Source: Public information provided by various governments and Global Trade Atlas.

(C) Impact on the U.S. industry

In 2018, the domestic U.S. steel production volume rose 5.40 million tons, 6% year on year, but import volume fell 3.74 million tons. Considering that total steel production and import volume were 86.60 million tons and 30.80 million tons, respectively, we may say that the impact was relatively slight.[126]

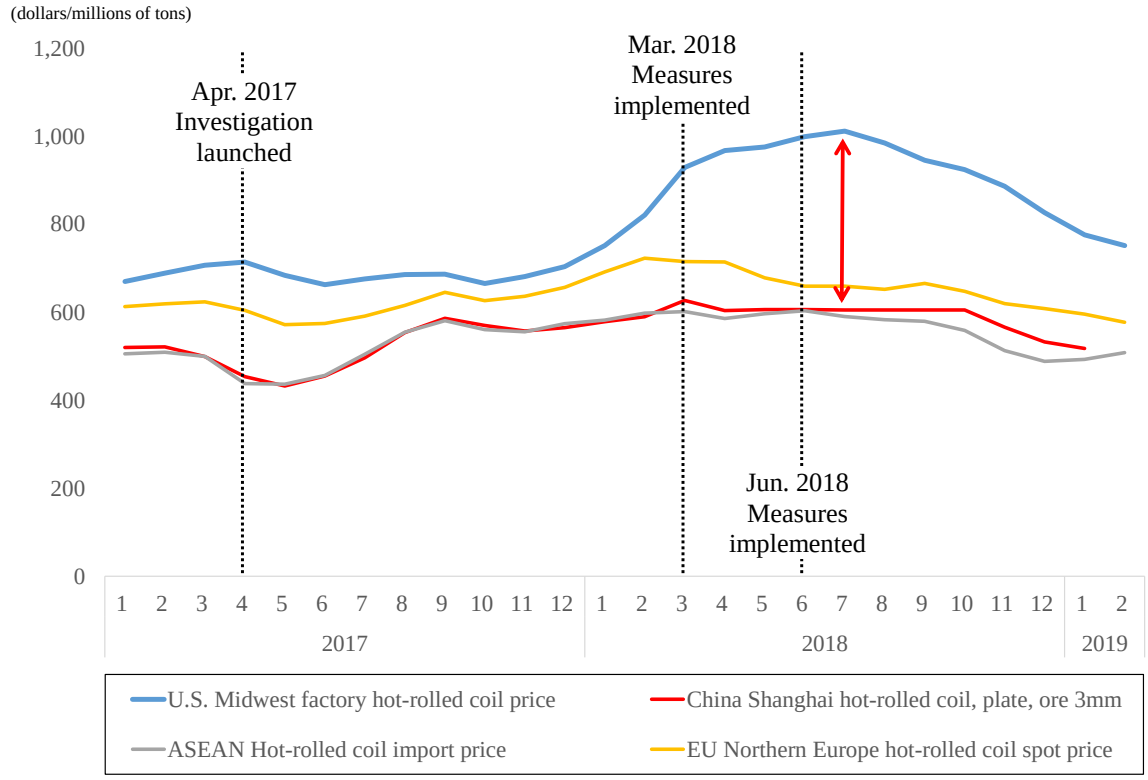
As for prices, let's look at hot-rolled coil (HRC), a leading benchmark. U.S. steels price have always been relatively high compared to other regions, and after the measures were activated, prices rose temporarily to almost 1,000 dollars/ton. Because prices in other regions remained flat, the price gap widened up to 1.5 times (Figure II-2-3-3-6). In addition, as can be seen in Figure II-2-3-3-7, the unit import price of targeted items (price before imposing tariffs) increased after the measures were activated, but there are no signs that the price of non-targeted steel and aluminum rose like when the 2002 SG measures were imposed. Due to such a rise in steel prices, the major U.S. steel manufacturers not only recorded growth in earnings following the Section 232 investigation and introduction of measures but also announced new investments, including the construction of new plants. The major manufacturers Nucor Corporation and Steel Dynamics announced that they would add 400 and 230 jobs, respectively. Furthermore, in 2018, United States Steel Corporation recorded profit of 1.1 billion dollars, an increase of almost 3 fold compared to 2017 (390 million dollars) (Figure II-2-3-3-8, Table II-2-3-3-9).

On the other hand, this increase in the price of steel leads to a rise in costs for downstream industries that use steel as materials as also seen in the above analysis of past steel SG measures. Steel is called the "bread of industry," and price increases have a negative impact on a broad range of industries, particularly manufacturers. Ford Motor, a major U.S. car manufacturer, called for the quick resolution

126 USDOC (2019).

to the trade dispute because the tariffs and greater prices weighed down its profits about 1.0 billion dollars.[127] Furthermore, according to a calculation by a U.S. private-sector think tank, the tariffs boosted corporate profits before taxes by 2.4 billion dollars and led to an additional 8,700 jobs but placed a burden of 5.6 billion dollars on steel users in downstream industries. Therefore, there was negative impact on overall the U.S. economy, and each new job cost 650 thousand dollars.[128]

Figure II-2-3-3-6 Market prices of hot-rolled coil steel in major markets



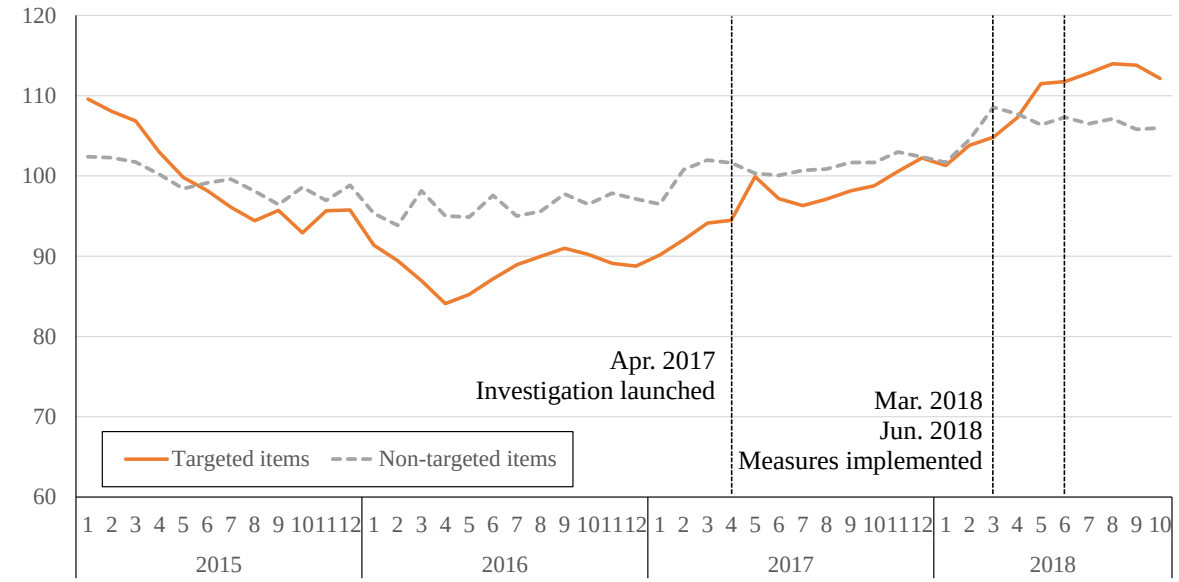
Source: Bloomberg.

127 Ford Motor Company recorded a dramatic decline in profit as 2018 profit shrank 52.5% year on year to 3.68 billion dollars from 7.73 billion dollars in 2017 even though 2018 sales rose to 160.34 billion dollars compared to 156.78 billion dollars in 2017. A major reason for this was weak sales in markets outside of North America.

128 Gary Clyde Hufbauer and Euijin Jung (2018).

Figure II-2-3-3-7　Unit import price of targeted items in the U.S. (Fisher index)

(2015 = 100)

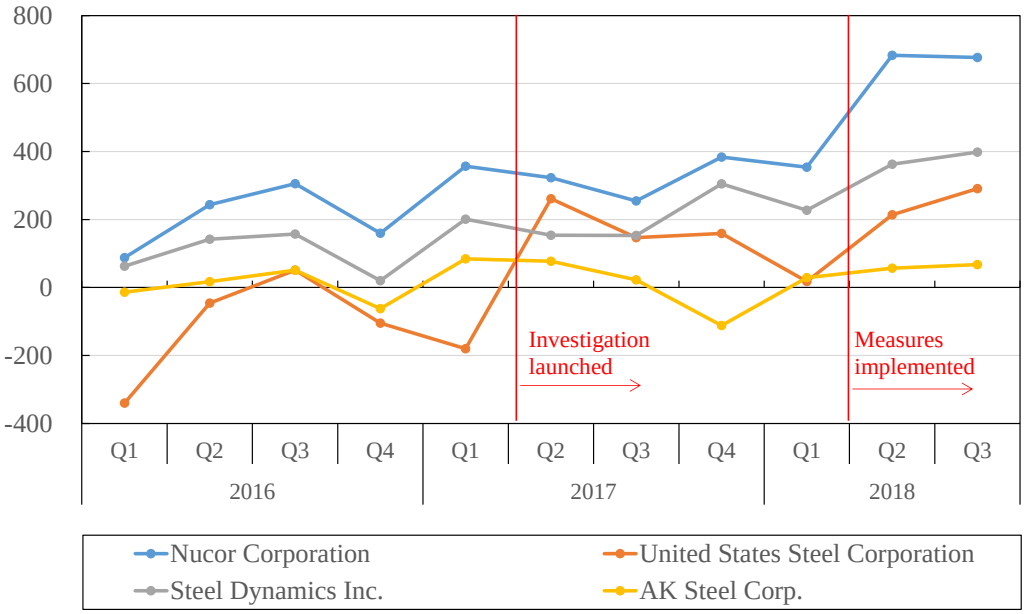


Note: The graph was created by applying the Fisher Index to targeted items and non-targeted items (six-digit HS code) for HS category 72, 73, and 76. Average for 2015 set as 100.

Source: U.S. government public information and Global Trade Atlas.

Figure II-2-3-3-8　Earnings for major U.S. steel manufacturers (net profit, GAAP)

(Million dollars)



Source: Bloomberg.

Table II-2-3-3-9 Media reports on earning of major U.S. steel manufacturers

Company	Media report, etc.
Nucor Corporation	The Q4 2018 earnings beat forecasts due to import tariffs. The forecasts are bullish for Q1 2019 despite decline in steel plate prices. Supported by tariffs, the company **announced the construction of 1.35 billion dollar steel plate plant**. The plant is expected to launch operation in 2022 and **add 400 jobs**.
United States Steel Corporation	Profit rose because of the tariffs but fell short of market forecasts. **Profit grew to 1.1 billion dollars in 2018, almost three times the 390 million dollars for last year.** **The company increased production at steel town Granite City, Illinois**, conducted a 300 million dollar share buyback, and expanded sales, particularly in the energy industry.
Steel Dynamics Inc.	Steel Dynamics's earnings were firm, but growth slowed from third quarter to the fourth quarter, 2018. The company **plans to construct 1.7-1.8 billion dollar rolled steel plate mill in Southwest U.S.** The plant is expected to launch operations in 2021 and **add 600 jobs**.
AK Steel Corporation	Credit Suisse, Morgan Stanley, and others lower their price target for AK Steel. The company **announced that it will close a blast-furnace plant in Kentucky** with low utilization rate to achieve several goals, including cutting costs and increasing efficiency. **This will result in the loss of 230 jobs.**

Source: Various media.

(D) Spillover effect on other countries/regions (inflow of steel to the EU)

As noted above, the volume of U.S. steel imports fell dramatically following the introduction of the activation measures. On the other hand, it was observed that overseas products that used to be exported to the U.S. are flowing into other countries/regions. One example of this can be seen in U.S. and EU steel imports (HS7208–7212 flat rolled products) after the measures were activated (Figure II-2-3-3-10).

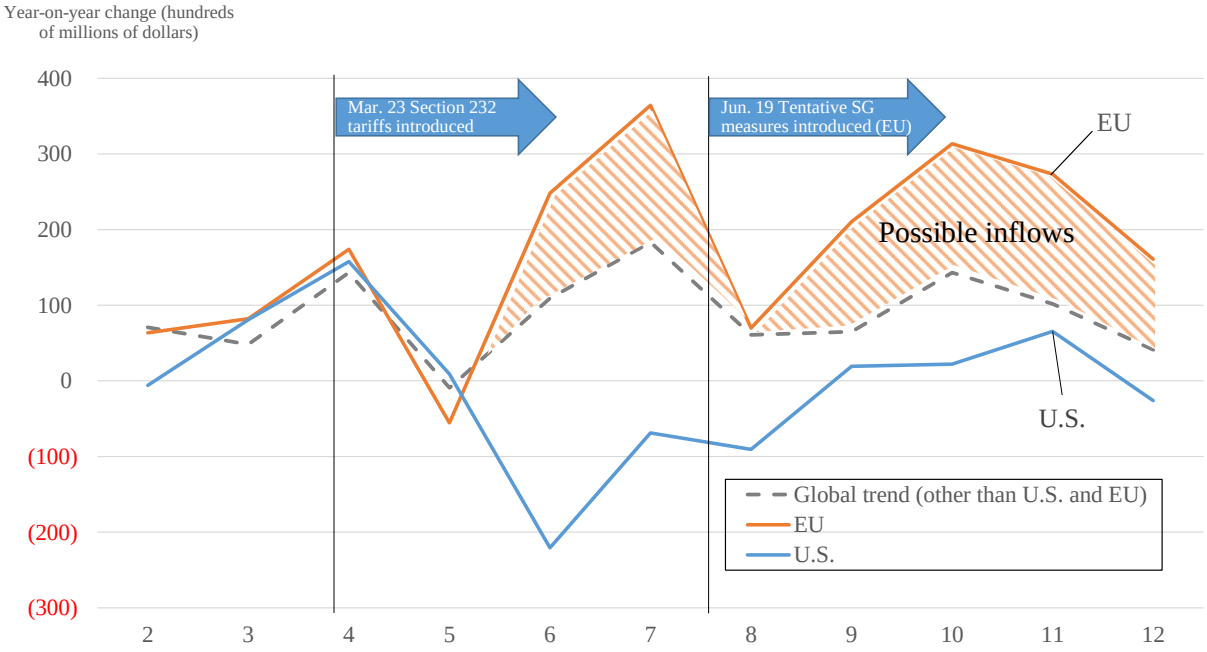
Examining the monthly value of imports of flat-rolled steel products for the U.S., EU, and the world, each country and region showed the similar trends through the first five months of 2018, the U.S. trend, however started to substantially diverge from the EU trend in June. For the U.S., monthly imports fell up to 20.0 billion dollars year on year, but EU imports rose up to 35.0 billion dollars, which was substantially greater than even global trends.

As for the contribution to year-on-year changes in the value of flat-rolled steel product imports by

country, there were completely different trends in contributions from Turkey, Russia, and China to the U.S. and EU imports. For the U.S. there was a major decline in imports from these three countries, but for the EU, imports from these three countries sharply increased. Steel that should have been exported to the U.S. may have flowed into the EU. In particular, Turkish products boosted EU imports about 10% compared to the previous year (Figure II-2-3-3-11 and Figure II-2-3-3-12).

In order to protect their domestic steel industries from the negative impact of the inflow of steel products due to the spillover effect of U.S. Section 232 measures, the EU imposed tentative safeguard measures in July 2018 and finalized them in February 2019. The imposition of the U.S. trade-restrictive measures can negatively affect third countries and distort market mechanism as a consequence.

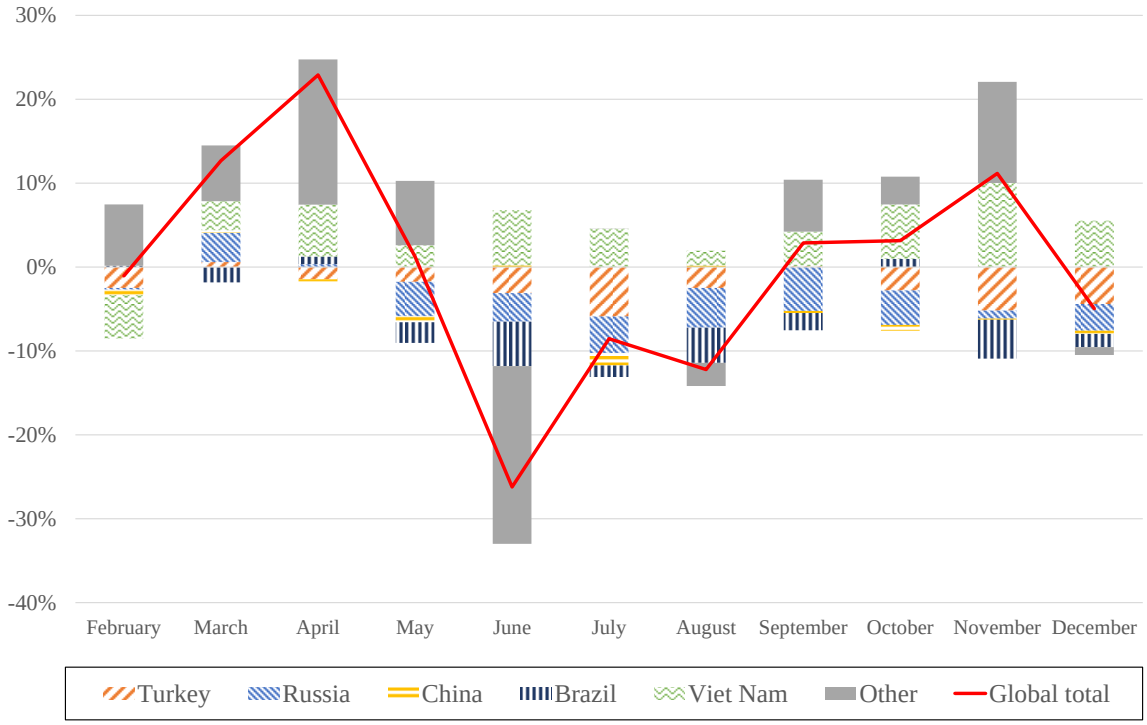
Figure II-2-3-3-10 Monthly steel imports of the U.S., and Global Trend (2018)



Notes. Adjustments were for the global trend so that the average for Feb. through May was consistent with the EU and U.S.

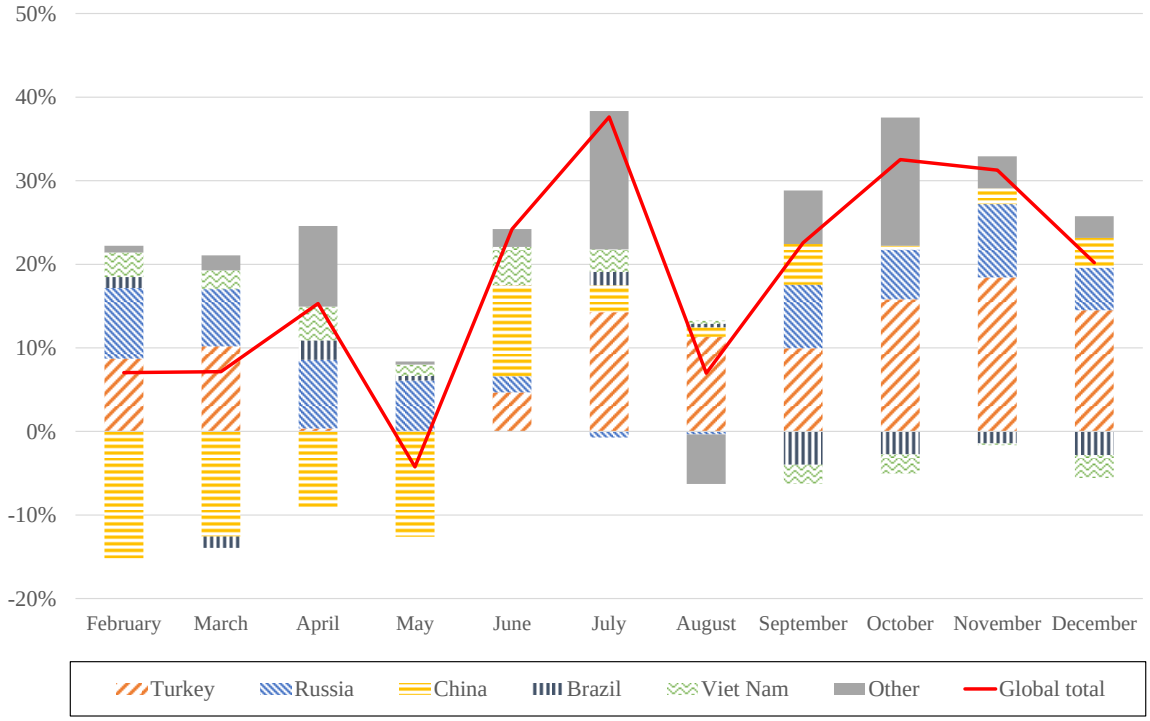
Source: Global Trade Atlas (flat-rolled steel products, HS7208–7212).

Figure II-2-3-3-11 Changes in the U.S. flat-rolled steel product import value and contribution by country (year-on-year change)



Source: Global Trade Atlas.

Figure II-2-3-3-12 Changes in the EU flat-rolled steel product import value and contribution by country (year-on-year change)



Source: Global Trade Atlas.

(2) Impact of U.S. Trade Act of 1974 Section 301 tariffs

(A) Impact of U.S. measures on trade

Additional tariffs based on the U.S. Trade Act of 1974 Section 301 were imposed in three rounds in 2018 as discussed above. They targeted up to 6,842 items that is equivalent to 50% of the amount of imports from China in 2017, 505.0 billion dollars.

For the first round, based on the list of targeted items announced on June 15, 2018, an additional tariff of 25% was imposed starting July 6, 2018. The tariffs targeted a total of 818 items, including industrial machinery, cars, telecommunications equipment, semiconductors, [129] airplanes, and spacecraft, and the total amount of import accounts for about 34.0 billion dollars according to the trade statistics in 2017. For Table II-2-3-3-13, figures were compiled based on the eight-digit HTS codes[130] provided in the list of targeted items and then organized based on two-digit HS codes (the same method was used for round 2 and round 3 figures).[131] The first round of measures resulted in an overall decline in imports of 5.9% year on year in 2018. In particularly, imports of the items as follows are falling—general machinery, -3.2%; electrical machinery, -12.2%; and optical machinery, -2.6% (Table II-2-3-3-13 (A)). Furthermore Figure II-2-3-3-14 shows a comparison of the year-on-year change in imports (value) from China of round 1 targeted items since January 2018 and the year-on-year change in imports from China of all products (the same method was used for round 2 and round 3 figures). According to this, the value of imports between April, when additional tariffs was implied and June before the tariffs were imposed rose year on year. On the contrary, the value of imports fell year on year since July, when the tariffs were introduced. Through the end of the year, the percent year-on-year decline more and more , and in December 2018, imports (value) of round 1 targeted items fell 28% to 72% of the value for the previous year (Figure II-2-3-3-14 (A)).

For the second round of measures, a list of targeted items was released on June 15 as same as the first round of measures. The final list was set on August 7, and an additional tariff of 25% was imposed starting on August 23. They targeted a total of 279 items, including semiconductors and industrial machinery, and the value of these imports totaled about 16.0 billion dollars according to trade statistics in 2017. The value of imports of round 2 targeted item increased 7.3% in 2018 (Table II-2-3-3-13 (B)). A comparison of the year-on-year change in the value of U.S. imports from China of round 2 targeted items since January 2018 and the year-on-year change in the value of U.S. imports from China of all items show that imports suddenly rose between June, when the list of targeted items was released, and August, before the tariffs were imposed, peaking in July at +41% year on year (Figure II-2-3-3-14 (B)). On the other hand, the year-on-year percent change in the value of imports since September (Figure II-2-3-3-14 (B)) fell dramatically due to the impact of the additional tariffs just like for the first round of tariffs (size of year-on-year decline grew from -14% in September to -29% in December). Last-minute

129 On the two-digit HS product category level, items fell primarily into category 85.

130 Public U.S. government material uses harmonized tariff schedule (HTS), and figures are compiled using the corresponding harmonized system (HS) code of the Global Trade Atlas.

131 As for the list of targeted items, targeted items are broadly grouped using the eight-digit HTS code. For individually exempted items, the ten-digit HTS code for the item and distinguishing characteristics of the exempted item are provided. For this statistical analysis, however, figures are compiled using the eight-digit HTS code because of the difficulty in comprehensively compiling figures.

demand before the tariffs were imposed probably contributed to the annual growth in the value of imports for 2018.

As for the third round of tariffs, an order to examine additional tariffs on 100.0 billion dollars' worth of imports was issued on April 5, and the scope of the investigation grew to 200.0 billion dollars on June 18. On September 17, an announcement was made that an additional tariff of 10% would be levied on 5,745 items (worth 200.0 billion dollars), including industrial machinery, steel products, food products, and hats, and the tariffs were imposed on September 24. For the third round of tariffs, the value of imports of targeted items also rose year on year in 2018 (Table II-2-3-3-13 (C)) because the value of imports increased due to last-minute demand between May, when the initial stages of the investigation were launched, and September when the tariffs were imposed (Figure II-2-3-3-14 (C)). The list of targeted items is divided into part 1 and part 2, and while imports of part 1 items grew 13.9% year on year, imports of part 2 items rose 2.7% year on year (Table II-2-3-3-13 (C)).[132] In this way, there was no remarkable decline in imports due to the third round of measures. On the contrary, the growth rates of 3 targeted items tended to be higher than the overall U.S. imports from China in almost all months (Figure II-2-3-3-14 (C)).

Table II-2-3-3-13 U.S. imports (value) from China of items targeted under Section 301 of the U.S. Trade Act of 1974

(A) Round 1

Round 1 (additional tariff of 25%)

Two-digit HS code	Item summary	Value of imports (millions of dollars)		Change (%)	Number of items
		2017	2018		
	Total	32,236	30,339	-5.9%	818
84	General machinery	15,779	15,272	-3.2%	417
85	Electrical machinery	9,612	8,436	-12.2%	186
90	Optical and precision machinery	4,443	4,328	-2.6%	129
87	Cars, etc.	1,734	1,569	-9.5%	41
88	Aircraft and spacecraft	507	550	8.5%	15
-	Other	161	184	14.3%	30

(B) Round 2

Round 2 (additional tariff of 25%)

Two-digit HS code	Item summary	Value of imports (millions of dollars)		Change (%)	Number of items
		2017	2018		
	Total	13,682	14,674	7.3%	279
85	Electrical machinery	7,504	7,806	4.0%	36
39	Plastics	2,152	2,379	10.5%	146
84	General machinery	2,024	2,186	8.0%	31
73	Iron and steel products	883	900	1.9%	6
90	Optical and precision machinery	597	631	5.7%	16
-	Other	522	772	47.9%	44

132 List of round 3 targeted items:
https://ustr.gov/sites/default/files/enforcement/301Investigations/Tariff%20List-09.17.18.pdf

(C) Round 3

Round 3 Part 1 (additional tariff of 10%)

Two-digit HS code	Item summary	Value of imports (millions of dollars)		Change (%)	Number of items
		2017	2018		
	Total	160,133	182,460	13.9%	5,734
84	General machinery	37,660	43,288	14.9%	196
85	Electrical machinery	25,450	29,096	14.3%	212
94	Furniture	22,887	25,315	10.6%	68
87	Cars, etc.	11,637	13,733	18.0%	125
73	Iron and steel products	7,693	9,158	19.0%	134
42	Leather goods	7,330	7,407	1.1%	86
39	Plastics	5,635	7,176	27.3%	53
83	Base metal products	3,288	3,695	12.4%	36
40	Rubber	3,187	3,764	18.1%	143
44	Wood, etc.	3,134	3,015	-3.8%	180
48	Paper	2,973	3,280	10.3%	222
82	Base metal tools, etc.	2,924	3,470	18.7%	94
29	Organic chemicals	2,817	3,665	30.1%	692
70	Glass	2,457	2,778	13.1%	149
68	Stone, plaster, cement, etc.	1,948	2,184	12.1%	65
30	Pharmaceutical products	1,601	1,654	3.3%	264
33	Essential oils, resinoids, etc.	1,336	1,367	2.3%	25
65	Hats	1,234	1,320	7.0%	26
20	Vegetables and fruits	1,153	1,262	9.5%	146
90	Optical and precision machinery	1,000	1,132	13.2%	71
-	Other	12,789	14,701	15.0%	2,747

Round 3 Part 2 (addition tariff of 10%)

Two-digit HS code	Item summary	Value of imports (millions of dollars)		Change (%)	Number of items
		2017	2018		
	Total	29,616	30,424	2.7%	11
85	Electrical machinery	22,935	23,483	2.4%	1
94	Furniture	6,282	6,476	3.1%	9
29	Organic chemicals	399	465	16.5%	1

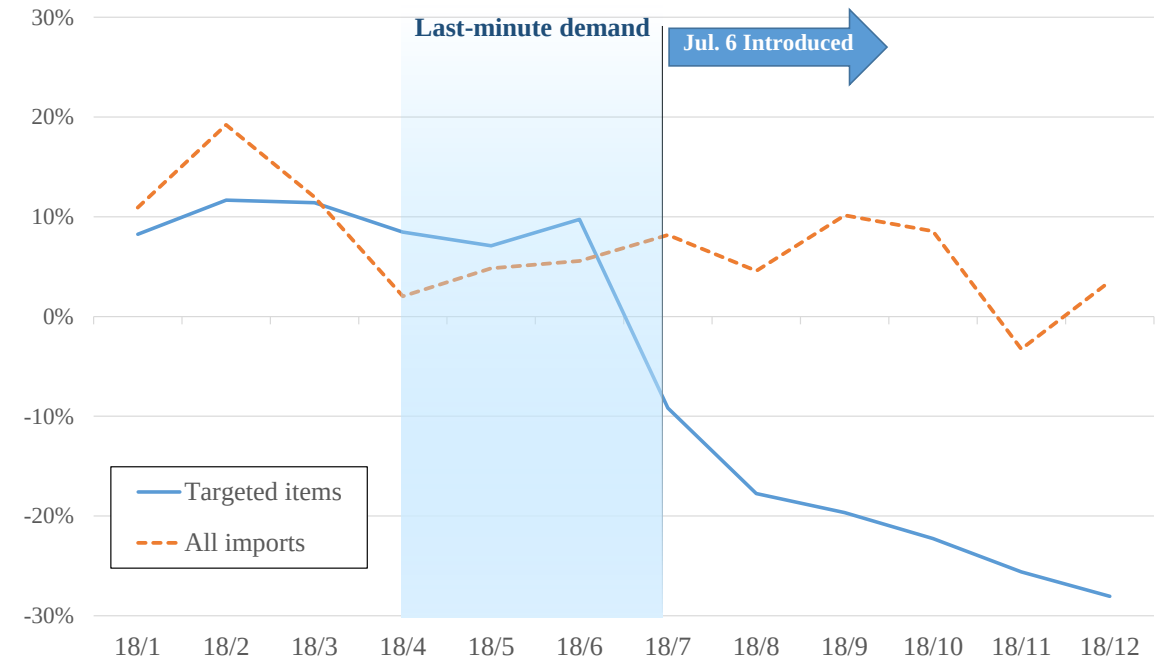
Notes: In line with U.S. Department of Commerce statistics, figures for the value of imports of targeted items were compiled using the ten-digit code and then grouped using two-digit code.

Source: Global Trade Atlas.

Figure II-2-3-3-14 U.S. imports (value) from China of U.S. Trade Act of 1974 Section 301 targeted items

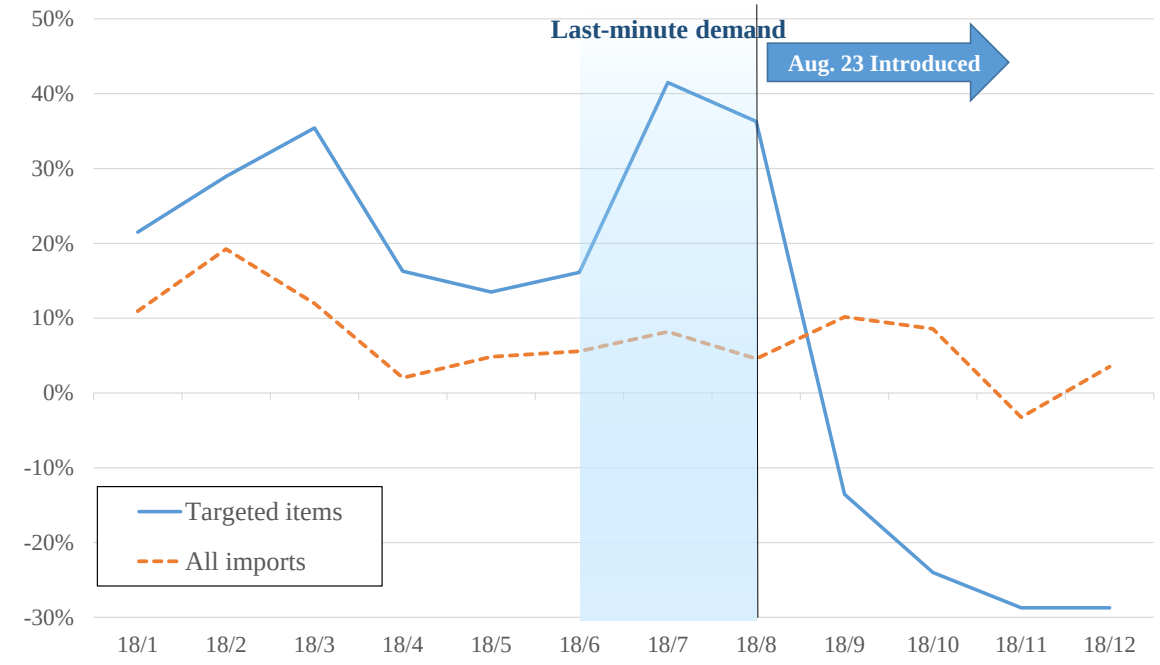
(A) Round 1

(year-on-year change, %)



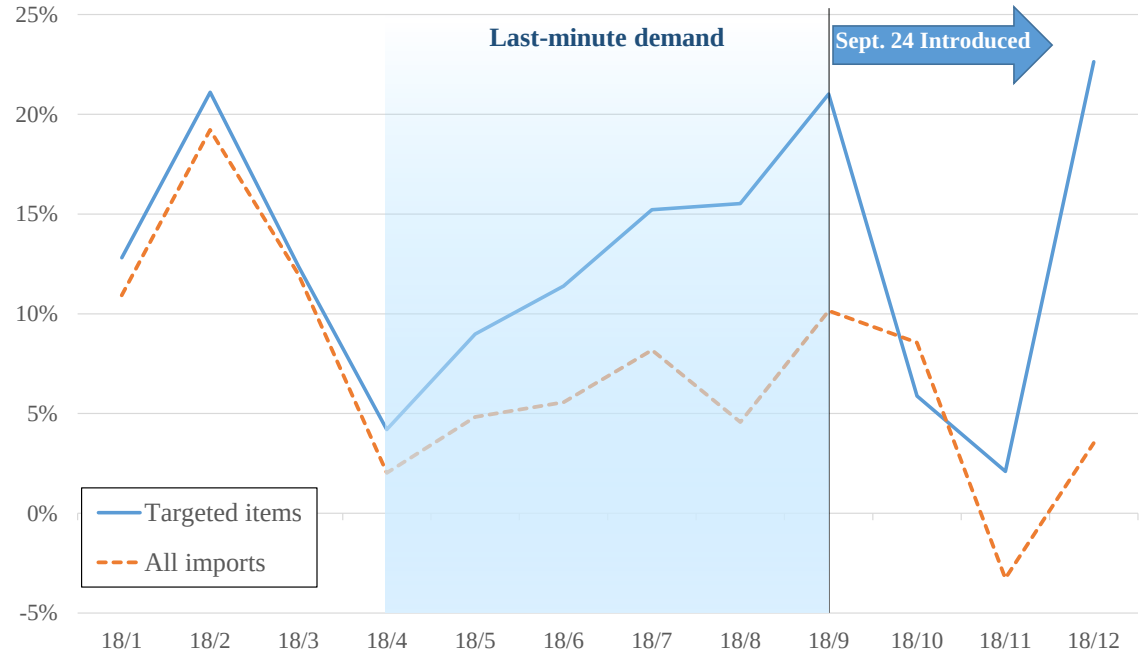
(B) Round 2

(year-on-year change, %)



(C) Round 3

(year-on-year change, %)



Notes: In line with U.S. Department of Commerce statistics, figures for the value of imports of targeted items were compiled using the ten-digit code and then grouped using two-digit code. The information is that available as of April 2019 (trade data as of March).

Source: Global Trade Atlas.

(B) Impact of China's countermeasures on trade

In response to the U.S. measures, China imposed additional tariffs on imports from the U.S. on the same days that the U.S. levied one of the three rounds of additional tariffs. These additional tariffs targeted 6,085 items, which account for about 80% of the 130.0 billion dollars of China's imports from the U.S. in 2017. Similar to the way that the figures were compiled for U.S. measures in (A) above, we used China's import statistics to conduct an analysis of the list of targeted items announced by the Tariff Commission of the State Council (eight-digit HS code).

For the first round, China levied an additional tariff of 25% on 545 items, including soybeans, pork, wheat, and cars (the value of these imports from the U.S. was about 34.0 billion dollars in 2017), and the tariffs came into effect on July 6. There was a dramatic decline in China's imports from the U.S. due to the first round of measures, with the value of imports of targeted items falling 30.7% year on year (Table II-2-3-3-15 (A)). In more detail, among items targeted by the first round of measures, ten items that experienced the largest decline in the value of imports included yellow soybeans (-49.4% year on year), 4WD cars (-24.9% year on year), diesel vehicles (-21.7% year on year), and other frozen pork (-60.6%) (Table II-2-3-3-16). Furthermore, the trends since January 2018 shows the value of imports declined dramatically between May (-18% year on year), when the measures were hinted at and an examination was undertaken, and June (-21% year on year). The value of imports rose a slight 3% in July, but then contracted more and more on a year-on-year basis starting in August, falling 34% as of December (Figure II-2-3-3-17 (A)). Considering that the value of imports fell 28% year on year in

December 2018, when the U.S. imposed its first round of measures, as discussed above, the decline in the value of China's imports from the U.S. due to its counter-tariffs was greater (Figure II-2-3-3-18 (A)). Since November 2018, there has been a remarkable decrease in overall imports, in addition to imports of targeted items under China's slow economic growth in the second half of the same year. Therefore, it is necessary to keep in mind the possibility that the decline in the value of imports of targeted items may not only be due to additional tariffs (the same is true for the second and third round of measures).

For the second round, China levied an additional tariff of 25% on 333 items, including used paper, copper, and cars (the value of these imports from the U.S. was about 16.0 billion dollars in 2017), and the tariffs came into effect on August 23. Similar to when the first round of measures was imposed, the value of imports from the U.S. of targeted items fell substantially in 2018, declining 14.3%. In particular, there were major contractions in the imports of several products, including mineral fuels, such as propane gas and coal (-23.5% year on year), wood pulp (-41.1% year on year), and copper (-4.8% year on year) (Table II-2-3-3-15 (B)). The trends since January 2018 shows that while the value of imports rose year on year in July (+6% year on year) and August (+23% year on year), before the measures were imposed, it fell dramatically staring in September just like for the first round of measures (Figure II-2-3-3-17 (B)). If one compares the value of imports from China of Section 301 tariff targeted items and the value of imports from the U.S. of China counter-tariff targeted items (Figure II-2-3-3-18 (B)), one sees that since September, when the measures were implemented, the percent decline in China's imports has been greater than that of that in U.S. imports.

The third round of measures are composed of four lists of targeted items (list 1–4). Since September 24, an additional tariff of 10% has been imposed on items appearing on list 1 (2,493 items) and list 2 (1,078 items), including liquefied natural gas (LNG), copper ore, machinery, and optical devices, and an additional tariff of 5% has been levied on items included on list 3 (974 items) and list 4 (662 items), including glass, laser equipment, and chemical wood pulp. The value of imports of targeted items in 2017 totaled 60.0 billion dollars, and the value of imports of targeted items in 2018 rose year on year for items on all four lists (Table II-2-3-3-15 (C)). Looking at trends since January 2018, there was a remarkable increase in the year-on-year change for various items, particularly LNG, in both May (+51%) and August (+59%), which made major contributions to the annual increase in the volume of imports. On the other hand, since September, the value of China's imports from the U.S. of targeted items contracted 30%–40% year on year (Figure II-2-3-3-17 (C)). Therefore, comparing the value of U.S. imports from China of Section 301 tariff targeted items and China's imports from the U.S. of China counter-tariff targeted items since September reveals that U.S. measures hardly had an impact, falling short of the decline in China's imports from the U.S. of China countermeasure targeted items (Figure II-2-3-3-18 (C)).

Table II-2-3-3-15 China's imports (value) from the U.S. of China countermeasure targeted items (by item)

(A) Round 1 (B) Round 2

Round 1 (additional tariff of 25%)

Two-digit HS code	Item summary	Value of imports (millions of dollars) 2017	2018	Change (%)	Number of items
	Total	33,823	23,439	-30.7%	545
12	Oil seeds and fruits	14,359	7,448	-48.1%	4
87	Cars, etc.	12,940	10,549	-18.5%	28
10	Cereals	1,507	908	-39.7%	14
30	Pharmaceutical products	1,314	1,253	-4.6%	182
20	Vegetables and fruits	1,232	593	-51.9%	47
52	Cotton	980	1,063	8.5%	1
80	Tin	754	795	5.4%	62
40	Rubber	423	325	-23.2%	21
24	Tobacco	169	162	-4.1%	12
23	Residues and waste from the food industries	94	79	-16.0%	3
-	Other	51	264	417.6%	171

Round 2 (additional tariff of 25%)

Two-digit HS code	Item summary	Value of imports (millions of dollars) 2017	2018	Change (%)	Number of items
	Total	14,103	12,084	-14.3%	12,084
27	Mineral fuels	3,423	2,618	-23.5%	2,618
47	Wood pulp, etc.	2,717	1,600	-41.1%	1,600
74	Copper	1,390	1,323	-4.8%	1,323
39	Plastics	1,114	892	-19.9%	892
29	Organic chemicals	924	800	-13.4%	800
90	Optical and precision machinery	847	1,488	75.7%	1,488
87	Cars, etc.	838	589	-29.7%	589
76	Aluminum	832	815	-2.0%	815
85	Electrical machinery	460	465	1.1%	465
34	Soap, etc.	444	389	-12.4%	389
-	Other	1,114	1,105	-0.8%	1,105

Round 3

Round 3 List 1 (additional tariff of 10%)

Two-digit HS code	Item summary	Value of imports (millions of dollars) 2017	2018	Change (%)	Number of items
	Total	9,574	10,797	12.8%	2,493
85	Electrical machinery	2,167	2,437	12.5%	221
84	General machinery	1,215	1,391	14.5%	341
26	Ore, slag, ash	1,000	844	-15.6%	10
44	Wood, etc.	978	910	-7.0%	68
27	Mineral fuels	644	1,102	71.1%	1
33	Essential oils, resinoids, etc.	610	991	62.5%	13
29	Organic chemicals	503	468	-7.0%	130
37	Photographic and cinematographic goods	346	398	15.0%	13
28	Precious metals, etc.	278	70	-74.8%	83
90	Optical and precision machinery	226	187	-17.3%	72
39	Plastics	139	103	-25.9%	44
74	Copper	116	135	16.4%	38
22	Beverages and spirits	108	144	33.3%	20
15	Animal and vegetable oils	104	64	-38.5%	23
71	Accessories, etc.	102	168	64.7%	43
82	Base metal tools, etc.	75	70	-6.7%	35
52	Cotton	71	34	-52.1%	68
50	Silk	70	78	11.4%	10
72	Iron and steel	67	89	32.8%	112
55	Man-made staple fiber	56	55	-1.8%	61
-	Other	699	1,059	51.5%	1,087

Round 3 List 2 (additional tariff of 10%)

Two-digit HS code	Item summary	Value of imports (millions of dollars) 2017	2018	Change (%)	Number of items
	Total	10,066	13,144	30.6%	1,078
84	General machinery	3,288	3,394	3.2%	200
85	Electrical machinery	1,915	1,962	2.5%	106
44	Wood, etc.	1,025	1,080	5.4%	29
90	Optical and precision machinery	822	955	16.2%	38
39	Plastics	395	420	6.3%	33
40	Rubber	249	195	-21.7%	25
28	Inorganic chemicals, precious metals, etc.	212	156	-26.4%	35
29	Organic chemicals	188	212	12.8%	57
48	Paper	187	192	2.7%	49
38	Chemical products	172	190	10.5%	11
73	Iron and steel products	147	155	5.4%	36
33	Essential oils, resinoids, etc.	145	189	30.3%	16
32	Dyes, pigments, etc.	144	171	18.8%	18
74	Copper	97	112	15.5%	17
72	Iron and steel	91	87	-4.4%	28
71	Accessories, etc.	75	2,739	3552.0%	10
82	Base metal tools, etc.	70	80	14.3%	22
26	Ore, slag, ash	68	18	-73.5%	1
70	Glass	52	37	-28.8%	7
76	Aluminum	51	55	7.8%	8
-	Other	673	745	10.7%	332

Round 3 List 3 (additional tariff of 5%)

Two-digit HS code	Item summary	Value of imports (millions of dollars)		Change (%)	Number of items
		2017	2018		
	Total	15,635	16,976	8.6%	16,976
84	General machinery	2,761	2,991	8.3%	2,991
90	Optical and precision machinery	2,213	2,454	10.9%	2,454
85	Electrical machinery	1,347	1,555	15.4%	1,555
39	Plastics	889	1,006	13.2%	1,006
70	Glass	734	882	20.2%	882
73	Iron and steel products	728	746	2.5%	746
29	Organic chemicals	584	586	0.3%	586
40	Rubber	448	476	6.3%	476
26	Ore, slag, ash	395	200	-49.4%	200
21	Miscellaneous edible preparations	388	610	57.2%	610
71	Accessories, etc.	362	349	-3.6%	349
34	Soap, etc.	318	388	22.0%	388
75	Nickel	297	375	26.3%	375
32	Dyes, pigments, etc.	275	266	-3.3%	266
76	Aluminum	272	311	14.3%	311
23	Residues and waste from the food industries	267	293	9.7%	293
81	Other base metal items	265	237	-10.6%	237
25	Salt, sulfur, etc.	263	279	6.1%	279
38	Chemical products	248	258	4.0%	258
35	Starches, etc.	230	281	22.2%	281
-	Other	2,351	2,433	3.5%	2,433

Round 3 List 4 (additional tariff of 5%)

Two-digit HS code	Item summary	Value of imports (millions of dollars)		Change (%)	Number of items
		2017	2018		
	Total	17,926	19,411	8.3%	662
90	Optical and precision machinery	4,896	5,452	11.4%	58
84	General machinery	2,047	2,199	7.4%	78
47	Wood pulp, etc.	1,654	1,792	8.3%	12
29	Organic chemicals	1,473	1,765	19.8%	94
85	Electrical machinery	1,255	1,282	2.2%	71
41	Raw hides and leather	1,141	843	-26.1%	6
44	Wood, etc.	802	800	-0.2%	12
87	Cars, etc.	657	777	18.3%	91
48	Paper	646	793	22.8%	23
38	Chemical products	589	702	19.2%	22
-	Other	2,766	3,006	8.7%	195

Notes: In line with China's General Administration of Customs statistics, figures for the value of imports of targeted items were compiled using the ten-digit code and then grouped using two-digit code.

Source: Global Trade Atlas.

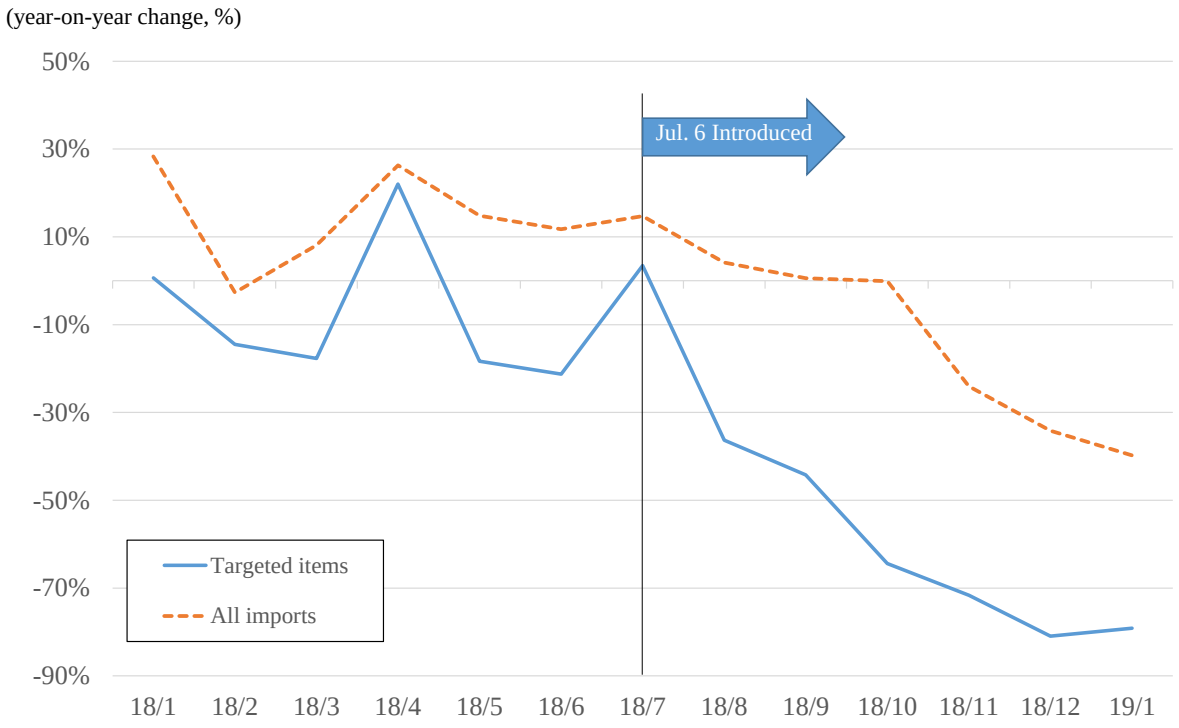
Table II-2-3-3-16 China's imports (value) from the U.S. of first round countermeasure targeted items (eight-digit HS category, top ten products)

Rank	8-digit code	Item	Value of imports (millions of dollars)		Change (%)	As % of round 1 (%)
			2017	2018		
1	12019010	Yellow soybeans	13,959	7,065	-49.4%	30%
2	87032362	4WD cars (2.5L–3L)	5,428	5,487	1.1%	23%
3	87032342	4WD cars (1.5L–2L9)	2,363	1,775	-24.9%	8%
4	87038000	Diesel cars	1,403	1,098	-21.7%	5%
5	52010000	Cotton	980	1,063	8.5%	5%
6	10079000	Grain sorghum	956	726	-24.1%	3%
7	87084099	Gear box parts	660	625	-5.3%	3%
8	12149000	Other plant for feed	399	383	-4.0%	2%
9	02064900	Other frozen pork	874	344	-60.6%	1%
10	87032412	Vehicles	284	334	17.6%	1%

Source: Global Trade Atlas.

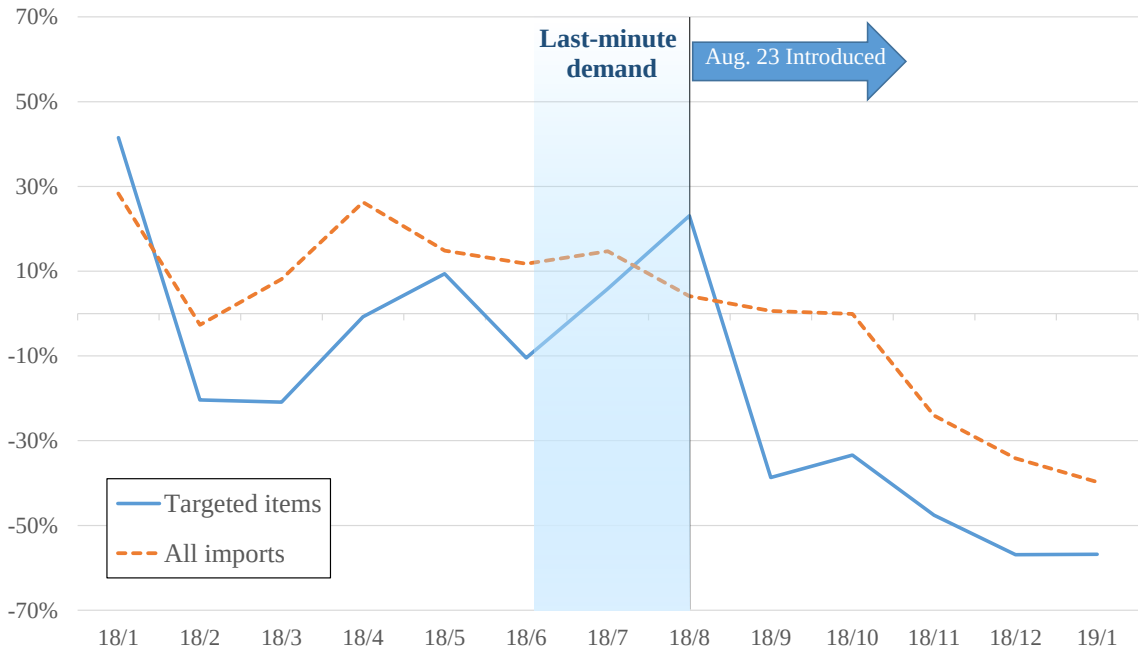
Figure II-2-3-3-17 China's imports (value) from the U.S. of countermeasure targeted items

(A) Round 1



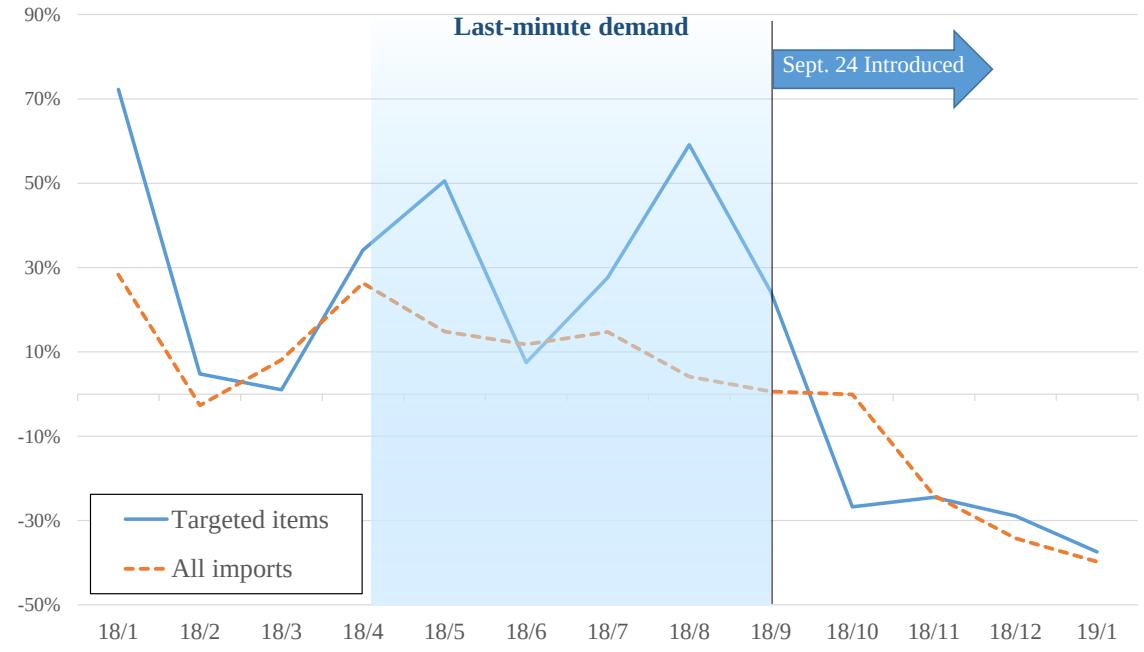
(B) Round 2

(year-on-year change, %)



(C) Round 3

(year-on-year change, %)

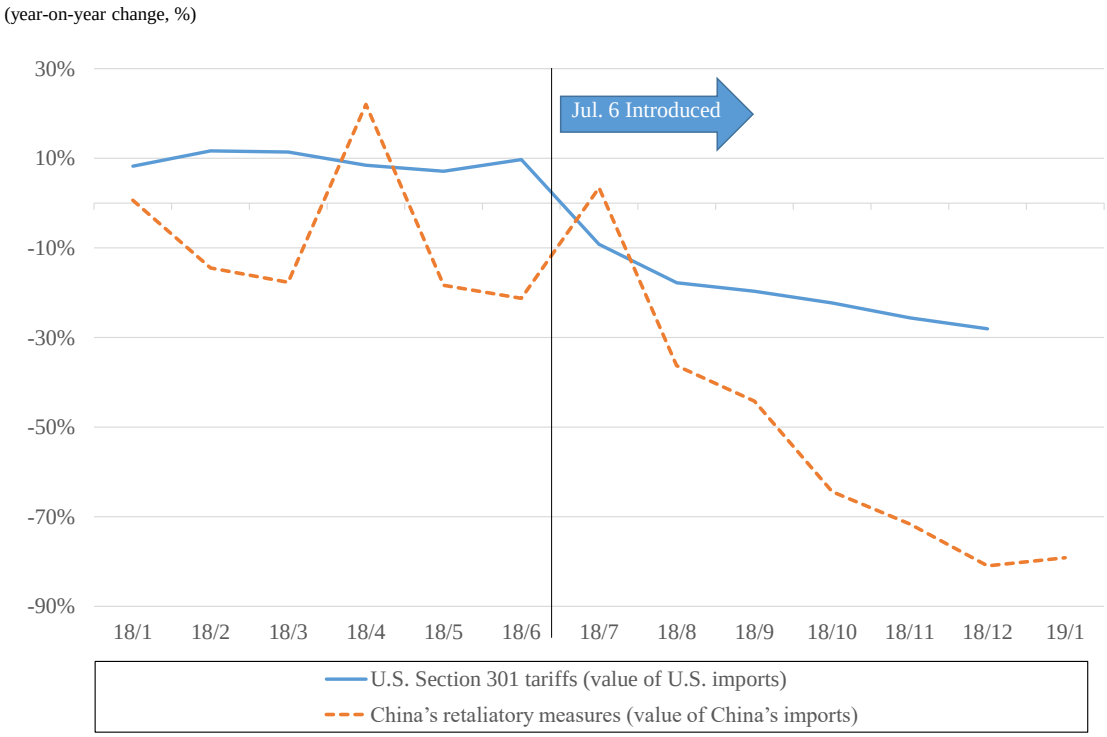


Note: The information is that available as of April 2019 (trade data as of March).

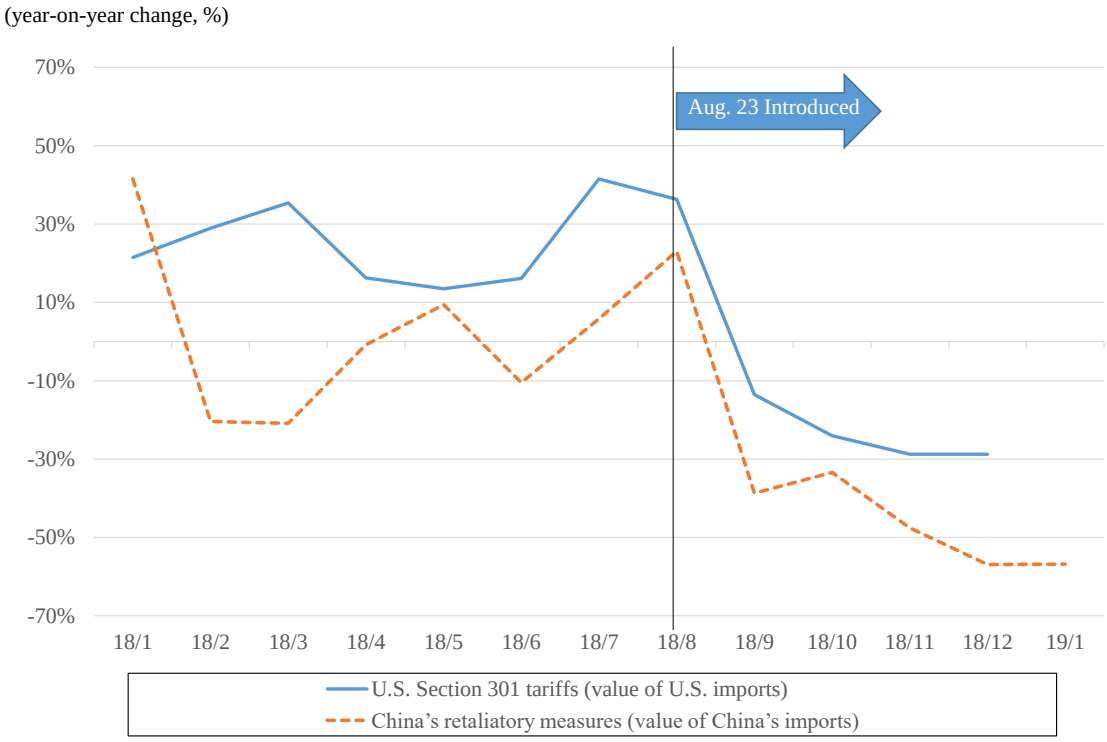
Source: Global Trade Atlas.

Figure II-2-3-3-18 Comparison of imports (value) from China of Section 301 tariff targeted items and imports (value) from the U.S. of China counter-tariff targeted items

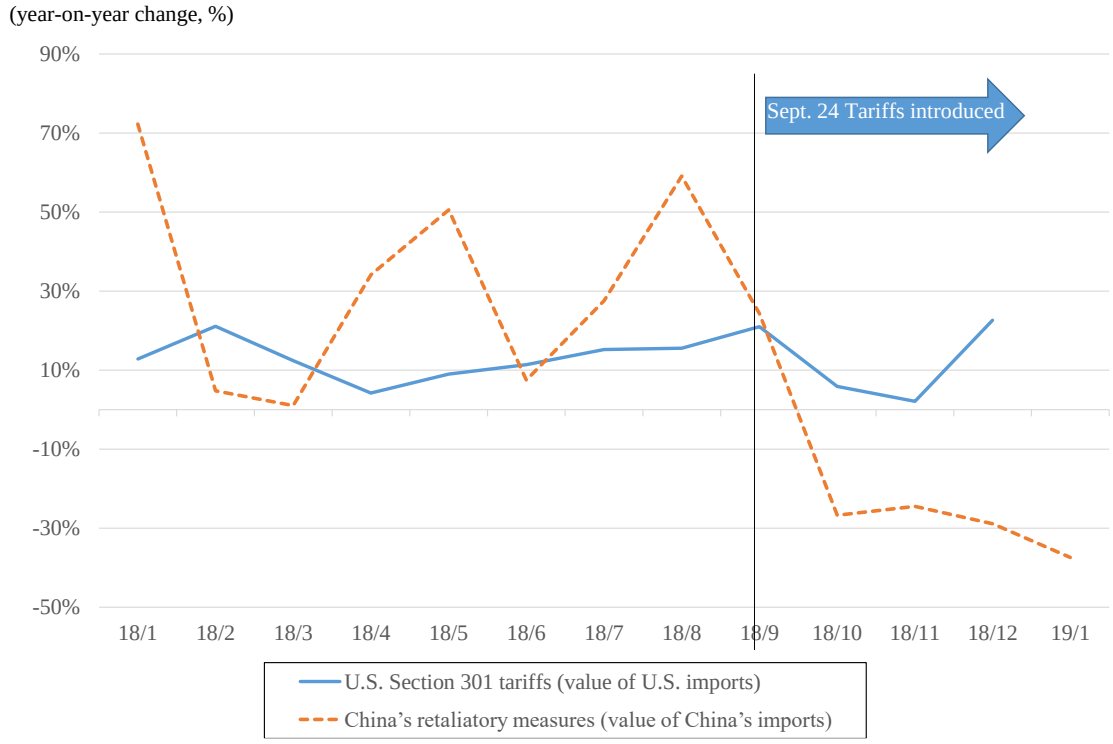
(A) Round 1



(B) Round 2



(C) Round 3



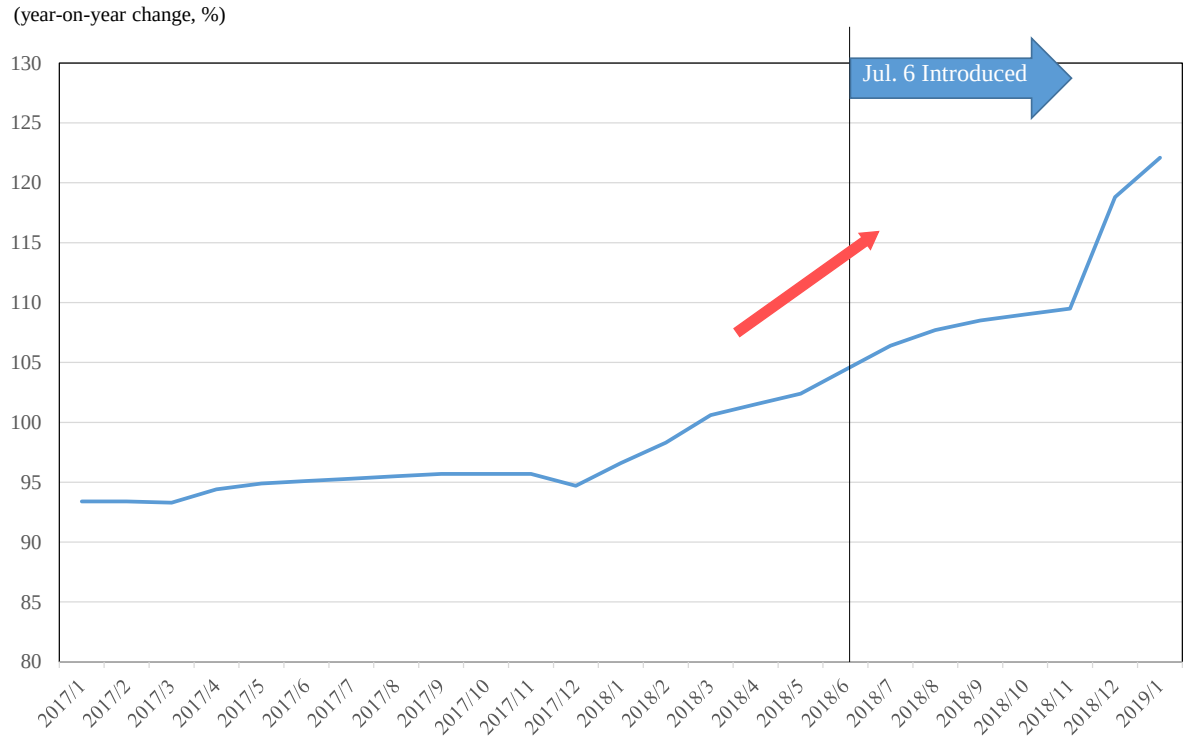
Notes: In line with U.S. Department of Commerce and China's General Administration of Customs statistics, figures for the value of imports of targeted items were compiled using the ten-digit code and then grouped using two-digit code. The information is that available as of April 2019 (trade data as of March).

Source: Global Trade Atlas.

(C) Impact on consumers and users in countries that implemented the measures

Similar to cases when tariffs were raised in the past and under Section 232 of the Trade Expansion Act of 1962 discussed above, an increase in U.S. Trade Act of 1974 Section 301-related tariffs probably also have negative impacts on consumers and users in the country that implemented the measures. The increase in tariffs reduces imports, impacts domestic demand, and leads to an increase in domestic prices. A concrete example of this is pork, which China imposed an additional tariff of 25% on imports from the U.S. in July 2018 as its first round of countermeasures. Looking at China's domestic price, one can see that the price rose after the measures were implemented as shown in Figure II-2-3-3-19. While the price increase at the end of 2018 may have also been due to the outbreak of classical swine fever in China, it is thought that the tariff hikes had a major impact on the increase in prices up to them. Pork and other food products are consumer goods that directly impact consumers, and this is a typical case of consumer being negatively impacted by tariffs.

Figure II-2-3-3-19　China domestic price of pork



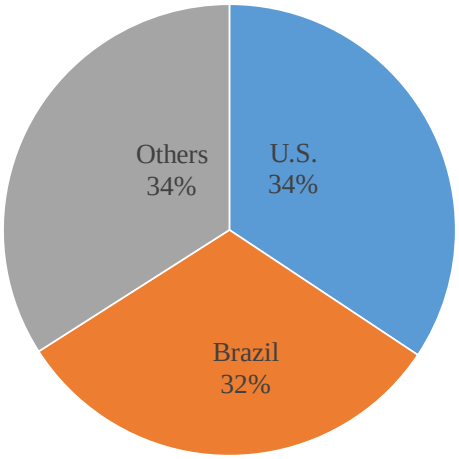
Source: Refinitiv.

(D) Spillover effect (soybeans)

The U.S. exported 12.25 billion dollars' worth of soybeans to China in 2017, and China added soybeans to the list of items that an additional tariff of 25% would be imposed on as the first round of countermeasures against U.S. Trade Act of 1974 Section 301 tariffs (34.0 billion dollars).

The U.S. and Brazil are two of the major soybean producing countries in the world (Figure II-2-3-3-20). The soybean harvest season is September–January in the northern hemisphere and March–July in the southern hemisphere, and China was able to import the majority of the soybeans it needs from the U.S. and Brazil by making use of the difference in harvest periods for geographical reasons (Figure II-2-3-3-21).

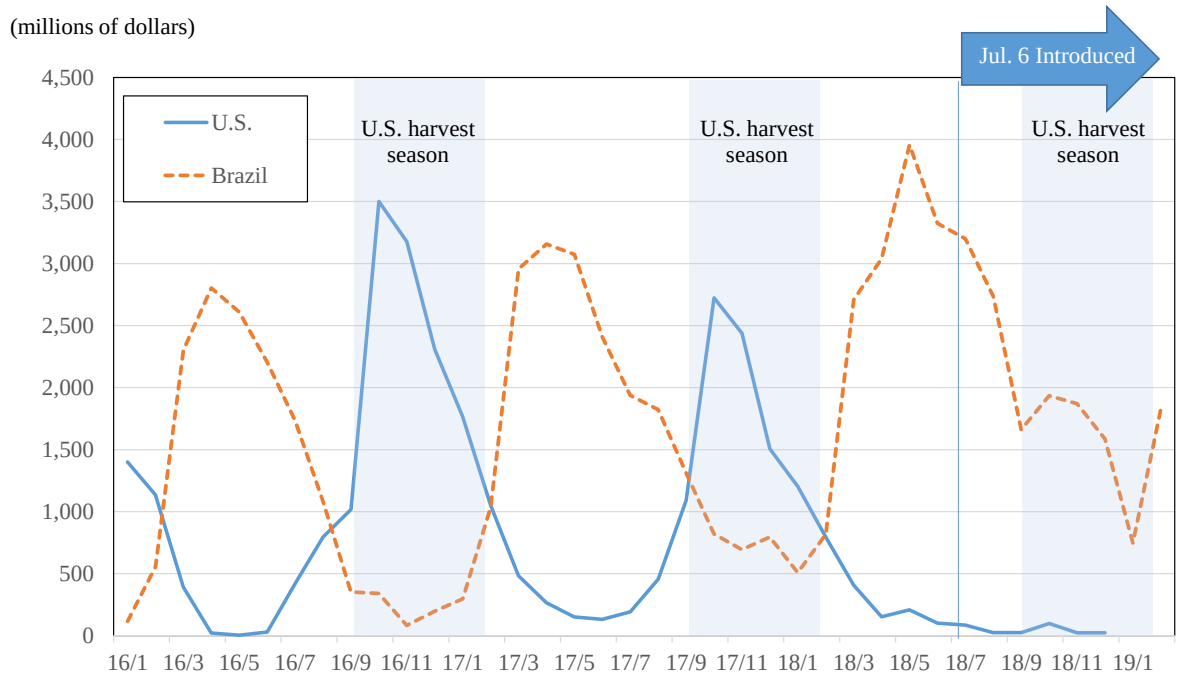
Figure II-2-3-3-20　Share of global production of soybeans (2018)



Notes: Breakdown of 2018 global production (360 million tons).

Source: U.S. Department of Agriculture (USDA) and Brazil Companhia Nacional de Abastecimento (CONAB).

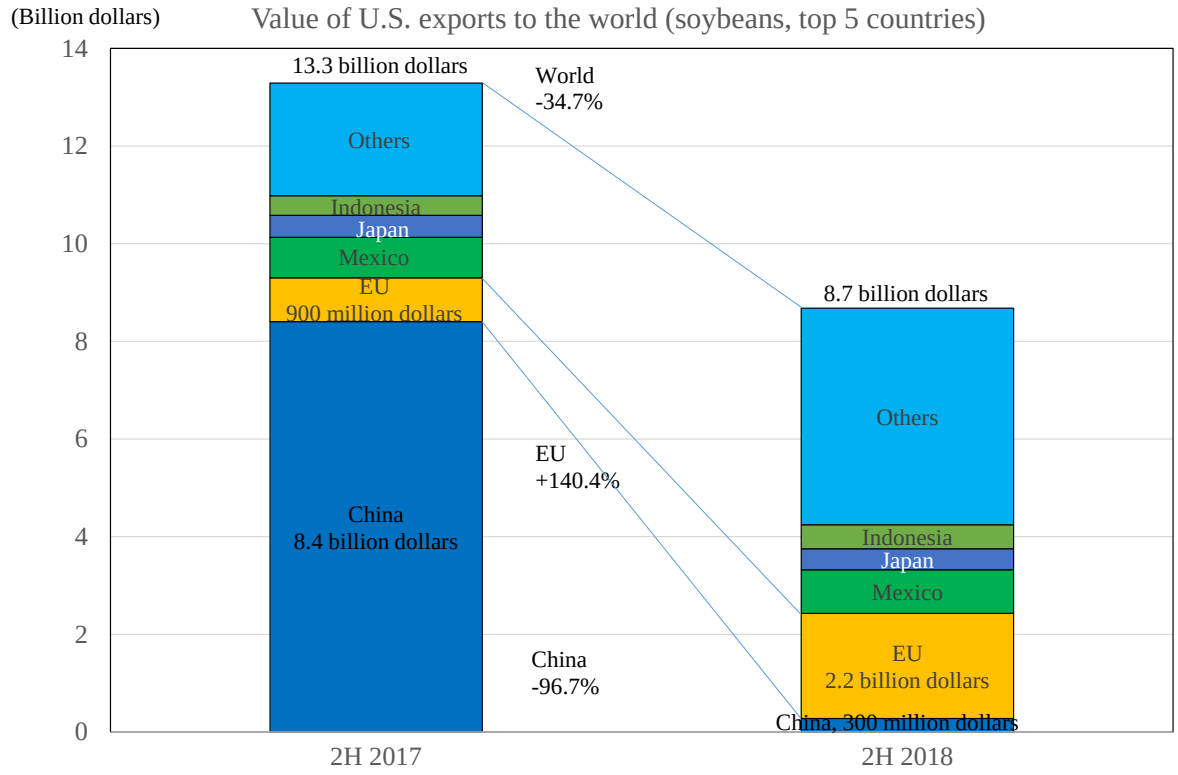
Figure II-2-3-3-21　China's imports (value) from the U.S. and Brazil of soybeans



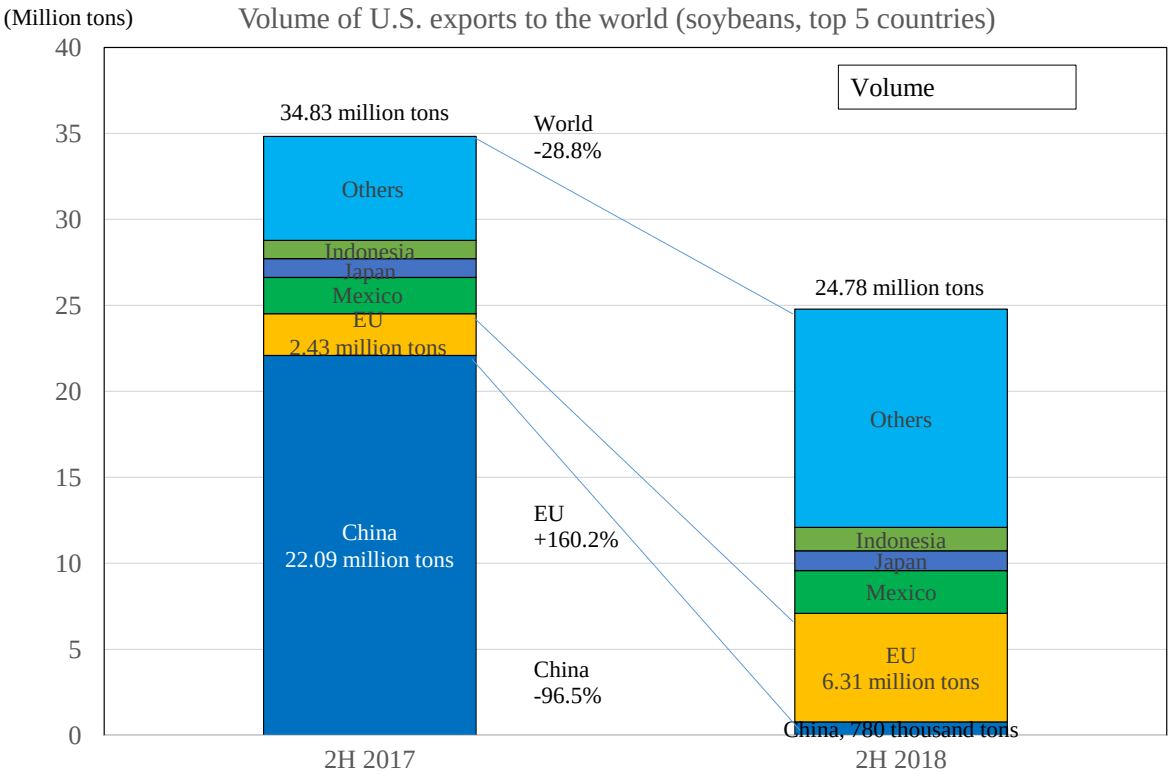
Source: Global Trade Atlas.

However, U.S. exports of soybeans to China fell dramatically because of the tariffs, contracting 96.7% year on year in the second half of 2018, and exports to the world fell 34.7% year on year (Figure II-2-3-3-22). To replace U.S. soybeans, China increased its imports of soybeans from Brazil. Therefore Brazil's exports of soybeans to China rose 75.9% year on year and those to the world increased 63.1% in the second half (Figure II-2-3-3-23).

Figure II-2-3-3-22 U.S. exports to the world of soybeans (second half, value, and volume)

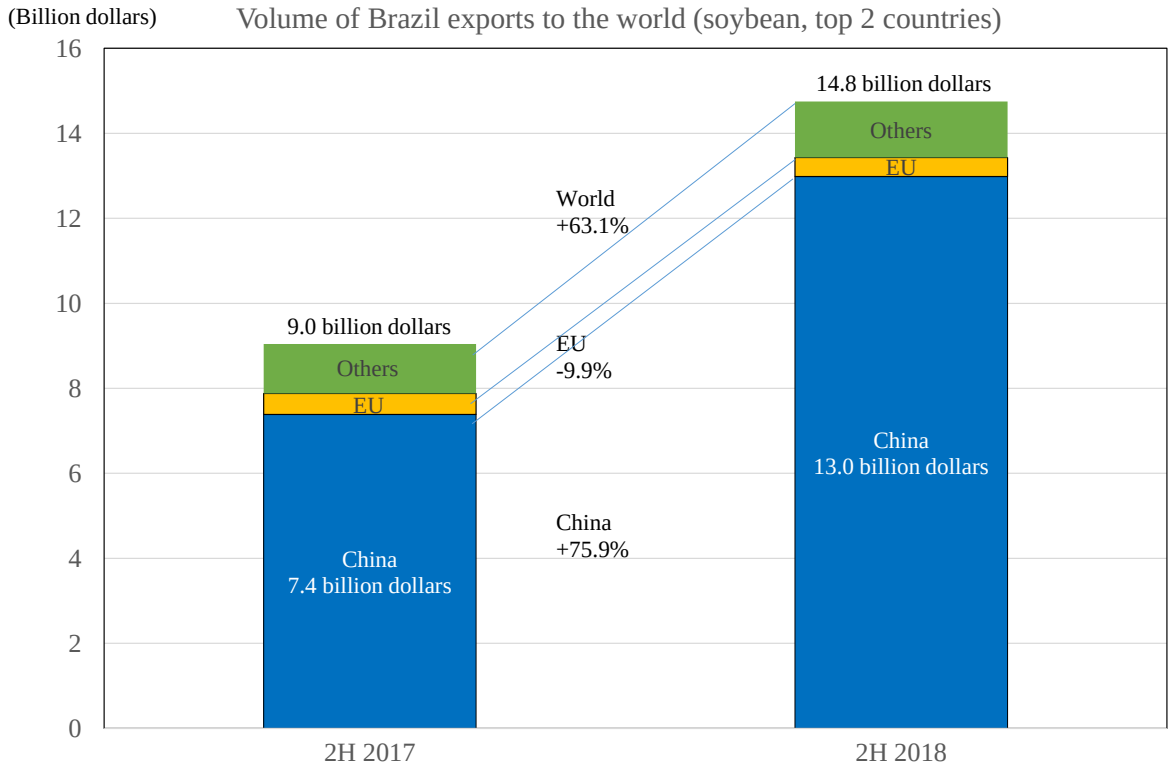


Source: Global Trade Atlas.

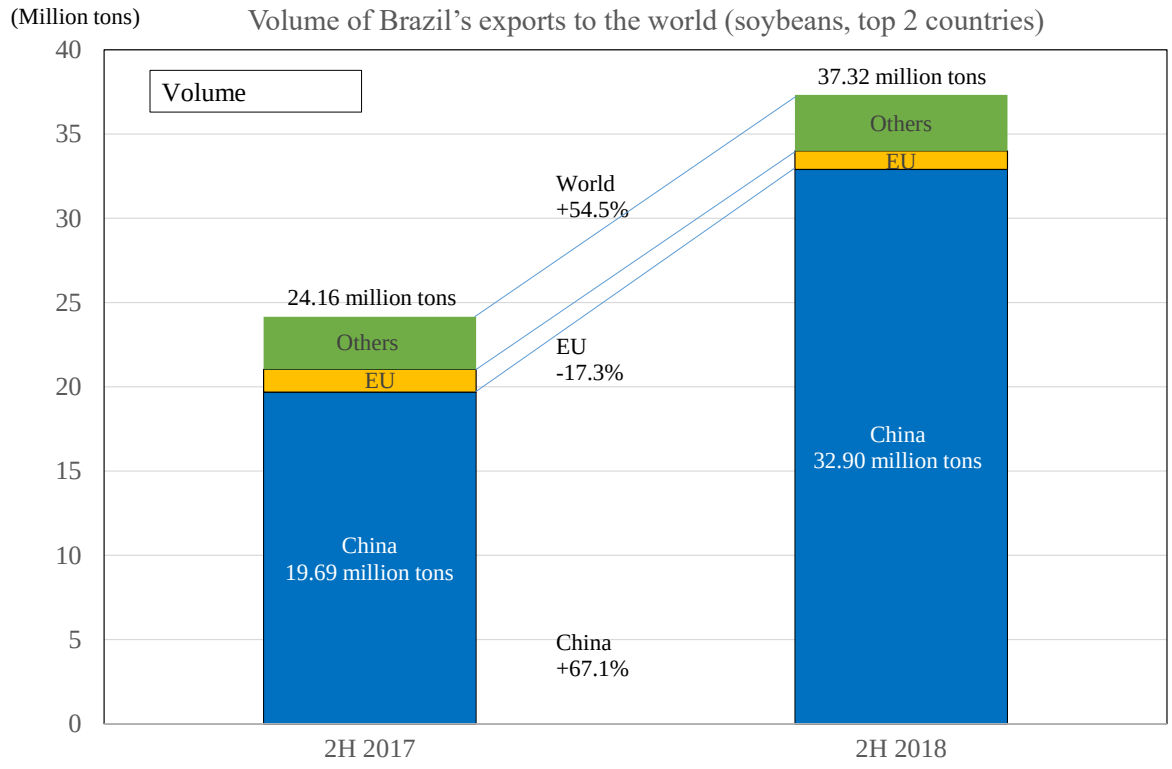


Source: Global Trade Atlas.

Figure II-2-3-3-23 Brazil's exports to the world of soybeans (second half, value, and volume)



Source: Global Trade Atlas.



Source: Global Trade Atlas.

This abrupt substitution of imports resulted in an increase in the import unit price of Brazilian soybeans, which boosted global import unit prices (Table II-2-3-3-24). Soybean supplies tightened throughout the world, and this was reflected in the market price. While Brazil's price rose to more than 130 compared to the beginning of 2018, the U.S.'s price fell to 80 (Figure II-2-3-3-25).

On the other hand, the EU increased its imports of soybeans from the U.S. in response to this change in prices (Figure II-2-3-3-26). In particular, EU imports from the U.S. in the second half of 2018 rose 113.2% year on year (140.4% increase according to U.S. statistics). On the other hand, Brazil's exports to the EU declined 9.9% during the same period. Price issues were probably the main reason that the EU increased the volume of its soybean imports from Japan and EU leaders agreed to eliminate trade barriers in July 25, 2019, and this agreement included moving forward with expanding trade of U.S. soybeans.[133]

Table II-2-3-3-24 Global soybean import unit price

	Unit price (dollars/kg)		
	2016	2017	2018
World	0.41	0.42	0.43
Brazil	0.41	0.41	0.44
U.S.	0.41	0.42	0.42

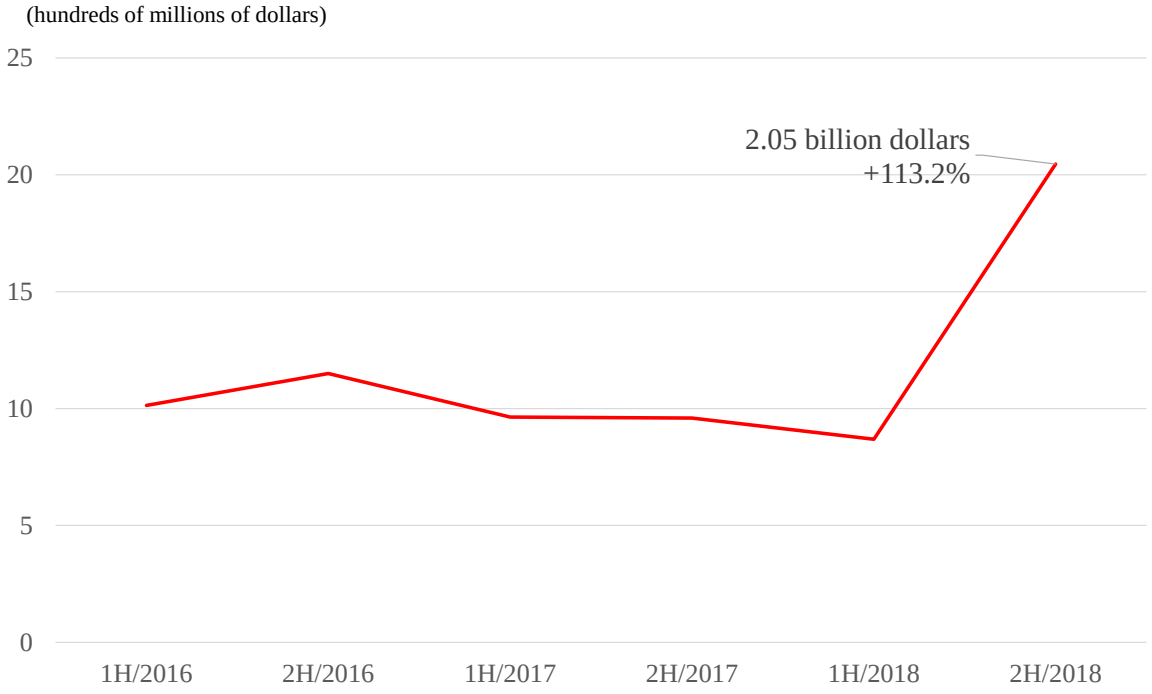
Source: Global Trade Atlas.

133 Jetro Business Tanshin (July 26, 2018), "*EU BEIKOKUSHUNOKAIDAN, MASATSU KARA KYOCHO NO MICHI SAGURU KYODOSEIMEI*"

Figure II-2-3-3-25 Soybean price (U.S. and Brazil)

Source: Refinitiv.

Figure II-2-3-3-26 EU soybean imports (2H, value)

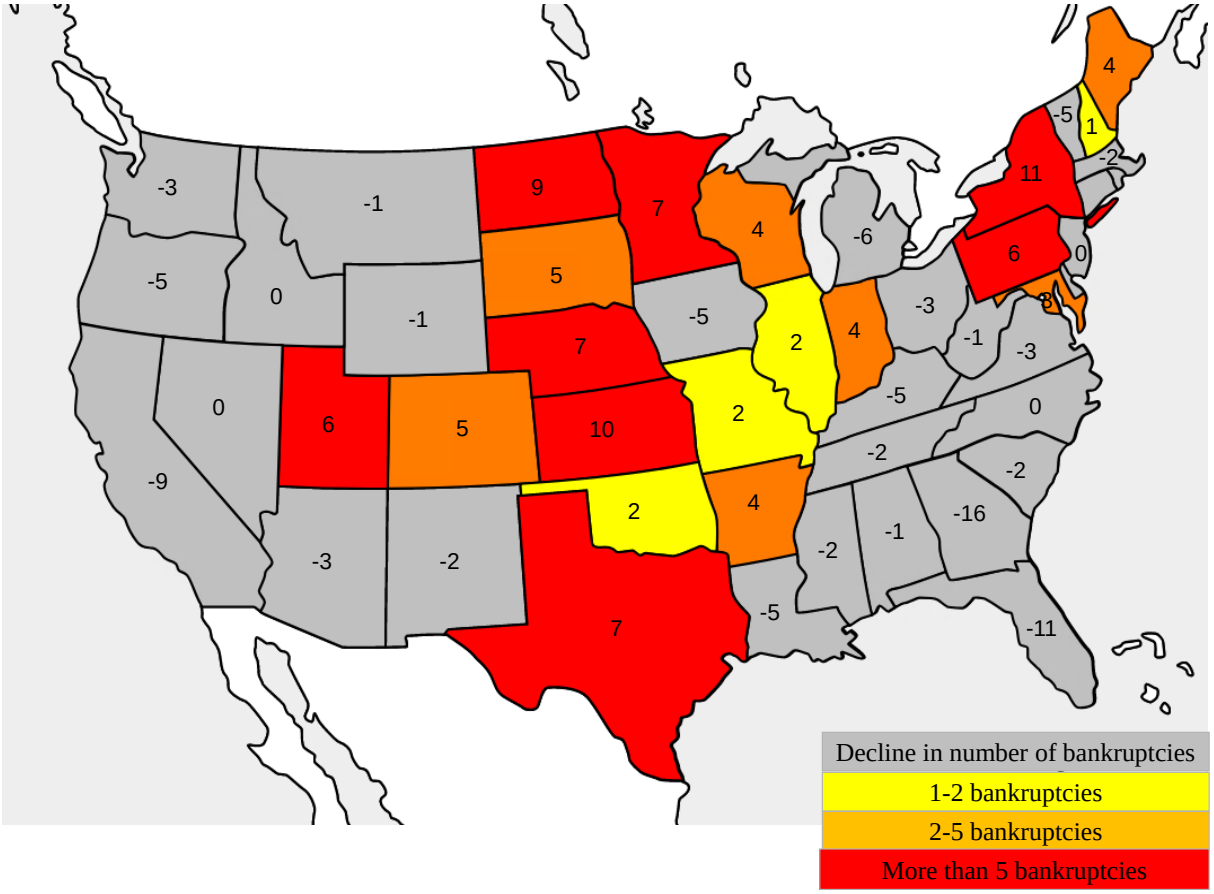


Source: Global Trade Atlas.

We will now take a more detailed look at the impact on each country. In the U.S., the domestic price

of soybeans, which was already low, fell on account of the dramatic decline in exports, and domestic U.S. soybean farmers suffered from serious damage. In response to the difficult situation, particularly for soybean farmers, the U.S. government provided more than 20.0 billion dollars in support in 2018 to compensate domestic farmers for damage they sustained from the trade dispute.[134] Even so, there has been an increase in the number of farm bankruptcies in the Midwest, a major soybean production area (Figure II-2-3-3-27). While there was a decline in bankruptcies due to firm economic condition in the US as a whole,[135] the impact on Midwest farmers was severe.

Figure II-2-3-3-27 Increase in U.S. farm bankruptcies



Note: This is the number of farms that applied for bankruptcy under Chapter 12 of the Federal Bankruptcy Code. Change in the number of cases between 2017 and 2018.

Source: U.S. agriculture associations.

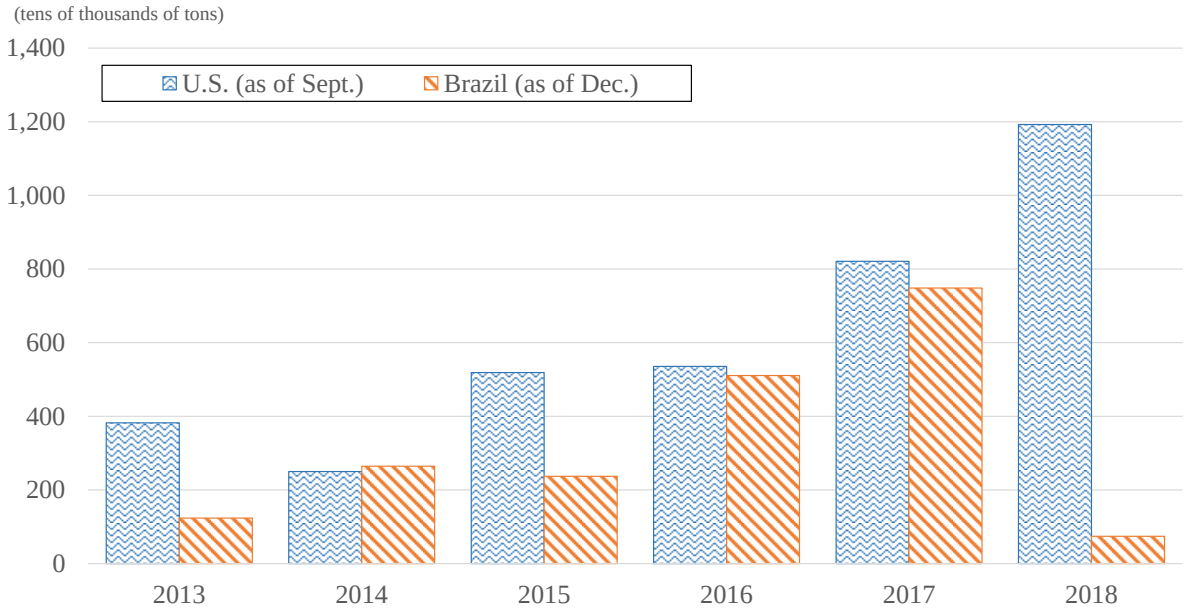
On the other hand, the export price of soybeans rose in Brazil at the same time that exports of soybeans to China increased substantially. One can view this as Brazil profiting from the trade dispute between the U.S. and China. However, its inventory of soybeans shrank substantially because Brazil increased its exports without considering their seasonal nature. By the end of 2018, inventories had

134 JETRO Business Tanshin (Dec. 27, 2018), "*BEIKOKUNOMUSHO GA DAIZUNOKA E NO 73OKU DORU SHIEN WO HAPPYO, BOEKIFUNSO NO EIKYOKANWASHIENKIN DAI2DAN*"

135 American Farm Bureau Federation (2019).

fallen to 750 thousand tons, one-tenth that for the previous year (Figure II-2-3-3-28). Even though Brazil could handle the increase in exports in 2018 by releasing inventory, there may be limits to continue to expand it. Although Brazilian soybean farmers have the option to increase production by planting more acreage, they would bear substantial risk due to uncertainty in the future, as the U.S. may restart exports of soybeans to China depending on negotiations progress. In addition, the area devoted to soybean cultivation fell in the U.S. in 2019, and now Brazil has more area devoted to soybean cultivation than the U.S. (Figure II-2-3-3-29). It is important to pay close attention to progress in U.S.-China negotiations for future trends.

Figure II-2-3-3-28 Soybean inventories (U.S. and Brazil)

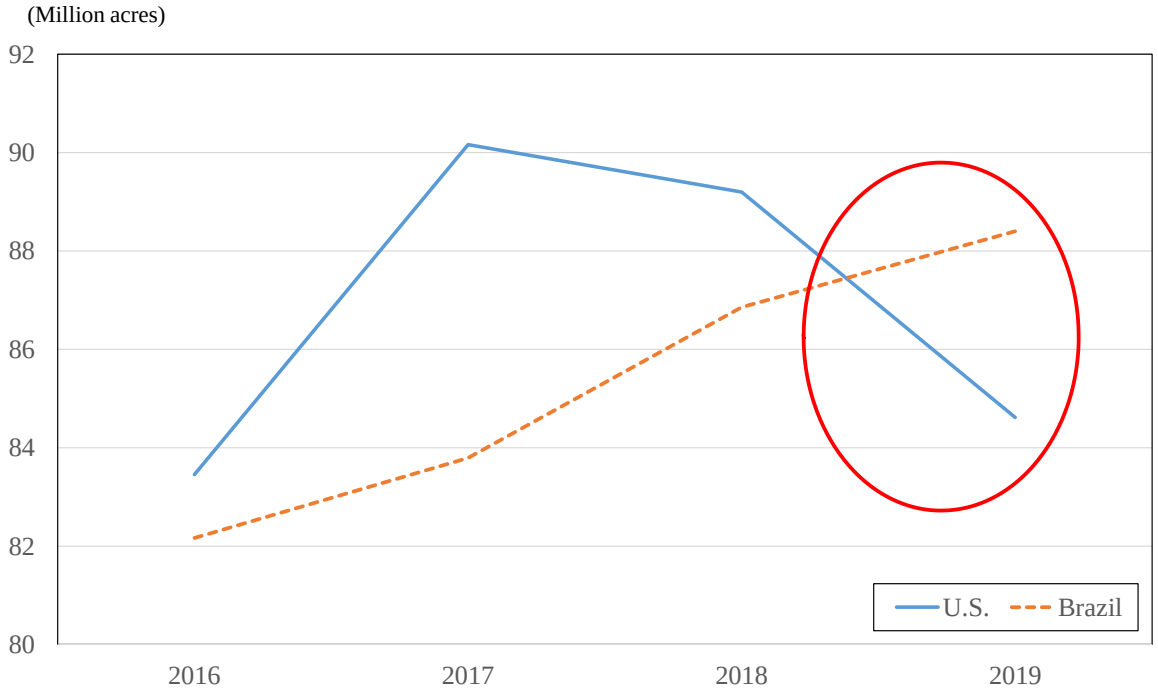


Notes 1. Pre-harvest figures for both countries because of the season nature.

2. Calculated assuming 1 bushel = 0.0272155 tons.

Source: Public material from the U.S. Department of Agriculture for U.S. data and public material from Companhia Nacional de Abastecimento for Brazil data.

Figure II-2-3-3-29 Area of soybean cultivation (Brazil and U.S.)

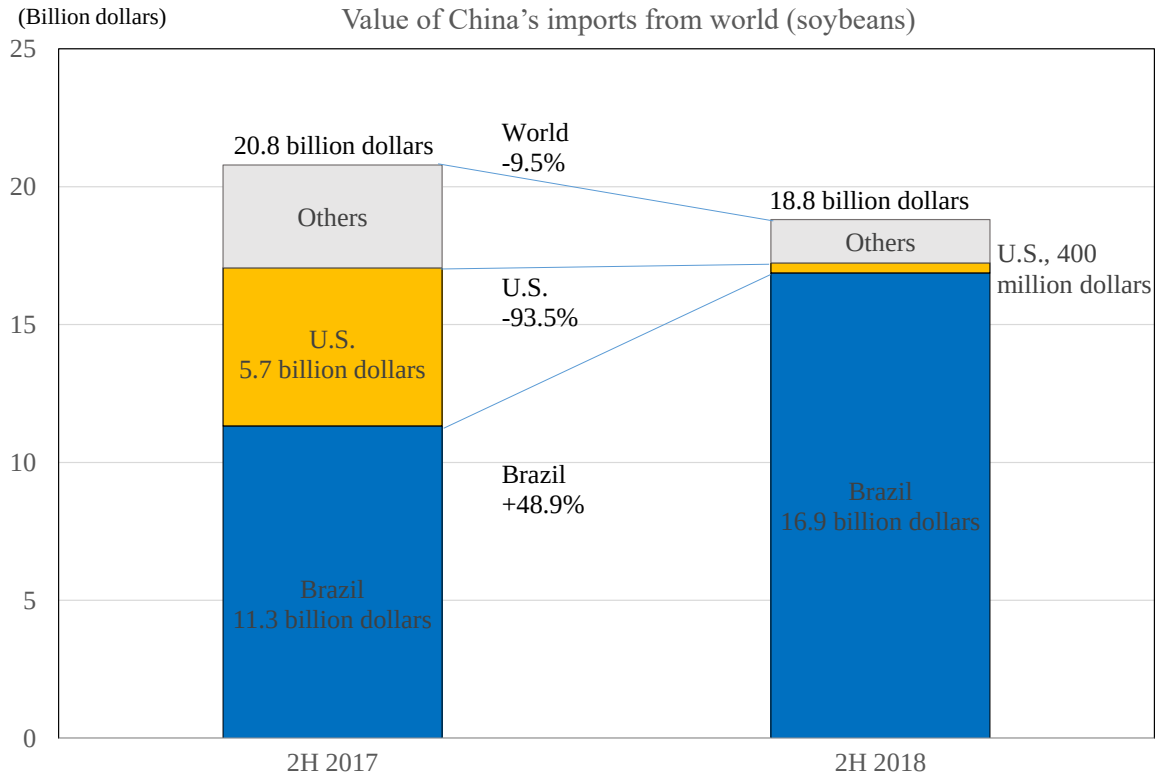


Source: U.S. Department of Agriculture (USDA) and Companhia Nacional de Abastecimento (CONAB).

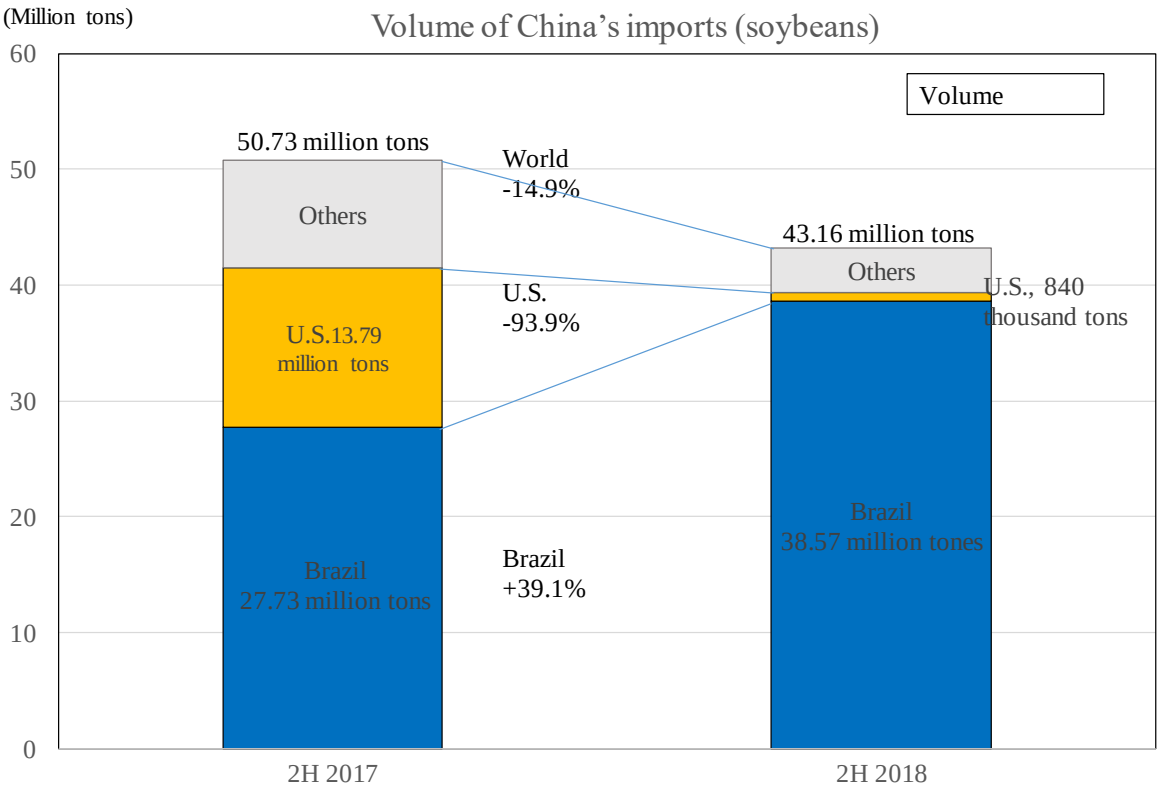
Regarding China, although it has substituted soybean imports from the U.S. Brazil, total soybean imports fell year on year in 2018 (Figure II-2-3-3-30). While there is a perspective that demand has been reduced by replacing soybean oil, one use of imported soybeans, with other oils and lowering the percentage of soybean cake in feed used in the livestock industry,[136] it has also been reported that some pig farms are being pushed to the brink of bankruptcy due to inadequate availability of feed.[137] It will probably be difficult for Brazil to continue to increase its exports to China of soybeans and cover the decline in imports from the U.S. as discussed above. Under these conditions and considering the original volume of imports from the U.S. of soybeans, there are probably limits to how much China can meet domestic demand in the short term as it is not easy to find new soybean exporting countries that could sufficiently replace the U.S. Therefore, China, too, is likely in a difficult situation in the medium and long term.

136 Nikkei Business (Nov. 2, 2019), "*CHUGOKU TSUIKAKANZEI GA MOTARASHITA YUNYUDAIZU NO KYOUKYUUBUZOKU*"
137 AERA.dot (Dec. 26, 2018), "*BEICHUUBOEKISENSO DE CHUGOKU NI DAIBUUMERAN 'DAIZUSHOKKU' DE CHIKUSAN HOUKAI SUIZEN!*"

Figure II-2-3-3-30 China's imports from the world of soybeans



Source: Global Trade Atlas.



Source: Global Trade Atlas.

(3) Analysis of the impact of trade disputes

As the trade dispute between the U.S. and China has grown more serious, numerous entities, including international institutions and think tanks, have released analyses of the economic impact of countries imposing tariffs on each other. Here, we would like to discuss model analysis conducted by the IMF and OECD.

The IMF looked at five scenarios and conducted an analysis of the impact of additional tariffs between the U.S. and its trading partners in October 2018 (Figure II-2-3-3-31 and Figure II-2-3-3-32). For scenario 1, it is assumed that the U.S. levies Trade Expansion Act of 1962 Section 232 tariffs on steel and aluminum imports and U.S. Trade Act of 1974 Section 301 tariffs on imports from China of targeted items[138] and that China imposes counter-tariffs to these as of October 2018. Scenario 2 includes the same assumptions of scenario 1 and that the U.S. imposes other additional tariffs on imports from China equivalent to 267.0 billion dollars in 2017 and that China imposes counter-tariffs on all imports from the U.S. (total including scenario 1 of 130.0 billion dollars[139]). Scenario 3 includes the assumptions of scenario 2 and that the U.S. levies a tariff of 25% on imports of cars and car parts, and in response, U.S. trading partners impose equivalent countermeasures. Scenario 4 includes the assumptions of scenario 3 and that companies change their investment plans due to uncertainty from the trade war.[140] Scenario 5 includes the assumptions of scenario 4 and a trial calculation of other factors including the market impact of corporate earnings falling 15% if the trade dispute between the U.S. and China deteriorates to its worst possible.

Under scenario 1 and 2, which assumes U.S. Trade Act of 1974 Section 301 tariffs and countermeasures, the impact on 2019 U.S. GDP, which would be impacted by these additional tariffs and counter-tariffs, is a mere -0.2%. On the other hand, under scenario 1 and 2 for the same year, there is a negative impact on China's GDP of slightly less than 1.2%, more than six times the impact on the U.S.'s GDP. If the impact of scenario 3 car tariffs are included, however, the negative impact on the GDP of the U.S., a major exporter of cars,[141] jumps to -0.6%, and if the impact of credit concerns (scenario 4) and markets (scenario 5) are included, the negative impact increases to -0.9%. For China, however, scenario 3 (car tariffs) does not increase the negative impact much, but adding scenario 5's impact on the market has a major impact. It is assumed that the strong negative impact on China under scenario 5 is because generally speaking, it is more difficult for companies in emerging countries to raise funds than for companies in advanced countries (Figure II-2-3-3-31 (B)). Furthermore, if one considers the impact of scenario 5, which entails the strongest negative impact, by region, a trial calculation reveals that in 2019 there is an overall impact of -0.8% for the whole world while in the long term it falls to about -0.4%. It is important to keep in mind that this analysis does not reflect the details of the United States-Mexico-Canada Agreement (USMCA) (new North American Free Trade

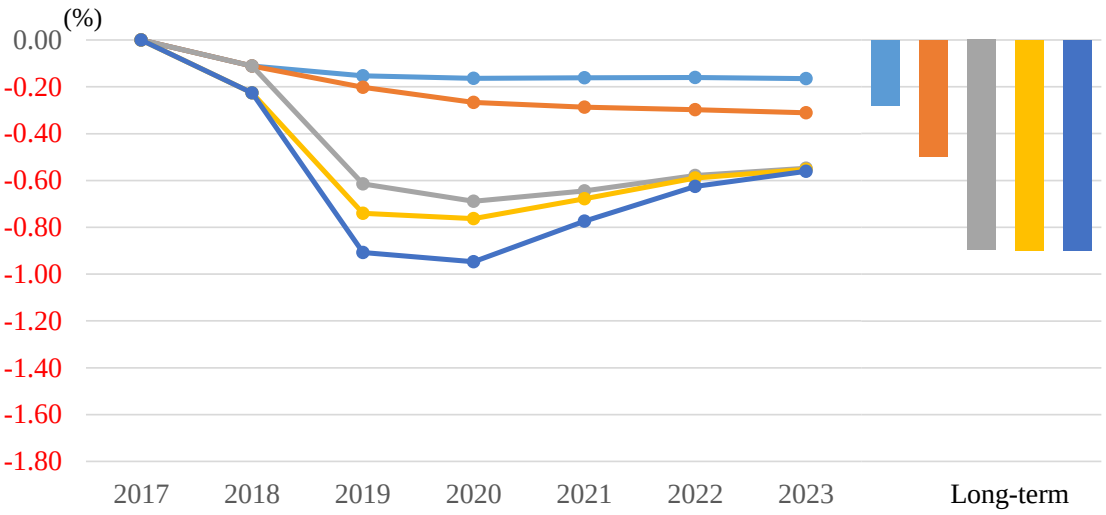
138 This includes the first round of tariffs (levied on July 6, 2018), second round of tariffs (levied on Aug. 23), and the third round of tariffs (levied Sept. 24).
139 Estimates are based on 2017 U.S. trade statistics.
140 The trial calculation includes a decline in investment of about 1/6th that due to the global financial crisis.
141 Items such as cars account for 7.8% of U.S. exports in 2018, and it is assumed that retaliatory measures would have a major impact (see Part 1, Chapter 3, Section 1, "United States").

Agreement) concluded by September 2018, and there are indications that the impact on NAFTA is substantial. A trial calculation reveals that for Japan, too, this would have a negative impact of -0.5% in 2019 and approximately -0.2% in the long term because of Japan's strong car trade with the U.S. (Figure II-2-3-3-32).

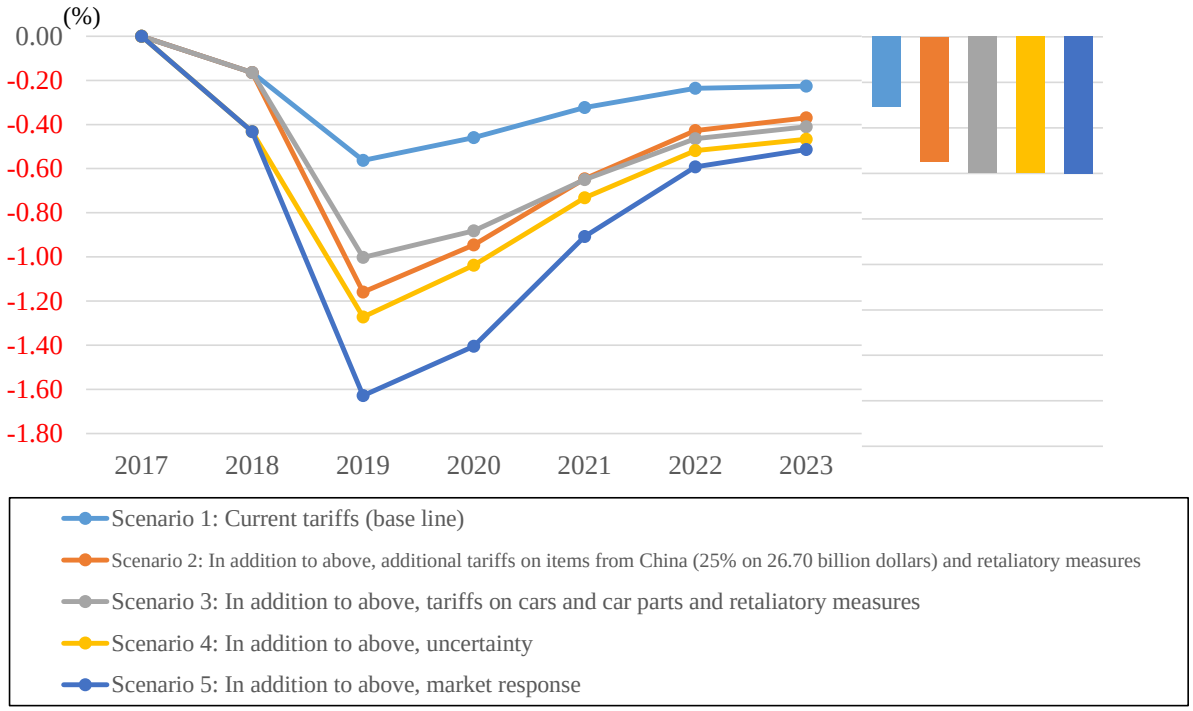
Next, we would like to look at an analysis by the OECD of the impact of additional tariffs between the U.S. and China. In November 2018, the OECD looked at four scenarios and analyzed the impact that U.S. and China's tariffs would have on GDP and trade through 2021 (Figure II-2-3-3-33). Scenario 1 is an analysis of the impact of tariffs levied by the U.S. and China on trade with each other through September 2018. Scenario 2 envisions that the U.S. imposes an additional tariff of 10%–25% on 200.0 billion dollars' worth of imports from China starting in January 2019, and in response, China levies counter-tariffs on 60.0 billion of imports from the U.S. Scenario 3 assumes that tariffs of 25% are imposed on all remaining items starting in July 2019. Scenario 4 assumes that the risk premium increases 50 bps throughout the world for three years.[142]

142 This assumes that the risk premium gradually returns to normal after three years.

Figure II-2-3-3-31　IMF analysis (Scenario 1-5: Impact on U.S. and China)

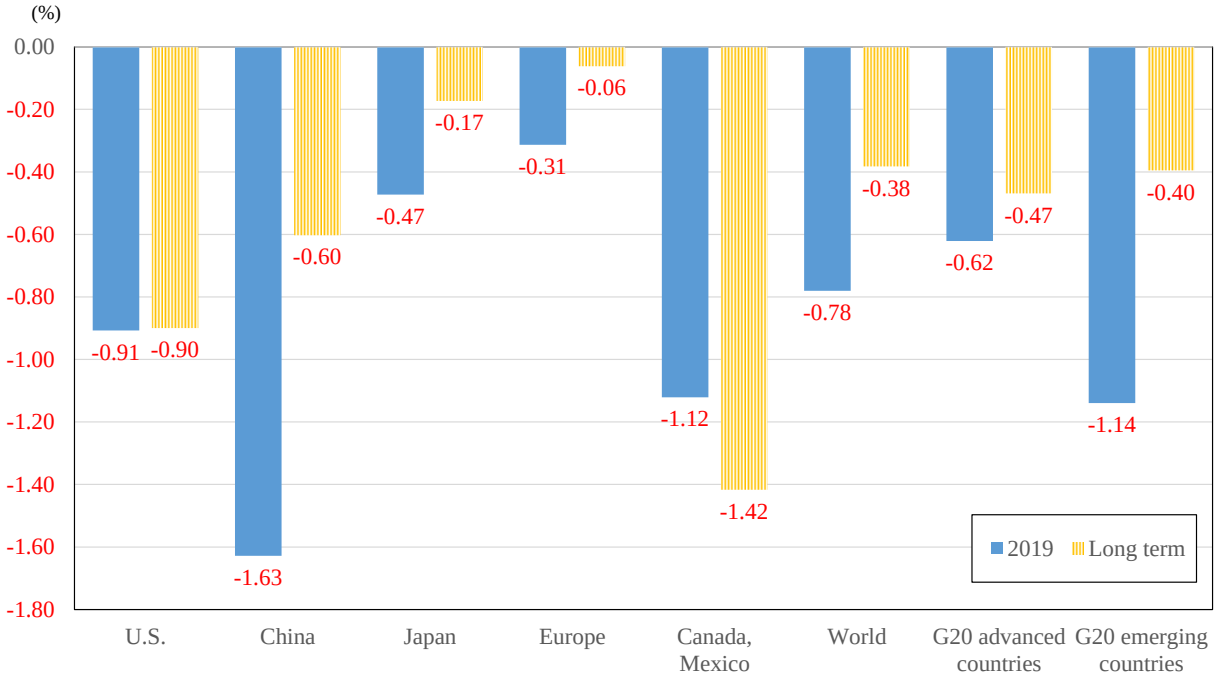


Source: World Economic Outlook, IMF (Oct. 2018).



Source: World Economic Outlook, IMF (Oct. 2018).

Figure II-2-3-3-32　IMF analysis of impact (scenario 5, by region)

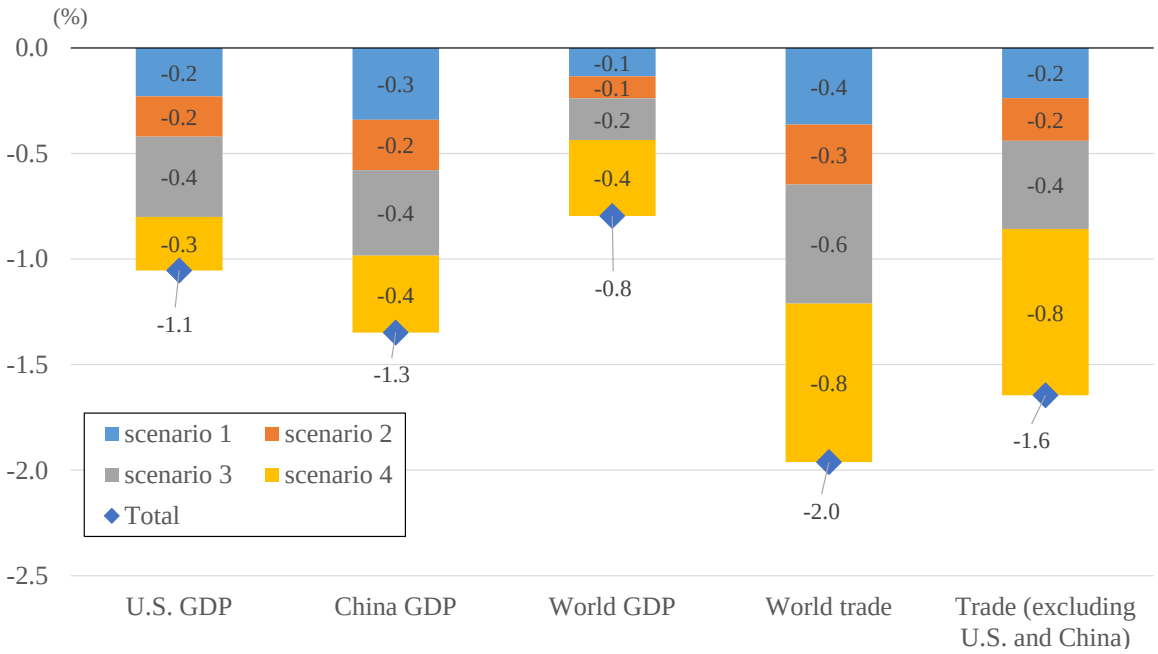


Notes 1. The IMF analysis breaks down the impact of trade disputes into five scenarios, and the figures in this graph represent the results of the analysis of scenario 5, which takes into consideration all factors—additional tariffs and retaliatory measures already implemented, tariffs on cars being examined, uncertainty, and market responses.

2. It is important to keep in mind that this analysis is as of October 2018, and the scenario does not reflect the content of the United States-Mexico-Canada Agreement (new North American Free Trade Agreement) concluded in September 2018, and this will have a major impact on Canada and Mexico.

Source: IMF WEO, October 2018.

Figure II-2-3-3-33 OECD analysis of impact



Notes: Scenario 1 is the impact of tariffs imposed on trade between China and the U.S. through September 2018. Scenario 2 is the impact of the U.S. levying an additional tariff of 10%–25% on 200.0 billion dollars' worth of imports from China (and includes China's retaliatory tariffs on 60.0 billion dollars' worth of imports) starting in January 2019. Scenario 3 is the impact of levying a tariff of 25% on all remaining trade starting in July 2019. Scenario 4 is the impact of a global rise in the risk premium of 50 bps for three years (it is assumed that after three years, the risk premium gradually falls).

Source: OECD Global Economic Outlook (Nov. 2018).

In scenario 1, there is not only a contraction in global trade, but the increase in producer costs and consumer prices weights[143] down the economy, and global GDP falls 0.1%. As for details, countries other than the U.S. and China benefit from greater competitiveness in the U.S. and Chinese markets in the short term. In the long term, however, the decline in demand in the U.S. and China, massive markets, negates the replacement effect.

In scenario 2, the impact on the global, U.S., and China GDP is up to twice as large as that in scenario 1. In particular, a major point is the expected 0.6% increase in U.S. consumer prices.

In scenario 3, the volume of U.S. imports from China and China's imports from the U.S. are assumed to fall 2% in both 2020 and 2021. In addition, it is assumed that in 2021, U.S. GDP declines dramatically, about 0.75%, because of an approximately 2% contraction in corporate investment in the U.S. and a 0.9% increase in consumer prices. In particular, it is assumed there is a 0.25% decline in GDP for both Mexico and Canada, which have close economic ties to the U.S.

In scenario 4, it is envisioned that uncertainty about trade policy and concerns about hikes in a broader range of items have a negative impact on the investment plans of companies throughout the world. If the investment risk premium increases 50 bps for three years throughout the world, it is

143 It is assumed that consumer prices increase 0.2% in both 2019 and 2020.

assumed that global GDP falls 0.8% through 2021 because of the greater capital costs and tariffs.

This analysis in only an economic model that focuses on a certain process, but in fact there are various economic variables that have not been included in the analysis. As of the writing of this white paper, current conditions fall under scenario 1 of both IMF and OECD analyses, but the analyses are different, and in fact, the economic impact has been greater on the U.S. than discussed above. It is important to keep in mind that if the U.S.-China trade dispute grows more serious or continues for a long time, it is extremely difficult to accurately determine how far the impact will spread in the medium and long term and that these analyses should only be used as a single reference.

(4) Harmful impact of trade-restrictive measures

As discussed above, the recent tit for tat raising of tariffs is arbitrarily altering the flow of global trade and impacting not only involved countries (countries that imposed the tariffs and targeted countries) but also third-party countries, and this is inviting a series of hikes in tariffs. Furthermore, trade flows may change once again depending on progress in trade negotiations between involved countries, and uncertainty about the future is a major risk for business decisions by various entities undertaking business activities. There is the risk that this could lead to a decline in economic activity and thus slow global economic growth.

In addition, these unilateral measures that restrict trade are fundamentally inconsistent with WTO principles of a multilateral trade system. The WTO Agreement clearly prohibits implementing unilateral sanctions not based on WTO dispute resolution procedures. A multilateral trade system is based on all countries adhering to international rules, including the WTO Agreement, which gives order to the system, and when disputes arise, they should be resolved through international rule-based dispute resolution procedures, not unilateral action. Furthermore, bilateral agreements based on negotiations due to unilateral measures may deviate from the principle of most-favored-nation treatment, and there is the danger that these measures will lead to punitive measures and a vicious cycle of unilateral countermeasures. From this perspective, too, it is important to pay close attention so that unilateral actions do not undermine the system of free trade that the WTO aims to create.

Column 8 Impact of greater car and car part tariffs based on Trade Expansion Act of 1962 Section 232[144]

On May 23, 2018, U.S. President Trump instructed the U.S. Department of Commerce to conduct a security investigation related to car and car part imports based on Section 232 of the Trade Expansion Act of 1962. On February 17, 2019, the Department of Commerce submitted a report on the investigation to the president.

In 2018, the top countries in terms of U.S. imports (value) of cars and car parts were Mexico (107.1 billion dollars), Canada (55.4 billion dollars), Japan (53.1 billion dollars), Germany (27.2 billion dollars), and Republic of Korea (19.2 billion dollars). Additional tariffs would probably impact imports from these countries.

The Center for Automotive Research (CAR), an organization that specializes in car industry research, released a report on the impact that the series of commerce-related measures implemented by the Trump administration, including the possibility of imposing additional tariffs on cars and car parts, would have on the U.S. car market and employment. According to the report, if besides the additional tariffs on steel and aluminum already imposed, additional tariffs on cars and car parts are levied, the volume of U.S. car sales would decline about 1.32 million units annually and 370,000 jobs would be lost.

Furthermore, the Peterson Institute for International Economics, a U.S. think tank, calculated that if domestic car production falls 1.5%, 195,000 jobs are lost for 1-3 years or more, and all countries/regions that import U.S. items impose similar countermeasures on the U.S., 624,000 jobs would be lost.

Industry associations in Japan and other countries, including the car associations of various countries, released comments to the effect that there are concerns about the impact that import-restrictive measure will have on the U.S. car industry, economy, employment, etc. The focus is on what will happen next.

144 This column is based on information available as of April 2019.