Chapter 2
Quantitative Modeling Results

As noted in chapter 1, the Bipartisan Congressional Trade Priorities and Accountability Act of 2015 requires the Commission to assess TPP's impact on U.S. real gross domestic product (GDP); exports and imports; aggregate employment and employment opportunities; and the production, employment, and competitive position of industries likely to be significantly affected by a trade agreement.

In response to this requirement, this chapter presents a quantitative analysis of the TPP Agreement using a dynamic computable general equilibrium (CGE) model. This model incorporates the U.S. economy's projected growth in labor, capital, and GDP from 2017 to 2047, when the agreement would be fully implemented, assuming a 2017 entry into force. Under that scenario, the majority of TPP's provisions would be phased in by 2032 (year 15). Most of the modeling results in this report refer to the impact of the agreement in that medium term or year 15.

This chapter goes further than the Commission's previous analyses of free trade agreements (FTAs), which estimated only the effects of liberalizing tariffs and nontariff measures (NTMs) on goods. The analysis in this chapter not only examines these effects, but also presents the effects of liberalization in services NTMs and in cross-border investment among member economies.

Model Results on the Effects of the TPP Agreement

This section presents the effects of the TPP Agreement on the U.S. economy. It first considers effects at the economy-wide level, followed by effects at the broad sector level, and finally at varying industry levels, as defined by the sectoral aggregates in the model. The presentation of industry results in this chapter is general. More specific discussions about selected industries, including modeling results, are included in subsequent chapters.

Economy-wide Effects

The Commission estimates that by 2032, the TPP Agreement would increase annual U.S. GDP in 2032 relative to the 2032 baseline by $42.7 billion in 2017 dollars, or by 0.15 percent of total

U.S. GDP (table 2.1 and box 2.1).[29] By year 2047, U.S. real GDP would expand by $67 billion, or by 0.18 percent, relative to the 2047 baseline value. The U.S. economic benefits of improved market access and investment conditions would be magnified over time through growth in the U.S. workforce and U.S. investment.

The Commission estimates that by 2032, TPP would expand U.S. employment by close to 128,000 full-time equivalents (FTEs) above the 2032 baseline, or about 0.07 percent of total U.S. employment.[30] By year 2047, employment would expand by nearly 174,000 FTEs, or 0.09 percent, relative to 2047 employment in the baseline. TPP would cause U.S. investment in capital goods to expand and, as a result, installed capital would expand by 0.18 percent by 2032. By year 2047, the capital stock would expand by 0.24, relative to the baseline in that year.

Table 2.1: Economy-wide effects of TPP: Changes relative to baseline in 2032 and 2047

	2032		2047	
	Billion $	Percent	Billion $	Percent
Real income	57.3	0.23	82.5	0.28
Real GDP	42.7	0.15	67.0	0.18
Employment (full time equivalents, thousands)	128.2	0.07	174.3	0.09
Capital stock	171.5	0.18	343.5	0.24

Source: USITC estimates.
Note: Dollar values are in 2017 prices.

The Commission also estimates that U.S. real income would increase by $57.3 billion (or 0.23 percent of GDP) relative to the baseline in 2032. The change in real income summarizes growth in U.S. purchasing power, and can be interpreted as stating that TPP would provide annual benefits to U.S. consumers worth $57.3 billion in 2017 dollars by 2032.[31] By 2047, U.S. real income would increase by $82.5 billion, or 0.28 percent, due to TPP.

The Commission model estimates that by 2032, U.S. exports to the TPP countries would increase by $57.2 billion over the 2032 baseline, with the majority of these exports due to growth in exports to new FTA partners in the agreement (table 2.2). Total exports to the world would increase by $27.2 billion, indicating that some of the additional U.S. exports to the TPP region would represent exports diverted away from non-TPP countries.

[29] For the purpose of the modeling analysis, an entry into force in 2017 is assumed. See box 2.1 for information on how to interpret the modeling results and appendix G for details on the construction of the baseline projection.
[30] Additional discussion of results related to employment and the U.S. trade balance can be found later in this chapter.
[31] Real income includes both real GDP (which measures production and the allocative efficiency of resources in the domestic economy) and benefits realized through changes in international prices ("terms of trade" effects). As a welfare measure, a change in real income is often referred to as the "equivalent variation."

Table 2.2: Effects of TPP on U.S. trade: Changes relative to baseline in 2032

	Exports		Imports	
	Billion $	Percent	Billion $	Percent
Trade with TPP partners	57.2	5.6	47.5	3.5
New FTA partners	34.6	18.7	23.4	10.4
Existing FTA partners	22.6	2.7	24.2	2.1
Trade with the world	27.2	1.0	48.9	1.1

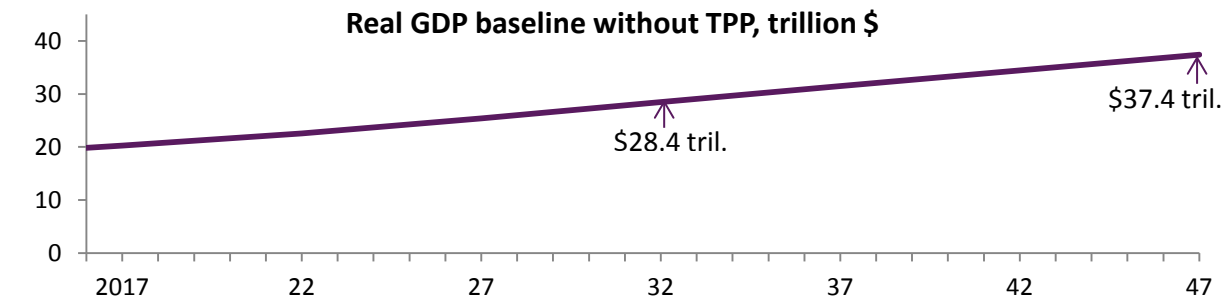
Source: USITC estimates.
Note: Dollar values are in 2017 prices.

Meanwhile, U.S. imports from the TPP countries would increase by $47.5 billion over the 2032 baseline. The percent increase in imports from new FTA partners would be five times that of imports from existing FTA partners. However, owing to the much higher pre-TPP trade flows with existing partners, existing partners' imports would increase slightly more than for new partners. U.S. imports from the world would increase by $48.9 billion from the effects of TPP.

U.S. net exports (exports minus imports) with respect to the TPP parties would increase by $9.6 billion. However, net exports to the world, or the aggregate U.S. trade balance, would decrease by $21.7 billion. The results for the United States' aggregate trade balance, however, depend on model assumptions on the rate of saving versus investment, which are explained later in this chapter.

Box 2.1: Interpreting the Commission's modeling results

In its analysis of the TPP Agreement, the Commission first developed a baseline projection that reflects the potential evolution of the U.S. and global economies to 2047 in the absence of TPP. This baseline is based on economic and demographic projections for the 12 countries in TPP as well as major non-TPP trading partners. These projections are considered the baseline projection (i.e., the projection models the world with no TPP) for the 30 year period during which TPP is to be implemented. For example, the baseline projection estimates the U.S. real GDP (or the size of the U.S. economy) to be $37.4 trillion in 2047; an increase of 88.2 percent over the $19.9 trillion size of the GDP in 2017. The Commission then analyzes the potential impact of TPP relative to this projection of the world economy under the assumption of a TPP entry into force in 2017

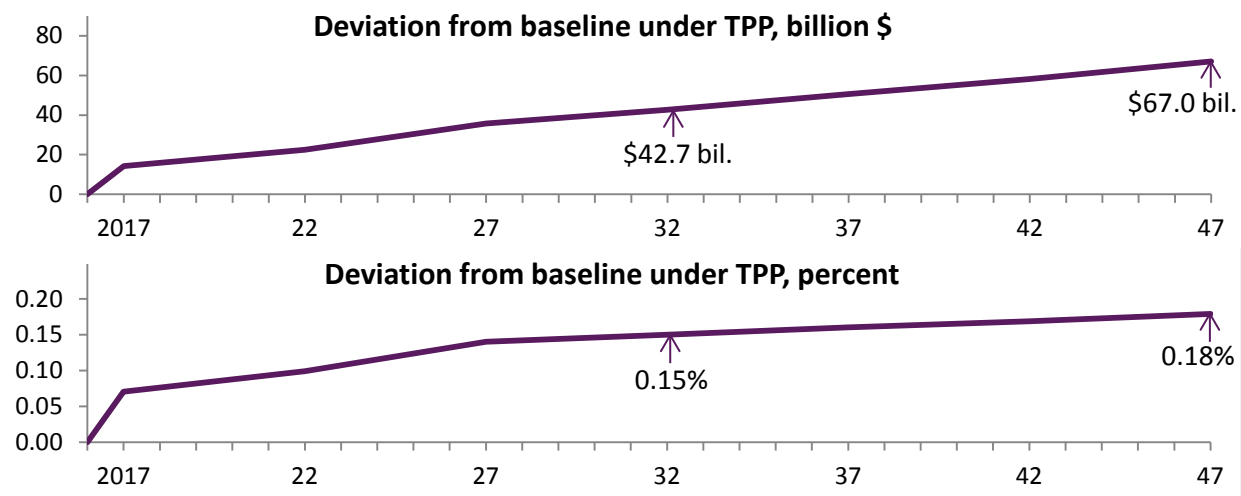


Source: USITC estimates.

Modeling results are expressed as changes from the baseline projection, either as dollar changes or as percentage changes, unless otherwise noted. For example, the Commission estimates that TPP would expand U.S. real GDP by $42.7 billion relative to the baseline GDP projection of $28.4 trillion in 2032

(i.e.,15 years into the agreement). Since the United States' projected GDP is $28.4 trillion in 2032, the percentage deviation from the baseline due to TPP would be small (about a 0.15 percent increase).

The figure below shows baseline GDP up to the year 2047 (upper panel) and the deviations from the baseline during the period (lower panels), on a dollar and percentage basis. The majority of the effects on GDP are experienced early in the agreement by 2032 (year 15 of the agreement). By year 2047, or year 30, TPP would increase GDP by $67 billion relative to the baseline (about a 0.18 percent increase).Most quantified effects in terms of output, employment, and trade, especially at the economy-wide level, would likewise be small in their impacts. Certain industry sectors, however, may exhibit more pronounced effects under the agreement, as shown in chapters 3, 4, and 5.



Source: USITC estimates.

Broad Sector-level Effects

While output and employment would increase in the overall economy due to TPP, this change would be driven by expansion in the agriculture and food sector and the services sector. In dollar terms, the output of the services sector would expand the most ($42.3 billion) relative to its baseline volume in 2032 (table 2.3). In percentage terms, however, the output and employment of the agriculture and food sector would expand the most, by 0.5 percent. Meanwhile, output and employment in the manufacturing, natural resources, and energy sector would contract slightly under TPP, compared with the baseline. Trade barriers in this sector are already low, and larger liberalization in other sectors of the economy would likely drive a reallocation of resources away from these sectors and into other expanding sectors in the economy. At a more disaggregated level, however, certain industries in manufacturing would expand under TPP.

The Commission estimates that TPP would increase imports and exports for all broad sectors of the economy. U.S. exports of manufacturing, natural resources, and energy would expand the most in dollar terms, growing by $15.2 billion relative to the baseline in 2032; however, agriculture and food exports would expand the most in percentage terms. Similarly, the largest expansion of U.S. imports in percentage terms would be for agriculture and food products

(1.5 percent). U.S. imports of manufacturing, natural resources, and energy would increase the most in dollar terms, by $39.2 billion relative to the baseline.

The manufacturing sector would experience both a rise in imports and a decline in output. In some manufacturing sectors, such as titanium, the rise in imports would be due to demand for cheaper imports driven by lower U.S. tariffs. For the manufacturing sector as a whole, however, the model does not suggest that the rise in cheaper imports would be the main driver of the output decline. The CGE model assumes that U.S. aggregate output is equal to its productive capacity. It flows from this that greater liberalization in one sector will drive a reallocation of resources away from other sectors that experience less liberalization or where liberalization has already occurred. Hence, for the manufacturing sector as a whole, output would grow less rapidly relative to the baseline projection, as capital and workers move to services and agriculture, which in turn would raise demand for manufactured imports. As explained below, the model does not capture the costs associated with employment transition between sectors and temporary unemployment.

Table 2.3: Broad sector level effects of TPP on U.S. output, employment, and trade: Changes relative to baseline estimates in 2032

	Exports		Imports		Output		Employment
	Billion $	Percent	Billion $	Percent	Billion $	Percent	Percent
Agriculture and food	7.2	2.6	2.7	1.5	10.0	0.5	0.5
Manufacturing, natural resources, and energy	15.2	0.9	39.2	1.1	-10.8	-0.1	-0.2
Services	4.8	0.6	7.0	1.2	42.3	0.1	0.1

Source: USITC estimates.
Note: Dollar values are in 2017 prices.

Industry-level Effects

Sectoral results of the modeling are shown in tables 2.4, 2.5, and 2.6. Many of these sectors are addressed in detail in chapters 3, 4, and 5, respectively, of this report. An overview of the results is presented here to provide a basis for understanding the range of sectoral results shown in the table. At its core, the TPP liberalization as modeled is driven by the reduction or removal of tariffs and nontariff barriers. Sectors benefiting from the most extensive liberalization measures tend to expand production and exports as they become relatively more competitive in the world economy: these are the direct effects of TPP. In turn, these direct effects trigger a cascade of indirect effects in the economies benefiting from liberalization, and spreading to other economies through trade and investment channels. Because of the "general equilibrium" nature of the model, sectors that benefit less from liberalization may shrink relative to sectors in which the effects of liberalization are more pronounced and baseline estimates as resources move to sectors with greater opportunities.

Although the model estimates that TPP liberalization will cause U.S. production to be lower in certain industry sectors relative to baseline, the Commission expects that U.S. production in all 56 sectors included in the model would increase on an absolute basis between 2017 and 2032, under both the baseline estimate and the provisions of the TPP. This expectation is incorporated in the TPP model and is based on sectoral growth projections informed from macroeconomic projections from the IMF, the OECD, and the ILO, as well as Commission expertise.

Consider, for example, the results in agriculture and food products (table 2.4). A number of subsectors would experience substantial expansion for U.S. exports under TPP, such as beef meat and dairy products (both discussed in chapter 3). U.S. beef exports would experience not only tariff reduction, but also substantial expansion in their tariff-rate quotas (TRQs) in certain TPP countries, which would allow for additional market access. The same would be generally true for dairy products. Looking at the upstream effects of this change, expansion of beef meat production would drive increased demand for cattle which, in turn, would lead to a contraction in live cattle exports and an expansion in U.S. cattle herds. The expanded cattle herds would generate more demand for feed from the corn and other grains sectors, which in turn would drive an expansion in these sectors and draw production from net exports of grains toward domestic use to ultimately produce beef meat.

Dairy products would follow the same pattern: as U.S. dairy producers would face falling tariffs and more generous TRQs overseas, the raw milk sector (grouped here under all other agriculture) would expand and draw with it higher volumes of corn and other grains for domestic feed. The other meats sector would follow the same pattern observed in beef meat and in dairy products. Because agriculture production requires land, of which only a fixed quantity is available in the model, expansion of meat, dairy, and related animal feed sectors would draw in land and lead to an attenuation or contraction of other agricultural sectors. Wheat and soybeans in particular would be adversely affected. Neither sector would experience substantial trade liberalization under TPP, while at the same time they would face higher land prices as liberalizing sectors absorb resources.

Meanwhile, beverages and tobacco products would experience a substantial reduction in the export tariffs faced by the industry. This change would result in export and output gains in this sector.

Table 2.4: Estimated effects of TPP on U.S. agricultural and food sectors: Changes relative to baseline in 2032

	Exports		Imports		Output		Employment
	Million $	Percent	Million $	Percent	Million $	Percent	Percent
Rice	-12.5	-0.3	15.3	1.6	-17.7	-0.1	0.0
Wheat	-1.5	0.0	18.2	1.5	-7.9	0.0	-0.7
Other grains	-5.5	-0.2	16.5	1.0	217.0	0.5	0.6
Corn grain	-31.3	-0.1	2.5	1.3	206.7	0.3	0.4
Fresh fruit, vegetables, and nuts	574.9	2.0	119.2	0.5	172.1	0.2	0.3
Soybeans	-419.4	-1.0	26.6	1.7	-406.9	-0.9	-0.9
Other oil seeds	-1.6	-0.1	40.8	2.7	52.8	0.3	0.4
All other agriculture	637.9	2.4	503.8	2.0	1,764.5	0.7	0.6
Cattle, sheep, goats, and horses	-3.0	-0.3	60.8	1.7	214.3	0.3	0.4
Hides and skins	115.1	0.8	35.3	2.6	141.9	0.3	0.4
Seafood	74.1	2.2	231.9	0.9	-51.5	-0.2	-0.2
Beef meat	876.1	8.4	419.0	5.7	614.6	0.5	0.4
Other meats	690.5	24.8	41.2	2.5	657.7	3.9	3.0
Pork meat products	219.3	1.9	94.4	4.4	180.3	0.3	0.3
Poultry meat prods	173.9	1.3	-16.6	-3.6	265.8	0.6	0.6
Soybean oil	27.7	1.3	2.8	3.3	54.1	0.7	0.6
Soybean meal	113.4	1.1	8.1	3.9	169.9	0.7	0.6
Dairy products	1,845.5	18.0	348.6	10.3	1,839.3	1.3	1.1
Sugar, sweeteners, and SCP	129.6	4.3	132.1	2.4	517.7	0.4	0.4
Processed foods	1,540.0	3.8	427.2	1.1	2,396.5	0.8	0.7
Beverages and tobacco products	683.9	3.7	206.2	0.7	1,033.9	0.4	0.3

Source: USITC estimates.
Notes: Dollar values are in 2017 prices. N.e.c. = not elsewhere classified; SCP = sugar-containing products.

Similarly, resources would flow to manufacturing sectors benefiting from greater liberalization (see table 2.5). Textiles, wearing apparel, leather products, and footwear would all experience substantial reductions of tariffs, both abroad and at home, yielding a mixed outcome. Imports and exports would uniformly rise relative to the baseline, though to varying degrees. Output of textiles and leather products would contract relative to the baseline, although output of footwear and wearing apparel would experience modest expansion relative to the baseline. In footwear and leather products, tariffs on U.S. exports would actually fall more than those on imports into the United States.32 Electronic equipment would experience only slight declines in average tariffs—0.03 on imports and 0.01 on exports. The U.S. industry would contract relative to the baseline estimate by a seemingly disproportionate 0.8 percent, with imports growing by $5.3 billion and exports by only $622 million. This pattern, however, reflects the global value chains present in electronic equipment—in particular, the role of services. Services are important inputs to electronic equipment production worldwide and would experience

[32] Average tariffs on U.S. imports of footwear and leather products would fall by 0.60 and 1.85 percent, respectively, while average tariffs on U.S. exports would fall by 1.21 and 2.94 percent. The average tariffs represent trade weighted averages, using bilateral imports as weights.

liberalization among TPP parties under the agreement. Services liberalization would encourage expanded production in this sector, particularly in Mexico and Malaysia.

Table 2.5: Estimated effects of TPP on U.S. manufacturing, natural resources, and energy sectors: Changes relative to baseline in 2032

	Exports		Imports		Output		Employment
	Million $	Percent	Million $	Percent	Million $	Percent	Percent
Forestry	-305.3	-3.4	-1.6	-0.3	-286.6	-0.8	-1.3
Coal	-126.9	-0.5	13.5	1.0	-76.5	-0.1	-0.3
Oil	1,338.1	7.8	884.1	0.3	-486.1	-0.1	-0.3
Gas	1,384.0	5.3	1,415.4	6.1	-89.4	0.0	-0.1
Minerals and minerals products n.e.c.	441.7	1.1	509.3	1.0	18.0	0.0	0.0
Chemicals	1,944.1	0.7	5,283.4	1.3	-2,854.8	-0.3	-0.3
Textiles	256.6	1.3	869.4	1.6	-328.5	-0.4	-0.4
Wearing apparel	10.3	0.3	1,891.3	1.4	424.7	1.0	0.9
Leather products	59.5	6.0	439.2	2.0	-118.7	-1.5	-1.5
Footwear	137.7	12.2	1,103.6	2.7	29.8	0.5	0.8
Wood products	135.4	0.8	2,204.9	2.1	-1,539.7	-0.5	-0.6
Paper products, publishing	39.7	0.1	722.2	2.0	-32.3	0.0	0.0
Petroleum, coal products	1,023.8	0.7	518.8	0.4	2,931.5	0.2	0.2
Machinery and equipment	1,510.7	0.6	3,914.4	0.8	-1,683.6	-0.2	-0.2
Metals and metal products n.e.c.	1,159.1	0.7	3,191.6	1.4	-3,664.8	-0.4	-0.3
Titanium downstream products	-33.9	-1.1	115.4	14.2	-202.4	-1.2	-1.3
Passenger vehicles	1,953.9	1.9	2,371.7	0.8	1,628.3	0.3	0.3
Auto parts and trailers	1,219.8	1.2	3,039.2	1.6	-1,365.9	-0.3	-0.3
Other transportation equipment	2,074.1	1.3	3,016.8	2.1	80.1	0.0	0.0
Electronic equipment	622.4	0.8	5,323.0	0.9	-3,729.5	-0.8	-0.8
Instruments and medical devices	169.7	0.2	1,044.6	0.7	-641.1	-0.2	-0.3
Toys, sporting goods, and other manufacturers	149.3	0.7	1,282.1	0.8	-136.1	-0.3	-0.3
Electricity	26.1	3.1	83.9	2.0	1,088.7	0.2	0.0
Gas manufacture, distribution	0.0	3.4	0.0	1.6	175.1	0.1	0.0
Water	-2.5	-2.1	9.4	1.4	17.0	0.1	0.0

Source: USITC estimates.
Notes: Dollar values are in 2017 prices. N.e.c. = not elsewhere classified.

The estimated effects of the agreement on services sectors are shown in table 2.6. Most of these sectors are discussed in detail in chapter 5. Construction would experience modest expansion in output and imports, and a modest decline in exports. These changes would not be the result of direct liberalization, but of general equilibrium effects. Rising investment in the U.S. economy would drive increased demand for construction services and would increase

domestic output, draw in some imports, and cause domestic builders to shift modestly from serving export markets to focus more on domestic customers.

Table 2.6: Estimated effects of TPP on U.S. services sectors: Changes relative to baseline in 2032

	Exports		Imports		Output		Employment
	Million $	Percent	Million $	Percent	Million $	Percent	Percent
Construction	-186.4	-2.0	161.4	1.5	7,234.8	0.2	0.2
Wholesale and retail trade	848.7	2.5	542.4	1.2	7,447.5	0.1	0.1
Transportation, logistics, travel and tourism	-1,258.4	-1.1	1,770.5	1.5	-719.9	0.0	-0.1
Communications	877.7	2.8	306.4	1.2	2,845.6	0.2	0.1
Financial services n.e.c.	-12.1	0.0	787.8	1.1	1,520.0	0.1	0.1
Insurance	34.4	0.1	703.5	1.1	707.9	0.1	0.0
Business services n.e.c.	4,575.5	1.6	2,031.5	1.2	11,576.0	0.2	0.1
Recreational and other services	-687.8	-1.5	199.3	0.9	1,749.8	0.1	0.1
Public administration, defense, education, health	605.8	0.4	459.6	0.8	9,981.0	0.1	0.1

Source: USITC estimates.
Notes: Dollar values are in 2017 prices. N.e.c. = not elsewhere classified.

Analytical Framework

The Commission's analysis that quantifies the effects of implementing TPP is based on the CGE model developed and maintained by the Global Trade Analysis Project (GTAP). The GTAP model is an appropriate tool for analyzing the effects of trade agreements because it consists of a database with international trade flows and other macroeconomic information, social accounting matrixes that show how different segments of the economy are interlinked, and national income accounts data. As a multicountry model, it permits the assessment of TPP's impact on the U.S. economy and is a straightforward way to incorporate policy changes. It includes a number of supply and demand relationships and macroeconomic identities that lead to consistent estimates based on standard economic logic.

This section describes the modifications that the Commission made to the standard GTAP model to analyze TPP and the estimated policy changes the Commission introduced to assess the impact of implementing the agreement. The modeling approach extends previous work by including the effects of provisions in TPP's Investment chapter and the removal of certain NTMs that tend to act as barriers to trade in goods and services. Despite the benefits of CGE models, there are also limitations to the results generated by these models, as even the most state-of-the art models are not able to analyze certain issues. For example, the GTAP model can estimate the change in employment across sectors as import competition increases in some sectors and export opportunities grow in others in response to changes in trade policy. However, the model does not capture the costs associated with employment transition

between sectors and temporary unemployment. A later discussion on employment in this chapter presents model assumptions and caveats related to the labor market.

Assessing the Impact of the Agreement

To assess the effects of TPP, the Commission first developed a baseline that simulates how the economies in the model would evolve in the future without TPP in place. This dynamic version of the GTAP model simulates the economy year by year, incorporating certain macroeconomic benchmarks as forecast by the U.S. Congressional Budget Office and several international organizations.[33] The baseline includes tariff schedules under most-favored-nation (MFN) treatment and existing FTAs among TPP members, and takes into account any expected changes in existing tariffs for this time period.[34] Next, policy changes emanating from the TPP Agreement are incorporated into the model, leading these economies to react to the TPP policy changes and showing a different path from the one reflected in the baseline simulation. TPP's estimated impact on the U.S. economy, in terms of changes in GDP, real income, employment, exports and imports, is obtained by comparing the baseline to the second simulation incorporating the TPP policy changes. In addition to the 12 TPP countries, China, Hong Kong, Indonesia, South Korea, Thailand, the European Union (EU), and a combined region identified as the rest of the world—for a total of 19 economies or regions—are represented in the model. The model also covers a total of 56 industry sectors.[35]

The Commission analysis incorporates estimates of three different types of policy changes. First, it estimates the effects of removing or reducing tariffs, TRQs, and NTMs on trade in goods. Second, it estimates the effects of removing certain NTMs on services traded across borders. Third, it estimates the effects of provisions related to foreign investment. The next sections describe the approaches taken to model these different types of policy changes related to the agreement.

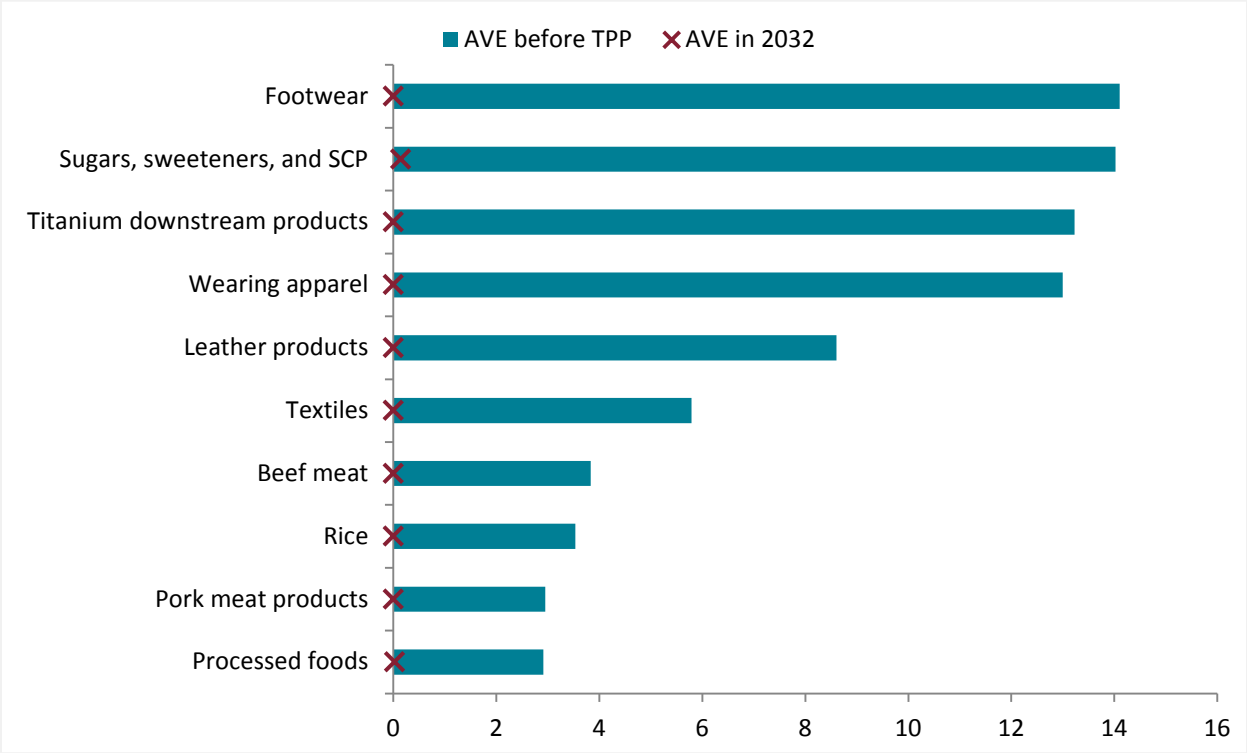
Modeling Provisions on Goods Trade

As in past Commission analyses of prospective FTAs, the main concerns addressed in modeling TPP's effects on trade in goods were tariffs and TRQs. The Commission assembled information about tariffs and TRQs as specified in the TPP text. Figure 2.1 shows the sectors with the largest

[33] See appendix G for details on the baseline.
[34] For example, the baseline incorporates tariff commitments under FTAs between TPP countries that have entered into force but have not yet been fully implemented.
[35] The standard GTAP database contains 57 sectors of goods and services. Some of the standard GTAP sectors were disaggregated, while others were combined, to best capture industries likely to be significantly affected by the TPP. Appendix G provides more detailed information about the model, including a list of all model sectors.

U.S. tariff reductions under TPP for parties that currently have no FTA with the United States.[36] For this category, U.S. import tariffs on certain footwear, sugars and sugar-containing products (SCP), and titanium downstream products would be reduced the most.

Figure 2.1: Sectors with the 10 largest U.S. tariff reductions under TPP for partners with which the United States has no existing FTAs, trade-weighted ad valorem rates



Source: USITC calculations; ITC, "Tariff Rates for 2016–2046 between TPP Member Countries," 2016. Corresponds to appendix table J.7.
Note: Does not include tariff lines subject to TRQs. TPP countries with which the United States has no existing FTAs are Brunei, Japan, Malaysia, New Zealand, and Vietnam. SCP = sugar-containing products.

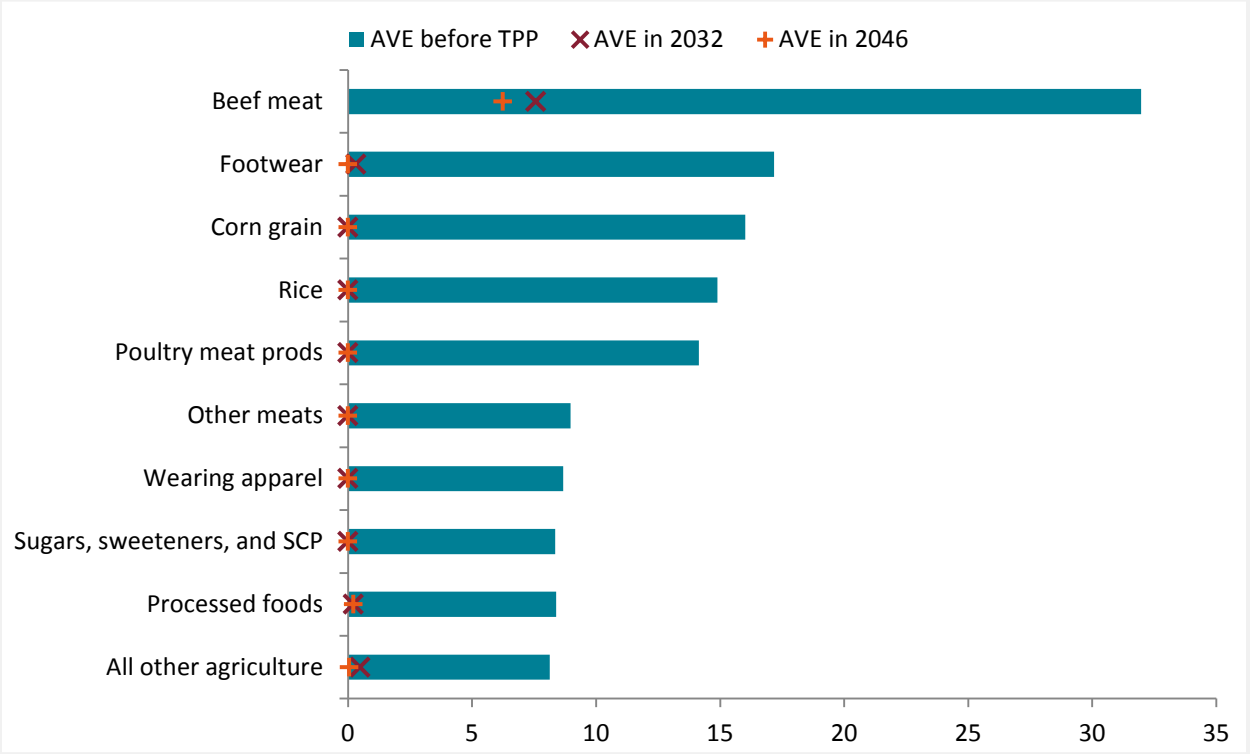
Figure 2.2 shows the largest tariff reductions on U.S. exports by TPP member countries with which the United States does not already have an FTA. Tariffs faced by U.S. exporters of beef, footwear, and corn grain would experience the largest tariff reductions by these TPP partners.

Under TPP, six countries (Canada, Japan, Mexico, Malaysia, the United States, and Vietnam) would be allowed to impose TRQs on imports from other TPP partners, bilaterally, multilaterally, or both. Most of these TRQs apply to food and agricultural products, although Vietnam imposes TRQs on passenger and other vehicles from all TPP partners. Table 2.7 shows sectors in which more than 50 percent of U.S. imports from TPP partners would be subject to

[36] While the TPP provides some additional tariff and TRQ advantages for parties with existing FTAs, the largest expected reductions in U.S. tariffs and TRQs are with TPP parties with which the United States has no existing FTA. Nevertheless, all tariff and TRQ changes under TPP are included in the TPP simulation and compared to the baseline.

TRQ measures under the agreement. This includes U.S. imports of beef, dairy, and sugar. Similarly, table 2.7 also shows TPP markets in which U.S. exports are most likely to face TRQs. Rice, wheat, and corn grain exports to Japan, passenger vehicles to Vietnam, and poultry meat to Canada and Malaysia are the sectors most affected by TRQ measures.[37]

Figure 2.2: Sectors with the 10 largest tariff reductions on U.S. exports under TPP to partners with which the United States has no existing FTAs, trade-weighted ad valorem rates



Source: USITC calculations; ITC, "Tariff Rates for 2016–2046 between TPP Member Countries," 2016. Corresponds to appendix table J.8.
Note: Does not include tariff lines subject to TRQs. TPP countries with which the United States has no existing FTAs are Brunei, Japan, Malaysia, New Zealand, and Vietnam. SCP = sugar-containing products.

[37] Based on trade-weighted averages using 2012–14 trade statistics. Coverage is computed at the HS 6-digit level due to lack of availability of national tariff-line trade statistics.

Table 2.7: U.S. imports from TPP partners and U.S. exports to TPP partners where more than half of trade is subject to TRQ measures under TPP, by sector

	Sector	Partners affected or imposing TRQs
U.S. TRQs imposed on imports from TPP partners	Beef meat	Japan
	Dairy products	Canada
	Sugar, sweeteners, and SCP	Australia, Canada, Chile, Japan, New Zealand, Peru
TPP partner TRQs imposed on U.S. exports	Corn grain	Japan
	Dairy products	Japan, Canada
	Other meats	Canada
	Passenger vehicles	Vietnam
	Poultry meat products	Canada, Malaysia
	Rice	Japan
	Sugar, sweeteners, and SCP	Japan
	Wheat	Japan

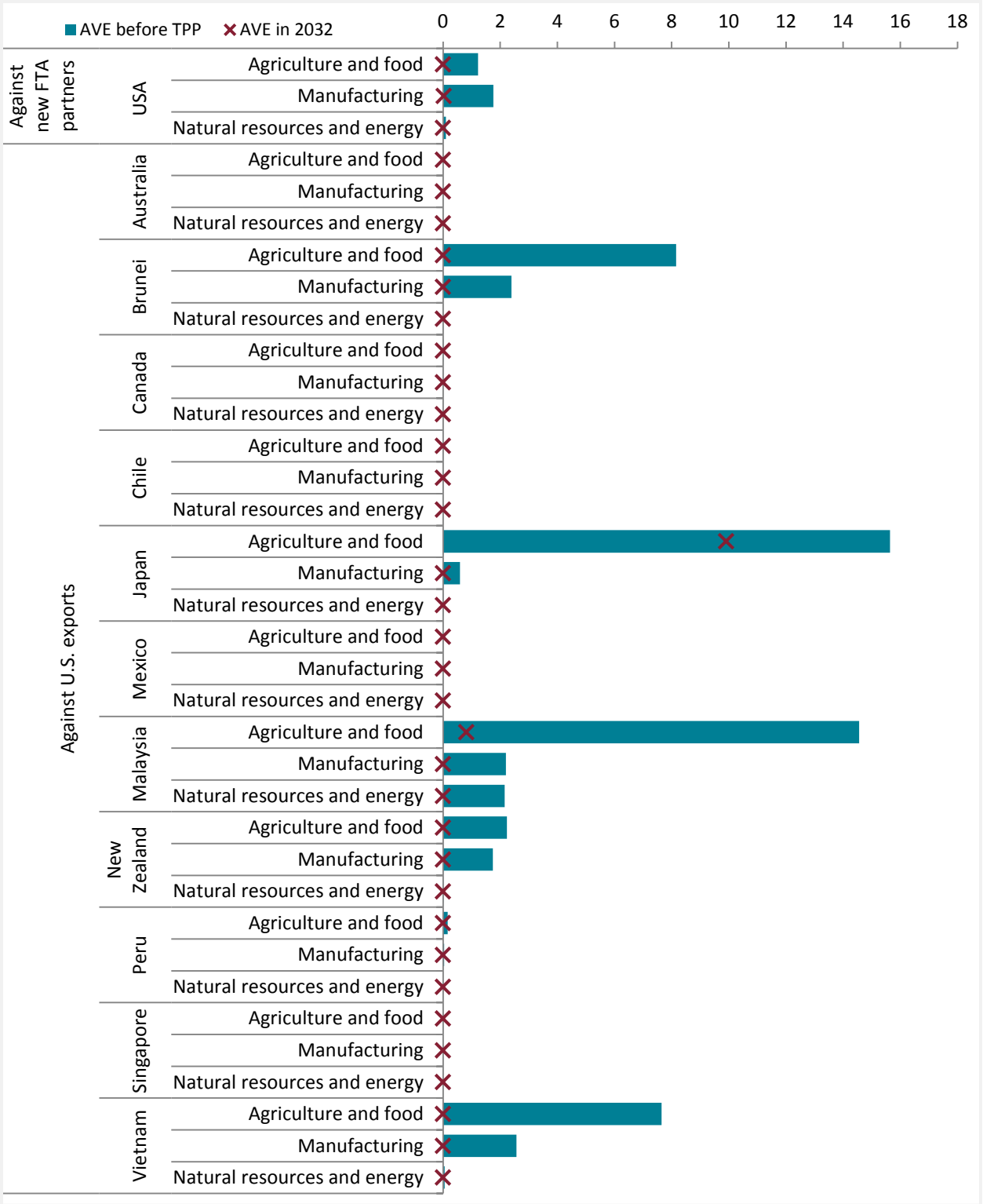
Source: USITC calculations; ITC, "Tariff Rates for 2016–2046 between TPP Member Countries," 2016.
Note: Based on trade-weighted averages using 2012–14 trade statistics. TRQ coverage is calculated at the HS 6-digit level due to lack of availability of national tariff line-level trade statistics. SCP = sugar-containing products.

At the broad sector level (agriculture and food, manufacturing, and natural resources),[38] currently the United States affords low tariffs to imports from TPP countries with which it does not already have an FTA (figure 2.3). Those tariffs would be almost completely eliminated within 15 years after TPP enters into force.

On average, U.S. exports to TPP partners currently face tariffs that are higher than the ones TPP partner exports face in the United States. U.S. agricultural exports face the highest tariffs (notably in Japan, Canada, and Malaysia), followed by tariffs on manufactured goods. By 2032, these tariffs would be almost completely eliminated, with exceptions for U.S. agricultural exports to Japan and Malaysia.

[38] Services are not directly affected by tariffs.

Figure 2.3: Effectively applied tariffs for U.S. imports and tariffs applied by TPP partners against U.S. exports, percent



Source: USITC calculations; ITC, "Tariff Rates for 2016–2046 between TPP Member Countries," 2016. Corresponds to appendix table J.9.
Note: Does not include tariff lines subject to TRQs. Based on trade-weighted averages using 2012–14 trade statistics.

With regard to NTMs on goods, the model assumes that TPP would reduce customs inefficiencies (border frictions) among the parties in several ways. For example, TPP's trade facilitation provisions would result in a small gain in efficiency (estimated at 1 percent) for all TPP countries. This increase is based on estimates in the literature of the effects of trade facilitation provisions on trade costs.[39] TPP provisions related to U.S. exports of vehicles and parts to Japan are believed to reduce existing NTMs that restrict exports to Japan. This impact was estimated by calculating the existing price gap for U.S. vehicle exports to Japan and assuming that the TPP provisions would reduce this gap by 50 percent.[40] This estimate takes into account bilateral letters between the United States and Japan on certain auto NTMs that would address some, but not all, auto NTMs in Japan.[41] However, despite the overall liberalization, the model retains barriers restricting exports of beef and poultry to Malaysia because NTMs related to halal certification are not expected to change under TPP.[42]

Modeling Provisions on Tradable Services

The TPP Agreement contains market access provisions that liberalize cross-border trade in services with TPP partners. These provisions appear in the TPP chapters on cross-border trade in services, financial services, and telecommunications. The Commission's CGE model takes into consideration TPP's major provisions affecting cross-border trade in services.[43] These can be grouped into three categories:

- Commitments to reduce or remove specific NTMs restricting trade in services, such as licensing or nationality requirements that discriminate against foreign providers;
- Adoption of a "negative list" approach for services liberalization in the agreement, meaning that current and future services not listed in TPP's Annex of Non-Conforming Measures gain the full benefit of the related TPP provisions;[44] and

[39] In particular, a recent study on the Trade Facilitation Agreement (TFA) at the World Trade Organization found that implementing the TFA provisions would result in an average trade cost reduction of 0.9 percentage points for imports and 1.2 percentage points for exports. See Hillberry and Zhang, "Policy and Performance in Customs," 2015.

[40] The estimate is based on unit values of U.S. vehicles sold in Japan relative to the unit values of similar U.S. vehicles sold in the rest of the world, calculated at the HS 6-digit level for passenger vehicles in HS 870322, 870323, and 870324. The estimated price gap in this category is 50 percent. For Malaysia, a gap of 10 percentage points is eliminated. For a description of the price gap estimation approach, see appendix J in USITC, *U.S.-Korea Free Trade Agreement*, 2007.

[41] See the discussion on passenger vehicles in chapter 4.

[42] See the discussion on beef and poultry in chapter 3.

[43] Services trade that is provided through a commercial presence in another party's territory ("mode 3," in the language of the WTO General Agreement on Trade in Services) is considered in the Commission's analysis through the effects it has on foreign affiliate sales, described in the following section.

[44] For more discussion of the negative list approach, see chapter 5.

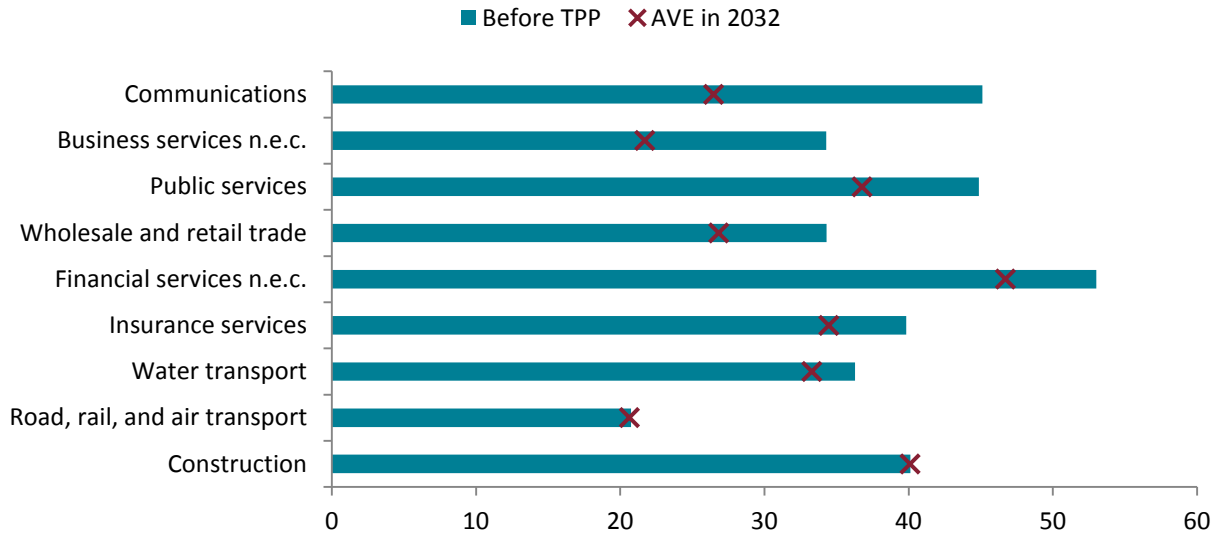
- Adoption of measures ensuring the ability to transmit data across borders and prohibiting data-localization measures (measures requiring data to be stored and/or processed only in-country).

To gauge the magnitude of existing barriers to cross-border trade in services, the Commission estimated the ad valorem costs (defined as tariff equivalents) associated with cross-border services trade by country and by broad services sector.[45] The Commission then assessed the degree to which these tariff equivalents would be reduced by the three factors listed above under TPP. The first factor, the effect of specific NTM commitments, was assessed using service trade restrictiveness indexes (STRIs). The second factor, adoption of the negative list, generates larger reductions in tariff equivalents in sectors that are more innovative, since a decreasing share of services products would be subject to restrictions in these sectors over time. The third factor generates larger reductions in sectors that are more digitally intensive.[46] These three factors are weighted equally when calculating the effect of TPP on cross-border services trade.

The Commission estimates that communications, other business services, and public services would undergo the greatest reduction in service trade restrictiveness under TPP (figure 2.4). Relatively little reduction would take place in construction and transportation services by the time the agreement is fully implemented.

[45] The Commission updated estimates of tariff equivalents that had been produced by staff of the French research institute CEPII, using gravity model analysis. Gravity models relate bilateral trade between countries to various country characteristics, such as distance, the presence of a common language and/or border, and the size of the economies. See appendix G for details of the Commission's estimates.
[46] This approach is presented in more detail in appendix G.

Figure 2.4: Estimated ad valorem equivalents of services trade barriers, by broad service sector, percent



Source: USITC estimates. Corresponds to appendix table J.10.

Modeling Provisions on Investment

TPP contains national treatment provisions that enable services firms to establish a commercial presence in TPP partner markets more easily.[47] These provisions are found in the TPP chapters on investment, financial services, and telecommunications. Investment provisions in TPP specify the rights of investors, establish rules to govern cross-border investment, and define an investor-state dispute settlement process. These provisions would lower barriers to U.S. investment, particularly in the five countries where the United States does not have an existing FTA. Less change is anticipated in inward U.S. investment, however, as the United States is already largely open to foreign investment. As with the chapter on cross-border trade in services, TPP's chapter on investment employs a negative list, meaning that sectors not included in the Annexes of Non-Conforming Measures gain the full benefit of the investment-related TPP provisions. Certain benefits of the Investment chapter, as listed in the Annexes, are not accorded to TPP investors in all countries and sectors.[48]

The analysis for this study followed a multistep procedure to model the effects of the investment provisions. The first step was to calculate how much TPP would relax restrictions on foreign direct investment (FDI), as measured by the OECD FDI Regulatory Restrictiveness Index (RRI). The Commission "rescored" the index for TPP countries in cases where TPP would lead to

[47] National treatment provisions include measures to ensure that foreign investors are treated as favorably as national ones.
[48] For a more detailed discussion of TPP investment provisions, see chapter 6.

reduced restrictiveness. Data were available for all TPP countries except for Brunei, Singapore, and Vietnam, for which initial values were imputed using values for similar economies.[49] The rescoring of the index takes into account the reform of certain industries in several countries stipulated by the Investment chapter of TPP, as well as the majority of the exemptions specified in TPP's Annexes. Based on the provisions of the agreement, Malaysia and New Zealand would have the greatest reductions in investment restrictiveness (table 2.8).[50]

The second step was to calculate how lower investment restrictiveness would affect sales by foreign affiliates. The Commission used an econometric model to estimate the increase in sales by host country in individual sectors (for example, increased sales by U.S. affiliates in the media sector in Malaysia). To ensure that the benefits of TPP were not overstated, the Commission assumed that there would be no change in sales by U.S. affiliates in TPP countries with which the US has an existing FTA;[51] however, affiliate sales by other TPP host countries may increase in these countries.[52]

Table 2.8: Investment restrictions in TPP countries, average FDI Regulatory Restrictiveness Index (RRI)

Country	RRI in 2014	RRI after TPP	Change
Brunei	0.150	0.130	-0.021
Japan	0.052	0.051	-0.001
Malaysia	0.211	0.139	-0.072
New Zealand	0.240	0.161	-0.079
U.S.	0.089	0.074	-0.015
Vietnam	0.150	0.141	-0.010

Source: USITC estimates of changes under TPP; OECD, FDI Regulatory Restrictiveness Index (initial 2014 values).
Note: Higher values denote greater restrictiveness. RRI values are imputed for Brunei and Vietnam.

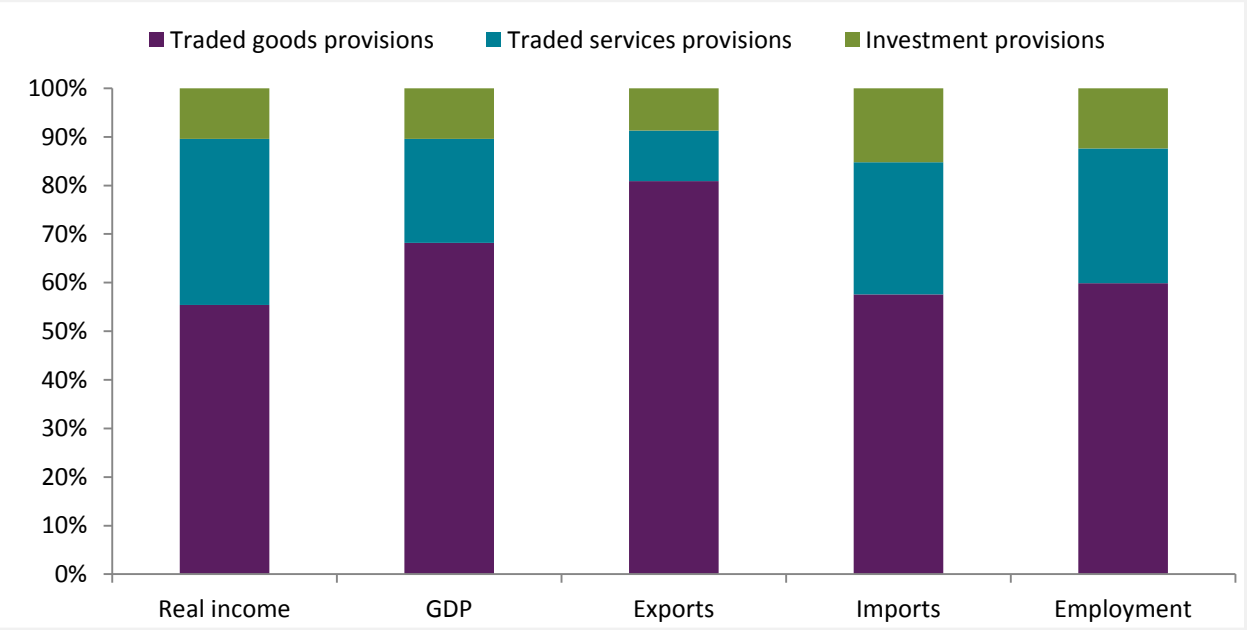
The final step is to determine the effects that these increases in affiliate sales in the United States and abroad would have on the U.S. economy. The Commission used the GTAP-FDI model to calculate changes in productivity for each sector in each TPP country due to the investment liberalization.[53] Finally, the estimated productivity gains were applied to the main dynamic GTAP model to provide estimates of the effects of the investment provisions of the TPP Agreement.

[49] See appendix G for more details on the data for and analysis of investment.
[50] The TPP would generate substantial reductions in RRI for Malaysia in the forestry and media sectors; New Zealand would experience a substantial RRI decline in communications sectors and moderate declines in numerous manufacturing and services sectors. See appendix G for RRI reductions in individual sectors for all TPP countries.
[51] Unlike TPP, the U.S.-Australia FTA does not include investor-state dispute settlement provisions. But this is not a factor in the RRI, so the model assumes no change in the index for Australia relative to the United States.
[52] See appendix G.
[53] The CGE model used in this step is an extension of the standard GTAP model, which makes it possible to track both the size of foreign affiliates abroad and their response to policy changes. See appendix G and USITC, *Trade, Investment, and Industrial Policies in India*, 2014.

Decomposition of Effects by Agreement Provisions

Figure 2.5 decomposes, or breaks down, the dynamic, economy-wide real income, GDP, exports, imports, and employment effects of TPP according to the three groups of provisions modeled: those for traded goods, those for tradable (cross-border) services, and those for investment.[54] The results show that the provisions related to traded goods (tariff, TRQs, and NTMs) would contribute the largest share of the economy-wide gain from TPP in all five variables, followed by the quantified provisions on traded services. A substantial share of gains in real income (about 34 percent) would relate to services trade.

Figure 2.5: Decomposition of U.S. real income, GDP, trade, and employment gains, by modeled TPP provisions, percent



Source: USITC estimates. Corresponds to appendix table J.11.

[54] The agreement contain provisions that are difficult to quantify, such as commitments on government procurement, competition, state-owned enterprises, and intellectual property that are not considered in the model. Nevertheless, these provisions can affect trade, output, employment, and consumers.

Contextualizing Model Results

Effects of TPP on the U.S. Labor Market

Economists, academics, and policy makers debate the effects of FTAs on the overall U.S. labor market. Some maintain that FTAs have a negligible effect on aggregate employment and a positive, yet small, effect on wages. Others express concern that FTAs cause declines in wages and employment, especially over the short run, and increased income inequality that persists over time.

Drawing from these concerns, some witnesses at the Commission's hearing questioned the assumptions that are traditionally incorporated into models used to simulate the economic impact of the FTAs on the U.S. labor force—namely, that models assume no changes to aggregate employment. Witnesses also stated that the Commission's analysis of TPP should address income distribution changes and unemployment resulting from the agreement.[55]

This section discusses the economic theory of the impact that FTAs have on labor markets, the assumptions and limitations related to employment dynamics in the GTAP model, and the employment and wage estimates from the Commission model.

Economic Theory behind FTAs and Their Effects on Labor Markets

Economic theory suggests that trade liberalization can affect labor markets in complicated ways. FTAs remove barriers to cross-border trade and investment and increase economic integration between signatory countries, which shifts production patterns in those countries. The result is a shift in labor demand between industries within each country. In the short term, this shift in labor demand is likely to be reflected more in changes in wages and at least temporary job loss, as workers transition from import-competing sectors that are contracting into exporting industries that are expanding and paying higher wages as demand for workers increases. In the long run, aggregate employment moves toward full employment, as the transition to a new equilibrium moves toward completion, but the effects on different types of workers in certain industries can persist. The speed and economic cost of the transition can be affected by policies in place to compensate displaced workers and to ease their transitions into

[55] Appendix D contains written submissions from hearing witnesses. In their submissions, several interested parties discussed the modeling of labor and employment and the TPP, including Representative Sander Levin; Representatives DeLauro, Slaughter, DeFazio, and Lee; the AFL-CIO Action Network; Citizens Trade Campaign; Coalition for a Prosperous America; Communications Workers of America; Society of Professional Engineering Employees in Aerospace; and Teamsters.

new jobs—for example, through retraining.[56] Aggregate employment could also change such that some workers may be encouraged to enter or exit the labor force, or the number of hours worked by existing workers may increase or decrease.

Model Assumptions and Limitations Related to TPP's Impact on Labor and Employment

The model presented in this report quantifies the expected impact of TPP on the economy-wide level of employment, assuming that the aggregate labor supply expands when the economy-wide real wage rate rises or contracts when the real wage rate falls. This response is known as labor supply elasticity, which is expressed as the percentage change in the supply of labor driven by a 1 percent change in the real wage rate.[57] Model results show changes in aggregate and sectoral employment, though the model does not generate estimates of changes in the U.S. unemployment rate.

The GTAP model used in this report quantifies the broad implications of the agreement on U.S. employment and wages in the medium and long term. Thus, the model does not capture the employment and wage adjustments that may result from the changes in trade policy in the short run.[58] As a result, this model assumes that in the medium and long term workers immediately move between sectors of the economy and that they can do so without incurring any costs other than changes in their wages.

Similarly, the GTAP model used in this analysis does not capture TPP's impact on different types of workers by income level—though it does capture labor's share of income relative to other factors of production in the aggregate economy. The model assumes instead that all workers with the same skill level[59] receive the same wage, regardless of the industry in which they work. In contrast, academic literature suggests that changes in trade flows may have particular effects on workers' wages depending on the industry and even the particular firm that employs them.

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[56] Recent research finds that this transition to the longer-term stage could take more time than previously believed. For more discussion, see Autor, Dorn, and Hanson, "The China Shock: Learning from Labor Market Adjustment to Large Changes in Trade," 2016.

[57] Through a review of government publications, academic journals, and working papers, the Commission found labor supply elasticities for nine TPP countries. Elasticities for developed economies ranged from 0.2 to 0.8; the Commission used the median of those elasticities—0.4—as the labor supply elasticity for all developed economies in the model. This is the same labor supply elasticity as the one calculated by the Congressional Budget Office for the United States. Labor supply elasticities for developing economies ranged from 0.3 to 0.6; the median of those ranges—0.44—was used for all developing countries in the model.

[58] For a discussion of the costs of labor transitions from the TPP, see Lawrence and Moran, "Adjustment and Income Distribution Impacts," 2016. For a discussion on the difficulties of modeling labor market transitions as a result of free trade agreements, see Riker and Swanson, "A Survey of Empirical Models of Labor Transitions," 2015.

[59] The model distinguishes between two types of labor, "skilled" and "unskilled." Skilled labor includes employment requiring long-term training or at least some college education. Unskilled labor includes employment requiring short-term training, a high school diploma, or less.

However, the model does show changes in labor's share of income relative to capital, land, and natural resources at the economy-wide level.

Model Results Related to U.S. Employment and Wages

By 2032, the Commission estimates that TPP would increase employment in the United States by about 128,000 full-time equivalent jobs, and increase the real wage rate by about 0.19 percent (table 2.9). [60] In percentage terms, the rise in the wages of unskilled workers would be similar to the rise for skilled workers.

Table 2.9: Effect of TPP on U.S. employment and real wage rate: Changes relative to baseline in 2032, percent

	Employment	Real wage rate
Labor	0.07	0.19
Unskilled labor	0.07	0.18
Skilled labor	0.08	0.19

Source: USITC estimates.

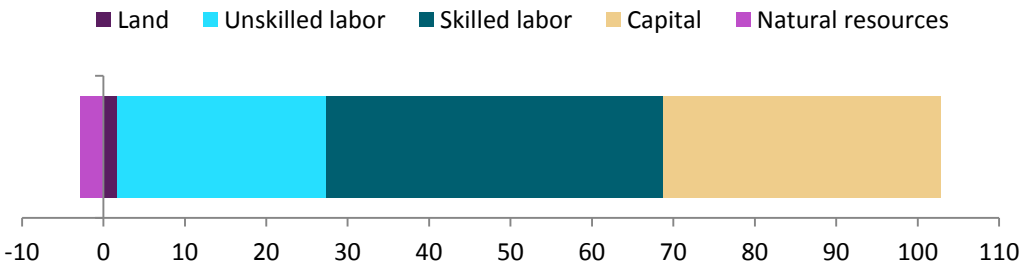
Growth in the aggregate U.S. economy can be broken down into the payments received by individual factors of production, such as labor and capital. Figure 2.6 decomposes the sources of the growth in nominal[61] GDP atributable to TPP by 2032. Increases in labor income and return from capital investments would account for almost all the growth in nominal GDP. Labor would receive a larger share of the GDP gains than capital. Increases in income of skilled labor, in particular, would account for about 41 percent of GDP growth, while increases in income of unskilled labor would account for about 25 percent of GDP growth. Increases in capital rents would account for about 34 percent of GDP growth. While land rents would increase and have a small but positive contribution to GDP growth, returns to other natural resources, like mines and forests, would decline because of TPP.[62]

[60] The real wage rate would rise by 0.18 percent for unskilled labor and by 0.19 percent for skilled labor. With a labor supply elasticity of 0.4, the 0.18–0.19 percent rise in real wages would lead to a rise in employment of 0.07–0.08 percent.

[61] Not only the availability of labor and capital expand in the United States but also their prices, that is wages and capital rents, also expand.

[62] Land is employed in agriculture and can move between agricultural sectors. Overall expansion in demand for U.S. agricultural goods pushes up returns to land. But non-land natural resources, necessary to the production of minerals, coal, oil, gas, and timber, and seafood, cannot easily move between natural resource-using sectors; for instance, most coal-producing land cannot be repurposed as oil-producing land. Income to natural resources, like income to labor and capital, is determined by the value of their marginal product. Liberalization would lead to a modest decline in demand for U.S. production in these sectors, depressing payments to natural resources.

Figure 2.6: Contribution to changes in nominal GDP in 2032 under TPP, including both price and quantity effects and excluding taxes and depreciation, percent



Source: USITC estimates.

Effects of TPP on the U.S. Trade Deficit

The effects of FTAs on the U.S. trade deficit are also widely debated.[63] Some policy makers, academics, and economists argue that FTAs help to reduce the trade deficit or have essentially no effect, while others argue that they have contributed to the worsening of the U.S. trade deficit, while others argue that they. The effect of a trade agreement on the U.S. trade deficit in the long run ultimately depends on how the agreement affects output, consumption, and investment in the United States.

This section discusses the economic theory and evidence describing this relationship and the GTAP model's assumptions and limitations surrounding trade balances.

FTA Impacts on Bilateral Trade Balances

Under most FTAs, tariff reductions for U.S. exports to FTA partner countries have been greater than U.S. tariff reductions for imports from FTA partners. This suggests that, holding all else constant, the U.S. bilateral trade balance with FTA partners should improve as the FTA is fully implemented.

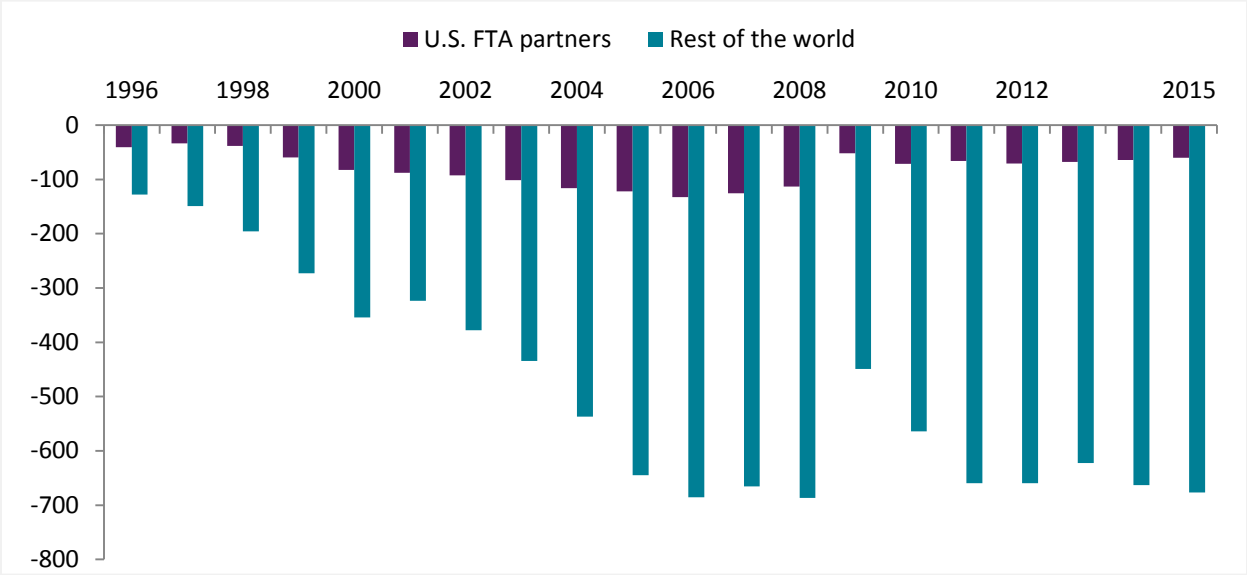
This effect on bilateral trade balances, however, is not readily apparent in aggregated trade statistics. The United States' merchandise trade balance with all FTA partners follows trends similar to those of its trade balance with non-FTA partners (figure 2.7).[64] In 2015, the United States had merchandise trade surpluses with 14 of its 20 FTA partners. These 14 are generally

[63] The discussion of the U.S. trade balance in this section uses the difference between total exports and general imports as the definition of the trade balance. For more discussion on the definition of the U.S. trade balance, see USITC, "A Note on U.S. Trade Statistics," 2014.

[64] Figure 2.7 shows bilateral merchandise trade balances and not bilateral trade balances (including both goods and services) because of the lack of bilateral services trade statistics for several U.S. FTA partners.

relatively small trading partners.[65] The United States had a merchandise trade deficit with the remaining 6 FTA partners—including some of its largest trading partners—resulting in an overall trade deficit with its FTA partners.

Figure 2.7: United States merchandise trade balance, 1996–2015, by partner type, billion dollars



Source: USITC DataWeb/USDOC (accessed on March 15, 2016). Corresponds to appendix table J.12.

Many macroeconomic factors contribute to bilateral trade balances. One important factor is the economic structures of the FTA partners, such as their level of development or their relative ability to trade in goods and services of high value. Changes in the FTA partners' business cycles and in other macroeconomic conditions can likewise shape bilateral trade balances both in the short and the long term. The weight of these macroeconomic factors can have a much greater effect on bilateral trade balances than FTAs.

FTA Impacts on the Aggregate Trade Balance

The effect of an FTA on the United States' aggregate trade balance is different and perhaps more ambiguous than its effect on U.S. bilateral trade balances, since the effect is largely determined by the effect of the agreement on aggregate output, consumption, and investment. Under FTAs, the production of goods and services becomes more efficient as costs associated with doing business and trade costs go down. Greater efficiency increases national output, which raises national consumption and saving. Greater efficiency also makes the FTA parties a

[65] The FTA partners with which the U.S. had a bilateral merchandise trade surplus in 2015 were Australia, Bahrain, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Morocco, Oman, Panama, Peru, and Singapore. FTA partners with which the U.S. had a bilateral merchandise trade deficit were Canada, Israel, Jordan, South Korea, Mexico, and Nicaragua.

more attractive destination for domestic and international investors, raising aggregate investment.

The magnitude of these two effects determines the change in a country's aggregate trade balance. Because foreign capital can be used to finance consumption, if investment rises faster than national saving (defined as output minus consumption), an FTA party can spend more than it produces. Hence imports will rise faster than exports, causing that party's aggregate trade balance to decline.[66] Conversely, if national saving rises faster than investment, then the FTA party's aggregate trade balance increases.

For an economy as large and complex as the United States, it is difficult to estimate the effects of an FTA on the aggregate trade balance. TPP, although it is a large trade agreement by historical standards, is expected to have a relatively small effect on U.S. output, consumption, and investment (table 2.1). Because the effect on the aggregate trade balance is determined jointly by all of these factors, estimating the net effect of small, offsetting, and interrelated changes presents a challenge.

Model Assumptions and TPP Effects on the Trade Balance

The model used in this report allows bilateral trade balances to change as trade costs decline and production of goods and services becomes more efficient under TPP. The Commission estimates that the U.S. trade balance with TPP member countries would improve by $9.6 billion by year 2032, relative to the baseline. Most of this improvement is accounted for by increased net exports to TPP parties with which the United States has no existing FTAs.

However, the GTAP model is not structured to account for the role of certain factors in influencing aggregate trade balances. The model assumes a constant rate of saving relative to GDP, while not imposing restrictions on foreign investors' perception of enhanced investment opportunities in the United States or other model regions over time. Yet foreign investors' response to such a positive perception can drive large increases in investment in the United States relative to savings and cause potentially large declines in the trade balance. In its analysis, the Commission imposes a restriction that the trade deficit to GDP ratio is fixed.[67] Under such a restriction, the Commission estimates that U.S. exports of goods and services to the world would expand by $27.2 billion by 2032 due to TPP, while U.S. imports would expand

[66] National saving includes saving by households, businesses, and government. By the national income accounts identity, when domestic saving (output minus government and private consumption) is less than domestic investment, capital inflow from abroad must supplement the domestic saving so as to meet the needs of domestic investment. For a more in-depth discussion of national income accounts, see Mankiw, *Principles of Economics,* 2004, 117–19.

[67] While the U.S. trade balance has fluctuated significantly since 1980, its correlation with U.S. GDP is about 0.9, during the same period, which suggests a stable relationship between the trade balance and GDP.

by $48.9 billion (table 2.2). Thus, the aggregate trade balance for the United States would decline by $21.7 billion by 2032.

Literature Review and Comparison with Commission Findings

Overview

This section reviews the economic literature that is relevant to assessing the impact of the TPP Agreement on the United States, and it is divided in two parts. The first part compares the Commission's model results with those of the literature that assesses the economy-wide impact of the actual, negotiated TPP Agreement on the U.S. economy. A 2016 article by Petri and Plummer is the only other study besides the current Commission report to do so.[68] Compared with this article, the Commission finds that TPP would have a smaller impact on U.S. real income (an increase of 0.23 percent of GDP, compared with 0.51 percent), and a smaller impact on U.S. exports (an increase of 1.0 percent compared with 9.1 percent). The differences between the two economic analyses are discussed in more detail below.

The second part of the literature review describes economic studies that assess a hypothetical TPP, (since they were conducted before the final text of the agreement was released) and estimate the potential impact of such an agreement on the U.S. economy. Given the differences between the hypothetical and the actual texts of the agreement, the findings of these studies are not directly comparable with the Commission's results, but they are provided where available. The review focuses on studies that assess the impact of TPP on the U.S. economy and that assume a TPP agreement encompassing the final list of all 12 TPP parties. It only briefly examines studies that assume an alternate list of TPP parties or that assess the impact of TPP on other economies.

The estimates made by most of the economic analyses reviewed here are based on a computable general equilibrium (CGE) model of the global economy—a multicountry, multisector tool widely used to predict the expected economy-wide and sectoral effects of changes in trade policy. Examples of such changes include the reduction or removal of tariffs, of nontariff measures on goods and services, and of barriers to foreign direct investment. Most CGE models use a dataset provided by the Global Trade Analysis Project (GTAP).[69]

[68] Petri and Plummer, "The Economic Effects of the Trans-Pacific Partnership," 2016. A related study by the World Bank draws from the work of Petri and Plummer and reports similar results. See World Bank, "Potential Macroeconomic Implications," 2016.
[69] For a more detailed description of the GTAP model, see chapter 2 and appendix G.

Literature Assessing the Negotiated TPP Compared with the Commission's Analysis

Comparison of Principal Results

According to estimations from Petri and Plummer, under TPP, annual real income in the United States would increase by $131 billion (0.51 percent of GDP) and U.S. annual exports would increase by $357 billion (9.1 percent of expected U.S. exports), compared with baseline projections, by 2030. In comparison, the Commission estimates that TPP would increase annual real incomes in the United States by $57.3 billion (0.23 percent of GDP) and that U.S. annual exports to the world would increase by $27.2 billion (1.0 percent of expected exports), compared with baseline projections, by 2032.[70]

With regard to employment effects, the analysis by Petri and Plummer assumes that TPP will not affect the total employment level or the trade balances of countries inside or outside of TPP. However, Petri and Plummer assume that there will be sectoral shifts in the labor market within the TPP economies, with zero net effect on aggregate employment. In contrast, the Commission model does permit changes in total employment. The Commission estimates that the TPP would lead to an increase of about 128,000 full-time equivalent workers (FTEs) in the United States by 2032, compared to the baseline projection (equal to 0.07 percent of the total U.S. labor force). Table 2.10 compares the key findings from both analyses.

Table 2.10: Summary of comparison between Petri and Plummer and Commission findings

	Petri and Plummer	Commission findings
Change in real income	0.51 percent of GDP	0.23 percent of GDP
Change in exports	9.1 percent of total exports	1.0 percent of total exports
Change in employment	No change in aggregate employment by assumption	128.2 (full time equivalent, thousands)
Model	Dynamic CGE model[a]	Dynamic GTAP model[b]
Type of liberalization experiment	Reduction of tariff, nontariff measures, and investment barriers	Reduction of tariff, nontariff measures, and investment barriers

[a] The dynamic CGE model used by Petri and Plummer incorporates the feature of the heterogeneity of firms to analyze TPP's welfare and income effects, based on changes in exports not only from activity by established exporters, but also from the entry of new exporting firms.
[b] GTAP is a CGE model used to estimate the economy-wide impact of trade agreements.

Though the analysis by Petri and Plummer assumes that TPP will not affect total employment, their study does include results on the shifts in employment between sectors and the costs of this labor adjustment. Petri and Plummer show that TPP would facilitate a shift in U.S. resources from general manufacturing toward traded services and advanced manufacturing, both of which mainly employ skilled labor. Hence, the nominal wages of skilled workers in the

[70] The Commission analyzes TPP over a 15-year period, from 2017 to 2032.

United States, who make up 60 percent of the labor force, would rise more than those of unskilled workers (0.63 percent vs. 0.37 percent).

In a related study, Lawrence and Moran further analyze the costs related to labor adjustments under TPP using the results from Petri and Plummer.[71] The authors take the estimates of the impact of the TPP on trade flows and the intersectoral reallocation of labor in the United States. Based on a series of "back end" calculations, they estimate that the upper bound for the annual displacement of workers due to TPP during the adjustment period would be 169,000 FTEs. The authors, however, argue that a large share of these displaced workers will be absorbed by rising employment in industries that are expected to expand due to increasing demand under TPP.[72] Others will be absorbed through normal churn, and still others through natural attrition, such as retirements.

Detailed Comparison of the Models

The Commission's simulation of the TPP Agreement differs from the simulation conducted by Petri and Plummer in four areas, and the different assumptions employed largely explain the difference in the final results. First, based on the Commission's industry expertise and its knowledge with regard to particular factors affecting trade in specific sectors across the economy, the Commission's simulation was implemented at a more disaggregated sector level than the simulation in the Petri and Plummer analysis. As a result, the Commission's simulation includes economic conditions and TPP provisions which are sector-specific. Some examples are the preference of Japanese consumers for domestic beef meat, the limited available expansion capacity for Malaysian-approved Halal meat plants in the United States, the existing regime of import duty drawbacks in Vietnam, the potential impact of TPP rules of origin on Vietnamese trade, and the structure of the TPP Agreement's TRQ provisions. All of these factors are likely to limit the impact of certain TPP provisions on U.S. trade.

Second, the Commission quantified TPP's investment provisions at a more disaggregated sector level than did Petri and Plummer, taking into account particular aspects of each industry for each TPP country and assuming that regulations for U.S. FDI would not be affected by the TPP investment provisions if the United States already has a trade agreement with the partner country. As a result, the Commission's quantification of the Agreement's investment provisions identified various degrees of changes in investment regulations at the sector level, ranging from no change for many sectors to significant change for just a few sectors. In contrast, Petri and Plummer estimated a single degree of investment liberalization across all industries for each

[71] Lawrence and Moran, "Adjustment and Income Distribution Impacts," 2016.
[72] According to the authors, under the TPP, U.S. employment in some industries is expected to rise as demand for their output from outside the United States increases. Also, some workers who would no longer be producing the goods and services displaced by imports may be reassigned to other activities within their firms.

TPP country and without excluding existing U.S. FTA partners, which produces larger estimated impacts of TPP's investment provisions.

Third, the Commission's simulations did not include any policy "spillover" effects. Petri and Plummer assumed that 20 percent of the liberalization of nontariff barriers under TPP would also apply to trade partners who are not TPP members. Such spillover effects may be a byproduct of the TPP Agreement, but they are not included in the provisions of TPP and are exceedingly difficult to accurately quantify. Thus, the Commission chose not to include them in the model. This factor was an important one in Petri and Plummer's overall results, and generated higher estimates of trade and real income changes than in the Commission's analysis.

Fourth, the Commission's simulation did not consider productivity differences at the firm level within a sector while the Petri and Plummer simulation was based on a model of firm heterogeneity. Under such a model, reduction in foreign trade barriers can raise the average productivity of firms within a sector. In Petri and Plummer, this assumption leads to greater gains in U.S. trade and real income. The Commission has not used such a model in previous reports, and it was not feasible to develop such a model with the industry and country detail required for Commission analysis in the timeframe of this report.

Petri and Plummer estimate the potential impact of TPP on the U.S. economy, as well as on other countries. The CGE model used in the study was developed by Zhai.[73] It uses the GTAP Version 9 dataset for 2011, covering 29 regions and 19 sectors. As noted above, the model recognizes the heterogeneity of firms within each country, showing increases in exports not only from existing exporters as a result of trade liberalization, but also from new firms which enter the market due to the change in trade policies.[74] In the model, agriculture, mining, and government services are assumed to exhibit perfect competition, while manufacturing and private services are characterized by monopolistic competition. Each sector with monopolistic competition consists of a continuum of firms that are differentiated by the varieties of goods they produce and by their productivity.

Petri and Plummer's model simulates the global economy from 2015 to 2030 under TPP, compared to a baseline without TPP in force. The study estimates actual tariff reductions as well as the reductions in NTMs on goods and services and in barriers to investment relative to this baseline. The authors assume that 75 percent of NTMs on goods and services should be

[73] Zhai, "Armington Meets Melitz," 2008.

[74] Unlike conventional CGE models, which only track changes in trade by established exporters (the intensive margin of trade), the CGE model used by Petri and Plummer incorporates the feature of the heterogeneity of firms. Such models analyze changes in exports not only by established exporters, but also from the entry of new exporting firms (the extensive margin of trade).

considered as barriers, and among those, only 50 percent of the NTMs applicable to services and 75 percent of those applicable to goods are "actionable."[75] The actionable portion of initially estimated NTMs is therefore calculated as 56.3 percent for goods and 37.5 percent for services. To simulate the effects of trade policies, these barriers are then reduced in proportion to scores (from 0 to 100)[76] that represent different provisions of an agreement that addresses barriers in various goods and services sectors. Reductions in barriers to foreign direct investment (FDI) are calculated using a similar methodology.

The analysis also assumes that countries that are not TPP parties benefit at the rate of 20 percent from the NTM liberalizations that apply to TPP parties. This additional reduction of NTMs means that the United States, for example, as one of the TPP member countries, would reduce its NTMs towards non-TPP member countries at the rate of 20 percent of the NTM reduction it applies towards other TPP parties. This reduction would allow non-TPP member countries to gain additional access to the U.S. domestic market, leading to gains in income and welfare beyond those directly associated with the TPP Agreement.

In contrast, as discussed in more detail in chapter 2, the Commission uses a dynamic GTAP model[77] incorporating the changes in tariffs, tariff-rate quotas (TRQs), NTMs in goods and services, and investment barriers based on the provisions of TPP. The figures for changes to services barriers came from three sources. First, the Commission assessed TPP's changes to specific services NTMs, as compared with the policies identified in the World Bank's Service Trade Restrictiveness Index (STRI). Second, the Commission assigned a value to the negative list entries in TPP's Cross-border Trade in Services chapter for each service sector.[78] Finally, the Commission estimated the reduction in trade costs expected to result from TPP's provisions on cross-border data flows, as laid out in the Electronic Commerce chapter. To quantify the changes in barriers to investment, the Commission used the level of restrictiveness reported in the OECD FDI Regulatory Restrictiveness Index (RRI), and assigned new RRI values based on TPP provisions that reduced barriers to investment. For additional detail on the methodology, see chapter 2 and appendix G of this report.

[75] The "actionable" NTMs are those that could be reduced or eliminated if politically feasible.
[76] Reduction of the NTMs is calculated as a product of three factors: (1) scores of the agreement in 21 issue areas (labor, environment, technical barriers to trade, SPS measures, IPR, etc.); (2) policy weights that translate scores into reductions in different NTMs; (3) maximum reduction rates for each type of NTM. The score is a measure of how good the TPP trade agreement is compared to other existing trade agreements. The higher the score, the more the remaining "actionable" portion of the NTMs among TPP member countries would be reduced or eliminated by the TPP agreement.
[77] Unlike the firm heterogeneity models, the dynamic GTAP model used by the Commission study assumes perfect competition in all sectors.
[78] The value assigned to each sector was dependent on its level of innovation and whether the country had an existing FTA with the United States.

Literature Assessing a Hypothetical TPP

As discussed above, only the Commission's analysis and the study by Petri and Plummer analyze the economy-wide effect of TPP based on the actual negotiated provisions of the agreement. However, there are a number of studies using either CGE models or another global econometric model to analyze the impact of a hypothetical TPP on the U.S. economy. These are studies conducted before the TPP Agreement was finalized, based on authors' conjectures of what the final agreement would include. Most of these studies use a comparative static analysis,[79] and are summarized below. Table 2.11 summarizes the principal findings from these studies.

Table 2.11: Model, liberalization experiment, and aggregate results: Selected economic literature on the effect of a hypothetical TPP

	Capaldo and Izurieta	Kawasaki	Burfisher et al.	Rahman and Ara	Li and Whalley	Cheong and Tongzon
Model	UN Global Policy Model	GTAP version 8.1	GTAP version 8	GTAP version 8	CGE model differentiating between traded and non-tradable goods	Dynamic GTAP
Database, base year	N/A	GTAP, 2007	GTAP, 2014	GTAP, 2007	2011	GTAP, 2012
Type of liberalization experiment	Change in exports and imports from Petri, Plummer, and Zhai	Tariffs and NTMs	All Tariffs and TRQs	All Tariffs	Tariffs and NTMs	All tariffs
Change in U.S. GDP or welfare	-0.54[a]	0.8[a]	0[a]	0[b]	0.67[b]	0[b]

Source: Economic analyses of TPP agreement, as cited.
Note: N/A = not available.
[a] Change in GDP (percent).
[b] Change in welfare (percent of GDP).

In a 2016 paper, Capaldo and Izurieta use the United Nations Global Policy Model (GPM), a demand-driven, global econometric model, to analyze the macroeconomic impact of TPP on the final 12 parties to the agreement.[80] As noted in a 2014 paper by Cripps and Izurieta, the GPM model features a set of behavioral equations that estimate the variables on income and expenditure, exports and imports of primary and manufacturing goods and services, capital

[79] Comparative statics is the comparison of two different economic outcomes, before and after a change in an exogenous parameter (such as a trade policy), while holding all other economic variables constant. For example, in a comparative static CGE model, the national capital stock is fixed, and capital and labor can move across industries within a country as part of the process of adjustment. On the other hand, a dynamic CGE model, such as the one used by the Commission in the current analysis, allows for capital accumulation over time, often driven by increases in foreign direct investment, while preserving all the other features of a comparative static CGE model.
[80] Capaldo and Izurieta, "Trading Down," 2016.

stock, private wealth and government debt, inflation, and employment.[81] Unlike CGE models (such as GTAP) that are commonly used to analyze changes in trade policy, the GPM model does not include, explicitly or implicitly, variables such as tariffs, NTMs, or barriers affecting investment. Therefore, the GPM model is not normally suitable for assessing the economy-wide effects of changes in tariffs, tariff-equivalent NTMs, or investment barriers based on actual or hypothetical TPP provisions. For this reason, to reflect the TPP Agreement in the UN GPM model and generate macroeconomic results, Capaldo and Izurieta use estimates of TPP's expected trade changes from a 2012 study by Petri, Plummer, and Zhai based on a hypothetical TPP agreement between the existing 12-country TPP region plus South Korea (TPP13).[82] Capaldo and Izurieta use the estimates obtained from Petri, Plummer, and Zhai related to the change in U.S. and global exports and imports from a simulation of TPP13 as model inputs for their GPM model, to analyze the macroeconomic impact of TPP on the U.S. and global economy. That is, Capaldo and Izurieta 2016 does not directly assess the impact of TPP's changes in tariffs and other trade barriers on the U.S. economy, as this model is not designed to conduct such analysis, thereby precluding an unambiguous interpretation of its results.

Capaldo and Izurieta find results that differ significantly from those of other studies reviewed here. It projects that the United States would suffer a net loss of GDP of 0.54 percent and job losses of about 450,000 FTEs by 2025 as a result of TPP. The principal reason that these estimates project such losses is that the GPM model does not differentiate between imports of intermediate and final goods. In the dynamic GTAP model used by the Commission, U.S. intermediate imports are assumed to be used in U.S. domestic production of goods, thereby contributing positively to U.S. domestic employment. In the UN GPM model, however, all imports are considered solely as final goods and therefore contribute only to domestic final demand.[83] Hence, in the analysis by Capaldo and Izurieta, increasing U.S. imports under the UN GPM model framework leads to a decline in U.S. domestic production, which leads to slower GDP growth which in turn decreases U.S. employment.[84]

In a 2014 study, Kawasaki also uses a CGE model[85] to simulate both tariff and NTM reductions among the 12 TPP member countries (TPP12). The author estimates the impact of a hypothetical TPP on the U.S. economy and other member countries under the TPP12 scenario

[81] Cripps and Izurieta, "The UN Global Policy Model," 2014.
[82] Petri, Plummer, and Zhai, "The Trans-Pacific Partnership and Asia-Pacific Integration," 2012. The model, while not the analysis, is similar to that described for Petri and Plummer, "The Economic Effects of the Trans-Pacific Partnership," 2016.
[83] Cripps and Izurieta, "The UN Global Policy Model," 2014.
[84] The behavior equations underlying the GPM model show that employment is decided by the urbanization rate and GDP growth, and the estimation shows that GDP and lagged GDP growth lead to higher employment. See Cripps and Khurasee, "Global Policy Model, Version 3.0," 2010. Hence, the slower GDP growth projected by the GPM model under the TPP results in job losses.
[85] Kawasaki, "The Relative Significance of EPAs in Asia-Pacific," 2014. The author uses GTAP version 8.1 (2007) data.

with a comparative static GTAP model. This study assumes that tariffs are completely eliminated, and the NTM reductions in trade of goods and services are assumed to be 50 percent with spillover effects to third countries at 50 percent, which implies 25 percent NTM reductions for all non-TPP member economies.[86] Kawasaki anticipates that U.S. GDP would increase by 0.8 percent. The author also concludes that the majority of U.S. income gains (0.7 percentage point) would result from NTM reductions on goods and services rather than tariff removals. The main reason why U.S. income gain in Kawasaki's analysis is larger than in the Commission findings is that the former analyzes a hypothetical TPP and assumes much larger tariff and NTM reductions than the Commission analysis does.[87]

Although most studies found by the Commission focus on analyzing aggregate macroeconomic changes, a 2014 report by Burfisher et al. of the U.S. Department of Agriculture estimates the impact of TPP on the United States and other member countries with particular emphasis on the agricultural sector.[88] Burfisher et al. use the GTAP comparative static model with the GTAP version 8 (2007) data, and updates the version 8 dataset to 2014 for the base year simulation analysis. The Burfisher et al. report simulates a full elimination of intra-TPP agricultural and nonagricultural tariffs and TRQs among the 12 TPP member countries. The simulation results indicate that tariff and TRQ elimination has minimal impact at the macroeconomic level, with no measurable change in U.S. real GDP by 2025, compared to the baseline simulation.

Burfisher et al. also addresses the percentage change in the value of U.S. agricultural exports and imports in 2025 under TPP, relative to the baseline. The report estimates that the value of U.S. agricultural exports to TPP partners in 2025 would be 5 percent ($2.8 billion) higher under the TPP scenario than in the baseline. Broken down by agricultural product, the largest increase of exports in percentage change terms relative to the baseline would be in the dairy, meat, and cereals sectors, which would increase by 32.2 percent, 11.0 percent, and 6.9 percent, respectively, under TPP. The largest increase in the value of U.S. agricultural imports (in percentage terms) would be in the dairy and meat sectors, where they would increase by 20.5 percent and 3.0 percent, respectively.

By contrast with the results in Burfisher et al., the Commission's findings show that U.S. food and agricultural exports to TPP member countries would increase by 10.7 percent ($11.1 billion) by 2032. The largest increases in exports (in percentage change terms) would be

[86] So countries outside TPP benefit at half the rate of countries inside the agreement. Kawasaki, "The Relative Significance of EPAs in Asia-Pacific," 2014, does not include reductions of investment barriers under TPP.
[87] In testimony before the Commission, Kawasaki specifically noted that since the reduction of tariffs in the actual TPP provisions is less than 100 percent, and the reduction of NTMs under the actual TPP provisions is also smaller than his study assumed, he expected that model results based on the final TPP provisions would show smaller effects. See USITC, hearing transcript, January 14, 2016, 630 (testimony of Kenichi Kawasaki, National Graduate Institute for Policy Studies).
[88] Burfisher et al., "Agriculture in the Trans-Pacific Partnership," 2014.

for other meat, dairy products, and hide and skins, which are estimated to increase by 54.9 percent, 37.0 percent, and 21.1 percent, respectively. The largest increase in U.S. agricultural imports (in percentage change terms) would be in dairy products and rice, which are estimated to increase by 31.2 percent and 14.9 percent, respectively. The Commission analysis finds a larger increase in total agricultural exports in part because the analysis incorporates NTM reductions as well as tariff and TRQ reductions. The Commission analysis quantifies the NTMs by assuming a 1 percent reduction in factor prices in the agricultural sector, equal to a 1 percent reduction of tariff, in the agricultural sector under TPP.

Rahman and Ara analyze the economy-wide impact of TPP on the United States and other member countries.[89] This study used a comparative static GTAP model and adopted Version 8 of the GTAP database for its analysis. The study assumes that all 12 TPP member countries completely eliminate import tariffs on each other's goods,[90] and the results indicate that U.S. welfare would increase by $0.1 billion; U.S. exports would increase by 0.48 percent, while U.S. imports would increase by 0.28 percent.

Carrère, Grujovic, and Robert-Nicoud develop a multicountry, multisector trade model to analyze the employment and welfare effects of TPP.[91] The authors compute the counterfactual changes in real wages, unemployment rates, and welfare due to TPP under the assumption that tariffs (and some nontariff barriers) in the agricultural and manufacturing sectors would be eliminated between all 12 TPP member countries. The authors project that the U.S. unemployment rate would decline by 0.25 percent, while U.S. real wages would increase by 0.05 percent and U.S. welfare would increase by 0.30 percent.

In their 2014 study, Li and Whalley analyze the impact of TPP on China and other potential TPP member economies, including the United States, using a CGE model.[92] The authors use an 11-region Armington-type CGE model.[93] The 11 regions are China; the United States; the European Union; Japan; South Korea; Canada; Mexico; Australia and New Zealand; Chile and Peru; Brunei, Malaysia, Singapore, and Vietnam; and the rest of world. Each economy produces two goods (tradable and non-tradable goods) and has two factors (capital and labor). The tradable and non-tradable goods are treated as heterogeneous across economies. Capital and labor are

[89] Rahman and Ara, "TPP, TTIP and RCEP," 2015. This study also analyzed alternative simulation scenarios related to the effects of two other proposed FTAs, the Transatlantic Trade and Investment Partnership (TTIP) and the Regional Comprehensive Economic Partnership (RCEP), as well as the potential economy-wide impact for Southeast Asian countries if they join the TPP. The results are not relevant to the United States and hence are not reported here.

[90] This study did not quantify the reduction of NTMs and investment barriers.

[91] Carrère, Grujovic, and Robert-Nicoud, "Trade and Frictional Unemployment in the Global Economy," 2015.

[92] Li and Whalley, "China and the Trans-Pacific Partnership," 2014.

[93] An Armington-type CGE model features product differentiation, which means that when a country imports from a group of other countries/regions, the source country/region's imports are of different varieties than those from an alternative source.

treated as mobile between sectors but internationally immobile. The analysis captures endogenously determined trade imbalances by incorporating both current consumption and expected future incremental consumption from savings into the model. The model is calibrated using 2011 data.

Li and Whalley divide the trade costs into two parts: import tariffs and all other nontariff barriers. The trade costs are estimated using a gravity model. The import tariff data are from the World Trade Organization statistical database, and nontariff barriers (NTBs) are calculated using trade costs minus import tariffs. The authors consider three different scenarios: (1) elimination of all trade costs between member countries, which includes both tariffs and all other NTBs; (2) elimination of import tariffs and half (50 percent) of NTBs between member countries; (3) elimination of import tariffs between member countries only. The simulated results show that U.S. welfare would increase by 0.02 percent under only tariff elimination. However, U.S. welfare would increase by 0.27 percent with tariff elimination and 50 percent NTB elimination, and by 0.67 percent with full tariff and NTB elimination.[94]

In a 2013 study, Cheong and Tongzon use a dynamic GTAP model to compute the economic impact of a 12-country TPP on the United States and other countries.[95] The study uses the GTAP version 8 database, which it updates to 2012 by including the existing U.S. free trade agreements for the 2007–12 period. The starting point of the simulation is 2013, and the impact is estimated annually and cumulatively through 2027. According to the simulation results, there would be no change to U.S. GDP by 2027 (U.S. GDP would increase by zero percent). The authors state that the United States does not gain under the TPP12 because Japan is one of the most competitive countries in the world, and under TPP, the United States would have to share its privileged position in the other NAFTA markets with Japan.

There are a number of other studies which analyze the economy-wide impact of a hypothetical TPP, assuming a different set of countries as parties to the agreement compared with the final 12 TPP parties. For instance, in a 2014 article, Li uses a dynamic CGE model to simulate the effect of TPP on 9 rather than 12 TPP member countries, under the scenario of complete tariff elimination.[96] The results show that U.S. real income would increase by 1.46 percent. In their 2012 paper, Itakura and Lee use a dynamic GTAP model to analyze the impact of TPP and the Free Trade Area of the Asia-Pacific (FTAAP) on all member countries.[97] Their simulation ranges from a 9-member TPP agreement over the period 2013–16, to a 13-member TPP over the

[94] Their study also considers an alternative scenario in which Japan is not part of TPP. Those results are not reported in this chapter.
[95] Cheong and Tongzon, "Comparing the Economic Impact of the Trans-Pacific Partnership and Regional Comprehensive Economic Partnership," 2013.
[96] Li, "A General Equilibrium Analysis of the TPP," 2014.
[97] Itakura and Lee, "Welfare Changes and Spectral Adjustments of Asia-Pacific Countries," 2012.

period 2017–22, to a TPP including the complete FTAAP membership over the period 2023–30. The study estimated that U.S. welfare would increase by 0.2 percent by 2020, 0.4 percent by 2025, and 0.8 percent by 2030. These studies are not discussed in detail in this chapter because their simulation scenarios are very different from the actual negotiated TPP, and hence are not comparable to the Commission findings.

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