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Agriculture in the Trans-Pacific Partnership

Mary E. Burfisher, John Dyck, Birgit Meade, Lorraine Mitchell, John Wainio, Steven Zahniser, Shawn Arita, and Jayson Beckman

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Abstract

The proposed Trans-Pacific Partnership (TPP) is a trade and investment agreement under negotiation by 12 countries in the Pacific Rim, including the United States. This report assesses the potential impacts of eliminating all agricultural and nonagricultural tariffs and tariff-rate quotas (TRQs) under a TPP agreement on the region's agriculture in 2025—the assumed end date of the pact's implementation—compared with baseline values for 2025 without a TPP. Cutting tariffs is only one of the many goals of the TPP negotiations, but it is an important one for agricultural trade. The value of intraregional agricultural trade in 2025 under a tariff-free, TRQ-free scenario is estimated to be 6 percent, or about $8.5 billion higher (in 2007 U.S. dollars) compared with baseline values. U.S. agricultural exports to the region will be 5 percent, or about $3 billion higher, and U.S. agricultural imports from the region in 2025 will be 2 percent, or $1 billion higher in value compared with the baseline.

Keywords: Trade, trade agreement, Trans-Pacific Partnership, TPP, computable general equilibrium (CGE) model, Pacific Rim, Japan

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Agriculture in the Trans-Pacific Partnership

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What Is the Issue?

The proposed Trans-Pacific Partnership (TPP) is a trade and investment agreement under negotiation by 12 Pacific Rim countries, including the United States. With a combined population of about 800 million and a combined gross domestic product (GDP) of about $28 trillion, these 12 countries encompassed 11 percent of global population and almost 40 percent of global GDP in 2012. The total size of their market for agricultural imports averaged $279 billion over 2010-12, 51 percent of which was sourced from TPP partners. The TPP accounts for 42 percent of the global agricultural exports of the United States and 47 percent of its agricultural imports. For over three decades, TPP members have been actively engaged in negotiating preferential trade agreements (PTAs) that have provided for greater market access in their trade with each other. Despite the intensity of PTA activity in the region, the high tariffs that remain among TPP partners on some agricultural products, as well as the trade flows between TPP members that have not already negotiated bilateral PTAs, leave scope for significant additional agricultural trade liberalization under the TPP.

What Did the Study Find?

This report quantifies the economic effects on agriculture of a hypothetical and stylized TPP scenario in which all agricultural and nonagricultural tariffs and tariff-rate quotas (TRQs) on intra-TPP trade are eliminated. Trade barriers between TPP countries and other countries remain unchanged in this analysis. However, because the TPP is expected to build upon its members' existing networks of bilateral and regional PTAs within the TPP region, the study first applies these previously negotiated tariff cuts in a baseline scenario.

The study finds that the existing regional PTAs do not eliminate or reduce all intra-TPP tariffs and TRQs. The elimination of the remaining tariffs and TRQs (i.e., the hypothetical TPP scenario) will increase the value of agricultural trade among TPP countries by 6 percent, or about $8.5 billion (all model values in the report are in 2007 U.S. dollars, the model's base year), in 2025 relative to the baseline scenario. While both agricultural imports and exports

in each member country will grow, Japan and the United States will account for the largest shares of the increases in intraregional imports and exports, respectively. The United States will supply about 33 percent of the expansion in intraregional agricultural exports—the value of U.S. agricultural exports to TPP partners in 2025 is estimated to be 5 percent ($2.8 billion) higher under the hypothetical TPP scenario than under the baseline. Japan will account for almost 70 percent of the expansion in intraregional agricultural imports—the value of Japan's agricultural imports from its TPP partners in 2025 is expected to be 14 percent ($5.8 billion) higher than under the baseline.

By commodity, the percentage increases in the value of intraregional trade due to eliminating tariffs and TRQs among TPP members will be largest for rice, sugar, and "other meat" (which includes animal fats and oils and offals). In absolute value terms, the increase will be greatest for bovine meat (which includes beef and mutton), "other foods" (which includes processed foods and feeds), and poultry meat; although their growth rates are lower, these commodities have large initial values in intra-TPP trade, so even relatively small percentage gains translate into relatively large absolute gains in their trade value. The total increased trade in meats of about $3.7 billion will account for 43 percent of the expansion in the value of intra-TPP trade in 2025, most of which is supplied by Australia, the United States, Canada, and New Zealand. About three-quarters of the increase in meat exports is destined for Japan, whose meat imports (mostly bovine meat) will increase by about $2.8 billion relative to the baseline.

Agricultural output in the United States will increase in most sectors due to increased market access within the TPP region, especially in cereals (1 percent), dairy products (0.5 percent), and meat (0.4 percent). Among TPP members, the largest percentage gains in agricultural output will be in meats in Australia, dairy in New Zealand, and "other agriculture" in Singapore. Agricultural output quantities will decline in most sectors in Japan and Vietnam in 2025 relative to the baseline.

Eliminating intraregional tariffs and TRQs will have zero or small positive effects on members' real gross domestic product (GDP). There are no measurable effects on U.S. real GDP in 2025 relative to the baseline scenario. Most of the increase in agricultural trade among TPP members is due to an expansion in their total trade, rather than a diversion of their trade away from the rest of the world toward TPP partners.

How Was the Study Conducted?

The study uses the Global Trade Analysis Project's (GTAP) static computable general equilibrium model with the GTAP v8 2007 database (the base year of the v8 dataset was updated from 2007 to 2014). Two scenarios were modeled to reflect developments between 2014 and 2025—the assumed implementation period for the TPP. The first is a "baseline scenario," which simulates projected growth in GDP, increased supplies of capital and labor, changes in population and diets, and the implementation of a network of preferential trade agreements and unilateral tariff reforms already committed to in the region. A hypothetical and stylized TPP scenario adds a full elimination of intra-TPP agricultural and nonagricultural tariffs and TRQs to the network of trade agreements. The differences between the scenarios capture the effects of eliminating intraregional tariffs and TRQs on members' economies in 2025. The scope of the TPP negotiations goes well beyond cutting tariffs; they also cover other areas that could impact agricultural trade, including investment, trade in services, technical barriers to trade, sanitary and phytosanitary barriers, etc. This analysis does not account for the gains that might be achieved in these other areas of the negotiations. This analysis also does not account for possible insulating domestic farm-policy responses or market responses (e.g., structural or efficiency changes in industries that lose their trade protections) or the productivity gains that may result from increased trade opportunities.

Agriculture in the Trans-Pacific Partnership

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Introduction

The proposed Trans-Pacific Partnership (TPP) is a comprehensive trade and investment agreement under negotiation among 12 Pacific Rim countries, including the United States. With a combined population of about 800 million and a combined gross domestic product (GDP) of about $28 trillion, these 12 countries encompassed 11 percent of global population and almost 40 percent of global GDP in 2012 (table 1). The total size of their market for agricultural imports averaged $279 billion over 2010-12, 51 percent of which was sourced from TPP partners. TPP countries shipped 43 percent of their total agricultural exports (which averaged $312 billion over 2010-12) to their TPP partners in 2012. Within the group, Canada and Mexico were the most dependent on their TPP partners as both a source of agricultural imports and a destination for agricultural exports (largely as a result of their trade with the United States).[1]

The TPP negotiations—begun in Melbourne, Australia, in March 2010—were scheduled to conclude in 2013, but are still underway as of October 2014. The leaders of TPP member countries aspire to achieve a high-quality, "21st century" agreement that will serve as a model for addressing both traditional and emerging trade issues. The membership's Trade Ministers have translated this goal into five defining features of the agreement (USTR, 2011). First, the TPP is intended to be a ***living agreement*** that can be updated as appropriate to address emerging trade issues or to include new members. Second, the TPP's provisions for ***comprehensive market-access reforms*** will eliminate or reduce tariffs and other barriers to trade and investment. Third, the TPP will support the development of ***integrated production and supply chains*** among its members. Fourth, the TPP will address ***cross-cutting issues***, including regulatory coherence, competitiveness and business facilitation, support for small- and medium-sized enterprises, and the strengthening of institutions important to economic development and governance. Fifth, the TPP aims to promote trade and investment in ***innovative products and services***.

[1] Brunei Darussalam is excluded from the study due to data limitations.

Table 1

Population, income, and agricultural trade of Trans-Pacific Partnership countries

Country name	Population	GDP	GDP per capita	Agricultural exports (2010-12 avg.)			Agricultural imports (2010-12 avg.)		
	2012			To world	To TPP	To TPP	From world	From TPP	From TPP
	(Millions)	*(Billions US$)*	*(US$)*	*(Millions US$)*	*(Millions US$)*	*Percent*	*(Millions US$)*	*(Millions US$)*	*Percent*
Australia	22.7	1,532.0	67,537	32,406.3	10,422.2	32%	10,716.3	4,882.7	46%
Brunei Darussalam	0.4	17.0	41,124	1.3	0.9	72%	154.9	108.0	70%
Canada	34.9	1,821.4	52,220	39,635.9	25,380.7	64%	30,717.4	21,628.5	70%
Chile	17.5	269.9	15,454	10,005.6	4,230.6	42%	5,131.5	1,004.8	20%
Japan	127.6	5,960.0	46,723	3,377.0	927.3	27%	62,142.6	30,680.1	49%
Malaysia	29.2	305.0	10,431	28,348.1	6,947.7	25%	15,347.6	3,809.8	25%
Mexico	120.9	1,178.0	9,747	19,889.3	16,846.6	85%	24,053.1	20,612.0	86%
New Zealand	4.4	167.4	37,749	19,691.3	6,935.6	35%	3,698.4	2,338.3	63%
Peru	30.0	203.8	6,796	4,009.5	1,409.0	35%	3,906.9	1,482.7	38%
Singapore	5.3	274.7	51,709	8,212.9	3,304.5	40%	11,348.8	4,732.1	42%
United States	313.9	16,240.0	51,734	134,537.4	56,596.8	42%	102,906.1	48,681.1	47%
Vietnam	88.8	155.8	1,755	12,042.5	2,476.4	21%	9,285.5	3,276.1	35%
Total	795.5	28,124.9	35,354	312,157.2	135,478.3	43%	279,408.9	143,236.5	51%

Note: TPP refers to the Trans-Pacific Partnership; GDP refers to gross domestic product. World trade includes trade with TPP partners.
Sources: World Bank, Country Data and the United Nations, Comtrade database.

These five features are being developed in detail in the agreement's 29 chapters. The chapters address issues that include tariff and nontariff barriers to trade in goods and services, labor and the environment, investment protections, intellectual property rights, and financial and telecommunication services. Agriculture is addressed in multiple chapters of the agreement. The market-access chapter provides for the reduction or elimination of tariffs and nontariff barriers among the TPP members, including barriers to agricultural trade. The chapter also covers food security and agricultural-export competition. Other chapters that could have potentially significant implications for agriculture address customs, the environment, intellectual property rights, rules of origin, sanitary and phytosanitary (SPS) standards, and technical barriers to trade.

This report uses an agriculture-focused, multi-country, computable general equilibrium (CGE) model to analyze the potential effects of eliminating tariffs and tariff-rate quotas (TRQs) between 11 of the TPP's 12 member countries (see appendices 1-3 for a description of the model). Two scenarios were modeled to reflect developments between 2014 and 2025—the assumed implementation period for the TPP. The first is a "baseline scenario," which simulates projections in 2014-25 for real GDP growth, increased supplies of capital and labor, changes in population and diets, and the implementation of a network of preferential trade agreements (PTAs) and unilateral tariff reforms already committed to in the region. A hypothetical and stylized TPP scenario adds a full elimination of intra-TPP agricultural and nonagricultural tariffs and tariff-rate quotas (TRQs) to the network of

trade agreements.[2] It is important to keep in mind the narrow definition of the TPP scenario in this analysis. The scope of the TPP negotiations goes well beyond cutting tariffs; it covers all aspects of commercial relations between TPP members. Among other topics under negotiation that could impact agricultural trade are investment regulations, trade in services, and nontariff barriers to trade (box 1).[3]

This analysis captures the effects of eliminating tariffs and TRQs on members' economies in 2025. Because not all tariffs are expected to be eliminated in the TPP agreement, it may overestimate the gains from this portion of the final agreement. However, because this analysis does not account for trade increases that might be achieved as a result of other areas of negotiation or the productivity gains that may result from increased trade opportunities, it may underestimate the overall trade gains of a final TPP agreement.

[2] The Trans-Pacific Partnership (TPP) scenario imposes the productivity growth described in the baseline scenario and allows real gross domestic product to change in response to the elimination of intra-TPP tariffs (appendix 1).

[3] The model does include a provision to restrict trade in meats between countries that are free of foot-and-mouth disease and those that are not (appendix 1).

Box 1—Nontariff Measures in the TPP Region

The estimated gains in agricultural trade from the Trans-Pacific Partnership (TPP) scenario presented in this study result from reductions in tariffs and tariff-rate quotas (TRQs)—however, the removal of nontariff measures (NTMs) may also generate significant growth in trade. According to the United Nations Multi-Agency Support Team (MAST) on NTMs, NTMs are policy measures other than tariffs that can potentially have an economic effect on international trade (UNCTAD, 2010).[1] They may include sanitary and phytosanitary (SPS) measures, technical barriers to trade (TBTs), pre-shipment clearance, price and quantity controls, taxes, domestic subsidies, distribution restrictions, and rules of origin. Among these, SPS measures are among the most important for agricultural trade and are the focus of this discussion.

Under the World Trade Organization's (WTO) *Agreement on the Application of Sanitary and Phytosanitary Measures* (1995), countries may take measures to protect human, animal, and plant health against threats arising from additives, contaminants, toxins, pests, and diseases in food, beverages, and feed as long as they are based on science, implemented with adequate risk assessment, and do not discriminate against foreign producers.[2] While most SPS measures address legitimate concerns, some countries have been identified by their trading partners as maintaining SPS measures that are disproportionate to the actual levels of risk. Because they can impede or even eliminate international trade flows, some SPS measures have prompted concern that they are being applied simply to protect domestic producers from import competition.

Unfortunately, it is difficult to assess the overall effects of SPS measures and other NTMs on trade. The literature on measuring and estimating the trade-restricting effects of NTMs is rich,[3] but in practice, strategies for appropriate assessment remain elusive. Unlike tariffs (which are more transparent), SPS measures are not always quantifiable, vary substantially by measure, and may entail different levels and types of costs depending on the measure itself and the country it impacts. Furthermore, the removal of SPS measures may lead to important demand-side effects that are difficult to anticipate (e.g., consumers' acceptance of hormone beef or products made from GMOs). Finally, as most SPS requirements address legitimate protections of human, animal, and plant health, it is not easy to identify which measures should be targeted for removal. Appropriate assessment requires precise data that are often difficult to come by and careful case-by-case investigation that is beyond the scope of this study.

Among the objectives of the TPP negotiations are provisions that seek to address some of the outstanding SPS disputes in the region and strengthen the rules on SPS measures beyond those of the WTO. The starting point for resolving many of these disputes within the WTO is for a country to raise a specific trade concern about another country's measure within the WTO's SPS Committee. A sample selection of several major SPS-specific trade

—continued

[1] This definition comprises a wider set of measures than the commonly employed term nontariff barriers (NTBs). In contrast to NTBs, the nontariff measures include those that may not necessarily be trade or welfare reducing.

[2] Measures for plant and animal health may be used to protect against the entry or spread of plant- or animal-borne pests or diseases. These measures may also be more restrictive than international guidelines when supported by scientific justification or when the guidelines do not take into account specific characteristics or needs of a country.

[3] Ferrantino (2010) provides a review of the literature.

concerns[4] involving TPP countries is summarized in the table below. The SPS measures in these trade concerns are viewed by exporters as being excessive to actual risk concerns, thereby unnecessarily restricting trade. Although this study focuses on the removal of tariffs, resolution of concerns about specific SPS measures and other NTMs could lead to further gains in intraregional agricultural trade.

Box 1—Selected SPS-specific trade concerns among TPP countries

SPS measures	Description of concern
Bovine Spongiform Encephalopathy (BSE)	Australia maintains strict import restrictions on beef from previously infected countries despite the World Organization for Animal Health (OIE, formerly known as the International Office for Epizootics) affirming minimal risk. Other TPP countries maintain partial restrictions outside of OIE recommendations.
Restrictions on pork and pork products	Australia and New Zealand have taken measures to restrict pork imports due to the risk of porcine reproductive & respiratory syndrome. Malaysia has banned and restricted pork products without notification or scientific assessment.
Poultry restrictions	Several TPP countries continue to maintain bans on poultry products due to the risk of avian influenza and other viruses that are not aligned with OIE guidelines. Application of restrictions only to high-risk pathogens, and regionalization of bans have been recommended.
Ban on offal	Concerns have been raised that Vietnam's ban on offal products over food safety concerns occurred without notification to the World Trade Organization or provision of scientific justification for the ban.
Food safety requirements	Countries have raised concerns over the inspections, certifications, and other export requirements mandated by the U.S. 2009 Food Safety Enhancement Act.

Note: SPS refers to sanitary and phytosanitary measures; TPP refers to the Trans-Pacific Partnership.

Source: World Trade Organization (2014) and U.S. Trade Representative (2013).

[4] World Trade Organization (WTO) specific trade concerns are not to be confused with WTO disputes. The former refers to a raised concern that does not normally lead to any formal adjudication. The latter refers to an official case that goes through the formal WTO dispute settlement system.

The Baseline Scenario in TPP Member Countries, 2014-25

Projected trends in TPP members' real GDP, population and dietary preferences, growth in supplies of capital and labor, engagement in existing preferential trade agreements, and unilateral tariff reforms create a dynamic context for the implementation of the TPP.

Economic, Population, and Dietary Trends

The TPP will unite countries at different stages of economic development and with different levels of income and consumer-demand preferences. Most of the 11 TPP members covered in this study are classified as high-income countries, based on their relative income levels (World Bank, 2013). Malaysia, Mexico, and Peru are classified as upper-middle-income countries, and Vietnam, the country with the lowest per capita income in this group, is classified as a lower-middle-income country.

Economic activity in the TPP region is projected to recover from the effects of the global financial crisis, with real GDP expected to grow at an average annual rate between 2.6 and 4.5 percent in most high-income member countries, and between 3.6 and 6.6 percent in middle-income member countries during 2014-25 (USDA-ERS, 2012) (table 2). Economic growth in Japan is projected to be positive, but comparatively low—largely because of the projected decline in the size of its population and labor force. Real per capita incomes are also projected to increase for all TPP members during 2014-25, particularly in the middle-income countries of Malaysia, Mexico, Peru, and Vietnam.

Table 2
Projected growth rates in real GDP and population in Trans-Pacific Partnership member countries, baseline scenario

	Average annual (compound) real GDP growth rate, 2014-25	Average annual (compound) population growth rate, 2014-25
High-income countries		
Australia	2.77	0.98
Canada	2.69	0.44
Chile	4.54	0.71
Japan	0.87	-0.27
New Zealand	2.84	0.70
Singapore	4.35	1.74
United States	2.61	0.69
Upper-middle-income countries		
Malaysia	4.29	1.30
Mexico	3.60	0.94
Peru	4.62	0.90
Lower-middle-income countries		
Vietnam	6.58	0.84

Note: GDP refers to gross domestic product. The baseline scenario imposes projected GDP growth rates.
Source: USDA, Economic Research Service, International Macroeconomic Data Set, 2012.

Reflecting their middle-to-upper income levels and the maturity of diets of TPP members, population growth will be the main engine driving the 10.4-percent real growth in the region's demand for food over 2014-25 under the baseline scenario. Growth in per capita food consumption will be modest because, in most TPP countries, daily per capita consumption is already close to or exceeds 3,000 calories (except for Peru (2,563), Vietnam (2,690), and Japan (2,723)) (UN-FAO, 2013).

While the total quantity of food consumed per capita is not expected to increase substantially, income growth and demographic/social changes will lead to some substitutions in the composition of the consumer food basket over the baseline time period (table 3). The model used in this study adjusts the parameter values that reflect the consumer demand response to rising incomes so that the baseline scenario simulates the changes in consumption patterns in the TPP region over 2014-25 as projected by various sources (including the Economic Research Service's (ERS) baseline projections, the USDA's Foreign Agriculture Service's Global Agricultural Information Network (GAIN) reports, and the United Nations Food and Agriculture Organization). These sources forecast a decline in households' direct per capita consumption quantities of cereals in many TPP countries over 2014-25, although increased demand for meats and processed foods will lead to an increase in the region's indirect consumption of cereals used as intermediate inputs into feeds and cereal-based food products.[4] Growth in per capita consumption of dairy products, such as powdered/fluid milk and cheese, will be positive in most TPP member countries and relatively high in middle-income countries, but will decline modestly in Canada.

Consumption trends described in the baseline scenario also reflect that income growth is associated with higher intakes of fresh fruits and vegetables in low- and middle-income countries (Hall et al., 2009) and high-income countries (Pollack, 2001; Cook, 2011; Lalluka et al., 2007) due to factors that include improvements in the quality and diversity of fresh produce and the effects of higher income on the demand for fresh fruits and vegetables. Following Muhammad et al. (2011), the base-

Table 3
Percent changes in per capita consumption quantities in baseline scenario, 2014-25

	Australia	Canada	Chile	Japan	Malaysia	Mexico	New Zealand	Peru	Singapore	United States	Vietnam
Cereals	-0.4	1.8	0.7	-0.3	-0.8	-0.5	-0.5	7.2	-0.4	-0.4	-0.9
Fruits/ vegetables	3.8	5.7	4.8	4.4	4.5	2.5	3.3	3.3	1.5	4.9	5.3
Oils and fats	3.0	0.3	10.3	0.4	11.9	7.2	3.1	12.5	2.4	-0.2	22.6
Meat	4.0	-3.3	12.1	1.6	14.4	10.9	1.3	12.6	3.1	3.5	20.8
Dairy	1.9	-1.8	10.6	0.4	10.8	11.4	2.4	9.2	4.8	2.2	19.6
Other foods	6.8	8.6	20.5	0.2	17.7	13.3	9.0	17.3	7.0	7.4	37.6
Nonfoods	18.4	22.5	40.5	15.2	37.1	30.2	24.6	42.6	16.8	19.9	55.9
Services	19.5	24.3	49.3	16.5	42.1	35.8	27.5	51.7	18.6	20.6	76.2

Note: Per capita consumption refers to private households' direct demands for final products. Quantity changes for commodity categories are constructed by weighting the quantity changes of the individual commodities in the model by their shares in the value of consumption of each aggregated commodity category in 2014.

Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

[4] See appendix 4 for detailed data on consumption trends.

line simulation describes a relatively large increase in per capita consumption of "other foods" as incomes rise; this category includes a wide variety of high-value, frozen, and prepared processed foods and convenience items. Much of the growth in per capita incomes in the TPP region will be spent on nonfood goods and services, which are more sensitive to income growth than food items (Muhammad et al., 2011).

Trade Policy Trends and Preferential Trade Agreements

For over three decades, TPP members have been actively engaged in negotiating PTAs, which have provided for greater market access in their trade with each other. This network of trade agreements in the Pacific Rim is part of what is sometimes called the "noodle bowl" because it has replaced the most-favored-nation tariff rates applied to all partners with a web of overlapping and differentiated bilateral preferential tariff rates. The earliest PTA in the region was signed by Australia and New Zealand in 1983. The most recent, implemented in 2013, was signed by Australia and Malaysia. Since signing a bilateral trade agreement with Canada in 1989, the United States has been an active participant in preferential trade pacts in the region. In 1994, it joined with Mexico and Canada to form the North American Free Trade Agreement (NAFTA), whose provisions (except for used cars) were fully implemented by 2008. The United States has also entered into bilateral trade agreements with Australia, Peru, Chile, and Singapore, and the provisions of all these agreements will largely be implemented by 2014.

While most of the previously negotiated preferential tariff cuts in TPP members' PTAs were scheduled to take place by 2014, some of the cuts are still to be implemented over the 2014-25 period. The overlay of the TPP on existing tariff-reform commitments means that the effects of the TPP must be measured in terms of its marginal impact, after accounting for the economic impacts of existing PTAs. In addition, Mexico will unilaterally implement tariff reductions on some agricultural commodities—these reforms are included in the PTA component of the baseline scenario.

In this study, the bilateral tariff rates reported in the Global Trade Analysis Project (GTAP) v8 database are aggregated from the HS6 level to GTAP sectors, and calculated from the MAcMaps database, which reports ad valorem tariffs and the ad valorem equivalents of specific tariffs and TRQs. The bilateral rates take into account trade preferences in place in 2007. Since then, however, TPP members have negotiated numerous additional PTAs among themselves. As of March 1, 2014, TPP members had notified 29 bilateral and regional PTAs to the World Trade Organization (WTO) that extended tariff preferences between at least two TPP members. While some of these 29 agreements are, to a certain degree, duplicative (e.g., Japan has a regional PTA with the 10 Association of Southeast Asian Nations (ASEAN)[5] countries, but it also has bilateral PTAs with the four ASEAN countries that are part of the TPP—Brunei, Malaysia, Singapore, and Vietnam), they currently extend preferential tariffs on at least part of 80 bilateral trade flows between TPP members. Over half of the PTAs began implementation after 2007, while three-quarters of them are still undergoing phased implementation of cuts to some tariff lines.

The TPP is expected to build upon its members' existing networks of bilateral and regional PTAs. To account for these previously negotiated tariff cuts, we constructed a database of intra-TPP trade agreements from PTA tariff schedules found in the World Trade Organization's Regional Trade

[5] The Association of Southeast Asian Nations (ASEAN) includes Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

Table 4

Bilateral trade flows covered by preferential trade agreements (PTAs); start/end of implementation

Reporter name	Australia	Brunei	Canada	Chile	Japan	Malaysia
Australia	---	2010/2025		2009/2015		2010/2025
Brunei	2010/2025	---		2006/2017	2008/2026	1992/2010
Canada			---	1997/2014		
Chile	2009/2015	2006/2017	1997/2014	---	2007/2022	2012/2016
Japan		2008/2026		2007/2022	---	2008/2026
Malaysia	2010/2025	1992/2010		2012/2016	2008/2026	---
Mexico			1994/2008	1999/2006	2005/2015	
New Zealand	1983/1995	2010/2025		2006/2017		2010/2025
Peru			2009/2025	2009/2016	2012/2027	
Singapore	2010/2025	2006/2017		2006/2017	2008/2026	1992/2010
United States	2005/2023		1994/2008	2004/2016		
Vietnam	2010/2025	1992/2018			2008/2026	1992/2018
Total PTAs	7	7	4	10	7	7

—continued

Table 4

Bilateral trade flows covered by preferential trade agreements (PTAs); start/end of implementation—continued

Reporter name	Mexico	New Zealand	Peru	Singapore	United States	Vietnam	Total PTAs
Australia		1983/1995		2010/2025	2005/2023	2010/2025	7
Brunei		2010/2025		2006/2017		1992/2010	7
Canada	1994/2008		2009/2025		1994/2008		4
Chile	1999/2006	2006/2017	2009/2016	2006/2017	2004/2016		10
Japan	2005/2015		2012/2027	2008/2026		2008/2026	7
Malaysia		2010/2025		1992/2010		1992/2010	7
Mexico	---		2012/2023		1994/2008		5
New Zealand		---		2010/2025		2010/2025	6
Peru	2012/2023		---	2009/2025	2009/2025		6
Singapore		2010/2025	2009/2025	---	2004/2014	1992/2010	9
United States	1994/2008		2009/2025	2004/2014	---		6
Vietnam		2010/2025		1992/2018		---	6
Total PTAs	5	6	6	9	6	6	80

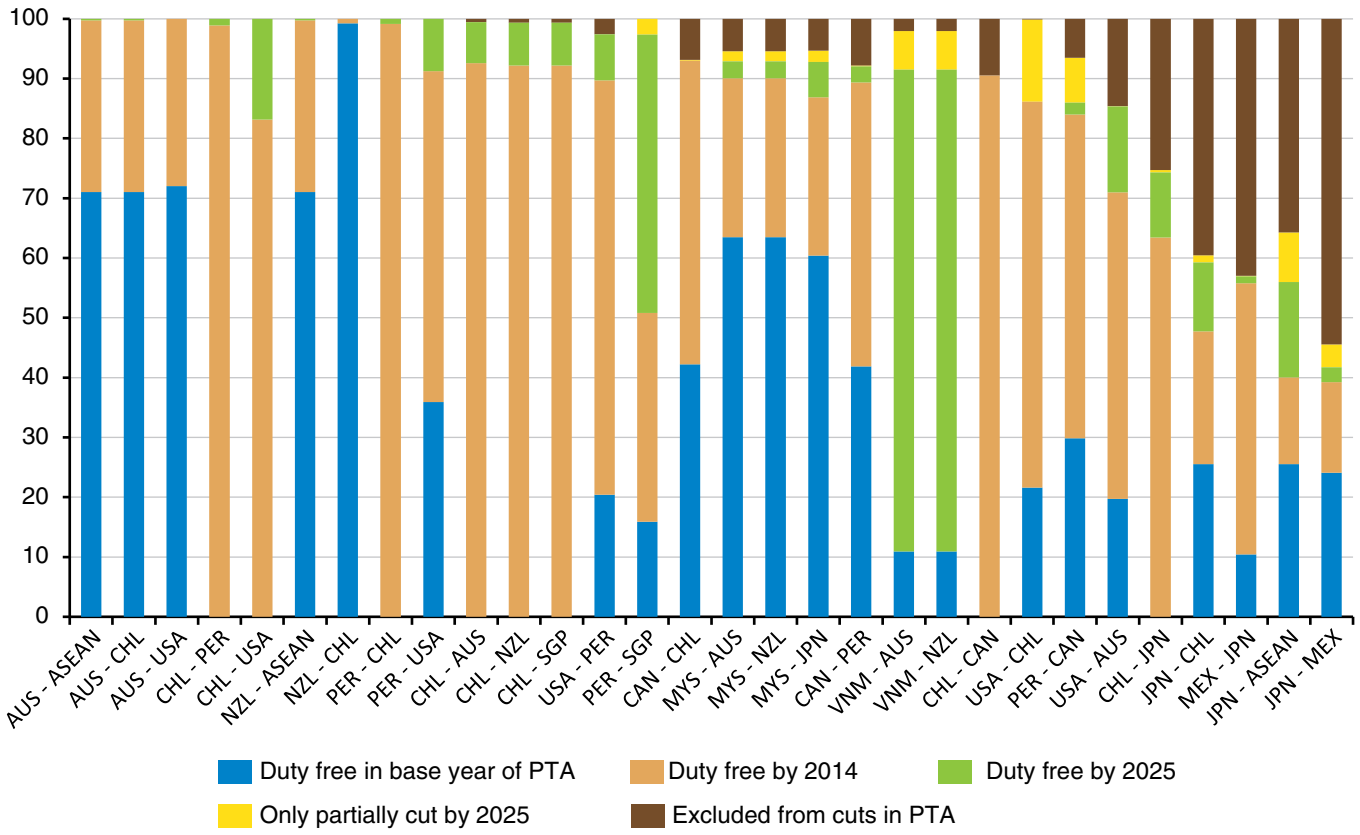
Note: Yellow shading denotes PTAs (covering goods) and Economic Integration Agreements (covering services); orange shading denotes PTAs only.

Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Agreements database. This was supplemented by constructing tariff schedules from the annexes of several trade agreements. Our database reflects the tariff cuts negotiated on over 50 of the 80 trade flows found in table 4 (none of the 14 trade flows between Brunei and its free trade agreement (FTA) partners are included as it is not in our model; PTAs are also not in our database if their last tariff cuts were implemented by 2007). These schedules of negotiated tariff reductions are used to implement bilateral tariff cuts among TPP members in the model's database update, from 2007 to 2014, and for the baseline scenario over 2014-25. We use a simple average to aggregate the preferential tariff data from tariff lines to the sectors defined in the TPP model. For the database update, we calculate the percentage cut in the average rate over the phased liberalization period over 2007-14 and apply that cut to the 2007 tariff rate reported in the GTAP database. Likewise, in the baseline scenario, we calculate the average tariff cuts between 2014 and 2025 and apply these cuts to the 2014 tariffs in the TPP model.

Figure 1 shows that, across the bilateral agricultural tariff schedules of the 30 PTAs in the TPP region for which data are available, a very large percent of tariff lines were scheduled to be duty free by 2014 (prior to the baseline period). Many of the PTA parties already levied duty-free rates in the base year of their agreements, either because their most-favored-nation (MFN)-applied tariff was

Figure 1
Agricultural tariff treatments under PTAs within the TPP region



Note: PTA refers to preferential trade agreements; TPP refers to the Trans-Pacific Partnership. ASEAN refers to the four TPP members that are members of the Association of Southeast Asian Nations (Brunei, Malaysia, Singapore, and Vietnam).
Source: World Trade Organization, Regional Trade Agreements Information System and USDA, Economic Research Service.

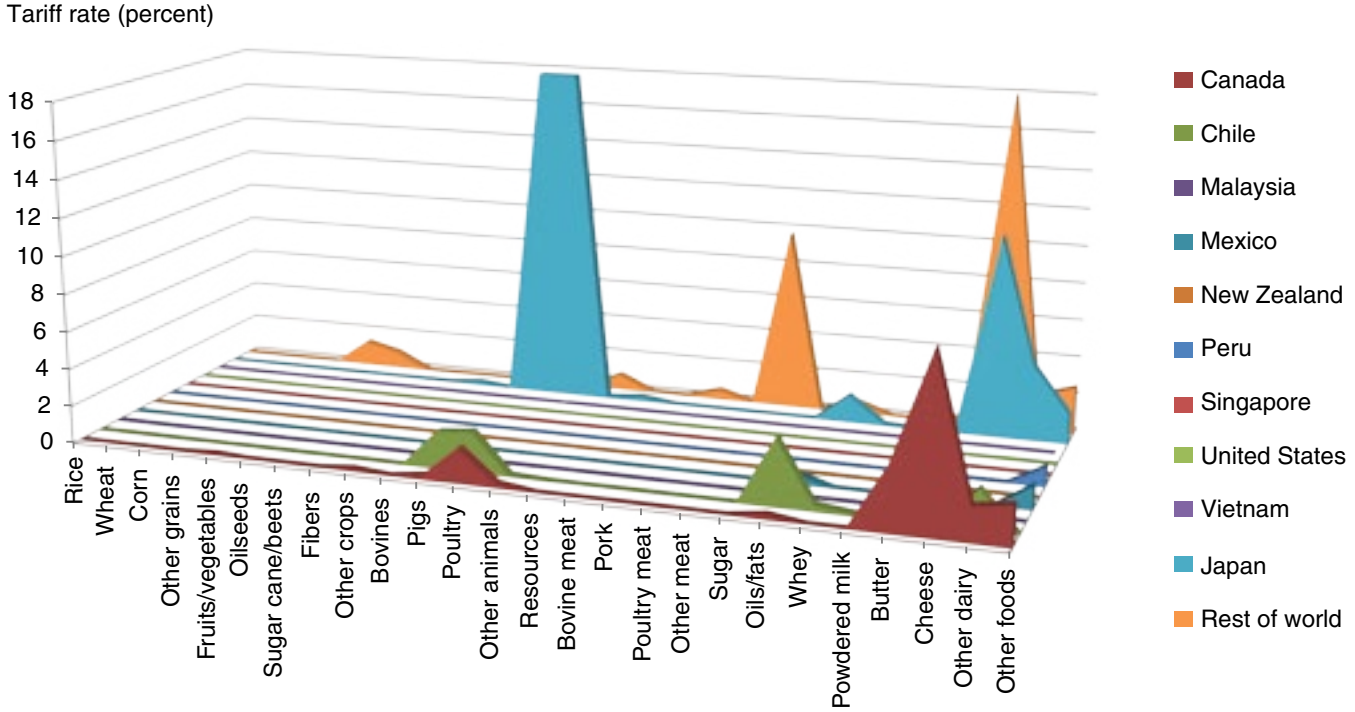
zero or because the parties were already extending duty-free access to their PTA partner through a program such as the Generalized System of Preferences (GSP). Across these 30 PTAs, only about 9 percent of the tariff lines are scheduled to be cut to zero between 2014 and 2025, with many of these reductions already in the latter stages of being implemented; another 1.3 percent are scheduled to be cut, but not to zero. The remaining tariff lines (13 percent) are not scheduled to be reduced between 2014 and 2025, either because they are already at the final level agreed upon in their PTA or because they are excluded from cuts due to their political or economic sensitivity.

Tariff reductions still to take place under existing PTAs over the 2014-2025 baseline period are largest on imports into Peru from Singapore, Vietnam from Australia and New Zealand, Japan from the ASEAN TPP countries (Malaysia, Vietnam, Singapore, and Brunei), the United States from Australia, Japan from Chile, and Chile from Japan. A large number of agricultural tariffs on intra-TPP trade will also decline in Mexico (although these are unilateral cuts of MFN rates, so they also apply to non-TPP countries).

Despite the intensity of PTA activity in the region, the high tariffs that remain among TPP partners on some agricultural products, as well as the trade flows between TPP members that have not already negotiated bilateral PTAs, leave scope for significant additional agricultural trade liberalization under the TPP. Figures 2-12 illustrate TPP members' bilateral agricultural tariffs in 2025, in the

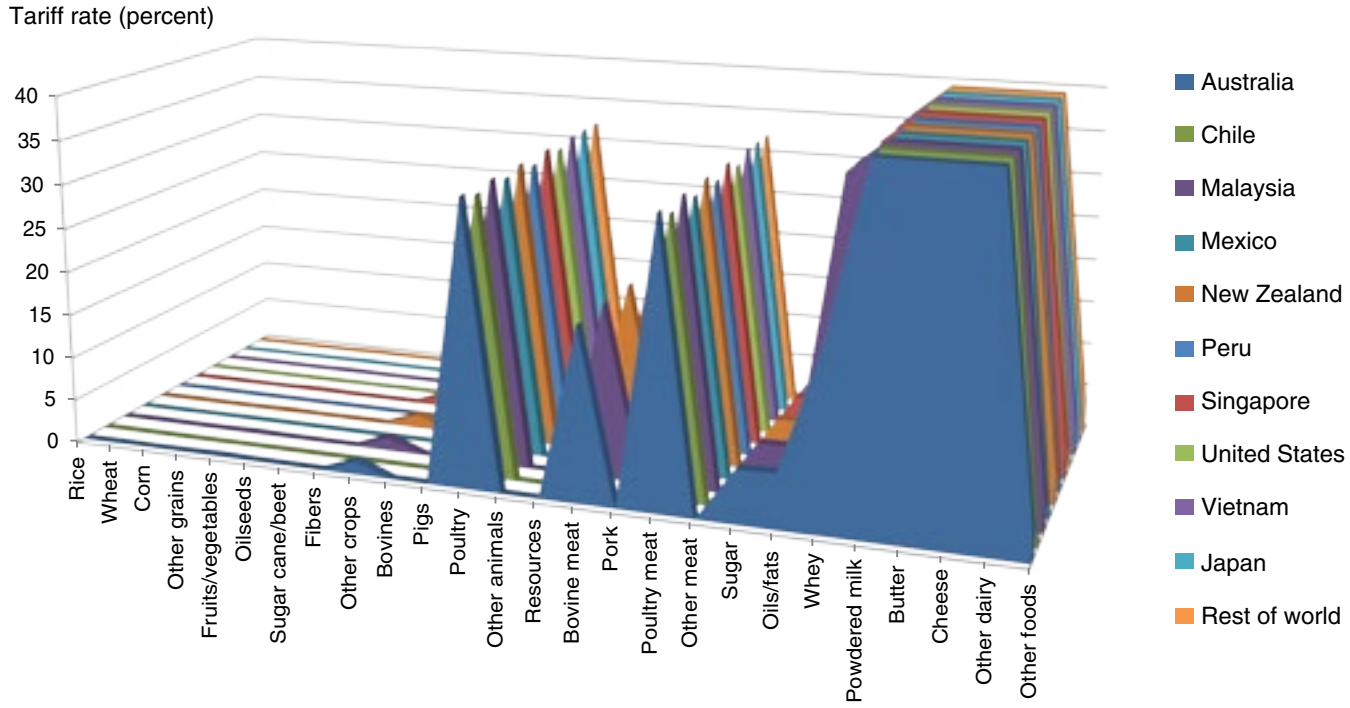
Figures 2-12 – Agricultural tariff structures of Trans-Pacific Partnership (TPP) members with TPP partners and rest of world, 2025

Figure 2
Australia's tariff structure, 2025



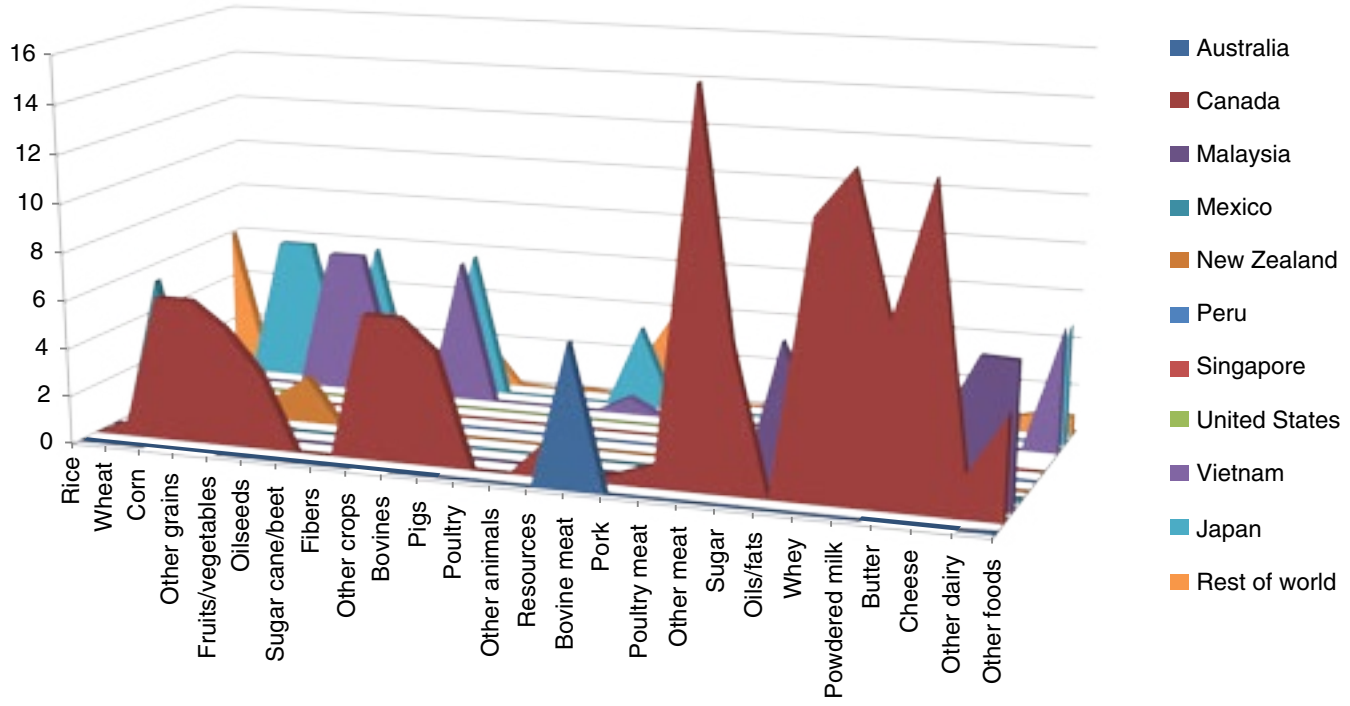
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 3
Canada's tariff structure, 2025



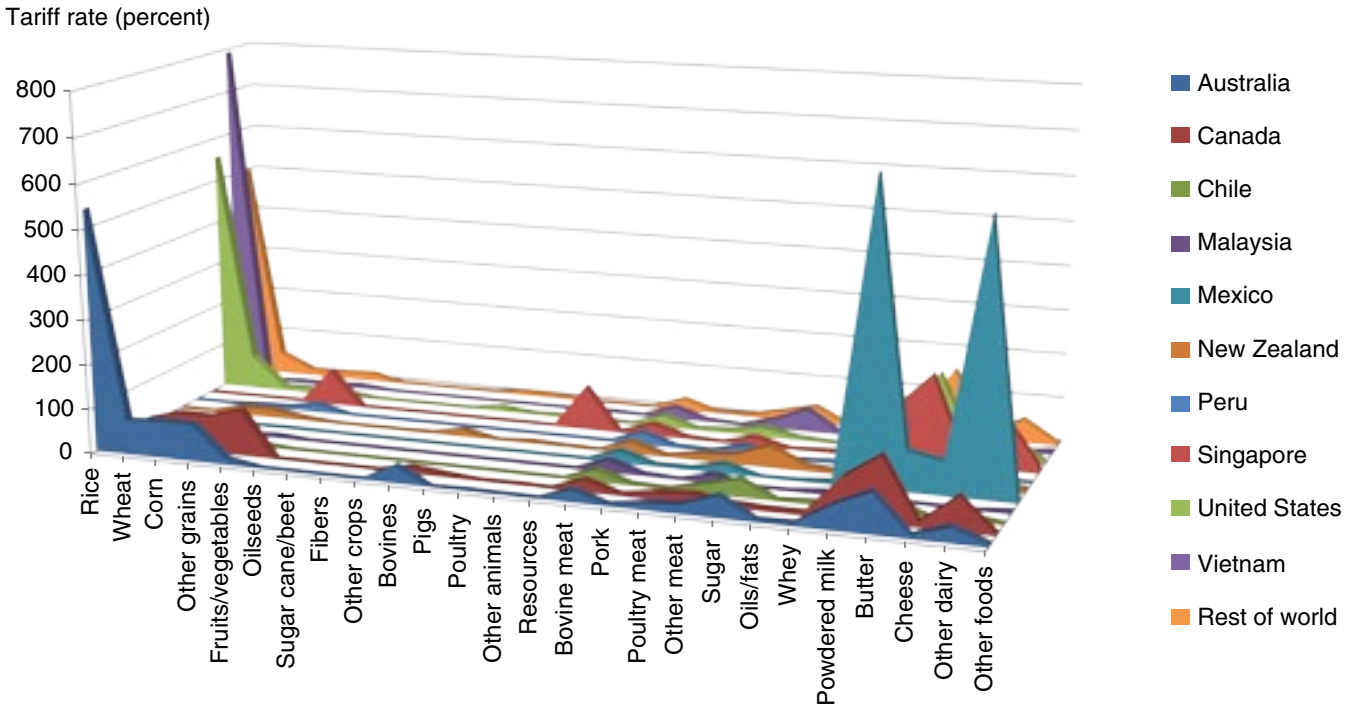
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 4
Chile's tariff structure, 2025



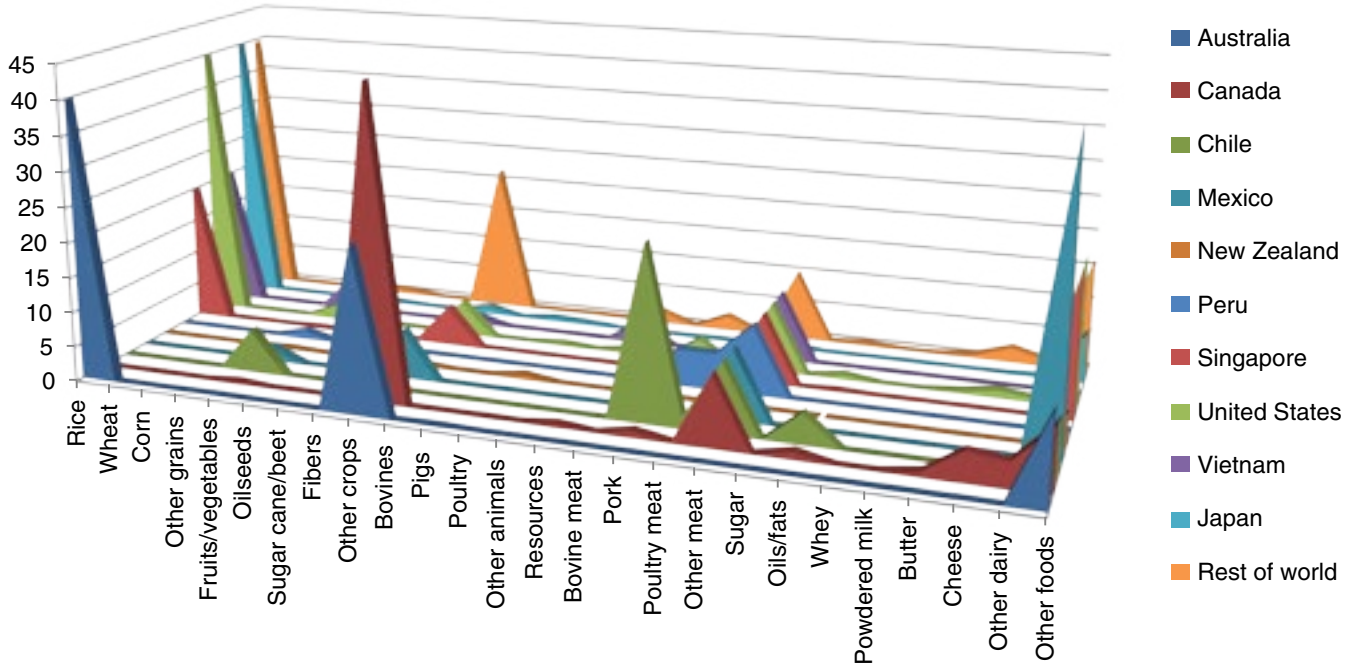
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 5
Japan's tariff structure, 2025



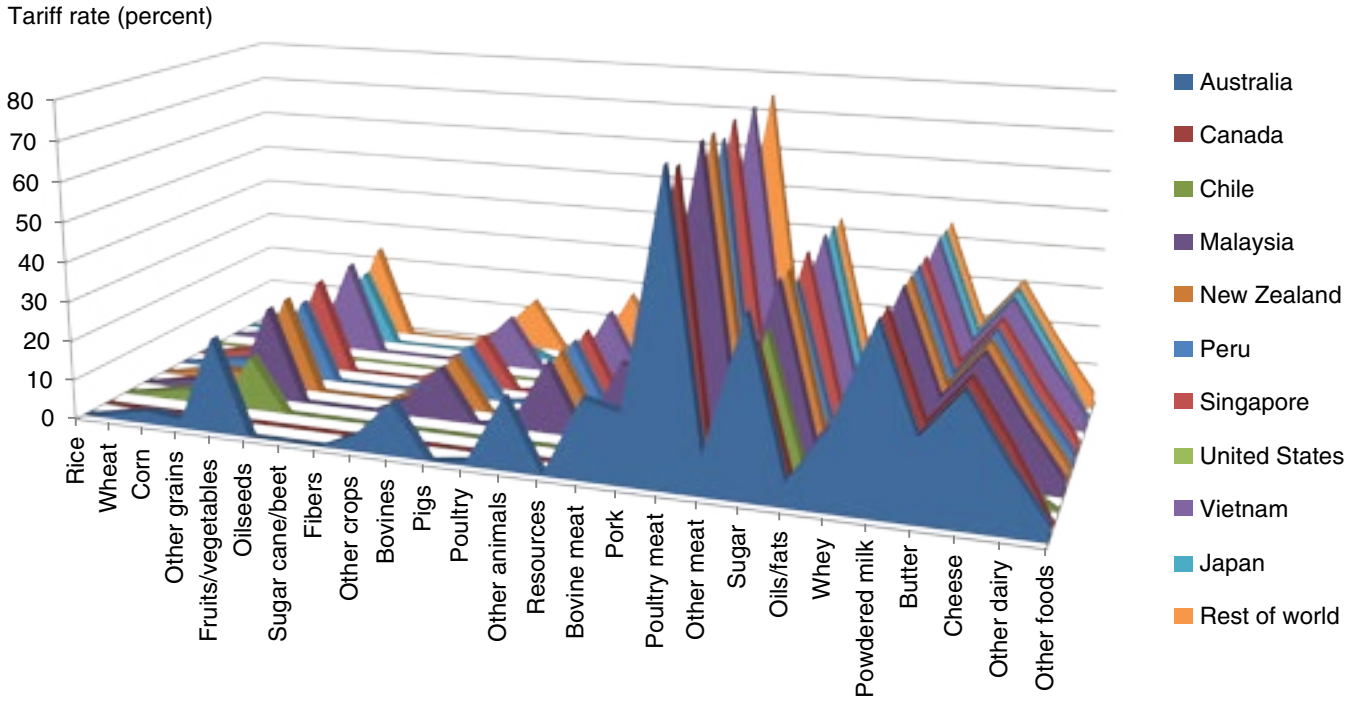
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 6
Malaysia's tariff structure, 2025



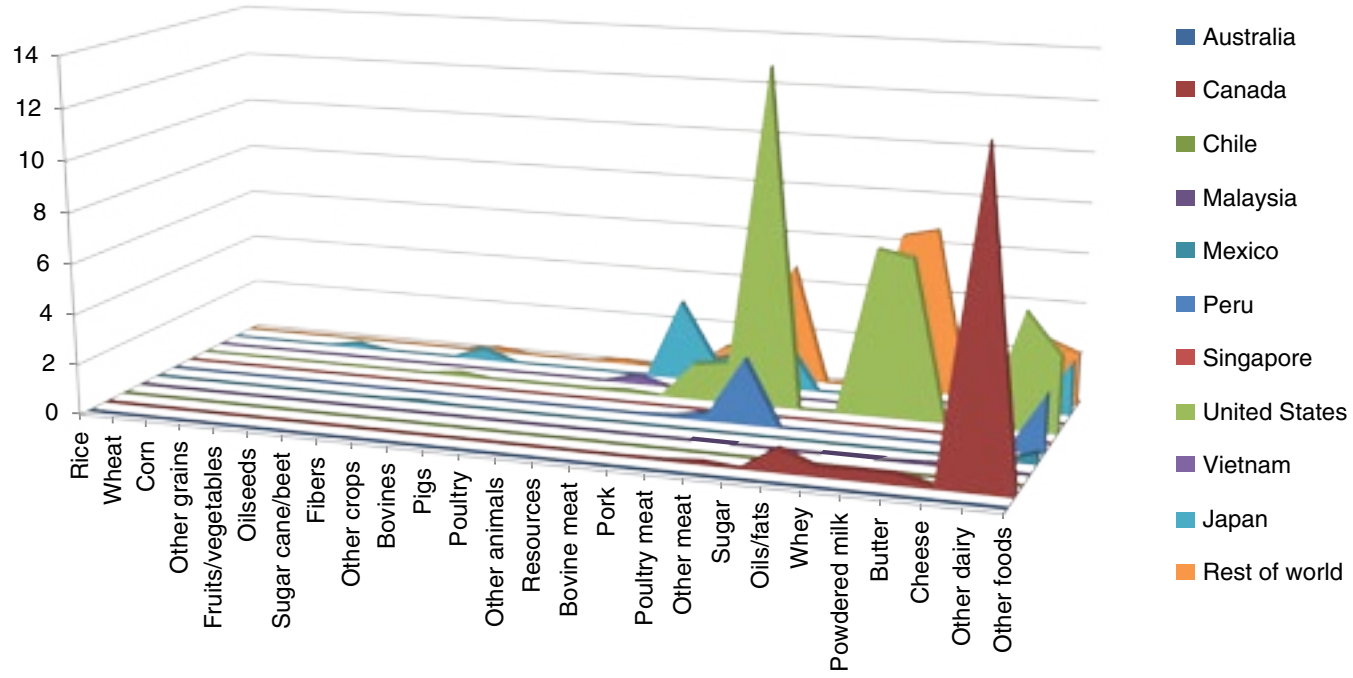
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 7
Mexico's tariff structure, 2025



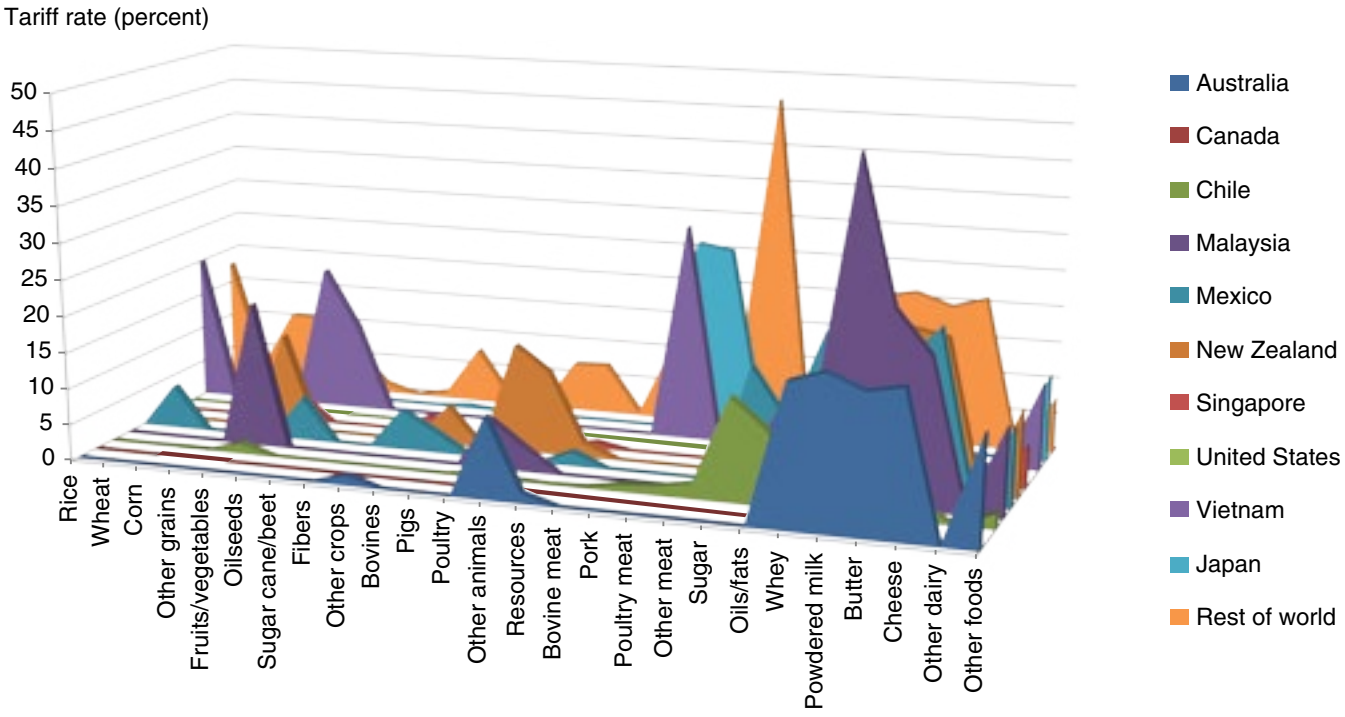
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 8
New Zealand's tariff structure, 2025



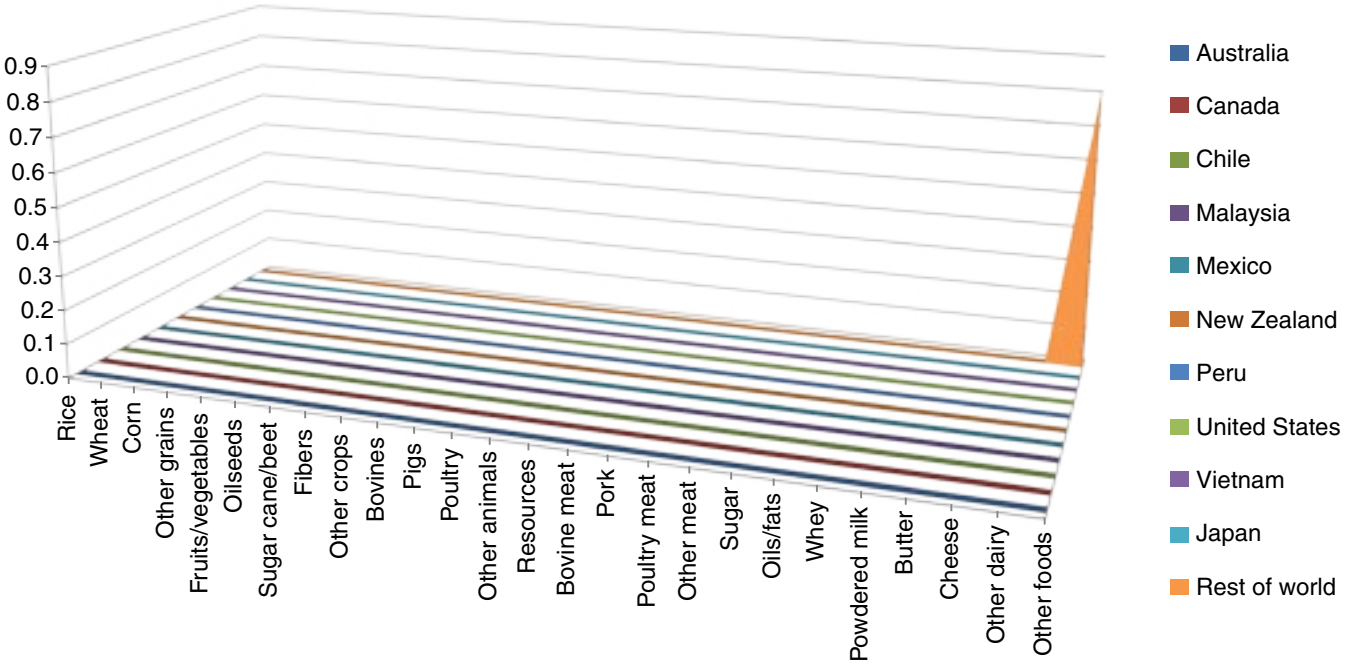
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 9
Peru's tariff structure, 2025



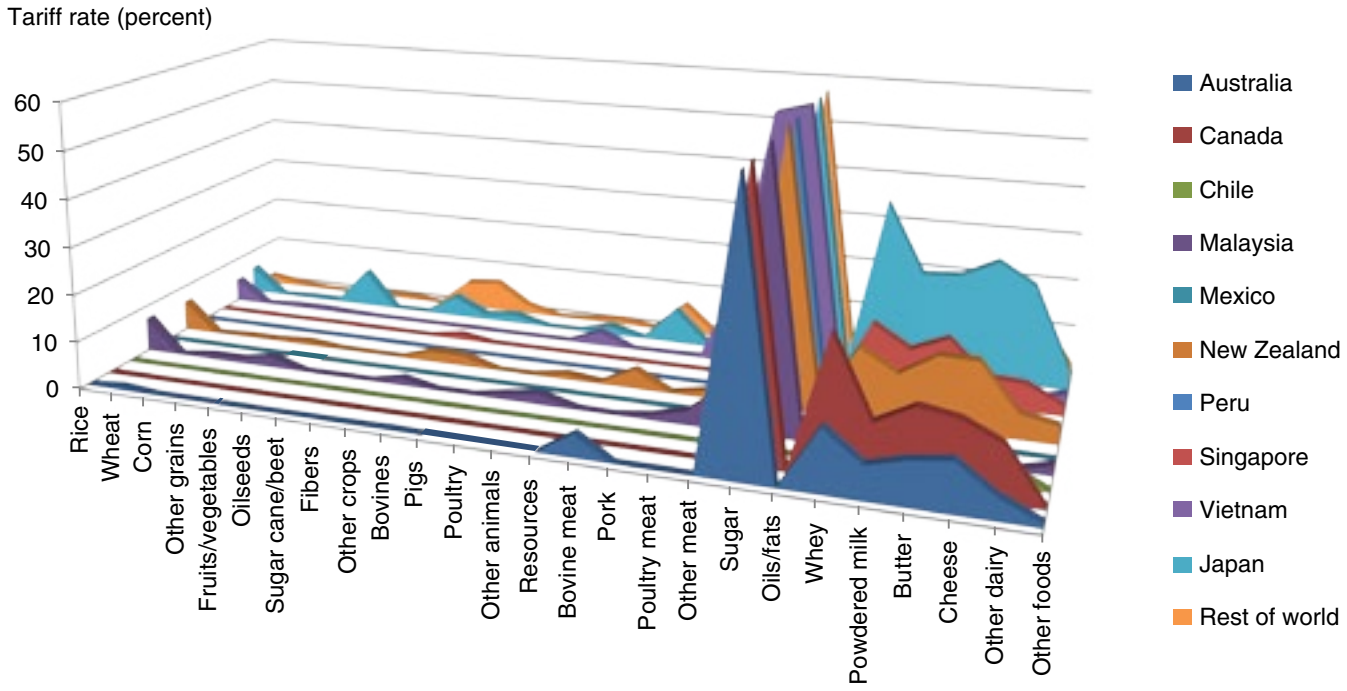
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 10
Singapore's tariff structure, 2025



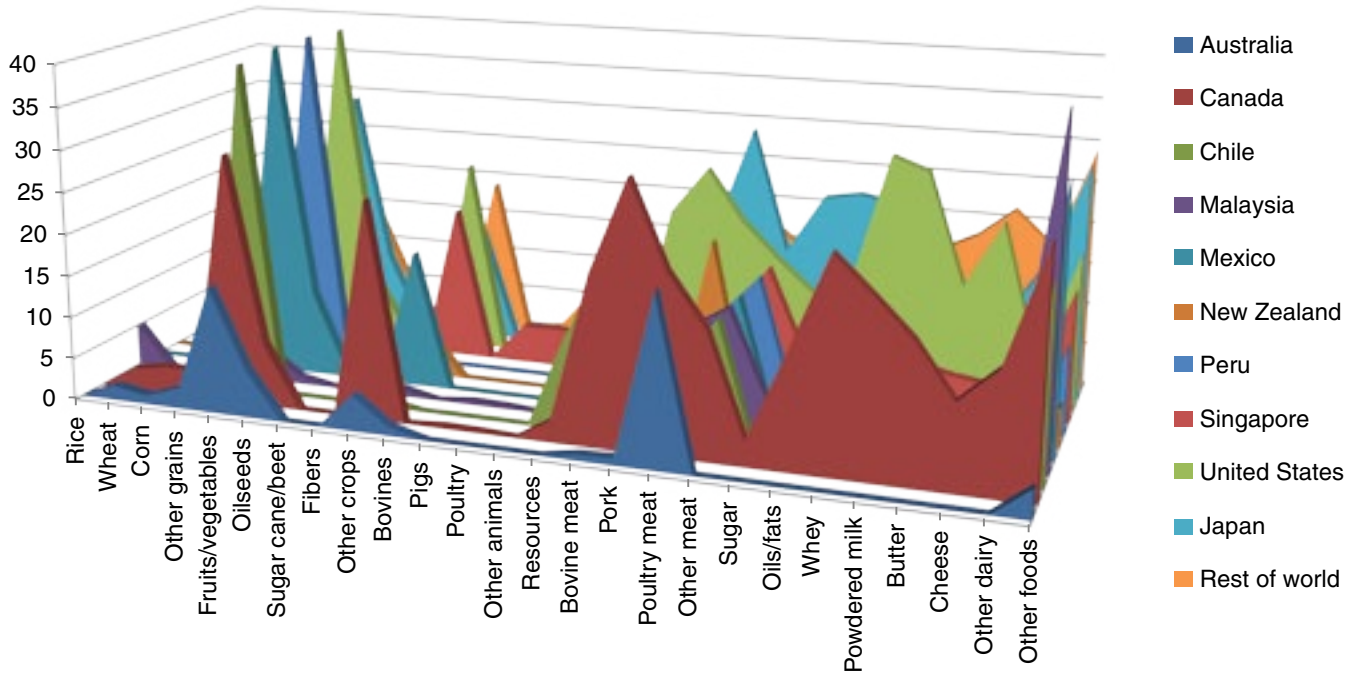
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 11
United States' tariff structure, 2025



Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure 12
Vietnam's tariff structure, 2025



Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

absence of the TPP, for the commodities in this report's model. The graphs reveal variation across the model's commodity groups, as well as across the tariffs that each country applies bilaterally on imports from its TPP partners. The variation in the scale of each country's vertical axis demonstrates the differences in the overall height of the most restrictive tariffs for each country.

While existing PTAs will marginally improve market access for some countries over the 2014-25 baseline for these and many other agricultural products, tariff peaks above 20 percent ad valorem remain on many product categories. By market, tariff peaks will remain in 2025 on Canadian dairy and poultry imports; Japanese imports of bovine meat, rice and other grains, sugar, dairy products, and selected fruits and vegetables; Malaysia's imports of rice and selected processed products; Mexican imports of dairy and poultry products, sugar, and selected fruits and vegetables; Peruvian dairy product imports; U.S. imports of sugar and selected dairy products; and Vietnam's imports of pork, poultry, selected dairy products, processed foods, and fruits and vegetables.

Trade and Production Trends, 2014-25

The baseline scenario results depict projected growth in trade and production over 2014-25 without the TPP. The baseline results for growth in intra-TPP agricultural trade by country are in table 5 and decompose the roles of growth (in real GDP, supplies of labor and capital, population, and food demand) and existing PTA and unilateral tariff-reform commitments. Overall, under the baseline scenario, the value of intraregional agricultural trade is projected to increase by 9.2 percent over 2014-25, an increase worth nearly $12 billion in 2007 U.S. dollars. The middle-income countries of Peru, Mexico, Vietnam, and Malaysia will be among the fastest growing markets for imports of the region's agricultural products, and Chile, New Zealand, Vietnam, and Singapore will be among the fastest growing agricultural exporters to the region. U.S. agricultural exports to the region are projected to increase by 7 percent ($3.4 billion) over the 2014-25 baseline period, while imports will increase by 8 percent ($3.4 billion). The trade flows reported for Singapore, which are large relative to the size of its agricultural sector, reflect its role as a major importer and re-exporter of food products within the Asian region.

Table 5
Growth in value of intra-TPP agricultural trade by country in baseline scenario, 2014-25

	Australia	Canada	Chile	Japan	Malaysia	Mexico	New Zealand
Agricultural imports from TPP partners							
Base value, 2014 ($US millions)	4,410	17,523	737	37,796	2,597	12,198	2,013
Percent change due to growth	13.6	4.3	8.9	8.7	12.2	17.4	6.3
Percent change due to PTAs	0.0	0.0	0.1	0.1	0.1	-0.2	0.1
Value in 2025 ($US millions)	5,013	18,271	804	41,118	2,915	14,296	2,141
Agricultural exports to TPP partners							
Base level, 2014 ($US millions)	12,385	24,881	5,942	1,055	4,188	13,106	7,054
Percent change due to growth	9.7	8.4	20.7	-5.9	7.9	10.9	13.5
Percent change due to PTAs	0.3	0.0	0.2	0.0	0.1	0.0	0.7
Value in 2025 ($US millions)	13,629	26,982	7,190	993	4,522	14,536	8,055

—continued

Table 5

Growth in value of intra-TPP agricultural trade by country in baseline scenario, 2014-25—continued

	Peru	Singapore	United States	Vietnam	Total
Agricultural imports from TPP partners					
Base value, 2014 ($US millions)	904	2,580	41,420	1,847	124,026
Percent change due to growth	17.2	15.0	8.3	11.4	9.2
Percent change due to PTAs	1.5	0.1	0.0	2.2	0.1
Value in 2025 ($US millions)	1,074	2,968	44,846	2,100	135,545
Agricultural exports to TPP partners					
Base level, 2014 ($US millions)	1,446	1,222	48,983	3,763	124,026
Percent change due to growth	10.8	10.0	7.1	13.3	9.2
Percent change due to PTAs	0.1	1.1	-0.1	0.5	0.1
Value in 2025 ($US millions)	1,603	1,357	52,395	4,284	135,545

Note: TPP refers to the Trans-Pacific Partnership; PTAs refer to preferential trade agreements. Base values in 2014 are simulation results from the model update. All values are in 2007 U.S. dollars. Growth component includes effects of increases in gross domestic product, supplies of labor and capital, population, and dietary changes.

Source: USDA, Economic Research Service, TPP model.

Projected growth in GDP, supplies of capital and labor, population, and dietary changes will account for nearly all of the growth in intra-TPP agricultural trade over the baseline period. The trade liberalization commitments in the region's PTAs, and Mexico's unilateral reforms that will be implemented over 2014-25, are estimated to have positive but very small effects on most members' intra-TPP agricultural trade; they will, however, have a small negative effect on U.S. exports to the region. In part, these small trade impacts reflect that some of the PTAs will already have been substantially implemented prior to 2014. Also, many of these agreements have either fully excluded or only partially cut the high tariffs maintained on politically sensitive agricultural products.

By commodity, growth rates in intra-TPP agricultural trade under the baseline scenario will be highest for poultry, "other animals," bovine meat (includes beef and mutton), fibers, pork, and fruits and vegetables (table 6). In value terms, growth will be largest for "other foods" (an aggregate category that includes processed foods and feeds), fruits and vegetables, bovine meat, and pork.

Agricultural production in the TPP countries will respond to the demand- and supply-side developments projected to occur during 2014-25. Demand-side drivers in the baseline scenario include population growth, growth in incomes and resulting changes in consumer food demand, and the import-price effects from the implementation of tariff cuts in existing PTAs. Supply-side drivers in the baseline scenario include growth in productivity and in countries' endowments of labor and capital. Growth in labor and capital supplies will lead to changes in relative factor costs, within and across countries. An important development will be the effects of a projected decline in the supply of unskilled relative to skilled labor in all TPP countries. In Japan, an absolute decline in the size of its unskilled labor force will lead to relatively high wage costs and a loss of competitiveness in sectors that use this type of labor intensively, particularly so for many agricultural and food products.

Agricultural output quantities in all TPP countries, except Japan and Singapore, will increase over the 2014-25 baseline period (table 7). The United States is, by far, the largest agricultural producer within the proposed trade pact, and growth in its real agricultural output between 2014 and 2015 will range from 8.5 percent for meat to about 17 percent for "other agriculture" (a diverse sector

Table 6

Change in value of intra-TPP agricultural trade by commodity in baseline scenario, 2014-25

Commodity	2014 intra-TPP trade	Change in value of intra-TPP trade, 2014-25	Percent change in value of intra-TPP trade, 2014-25
	$ US millions		*Percent*
Rice	716	64	8.9
Wheat	3,698	317	8.6
Corn	5,468	298	5.4
Other grains	2,217	91	4.1
Fruit/vegetables	14,605	2,455	16.8
Oilseeds	5,651	34	0.6
Sugar cane/beet	2	0	-1.2
Fibers	920	157	17.1
Other crops	3,988	485	12.2
Bovines	2,613	117	4.5
Pigs	900	77	8.6
Poultry	967	207	21.4
Other animals	704	140	19.9
Bovine meat	9,849	1,928	19.6
Pork	5,618	933	16.6
Poultry meat	3,211	87	2.7
Other animal products	1,171	-128	-10.9
Sugar	1,167	18	1.5
Oils/fats	5,473	140	2.6
Whey	552	38	6.8
Milk powder	1,679	238	14.2
Butter	897	66	7.4
Cheese	1,353	183	13.5
Other dairy	1,469	153	10.5
Other foods	49,143	3,419	7.0
Total	124,026	11,519	9.3

Note: TPP refers to the Trans-Pacific Partnership. Base values in 2014 are simulation results from the model update. All values are in 2007 U.S. dollars.

Source: USDA, Economic Research Service, TPP model.

which includes sugar, fibers, "other crops," "other animal," and "other foods"). Japan is the second-largest agricultural producer in the region, but its real output of most agricultural products, except for fruits and vegetables, is expected to decline between 2014 and 2025. Agricultural output growth is estimated to be very strong in Vietnam, Chile, and Peru over the baseline period. Although most TPP members' agricultural output will grow, an increasing proportion of their productive resources is expected to shift from agriculture toward manufacturing and services. This structural change reflects, in part, that dietary requirements are already largely met in the TPP countries (although quality is increasing) and that most of the rise in income will be spent on nonfood goods and services.

Table 7

Changes in agricultural output in baseline scenario, 2014-25

	Australia	Canada	Chile	Japan	Malaysia	Mexico
Value of output in 2014, $US millions						
Cereals	9,887	9,541	2,474	59,518	1,274	5,551
Fruits/vegetables	7,244	3,559	4,731	39,429	604	11,612
Oils and fats	3,888	9,194	611	7,198	32,078	3,123
Meat	38,807	35,768	6,178	57,666	3,501	19,289
Dairy	17,678	16,566	3,021	38,528	1,409	14,652
Other agriculture	60,310	60,861	19,238	384,006	11,862	76,968
Total agriculture	137,813	135,490	36,252	586,344	50,727	131,197
Percent change in quantities in baseline scenario, 2014-25						
Cereals	11.4	12.8	24.7	-3.0	12.1	12.7
Fruits/vegetables	15.4	23.0	21.4	0.6	9.8	11.4
Oils and fats	10.8	15.6	39.2	-9.4	7.9	19.7
Meat	13.2	9.0	47.9	-7.2	23.7	24.6
Dairy	17.1	7.8	25.9	-3.4	29.7	21.7
Other agriculture	17.1	16.2	34.0	-3.6	22.8	23.9

—continued

Table 7

Changes in agricultural output in baseline scenario, 2014-25—continued

	New Zealand	Peru	Singapore	United States	Vietnam
Value of output in 2014, $US millions					
Cereals	323	3,433	147	76,422	9,075
Fruits/vegetables	3,901	3,300	25	67,113	3,370
Oils and fats	1,652	1,881	280	46,558	449
Meat	12,027	6,803	600	283,768	3,209
Dairy	17,748	3,628	401	132,504	489
Other agriculture	11,380	21,078	3,094	550,741	15,310
Total agriculture	47,032	40,122	4,547	1,157,105	31,902
Percent change in quantities in baseline scenario, 2014-25					
Cereals	14.5	20.3	20.4	10.2	5.4
Fruits/vegetables	18.4	14.8	-0.2	16.3	17.1
Oils and fats	16.1	29.8	22.1	10.7	30.6
Meat	12.5	25.3	18.8	8.5	32.9
Dairy	9.9	20.1	30.1	14.1	41.5
Other agriculture	20.3	29.9	16.7	16.7	37.7

Notes: Base values in 2014 are simulation results from the model update. All values are in 2007 dollars. Quantity changes for commodity categories are constructed by weighting the quantity changes of the individual commodities in the model by their shares in the value of output in 2014 of each aggregated commodity category.

Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Impacts of Eliminating Tariffs and TRQs Within the TPP in 2025

A hypothetical and stylized TPP scenario eliminates all remaining intra-TPP agricultural and nonagricultural tariffs and TRQs. This section discusses the TPP's impacts on members' real GDP, agricultural trade, and agricultural output.

Impacts on Real GDP

The differences in real GDP in 2025 with the TPP, compared with the baseline scenario, are in table 8. Tariff and TRQ elimination in the TPP scenario results in minimal impacts at the macroeconomic level, with zero or small positive effects on members' real GDP. The largest macroeconomic impact of the TPP, in percentage terms, takes place in Vietnam, where real GDP would be 0.10 percent higher in 2025 with the implementation of the TPP than it would be under the baseline. Small gains in real GDP will also accrue to Japan (0.02 percent), and to New Zealand, Malaysia, and Mexico (all 0.01 percent). The TPP is projected to have no measurable impacts on real GDP in any other TPP member countries.

Impacts on Agricultural Trade Within the TPP

While the TPP is unlikely to have substantial macroeconomic effects, the TPP scenario has important implications for agricultural trade among the member countries. In 2025, the value of agricultural trade among TPP members is projected to be 6 percent (about $8.5 billion in 2007 U.S.

Table 8
Percentage difference in real GDP in 2025 in the hypothetical TPP scenario (relative to baseline)

High-income countries	
Australia	0.00
Canada	0.00
Chile	0.00
Japan	0.02
New Zealand	0.01
Singapore	0.00
United States	0.00
Upper-middle-income countries	
Malaysia	0.01
Mexico	0.01
Peru	0.00
Lower-middle-income countries	
Vietnam	0.10

Note: TPP refers to the Trans-Pacific Partnership. GDP refers to gross domestic product. Hypothetical TPP scenario eliminates tariffs and TRQs between TPP members.

Source: USDA, Economic Research Service, TPP model.

dollars) greater with the TPP, compared with the baseline scenario without the TPP (table 9). Every member country will experience growth in both its agricultural imports and exports. Increases in agricultural trade by the TPP's two largest economies, the United States and Japan, account for a large share of the trade expansion. The United States will supply about one-third of the expansion in intraregional agricultural exports—the value of U.S. agricultural exports to TPP partners in 2025 is estimated to be 5 percent ($2.8 billion) higher under the TPP scenario than in the baseline. Japan will account for almost 70 percent of the expansion in intraregional agricultural imports—the value of Japan's agricultural imports from its TPP partners in 2025 is expected to be 14 percent ($5.8 billion) higher than in the baseline (table 10).

By commodity, the percentage increase in the value of intraregional trade due to the elimination of intraregional tariffs and TRQs will be largest for rice, sugar, and "other meat" (which includes animal fats and oils and offals). In absolute value terms, the increase will be greatest for bovine meat (which includes beef and mutton), "other foods" (which includes processed foods and feeds), and poultry meat; although their growth rates are lower, these commodities have large initial values in intra-TPP trade so even relatively small percentage gains translate into relatively large absolute gains in their trade value (table 11).

The increased trade in meats of about $3.7 billion will account for 43 percent of the expansion in the value of intra-TPP trade in 2025, most of which is supplied by Australia, the United States, Canada, and New Zealand.[6] About three-quarters of the increase in meat exports is destined for Japan, whose meat imports (mostly bovine meat) will increase by about $2.8 billion relative to the baseline. In the case of Japan's pork imports, in addition to an ad valorem tariff, Japan's Gate Price system assesses an additional duty on each pork shipment whose unit value is less than the Gate Price (524 yen/kg). The duty is the difference between the Gate Price and the import unit value. The complexity and variability in this system made it impossible to estimate a tariff equivalent of the Gate Price duties, and the model results thus reflect elimination of the ad valorem tariff but the continued existence of the Gate Price system. Elimination of the Gate Price system would lead to further increases in pork imports.

In terms of bilateral flows, the growth in value of U.S. meat exports is largely due to increased poultry meat sales to Canada and increased sales of all types of meats to Japan and Vietnam. The growth in value of Australian meat exports is mainly due to increased sales of bovine meat to Japan, the United States, and Canada. Much of Canada's meat-export growth will be driven by increased sales of poultry meat to Japan, Mexico, and Vietnam. The largest growth in New Zealand's meat exports will take place in sales of bovine meat to Japan, Canada, the United States, and Mexico.

Dairy products will account for nearly 20 percent of the expansion in intra-TPP agricultural trade resulting from the TPP scenario due to the high tariffs that many TPP countries currently apply to dairy product imports (even though dairy products account for less than 5 percent of 2025 intra-TPP agricultural trade in the baseline scenario). The largest growth in dairy imports in 2025, relative to the baseline scenario, in both percentage terms and value of imports, is in Canada and Japan. Most of the increase in the region's dairy import demand is met by the United States, mainly in increased sales to Japan and Canada, and by New Zealand, with increased exports to Mexico, Canada, the

[6] See appendix 2 for a mapping of the model's 29 commodities into aggregated commodity sectors. Meats include bovines, pigs, poultry, bovine meat, pork, poultry meat, and other meat products.

Table 9

Effects of the TPP scenario on value of agricultural exports to TPP partners in 2025

	Australia	Canada	Chile	Japan	Malaysia	Mexico	New Zealand	Peru	Singapore	United States	Vietnam	Total
Baseline 2025 exports to TPP partners ($US millions)												
Cereals	399	2,445	217	8	8	58	3	5	1	9,582	142	12,869
Fruits/ vegetables	408	1,430	1,778	18	156	5,851	751	372	3	5,906	387	17,061
Oilseeds and products	204	3,635	17	26	2,160	94	17	24	66	5,030	24	11,297
Meat	6,231	7,560	997	22	299	1,320	1,811	140	12	9,094	64	27,550
Dairy	1,387	182	110	5	97	74	2,821	4	144	1,800	2	6,627
Other agriculture	5,000	11,729	4,070	914	1,803	7,139	2,652	1,059	1,130	20,982	3,664	60,142
Total agriculture	13,629	26,982	7,190	993	4,522	14,536	8,055	1,603	1,357	52,395	4,284	135,545
Percentage change in value in 2025 relative to the baseline, due to TPP												
Cereals	40.2	3.0	0.0	5.4	-5.4	6.2	1.6	-6.3	-16.6	6.9	59.1	7.7
Fruits/ vegetables	4.6	7.2	1.7	9.6	0.3	0.0	3.3	1.4	3.6	3.7	0.1	2.4
Oilseeds and products	-0.5	0.5	8.1	14.5	1.8	0.1	3.9	0.3	5.5	0.7	1.0	0.9
Meat	25.8	6.5	4.8	17.0	0.5	7.7	21.9	10.3	1.6	11.0	0.8	13.3
Dairy	25.7	37.3	21.9	15.3	12.0	10.9	18.5	3.8	8.1	32.2	8.4	23.9
Other agriculture	9.3	2.2	0.9	7.9	7.0	-0.2	3.6	6.2	16.7	1.6	5.1	3.0
Total agriculture	19.2	3.7	2.0	8.4	3.9	0.7	12.9	5.3	15.0	5.4	6.4	6.3
Change in value in 2025 relative to the baseline, due to TPP ($US millions)												
Cereals	161	73	0	0	0	4	0	0	0	664	84	985
Fruits/ vegetables	19	104	31	2	0	0	24	5	0	221	0	406
Oilseeds and products	-1	18	1	4	38	0	1	0	4	36	0	101
Meat	1,610	490	48	4	1	101	396	14	0	1,000	1	3,665
Dairy	357	68	24	1	12	8	523	0	12	580	0	1,585
Other agriculture	466	254	38	73	126	-14	95	65	188	326	187	1,805
Total agriculture	2,611	1,007	142	83	177	99	1,039	85	204	2,827	273	8,548

Notes: TPP refers to the Trans-Pacific Partnership. Values are in 2007 U.S. dollars.

Source: USDA, Economic Research Service, TPP model.

Table 10

Effects of the TPP scenario on value of agricultural imports from TPP partners in 2025

	Australia	Canada	Chile	Japan	Malaysia	Mexico	New Zealand	Peru	Singapore	United States	Vietnam	Total
Baseline 2025 imports from TPP partners ($US millions)												
Cereals	33	610	362	5,983	331	3,181	60	490	83	1,410	326	12,869
Fruits/ vegetables	459	3,565	41	2,268	201	831	167	80	337	9,022	89	17,061
Oilseeds and products	363	1,015	42	4,080	259	2,291	175	23	274	2,469	307	11,297
Meat	614	2,756	85	11,826	192	2,879	221	30	559	8,134	256	27,550
Dairy	473	561	18	1,783	792	1,094	89	55	547	914	301	6,627
Other agriculture	3,071	9,765	255	15,179	1,140	4,019	1,430	395	1,169	22,897	822	60,142
Total agriculture	5,013	18,271	804	41,118	2,915	14,296	2,141	1,074	2,968	44,846	2,100	135,545
Percentage change in value in 2025 relative to the baseline, due to TPP												
Cereals	1.7	0.3	0.5	15.9	4.7	-0.1	1.9	0.3	2.0	0.3	3.0	7.7
Fruits/ vegetables	1.1	0.2	3.8	14.0	1.8	0.3	1.3	0.7	0.0	0.1	65.5	2.4
Oilseeds and products	0.9	2.0	2.2	0.3	0.3	0.0	0.4	11.5	1.6	0.4	15.2	0.9
Meat	2.5	16.4	0.6	23.9	-0.5	1.4	2.7	1.1	0.1	3.0	29.7	13.3
Dairy	0.6	65.3	1.1	45.1	0.1	17.1	2.3	16.7	1.8	20.5	4.9	23.9
Other agriculture	0.5	0.3	1.0	6.0	15.0	0.2	1.1	2.3	0.8	2.0	22.3	3.0
Total agriculture	0.8	4.8	0.9	14.2	6.6	1.6	1.3	2.2	0.8	2.0	18.5	6.3
Change in value in 2025 relative to the baseline, due to TPP ($US millions)												
Cereals	1	2	2	951	15	-4	1	1	2	4	10	985
Fruits/ vegetables	5	5	2	317	4	2	2	1	0	10	58	406
Oilseeds and products	3	20	1	10	1	0	1	3	4	11	47	101
Meat	16	451	0	2,829	-1	41	6	0	0	247	76	3,665
Dairy	3	367	0	804	1	187	2	9	10	187	15	1,585
Other agriculture	14	26	3	918	171	8	16	9	9	448	183	1,805
Total agriculture	41	871	8	5,830	191	235	28	23	25	908	388	8,548

Notes: TPP refers to the Trans-Pacific Partnership. Values are in 2007 U.S. dollars.

Source: USDA, Economic Research Service, TPP model.

Table 11

Change in value of intra-TPP agricultural trade in 2025 with tariff and tariff-rate quota elimination, relative to the baseline

Commodity	2025 intra-TPP trade, baseline	Change in value of 2025 intra-TPP trade with TPP	Percent change in value of 2025 intra-TPP trade with TPP
	$US millions		*Percent*
Rice	780	604	77.5
Wheat	4,015	251	6.2
Corn	5,766	89	1.5
Other grains	2,308	41	1.8
Fruits/vegetables	17,061	406	2.4
Oilseeds	5,685	-7	-0.1
Sugar cane/beet	2	0	1.0
Fibers	1,077	3	0.2
Other crops	4,473	29	0.7
Bovines	2,729	31	1.1
Pigs	977	2	0.2
Poultry	1,174	32	2.7
Other animals	844	5	0.6
Bovine meat	11,777	2,161	18.3
Pork	6,550	157	2.4
Poultry meat	3,299	796	24.1
Other meat	1,043	487	46.6
Sugar	1,185	569	48.0
Oils and fats	5,612	108	1.9
Whey	590	69	11.8
Powdered milk	1,917	464	24.2
Butter	963	265	27.6
Cheese	1,536	255	16.6
Other dairy	1,622	531	32.8
Other foods	52,562	1,199	2.3
Total agriculture	135,545	8,548	6.3

Notes: TPP refers to the Trans-Pacific Partnership. Values in 2025 are simulation results of the baseline scenario. All values are in 2007 U.S. dollars.

Source: USDA, Economic Research Service, TPP model.

United States, and Japan. Growth in Australian dairy exports to the TPP region is mostly due to an expansion of its powdered milk sales to Japan.

An important caveat to this analysis is that the model does not account for possible policy or market responses that could mitigate the trade impacts of tariff elimination among the TPP countries. In fact, insulating price or income-support programs or efficiency gains as a result of structural changes in previously protected sectors could occur. For example, the projected growth in Canadian dairy

imports is based on the assumption that Canada eliminates its tariffs on dairy-product imports from other TPP countries. Canada's maintenance of over-quota tariffs on dairy, poultry, and egg products is an integral part of that country's supply-management system in these sectors, and the provision of duty-free access for dairy products from major dairy-producing countries, such as the United States and New Zealand, in a TPP would be a major policy departure for Canada. A more detailed discussion of the Canadian supply-management program is in box 2.

Intra-TPP trade in cereals is estimated to be about 8 percent higher in value in 2025 under the TPP scenario than in the 2025 baseline. Almost all (97 percent) of the expansion in intra-TPP cereals trade is accounted for by growth in Japan's grain imports, mostly of rice and wheat. Japan's imports of rice rise substantially under the TPP scenario, sourced primarily from the United States, with small increases from Australia and Vietnam. Despite an overall doubling of Japan's rice imports, however, the import share of Japan's domestic market only rises to 10 percent and its domestic production declines by less than 3 percent. Although eliminating Japan's extremely high over-quota tariffs for rice is a radical change in policy, it would be difficult for suppliers in the TPP group to provide much more rice to the Japanese market than is indicated in the model results. Japanese consumers have a strong preference for the japonica rice variety produced in Japan, and box 3 describes the constraints in Australia and the United States in increasing their production of japonica.

Tariff and TRQ elimination in a TPP results in a very small increase in the value of Japan's corn imports in 2025, relative to the baseline (appendix 5). Japan produces very little corn, and its animal production depends crucially on imported corn. The TPP scenario results in a contraction in Japan's production of bovines, hogs, and poultry, and, consequently, in its feed requirements. In the model, most of Japan's corn imports are used as an intermediate input into the "other foods" commodity, a sector that includes production of both animal feeds and corn-based starch and sweeteners, and which contracts one-tenth of a percent (appendix 6). The small growth in Japan's corn import demand in the model's results, despite declining feed demand and lower output of "other foods," is driven by a substitution toward imported corn in the production of "other foods."

Removal of all bilateral tariffs and TRQs in the TPP scenario would undo any preferential treatment previously accorded through the "noodle bowl" of PTAs in the region. One example is Mexico's loss of preferential treatment for its sales of sugar to the United States. Consequently, the quantity of Mexico's sugar exports to the United States will decline about 15 percent while Canada's and Australia's sugar exports to the United States will increase by about 189 and 185 percent, respectively (see appendix 7). Rest-of-world sugar exports to the United States will decline about 16 percent.

Impacts on Agricultural Trade Between TPP Members and Rest of World

Countries benefit from preferential trade agreements such as the TPP when the mutual elimination of import barriers leads to greater economic efficiency in production and consumption. Eliminating tariffs allows consumers to switch to lower cost imports and, by creating intraregional trade, leads to a reallocation of production within the preferential trade area toward lower cost producers. Both lower tariffs and production efficiencies boost consumer buying power in member countries. At the same time, tariff preferences can lead to inefficiencies if they divert trade to preferred partners and away from even lower cost producers who are outside of the trade agreement. There may be

Box 2 – The Canadian Supply-Management Program

Canada's system of supply management restricts the availability of domestic and imported dairy, poultry, and egg products in order to achieve higher returns for Canadian producers and greater stability of consumer prices. Production and marketing systems under supply management have three main features:

1. Price-support policies based on production costs and return on equity and management,
2. Production limited to domestic demand at the cost-determined price, and
3. Border measures to guard against foreign competition, including tariff-rate quotas (TRQs) with prohibitively high over-quota tariffs.

Under Canada's system of supply management, the quantities of fluid and industrial milk that may be produced by each province are limited and allocated only to quota-holding farmers. Similar quotas manage domestic production of poultry and eggs. While the quotas can be increased and additional quotas can be allocated to accommodate demand growth in the domestic market, most new entrants to the supply-managed sectors, along with any producers who wish to increase their output, must purchase quotas from willing sellers. A small quantity of quotas has resulted in high prices for the quotas and for supply-managed products, which has dampened Canadian demand for these products.[1]

In the TPP scenario in this report, TPP members gain duty-free access to the Canadian market for their dairy, poultry, and egg products. Canada's supply response in these sectors is difficult to simulate because many of the over-quota tariffs on its supply-managed commodities contain "water in the tariffs" (WIT), meaning that the tariff rates are set so high that they would have to be reduced substantially before a marginal increase in imports would result. For instance, for 2004, the over-quota tariff on fresh or chilled boneless chicken cuts and offals (0207.13.93) is the lesser of 249 percent or $6.74 CAD (Canadian dollars), about $6.06 U.S.[2] per kilogram (Canada Border Services Agency, 2014). By contrast, the unit value of U.S. exports (to all countries) of fresh or chilled chicken cuts or offal (boneless or bone-in) was $1.47 U.S. per kilogram in 2013.

To address the presence of WIT in Canada's over-quota tariffs, the model assigns import tariff rates for Canada's supply-managed commodities for 2014 and 2025 that correspond with estimates in the literature of the tariff rate for each product at which there would be no WIT (see table below).

The model's simulation of trade liberalization in a TPP results in larger percentage decreases in Canada's production of powdered milk and butter than of other supply-managed products (whey, cheese, "other dairy," poultry, and poultry meat). Relative to the baseline, Canadian production of powdered milk and butter decrease by 13.2 percent and 11.9 percent, respectively, while production of Canada's other supply-managed commodities change in the range of plus 1 and

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[1] Dessureault (2013) and Lupescu (2013) provide additional information on supply management in Canada's dairy and poultry sectors, respectively.

[2] This conversion is based on the exchange rate of $0.90 U.S. per $1 CAD for February 27, 2014.

Box 2 – The Canadian Supply-Management Program—continued

minus 3.8 percent (see appendix 6). These findings are broadly similar to estimates from two recent studies of the effects of a modification or elimination of supply management on Canada's dairy and poultry sectors. In a study of the TPP's possible effects on Canada's dairy sector, Rude and An (2013) find that the discontinuation of supply management coupled with a 70-percent cut in the over-quota tariffs on dairy products from the TPP countries would lower Canadian production of nonfat dry milk, butter, and cheese by between 3.02 percent and 6.59 percent, while raising Canadian production of yogurt and ice cream by 1.40 percent and 2.39 percent, respectively. In a study of draft modalities released in 2008 as part of the Doha Development Agenda negotiations at the World Trade Organization (WTO), Rafajlovic and Cardwell (2013) conclude that an agreement in which Canada's low-tariff WTO quota for imported chicken is raised from 7.5 percent to 10 percent of the previous year's domestic production, the within-quota tariff on imported chicken is eliminated, and the over-quota tariff is reduced from 238 percent to 182.5 percent would result in a modest contraction of domestic chicken supply of about 1 percent.

Literature used to guide specification of ad valorem equivalents for Canada's tariff-rate quotas on supply-managed commodities

Live poultry and poultry meat		Dairy products, except whey[1]	
	Percent		*Percent*
Canada's MFN tariff in TPP model	32.27	Canada's MFN tariff in TPP model	39.44
Selected estimates from the literature:			
Retail price premium for Canadian poultry, Cardwell et al. (2013)	49.0	Retail price premium for Canadian fluid milk, Cardwell et al. (2013)	34.0
Retail price premium for Canadian poultry, alternative scenario, Cardwell et al. (2013)	26.0	Retail price premium for Canadian fluid milk, alternative scenario, Cardwell et al. (2013)	47.0
Potential nominal rate of protection for chicken, Rafajlovic and Cardwell (2013)	21.3	Ratio of average cost of fluid milk production, farms in Canada in 2011 versus small farms in New York State in 2007, using data from Canadian Dairy Commission (2012) and Knoblauch et al. (2012).	34.4
Ratio of difference between Canadian farm price of chicken and estimated marginal cost of producing chicken to marginal cost, using data for 2007 from Rafajlovic and Cardwell (2013)	35.2	Ratio of average cost of fluid milk production, farms in Province of Ontario in 2012 versus large herd farms (900 cows or more) in New York State in 2011, using data from Canadian Dairy Commission and Dairy Farmers of Ontario (2014) and Karszes et al. (2012).	43.8
Price-preserving tariff, highest estimate, Huff et al. (2000)	37.3	Difference between over-quota tariff for fluid milk and WIT for 2007, as estimated by Zhang (2008) using adjusted Canadian wholesale price and U.S. wholesale price	38.1
Trade-preserving tariff, highest estimate, Huff et al. (2000)	24.9		

Notes: MFN refers to most-favored nation; WIT refers to water in tariff; TPP refers to the Trans-Pacific Partnership.

[1]An MFN tariff of 35.96 percent was assigned to Canada's whey sector, based on an import-weighted average of the tariffs applied to whey and whey products.

Source: USDA, Economic Research Service, TPP model.

Box 3 –Quality Response in the TPP Rice Market

The Trans-Pacific Partnership (TPP) scenario in this report removes Japan's high over-quota tariff on rice imports from TPP countries. Because Japan's government directly controls rice imports and carefully manages Japanese rice production, it is able to calibrate Japanese rice supply so that the market price within Japan is high by world standards. Since Japan's domestic rice prices are high, it might be expected that imports would account for a major share of Japan's rice consumption after tariff elimination in the TPP scenario. However, the rice market is strongly differentiated, and about 98 percent of Japan's rice supply—all of its production and about two-thirds of its imports— is classified as japonica rice. Japonica rice has a short, round grain, and is stickier than most indica rice. This reflects the preference of Japanese consumers for japonica rice; long-grain indica rice is not strongly substitutable for japonica rice in daily use. In the model, we capture the effects of these strong consumer preferences in constraining Japan's rice imports by assuming a low import-substitution-elasticity value for rice.

Japonica rice supply from other TPP countries is limited to the United States and Australia. Vietnam, a leading world supplier of rice, produces indica. Current production of japonica rice, (which includes japonica and similar japonica-type varieties) in the TPP region is in the table below. All rice production in Japan and Australia is japonica. In the United States, all California production is japonica, and there is also some japonica production in the Delta region of Arkansas, Mississippi, and Louisiana, alongside large indica acreage. To expand rice exports to Japan to levels substantially above those estimated in the model, exporters would need to either:

- Add new japonica rice area—not likely because of water and other constraints;
- Switch area from indica to japonica in the southern United States—not likely because past experience with Asian acceptance of japonica-type rice from warmer, more humid areas (such as the U.S. South) has been discouraging;
- Raise yields on existing japonica area—not likely as discussed below; or
- Divert existing japonica production from other uses to consumption in Japan.

Japonica rice production, average for 2011-13

Country	Production, milled basis, 1,000 metric tons
Japan	7,745
United States	1,934
Australia	718
Total TPP	10,397

Sources: USDA, Foreign Agricultural Service, Production, Supply and Distribution Online Database; USDA, Economic Research Service, Rice Yearbook.

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Box 3 –Quality Response in the TPP Rice Market—continued

In the United States and Australia, water supply is a major constraint to the expansion of rice paddy area. Drought sharply reduced Australia's production and exports in much of the last decade. Exports, which exceeded 500,000 tons in each year (1995-2001), dropped as low as 17,000 tons in 2009, and have not regained the 500,000-ton level since 2001.

If Japan's market is opened to other TPP partners, a decline in exporting-country yields is more likely than yield growth. Most japonica rice produced in the United States and Australia is currently of medium kernel length, called medium-grain rice. However, Asian japonica consumers prefer short-grain japonica rice. A switch to short-grain rice could lead to higher sales prices for U.S. and Australian growers, but would likely be accompanied by the lower yields that typify its production. Productivity per hectare could rise in value terms, but fall in quantity terms. Additionally, Japanese consumers have turned increasingly toward foods raised according to organic standards. The dry climate of California's Sacramento Valley makes organic production easier than in Japan, but organic production, while more profitable, is likely to have lower yields than current conventional japonica production.

Finally, diverting rice to Japan's market from other markets for U.S. and Australian rice is possible but unlikely to significantly impact Japanese imports. Japan already imports about 35 percent of exported medium- and short-grain U.S. rice. South Korea and Taiwan have country-specific quotas that mandate import access for the United States of over 100,000 tons annually—almost entirely filled by medium and short-grain rice. It would be difficult for Japanese buyers to bid U.S. rice away from the South Korean and Taiwanese markets. Diversion of U.S. japonica rice would come from current U.S. uses or exports to non-Asian countries. If Japan purchased all U.S. japonica rice exports not currently bound for East Asia (about 400,000 tons), it would increase U.S. exports to Japan by 130-150 percent, or about 5-6 percent of Japan's consumption. More rice could also come from Australia (in years when water supply there allows it). The upper ceiling on these shipments is likely to be 350,000 tons—another 4-5 percent of Japan's consumption. However, full access to Japan's market would likely trigger significant price increases in the exporting countries, somewhat limiting the appeal of imported rice in Japan. Given the current membership of the TPP group, supply constraints thus severely limit the degree to which imports could substitute for Japan's rice production.

additional efficiency losses due to factors including the costs of regulating and complying with the complex trade rules and regulations that inevitably accompany preferential treatment.

A preferential trade agreement is generally considered to be beneficial to its members if, on net, more trade is created within the pact than is diverted from trade with nonmembers. However, even when net trade-creating, it should be noted that the inefficiencies that result from preferential treatment are a key economic critique of preferential trade agreements as compared with global trade liberalization, which (in theory) yields no inefficiencies because it provides for the equal treatment of all trade partners.

Tariff and TRQ elimination in the TPP scenario results in a net creation of trade in agriculture. The expansion of agricultural trade within the region in 2025 of $8.5 billion is estimated to exceed the diversion of members' agricultural imports from the rest of the world of about $2.6 billion and the diversion of their exports to the rest of the world of about $438 million (table 12). On the import side, trade diversion will be greatest in the "other agriculture" and meat sectors, and is accounted for primarily by a shift worth nearly $770 million in Japan's "other agriculture" imports and an almost $900-million shift in its meat imports from nonmembers to TPP sourcing. On the export side, trade diversion will similarly be greatest in the meat and "other agriculture" sectors, largely due to a shift in exports of these products by Australia, New Zealand, Vietnam, and the United States into the TPP market. Some New Zealand dairy exports are also diverted from rest-of-world markets to TPP destinations.

It should be noted that in a market like the TPP region, where a large portion of trade is already taking place at preferential tariffs due to PTAs, much of the intraregional trade diversion that may

Table 12

Value of agricultural trade diversion in 2025 due to TPP scenario ($US millions)

	Austra-lia	Cana-da	Chile	Japan	Malay-sia	Mexi-co	New Zealand	Peru	Singa-pore	United States	Viet-nam	Total
Diversion of agricultural imports from the rest of world												
Cereals	1.4	0.9	1.5	-238.3	-4.5	0.0	0.4	0.0	3.9	0.3	-5.9	-240.3
Fruits/ vegetables	5.3	1.6	-0.4	-126.0	-1.8	-1.7	2.1	0.0	0.9	7.1	-30.2	-143.2
Oilseeds and products	8.5	-5.2	0.0	-17.7	1.4	0.6	1.7	-2.1	0.6	0.1	-34.4	-46.5
Meat	2.6	-57.8	0.8	-868.4	2.1	-5.1	0.5	-0.2	7.2	-20.8	-47.5	-986.5
Dairy	4.4	-59.8	0.3	-123.0	1.2	-11.2	1.0	-2.0	7.4	-11.1	-3.8	-196.7
Other agriculture	27.7	14.4	0.6	-768.0	-76.3	-4.5	5.9	-2.4	22.5	-128.4	-61.2	-969.7
Total agriculture	49.9	-106.0	2.9	-2,141.5	-25.8	6.4	-0.4	35.0	-154.8	-105.1	-183.0	-2,582.9
Diversion of agricultural exports to the rest of world												
Cereals	-14.3	-4.3	-0.1	0.0	0.0	0.3	-0.3	0.0	0.0	-34.2	2.9	-49.9
Fruits/ vegetables	-7.2	-1.8	-5.3	0.3	-0.1	0.0	-6.5	-0.2	-0.2	-8.6	-5.7	-35.4
Oilseeds and products	-2.4	-1.7	-0.1	0.1	-27.3	0.0	-0.5	0.0	-0.5	-24.5	-2.2	-59.2
Meat	-54.0	12.9	-4.2	0.4	-0.1	0.6	-61.2	0.2	-0.5	-6.9	-0.9	-113.6
Dairy	-7.4	0.8	-0.2	0.2	0.7	0.0	-48.2	0.0	-0.4	-0.6	-0.1	-55.2
Other agriculture	-36.4	-0.8	-4.4	12.8	0.0	0.0	-9.0	-1.7	-3.2	-23.0	-59.4	-125.1
Total agriculture	-121.6	5.2	-14.3	13.8	-26.9	0.9	-125.7	-1.8	-4.8	-97.9	-65.3	-438.4

Notes: Negative denotes a decline in Trans-Pacific Partnership (TPP) members' imports from or exports to rest of world; positive denotes an increase in imports from or exports to rest of world. Values are in 2007 U.S. dollars.

Source: USDA, Economic Research Service, TPP model.

have occurred when those PTAs were put into place should unwind as countries within the region are gradually repositioned onto a level trading field. Further, because this model does not account for reductions in tariffs due to PTAs between TPP members and nonmember countries over 2014-25, the model's results likely represent the upper bound of the potential trade-diversion effects of the TPP.

Impacts on Agricultural Production

Results of the TPP scenario describe the difference in output quantities in 2025 with the TPP, relative to the baseline. This analysis assumes no changes in land supply, domestic farm-subsidy programs, or structural or efficiency changes in formerly protected sectors in response to trade policy reforms. As a result, the output responses to tariff elimination in the TPP scenario may be overstated. With these assumptions, agricultural output quantities in 2025 in the TPP scenario for aggregated commodity categories are expected to change between +5.5 and -5.7 percent, relative to 2025 in the baseline (table 13). More detailed results of the production impacts of the TPP on agricultural commodities are in appendix 6.

Agricultural output in the United States will increase modestly in 2025 if tariffs and TRQs are eliminated, reflecting that its exports to TPP partners represent a relatively small share of total U.S. production. The largest growth in U.S. production quantities will be in cereals, dairy products, and meats. By commodity, the largest percentage gains in agricultural output in the TPP scenario will be in meats in Australia, dairy in New Zealand, and "other agriculture" in Singapore. Expansion of Australia's meat output will be largely due to its increased exports of bovine meat to Japan, the United States, and Canada. New Zealand's agricultural growth will be led by gains in its output of dairy and meat products as it increases its exports of these commodities to Japan, Canada, the United States, and Mexico. Growth in Singapore's "other agriculture" will be led by growth in its exports of processed food and feed products to Malaysia, Japan, and Vietnam.

Canada's agricultural output will increase for most commodities in 2025, relative to the baseline, with its largest percentage gain in fruits and vegetables and its largest absolute gains in "other agriculture." Canada's dairy sector will experience a 2.5-percent decrease in output quantities in 2025 in the TPP scenario, assuming the removal of its high tariffs on dairy products imported from TPP partners and no compensating changes in dairy-farm programs or industry structure.

Mexico's agricultural output is expected to change minimally in the TPP scenario, reflecting that most of its trade is with the United States, for which NAFTA already provides duty-free treatment. An exception is the 1.6-percent decline in its dairy output, due to the removal of its relatively high tariffs on dairy products imported from non-U.S. trade partners.

Agricultural output in 2025 in the TPP scenario is estimated to decline in most sectors in Japan relative to the baseline. Japan's cereal production quantities, mostly of rice, could decline more than 3 percent, largely due to the hypothetical elimination of its tariffs on rice and other cereal imports from its TPP partners. Agricultural output in most commodity categories will also decline in Vietnam. This result is partly due to the relatively high tariffs that Vietnam imposes on many agricultural products, but also reflects a pull of resources into its manufacturing sectors as its export demand, particularly for its labor-intensive manufactured products, increases due to the TPP.

It is important to place the effects on agricultural output in 2025 of eliminating tariffs and TRQs into the dynamic perspective of the changes expected to occur over the 2014-25 implementation

Table 13

Changes in agricultural output in 2025 with tariff and TRQ elimination and total change in output over 2014-25

	Austra-lia	Canada	Chile	Japan	Malay-sia	Mexico	New Zealand	Peru	Singa-pore	United States	Vietnam
Value of output in 2025 in baseline, $US millions											
Cereals	11,295	10,101	2,773	67,854	1,426	6,550	368	4,283	158	80,861	8,580
Fruits/ vegetables	8,657	4,220	5,643	48,820	721	14,096	4,616	4,058	29	75,265	4,153
Oils and fats	4,321	9,661	672	6,876	33,514	3,407	1,753	2,116	307	49,086	516
Meat	47,325	36,512	7,677	59,144	4,524	22,769	13,409	7,757	688	295,378	3,862
Dairy	20,790	15,854	3,106	41,659	1,599	15,233	19,580	3,753	639	139,693	539
Other agriculture	68,094	63,374	20,510	421,029	13,102	84,290	12,474	23,944	3,513	590,319	17,292
Total agriculture	160,480	139,722	40,381	645,383	54,887	146,345	52,199	45,911	5,334	1,230,601	34,941
Percent change in quantity of output in 2025 due to TTP scenario, relative to baseline											
Cereals	2.2	0.7	0.1	-3.2	-0.6	0.1	1.6	0.1	-0.1	1.0	1.3
Fruits/ vegetables	0.0	2.5	0.2	-0.5	0.0	0.0	0.4	0.1	-4.7	0.3	-0.9
Oils and fats	-0.3	0.0	0.3	-0.2	0.0	0.0	-0.1	0.0	1.5	0.1	-3.2
Meat	5.3	0.5	0.7	-5.7	0.3	0.1	3.2	0.3	-0.2	0.4	-1.0
Dairy	2.6	-2.5	1.0	-3.8	2.6	-1.6	3.7	-0.1	0.6	0.5	-1.6
Other agriculture	0.8	0.4	0.3	-0.2	0.5	0.0	0.5	0.3	5.5	0.0	-0.3
Total percent change in quantity of output over 2014-25, including the TPP scenario effect											
Cereals	13.9	13.6	24.8	-6.1	11.4	12.8	16.4	20.4	20.4	11.3	6.8
Fruits/ vegetables	15.4	26.1	21.7	0.1	9.8	11.4	18.8	14.9	-4.9	16.6	16.1
Oils and fats	10.4	15.6	39.5	-9.6	7.8	19.7	16.0	29.8	23.9	10.8	26.5
Meat	19.2	9.6	48.9	-12.5	24.1	24.8	16.1	25.6	18.6	8.9	31.5
Dairy	20.2	5.1	27.1	-7.1	33.0	19.8	14.0	19.9	30.9	14.6	39.2
Other agriculture	18.1	16.7	34.4	-3.8	23.4	23.8	20.9	30.3	23.1	16.7	37.4

Note: TPP refers to the Trans-Pacific Partnership. Values of output in 2025 are the results of the baseline simulation. All values are in 2007 U.S. dollars. Quantity changes for commodity categories are constructed by weighting the quantity changes of the individual commodities in the model by their shares in the value of output in 2014 of each aggregated commodity category.

Source: USDA, Economic Research Service, TPP model.

period. The TPP provisions can augment or diminish the changes in agricultural output projected to occur under the baseline scenario. In Vietnam, for example, the decline in agricultural output in the TPP scenario constitutes a relatively small scale-back when compared to the large growth in agricultural output expected to occur in Vietnam over the 2014-2025 baseline period. The net effect of the baseline developments plus the TPP is that agricultural output quantities increase in all countries and commodities (with the exception of most agricultural sectors in Japan and fruits and vegetables in Singapore) during the 2014-25 period.

Comparison of Results With Other CGE Model-Based Analyses of the TPP

The CGE model-based literature on the effects of the TPP on members' economies shares a broad consensus that the agreement will have relatively small effects on most members' real GDP or welfare. The studies find an annual gain for the United States of between zero and 0.4 percent in real GDP (table 14). Four of the six studies reviewed here find that the largest gains in welfare or real GDP from tariff elimination will accrue to Vietnam.

Differences in CGE model structure, assumptions about trade policies, and definitions of scenarios contribute to some of the differences in their results. The CGE models used in recent analyses of the TPP vary in terms of their dynamic versus static timeframes and in their theoretical structure. Cheong (2013) and Itakura and Lee (2012) use recursive dynamic CGE models, which solve sequentially forward to the end date of the TPP implementation period. Their models take into account the dynamic changes expected to occur in the region over the coming decade and describe the TPP in terms of its effect on the future state of members' economies. The other four studies reviewed here (this study's TPP model; Kawasaki, 2014; Petri and Plummer, 2012; and Todsadee et al., 2012) use static CGE models, which describe the before-and-after differences between an initial equilibrium and the economy after a shock, such as the TPP. Our model and Petri and Plummer (2012) solve their static models forward to 2025 and 2030, respectively. These two models describe the future state of members' economies with a TPP relative to without a TPP.

Key differences in CGE model structure that distinguish Petri and Plummer (2012) is their incorporation of the "Melitz" effect, following Zhai (2008) and the role of foreign direct investment (FDI). Their Melitz-CGE model recognizes that firms are heterogeneous in their levels of productivity. As a result, trade barriers that create fixed costs of entry into the export market, such as plant inspection services, will be surmountable only for the most efficient firms. Trade liberalization leads to economic gains because it raises the average productivity of a country's firms. Trade agreements lower trade costs, allowing new firms with lower productivity—but which may be greater than the average—to enter the export market and expand output, and causing the contraction or exit of a country's least-productive, nonexporting firms. A Melitz model can also lead to relatively large trade effects because firm entry may result in new trade in cases where there was previously zero trade. Without Melitz effects, Petri and Plummer's (2012) estimated impacts of a TPP on national incomes would be about 40 percent lower. They also account for growth in FDI as a result of the investment provisions of the TPP. The role of investment effects in their findings is significant; in the case of the United States, it accounts for one-third of estimated U.S. income gains from the TPP.

Kawasaki (2014) also accounts for investment growth and assumes that productivity will increase with an expansion of trade as firms confront greater price competition from imports. As in Petri and Plummer (2012), these assumptions are important drivers of the size of the estimated impacts of a

Table 14

CGE-based quantitative analyses of the Trans-Pacific Partnership (TPP)

Authors	Type of CGE model	Food and agriculture coverage	Data sources for tariffs and nontariff barriers (NTBs)	TPP scenario	Impact on United States	Results
This study	Static GTAP model, solved with macro-projections and trade policy updates to 2025, V8 (2007) GTAP database	Comprises 25 of 29 sectors	GTAP tariffs; tariffs and regional preferences updated to 2014 and 2025 by U.S. Department of Agriculture	Tariff elimination	Zero impact on U.S. real GDP in 2025 compared with baseline	Changes in real 2025 GDP compared with baseline range from zero for the U.S. and other countries to 0.1 percent for Vietnam
Cheong (2013)	Recursive dynamic GTAP solved over 2013-27 baseline, V8 (2007) GTAP database	Not specified	GTAP tariffs and updated regional trade preferences to 2027	Tariff elimination	Less than 0.01-percent increase in 2027 GDP compared with baseline	Changes in 2027 GDP compared with baseline range from -0.13 percent for Chile to 0.97 percent for New Zealand
Kawasaki (2014)	Static GTAP CGE model with capital accumulation and endogenous productivity growth, V8 (2007) GTAP database updated to 2010	Comprises 12 of 29 sectors	GTAP tariffs, estimates of NTBs from World Bank Trade Restrictiveness Index	Tariff elimination and 50 percent reduction in NTBs on preferred partners and 25 percent NTB reduction on rest of world	Up to 1.3-percent increase in welfare as percent of real GDP	Changes in welfare as percent of real GDP range from 9.9 percent in Vietnam to 0.1 percent in U.S. and Canada with tariff removal; with tariff and NTB removal, ranges between 20.6 percent for Malaysia and 1.3 percent for U.S.
Itakura and Lee (2012)	Recursive dynamic GTAP, solved over 2004-30, V7 (2004) GTAP database	Comprises 8 of 29 sectors in model	GTAP tariffs, estimates of NTBs in services from the literature	Tariff elimination and 25 percent reduction in NTBs, includes TPP plus an East Asian and an Asia-Pacific trade area	0.8-percent increase in 2030 welfare compared with baseline	Changes in 2030 welfare compared with baseline range from 0.8 percent for the U.S. to 5.6 percent for Vietnam.
Petri and Plummer (2012)	Static CGE model with Melitz firm heterogeneity, and with foreign direct investment flows, solved sequentially over 2010-30, preliminary GTAP V8 (2007) GTAP database.	Comprises 4 of 18 sectors in model	GTAP tariffs, qualitative assessments of previous preferential trade agreements to construct stylized tariff-reduction paths and utilization rates. NTBs on goods are iceberg transport costs based on Kee et al. (2009).	Partial removal of tariffs and NTBs, endogenous changes in foreign direct investment (TPP includes South Korea)	0.38-percent-increase in 2030 GDP compared with baseline	Changes in 2025 GDP compared with baseline range from 0.38 percent for the U.S. to 13.57 percent for Vietnam.
Todsadee et al. (2012)	Static GTAP, V7 (2004) GTAP database	Comprises 7 of 15 sectors in the model	GTAP tariffs	Tariff elimination	Less than 0.01-percent increase in 2027 GDP compared with baseline	Change in GDP range from -0.03 percent for Peru to 0.81 percent for Vietnam.

Note: CGE refers to the computable general equilibrium model; GDP refers to gross domestic product; GTAP refers to the Global Trade Analysis Project. Tariff elimination includes removal of tariff-rate quotas.

Source: USDA, Economic Research Service.

TPP on national income. Kawasaki (2014) concludes that investment and productivity growth will account for over 80 percent of the income gains from a TPP.

The CGE-based literature on the TPP features a striking reliance on the GTAP database, which describes countries' supply, demand, trade flows, bilateral tariff rates (inclusive of preferences), and the ad valorem equivalents of TRQs. One of the studies uses the GTAP version 7 database, which depicts the world economy and trade policies in 2004; all others use different editions of the version 8 database, which describes the world economy and trade policies in 2007. Five of the six studies update the GTAP trade policy data to incorporate tariff preferences entering into effect after 2007, or augment it to include nontariff barriers (NTBs). This study relied on USDA experts to review and update the GTAP v8 tariff rates from 2007-14 and 2025 and to develop a database on the implementation of tariff preferences in existing PTAs over 2007-25 for agricultural commodities. Tariff rates used in this analysis are generally lower than those reported in the GTAP database, and this contributes to its finding of relatively low GDP impacts. Petri and Plummer (2012) augment the GTAP tariff database with estimates of the ad valorem equivalents of NTBs by Kee et al. (2009), which are estimated on a most-favored nation (MFN) rather than bilateral basis, and are generally very high relative to tariff rates.

Analyses differed in their assumptions about the degree of liberalization and in the participants included in a TPP scenario. Models with TPP scenarios that only account for removal of tariffs and TRQs find modest annual changes in real GDP that, by country, range between -0.13 and 0.97 percent relative to a baseline value. Itakura and Lee (2012) and Kawasaki (2014) include both tariff/TRQ elimination and a partial reduction of NTBs in their TPP scenario. Petri and Plummer (2012) assume only partial tariff and TRQ removal, but include a reduction in NTBs. The latter three studies yield larger welfare or GDP effects than analyses that describe only tariff and TRQ reforms.

Conclusion

The ambition of the TPP initiative is to achieve a full liberalization of trade and investment flows among the member countries in a manner that addresses both traditional market-access issues in goods and services and more complex, "21st century" impediments to trade, such as nontariff barriers and regulatory inconsistencies. This report provides a quantitative assessment of the potential effects of a hypothetical and stylized TPP agreement in which all agricultural and nonagricultural tariffs and TRQs governing trade among the member countries are removed in their entirety. Trade barriers between TPP countries and other countries remain unchanged in this analysis. The scope of the TPP negotiations goes well beyond tariffs and TRQs; they also cover other areas that could impact agriculture, including investment, trade in services, technical barriers to trade, and sanitary and phytosanitary barriers. This analysis does not account for the gains that might be achieved in these other areas of the negotiations.

There is significant scope for agricultural trade expansion in the TPP region if intraregional tariffs and TRQs are eliminated, despite the fact that TPP countries have already liberalized a significant proportion of trade with many of their TPP partners through a web of preferential trade agreements. This study finds that full tariff and TRQ elimination between TPP partners will cause the value of intraregional agricultural trade in 2025—the assumed end date of the pact's implementation—to be 6 percent, or about $8.5 billion (in 2007 U.S. dollars) higher than under the baseline scenario. While each member country will experience growth in both its agricultural imports and exports, Japan and the United States will account for the largest shares of the increases in intraregional imports and exports, respectively. The United States will supply about 33 percent of the expansion in intraregional agricultural exports—the value of U.S. agricultural exports to TPP partners in 2025 is estimated to be 5 percent ($2.8 billion) higher under the TPP scenario than in the baseline. Japan will account for almost 70 percent of the expansion in intraregional agricultural imports—the value of Japan's agricultural imports from its TPP partners in 2025 is expected to be about 14 percent ($5.8 billion) higher than in the baseline.

By commodity, the percentage increase in the value of intraregional trade due to the elimination of tariffs and TRQs will be largest for rice, sugar, and "other meat" (which includes animal fats and oils and offals); in absolute value terms, the increase will be greatest for bovine meat (which includes beef and mutton), "other foods" (which includes processed foods and feeds), and poultry meat. The total increased trade in meats of about $3.7 billion will account for 43 percent of the expansion in the value of intra-TPP trade in 2025, most of which is supplied by Australia, the United States, Canada, and New Zealand. About three-quarters of the increase in meat exports is destined for Japan, whose meat imports (mostly bovine and poultry meats) from TPP members will increase by about $2.8 billion relative to the baseline.

The increase in intra-TPP agricultural trade is mostly the result of new trade, rather than the diversion of trade from the rest of the world. As countries within the TPP region gradually begin competing on a level playing field, much of the trade diversion that may have resulted from the PTAs currently in place between TPP members should begin to unwind.

The results of this study are presented with several caveats, the most important being the stylized depiction of a hypothetical TPP scenario that analyzes only an elimination of tariffs and TRQs. While the analysis accounts for the fact that many bilateral tariffs within the region are scheduled to be reduced or eliminated under previously negotiated preferential trade agreements between

TPP members, it does not account for any negotiated tariff reductions between the TPP countries with trade partners in the rest of the world. The study also does not account for possible insulating domestic farm-policy responses or market responses (such as structural or efficiency changes in industries that lose their trade protections) or for the productivity gains that may result from increased trade opportunities. Finally, with the exception of restrictions on meat trade related to livestock foot-and-mouth disease, this analysis does not specifically examine nontariff barriers to trade that are also a subject of the TPP negotiations, and whose removal could have potentially large impacts on the trade flows among the TPP countries.

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Appendix 1 – The Trans-Pacific Partnership Model

This analysis utilizes the GTAP computable general equilibrium (CGE) model developed by Hertel and others (Hertel, 1997). The Trans-Pacific Partnership (TPP) model's 29 commodities are mostly in the agricultural and food sectors, with nonagricultural sectors aggregated into labor-intensive manufacturing, capital-intensive manufacturing, and services. The 12 countries or regions in the model include TPP members (excluding Brunei) and an aggregated rest-of-world region. The four primary factors of production are skilled and unskilled labor, capital, and land.

In the model, producers are described as perfectly competitive cost-minimizers, with technology defined as a nested production function. Producers' demand for intermediate inputs responds to prices for inputs and outputs, subject to a Leontief intermediates production function. A constant-elasticity of substitution (CES) production function over value added allows producers to substitute among primary factors as their relative prices change. Consumer demand is described by a Constant Difference of Elasticity (CDE) demand system, a non-homogeneous function that allows income growth to affect consumer preferences. Cobb-Douglas functions describe government and investment demand, which imply constant budget shares in total expenditure. Import demand is described by nested Armington functions, in which demand is first allocated between the domestic good and the composite import, and then among national sourcing of the composite import. Countries (or regions) are linked through their bilateral trade flows, which explicitly account for transportation and marketing costs in moving goods from port to port. Factors are assumed to be fixed in national supply, fully employed, and mobile across sectors (except for land, which is assumed to have limited substitutability across crops). Each region's balance of trade is assumed to remain a fixed share of its gross domestic product (GDP), with cross-country differences in expected rates of return to investment.

The base year of the global GTAP v8.1 database used in this analysis is 2007. The study updates the base year's representation of the global economy from 2007 to 2014 using actual economic data for 2007-2012 and projections for 2012-2014. The baseline scenario describes projected changes in the global economy over the period 2014-25 in the absence of a TPP agreement. Actual and projected economic data are used for real GDP, population, capital stock, and skilled and unskilled labor. Projections for real GDP and population are from the International Macroeconomic Data Set of USDA's Economic Research Service (ERS). Factor-endowment growth rates are projections from Chappuis and Walmsley (2011). Both databases build upon and report projections developed by other organizations, including the International Monetary Fund, IHS Global Insight, Oxford Economic Forecasting, and the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

For both the update and the baseline projection, we change the GTAP model closure, exogenizing countries' real GDP and solving for endogenous total input productivity. In the TPP scenario, we assume the productivity growth described in the baseline scenario and solve for an endogenous real GDP.

The base year update and the baseline scenario incorporate changes in bilateral tariffs among TPP members due to liberalization commitments made under existing preferential trade agreements. We do not account for the implementation of preferences between TPP members and their nonmember trade partners. In addition, Mexico unilaterally reduced or eliminated its most-favored-nation

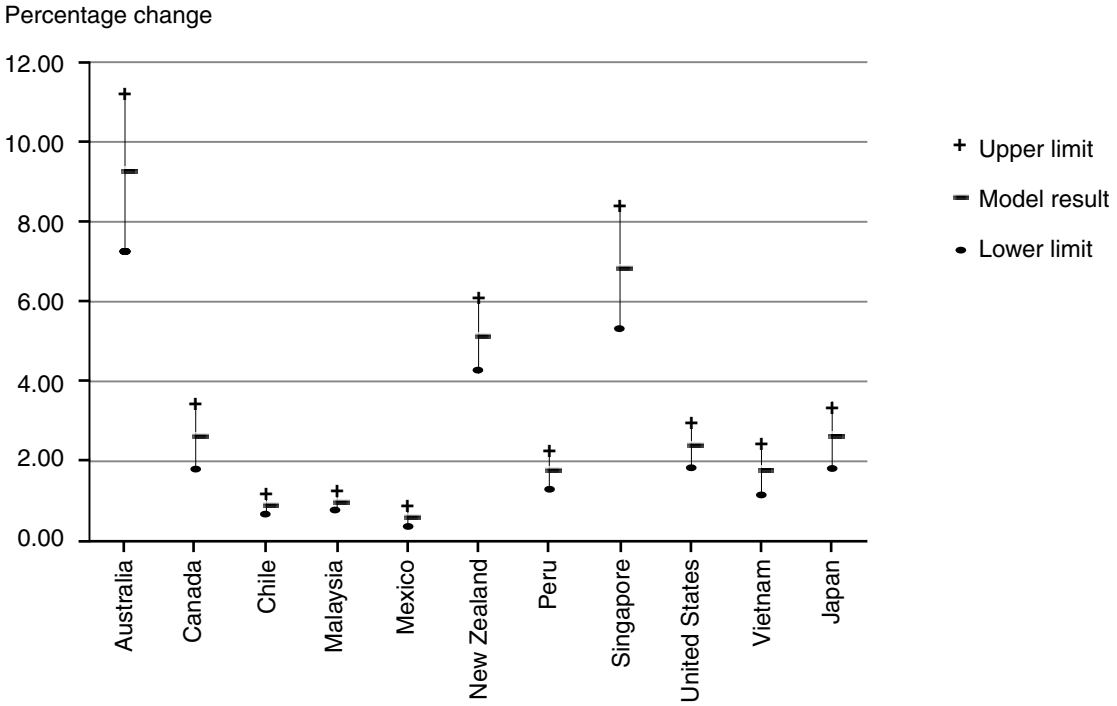
(MFN) tariffs on selected agricultural commodities during the 2007-14 and 2014-25 periods. These unilateral tariff changes are included in the base update and baseline scenarios.

The only nontariff trade barrier included in the model is the restriction on livestock foot-and-mouth disease (FMD) in intra-TPP trade. FMD-free countries are the United States, Australia, Canada, Chile, Mexico, Japan, and New Zealand, based on their disease-free status in 2012. Non-FMD-free countries may export to each other, but not to FMD-free countries. To represent import restrictions related to FMD, we fix the bovine meat and pork exports from FMD countries to FMD-free countries at their base year (2007) quantities and allow the model to solve for compensating levels of endogenous bilateral export taxes. Exports of bovine meat and pork from FMD countries to FMD-free countries in 2007 were generally low but not zero. This reflects the fact that some FMD-free countries allow the importation of certain beef and pork products from FMD countries, or from disease-free regions within FMD countries, under certain conditions.

The CGE model's calibration procedure for the CDE demand system solves for income and compensated own- and cross-price elasticities that are sufficiently close to the income and price-elasticity values supplied by the modeler while meeting the constraint that income elasticities that are less than one (inferior goods) or greater than one (luxury goods) remain so after calibration (Liu et al., 1999; Hertel et al., 2008). Income and own-price elasticities of demand in the TPP model are drawn from multiple sources, including Hertel et al. (2008), Muhammad et al. (2011), the Food and Agricultural Policy Research Institute (FAPRI), and country studies. Income elasticity parameters in the model are adjusted so that the baseline scenario simulates the dietary trends over the 2014-25 time period as projected by various sources, including ERS baseline projections, the USDA Foreign Agriculture Service's Global Agricultural Information Network (GAIN) reports, the Food and Agriculture Organization, and Msangi and Rosegrant (2011).

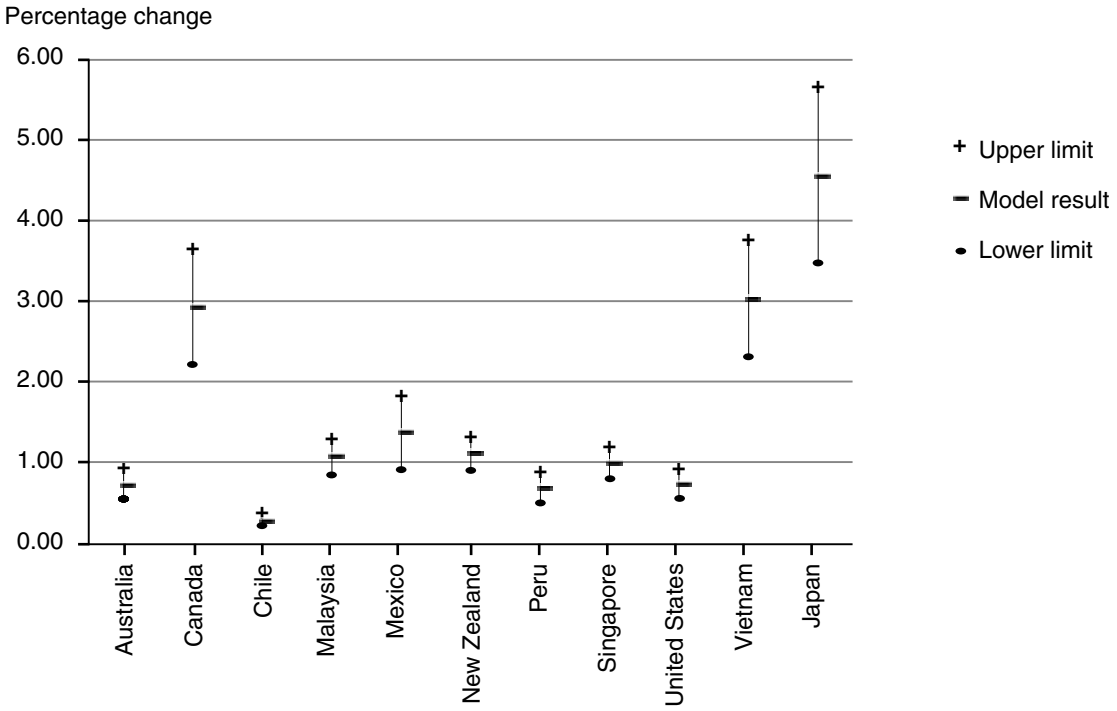
We carry out a sensitivity analysis of our model results in the TPP scenario with respect to the assumed parameter values for import-demand elasticities, a key behavioral parameter for a trade policy experiment. Our sensitivity analysis describes the mean and standard deviation in results over a range of plus and minus 50 percent of the assumed parameter values. Figures A1.1 and A1.2 report the model results for the percent change in value of each of the TPP members' global agricultural exports and imports, and the upper and lower limits of a 95-percent confidence interval around these country results. For TPP members in aggregate, there is 95-percent confidence that the TPP scenario will result in an increase in total value of their global agricultural exports in 2025 of $8.1 billion, plus or minus $2.0 billion. There is 95-percent confidence that the TPP scenario will result in an increase in total value of members' global agricultural imports in 2025 of $6.1 billion, plus or minus $1.5 billion.

Figure A1.1
Export confidence ranges



Note: This graph shows a 95% confidence range for the percentage change in value of members' 2025 global agricultural exports, compared to the baseline, with a 50% variation in the import substitution elasticity (ESUBD).
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Figure A1.2
Import confidence ranges



Note: This graph shows a 95% confidence range for the percentage change in value of members' 2025 global agricultural imports, compared to the baseline, with a 50% variation in the import substitution elasticity (ESUBD).
Source: USDA, Economic Research Service, Trans-Pacific Partnership model.

Appendix 2 – Countries and Sectors in the TPP Model

Table A2.1
Countries in the TPP Model

	Country/region	Global Trade Analysis Project country code
1	Australia	aus
2	Canada	can
3	Chile	chl
4	Japan	jpn
5	Malaysia	mys
6	Mexico	mex
7	New Zealand	nzl
8	Peru	per
9	Singapore	sgp
10	United States	usa
11	Vietnam	vnm
12	Rest of world	col cri gtm hnd nic pan slv xca xcb aut bel cyp cze dnk est fin fra deu grc hun irl ita lva ltu lux mlt nld pol prt svk svn esp swe gbr bgr rou twn phl tha idn chn hkg ind khm lao xse bra kor xoc mng xea bgd npl pak lka xsa xna arg bol ecu pry ury ven xsm che nor xef alb blr hrv rus ukr xee xer kaz kgz xsu arm aze geo bhr irn isr kwt omn qat sau tur are xws egy mar tun xnf cmr civ gha nga sen xwf xcf xac eth ken mdg mwi mus moz tza uga zmb zwe xec bwa nam zaf xsc xtw

Note: TPP refers to the Trans-Pacific Partnership.
Source: Country identification of each country code is available in the Global Trade Analysis Project (2014) database.

Table A2.2

Sectors and aggregations in TPP model

Sector in TPP Model	Name	Description	GTAP sector code for the TPP sector	Aggregation of sectors in discussion of private consumption results from TPP model	Aggregation of sectors in discussion of output and trade results from TPP model
1	Rice	Rice	pdr pcr	Cereals	Cereals
2	Wheat	Wheat	wht	Cereals	Cereals
3	Corn	Corn	gro	Cereals	Cereals
4	Other grains	Other grains	gro	Cereals	Cereals
5	Fruits/ vegetables	Fruits and vegetables	v_f	Fruits/ vegetables	Fruits/ vegetables
6	Oilseeds	Oilseeds	osd	Oils and fats	Oilseeds
7	Sugar cane/ beet	Sugar cane and sugar beet	c_b	Other foods	Other agriculture
8	Fibers	Plant-based fibers	pfb	Nonfoods	Other agriculture
9	Other crops	Other crops, not elsewhere classified.	ocr	Other foods	Other agriculture
10	Bovines	Bovine animals	ctl	Meat	Meat
11	Pigs	Hogs	oap wol	Meat	Meat
12	Poultry	Poultry and eggs	oap wol	Meat	Meat
13	Other animals	Other animals and products	oap wol	Nonfoods	Other agriculture
14	Resources	Fishery, forestry, mining, extraction	frs fsh coa oil gas omn	Nonfoods	Manufacturing
15	Bovine meat	Bovine meats and products	cmt	Meat	Meat
16	Pork	Pork and pork products	omt	Meat	Meat
17	Poultry meat	Poultry meats and products	omt	Meat	Meat
18	Other meat	Other meat products	omt	Meat	Meat
19	Sugar	Raw and refined sugar	sgr	Other foods	Other agriculture
20	Oils and fats	Vegetable oils and fats	vol	Oils and fats	Oilseeds
21	Whey	Whey	rmk mil	Dairy	Dairy
22	Powdered milk	Nonfat and whole milk powders	rmk mil	Dairy	Dairy
23	Butter	Butter, fats, oils and substitutes	rmk mil	Dairy	Dairy
24	Cheese	Cheese	rmk mil	Dairy	Dairy
25	Other dairy	Fluid milk and products	rmk mil	Dairy	Dairy
26	Other foods	Other food, feed, and beverage products	ofd b_t	Other foods	Other agriculture
27	Labor-int. mfg	Labor-intensive manufacturing	tex wap lea lum fmp mvh otn ele ome omf	Nonfoods	Manufacturing
28	Capital-int. mfg.	Capital-intensive manufacturing	ppp p_c crp nmm i_s nfm	Nonfoods	Manufacturing
29	Services	Services	ely gdt wtr cns trd otp wtp atp cmn ofi isr obs ros osg dwe	Services	Services

Note: TPP refers to the Trans-Pacific Partnership; GTAP refers to the Global Trade Analysis Project. Sugar cane and beets are raw materials used in the production of sugar; trade in cane and beet is negligible.

Source: USDA, Economic Research Service, TPP model.

Appendix 3 – Splitting GTAP Agricultural Sectors

We disaggregate four of the Global Trade Analysis Project (GTAP)-defined sectors into 13 subsectors using the SplitCom utility developed by Horridge (2008). SplitCom is a matrix-balancing program that allows the user to subdivide the rows and columns of a sector from a balanced social accounting matrix (SAM). The user provides data to disaggregate a GTAP sector's input demands, uses in intermediate and final demand and trade, and tax and tariff payments. SplitCom then uses methods similar to minimum entropy to balance the disaggregated SAM and to satisfy accounting identities. The utility manipulates only the disaggregated sectors, which can be re-aggregated to restore the original values in the GTAP SAM.

We use SplitCom to disaggregate 4 GTAP sectors—grains, animals, meat, and dairy—into 13 subsectors (see table A3.1). Data for the disaggregation are drawn from multiple sources. Trade and tariff data are disaggregated using TASTE (Tariff Analytical and Simulation Tool for Economists), software developed by Horridge and Laborde (2010) and based on the Market Access Maps (MAcMap) HS-6 trade and tariff database (Guimbard et al., 2012). We use TASTE v. October 2012, which is compatible with the GTAP v8.1 2007 database. TASTE reports the trade and tariffs at the HS-6 level within each GTAP sector. These disaggregated data are then summed into the 13 new subsectors defined in the TPP model, using the HS2002 concordance developed by Hutcheson (2006). Tariffs are aggregated into model sectors using regional trade weights, which help to overcome the problem of a country's small trade flows in the presence of high trade barriers.

Data for the disaggregation of subsectors' inputs and demands for their output are from multiple sources, including FAOSTAT; USDA's Production, Supply and Distribution Online Database; USDA's Global Agricultural Information Network (GAIN) reports; and national statistics.

Table A3.1
Splits of GTAP Sectors in TPP model

No.	Split sectors in TPP model	Description	GTAP sector
1	Corn	Corn	Cereal grains nec (gro)
2	Othrgrn	Other coarse grains	Cereal grains nec (gro)
3	Hogs	Hogs	Other animal products (oap), wool (wol)
4	Poultry	Poultry and eggs	Other animal products (oap), wool (wol)
5	Othanml	Other animals and products	Other animal products (oap), wool (wol)
6	Pork	Pork and pork products	Meat products nec (omt)
7	Pltrymt	Poultry meats and products	Meat products nec (omt)
8	Othmeat	Other meat products	Meat products nec (omt)
9	Whey	Whey	Raw milk (rmk) dairy products (mil)
10	PM	Nonfat and whole milk powders	Raw milk (rmk) dairy products (mil)
11	Butter	Butter, fats, oils and substitutes	Raw milk (rmk) dairy products (mil)
12	Cheese	Cheese	Raw milk (rmk) dairy products (mil)
13	OthDairy	Fluid milk and products	Raw milk (rmk) dairy products (mil)

Note: TPP refers to the Trans-Pacific Partnership; GTAP refers to the Global Trade Analysis Project.
Source: USDA, Economic Research Service, TPP model.

Appendix 4 – Changes in Private Household Consumption Quantities in 2025 With the TPP, Compared With 2025 in Baseline

Table A4.1

Percent change in private household per capita consumption quantities over 2014-25

Commodity	Austra-lia	Cana-da	Chile	Japan	Malay-sia	Mexico	New Zea-land	Peru	Singa-pore	United States	Viet-nam
Rice	-0.3	4.4	15.9	-0.3	-0.8	2.2	-0.5	16.2	-0.3	-0.4	-0.9
Wheat	-0.4	-0.4	-0.8	-0.3	-0.7	-0.7	-0.5	1.9	-0.4	-0.4	-1.0
Corn	-0.4	-0.4	1.2	-0.3	-0.7	-0.7	-0.5	2.0	-0.4	-0.4	-1.0
Other grains	-0.4	-0.4	-0.8	-0.3	-0.7	-0.8	-0.5	-1.0	-0.4	-0.4	-1.0
Fruits/vegetables	3.8	5.7	4.8	4.4	4.5	2.5	3.3	3.3	1.5	4.9	5.3
Oilseeds	1.4	0.2	4.0	0.4	3.2	1.6	2.6	1.8	1.2	0.2	4.6
Sugar cane/beet	1.4	0.1	3.9	0.4	1.6	0.0	2.8	2.0	-0.8	0.0	4.1
Fibers	3.7	6.2	9.5	3.1	7.1	6.4	6.0	7.7	3.8	5.2	12.1
Other crops	4.5	6.1	13.1	0.3	11.5	8.8	8.7	11.0	3.9	1.5	18.1
Bovines	2.0	-5.6	13.4	4.2	15.8	2.1	-0.6	10.9	1.2	-3.2	26.6
Pigs	2.4	0.4	14.4	0.3	11.3	11.6	3.5	13.8	2.3	4.2	19.6
Poultry	3.1	1.3	16.9	0.3	11.5	17.0	3.9	13.5	1.1	14.7	19.6
Other animals	2.3	0.2	2.3	0.3	1.9	6.3	3.3	0.5	2.1	0.2	3.3
Resources	9.0	11.5	18.3	0.4	28.8	13.2	11.0	16.8	5.6	10.3	35.4
Bovine meat	3.9	-5.6	9.9	4.1	18.1	2.3	-1.0	10.8	3.2	-3.4	29.1
Pork	4.2	0.1	15.3	0.3	12.9	11.8	6.0	13.4	3.8	3.7	20.5
Poultry meat	4.5	0.9	15.2	0.3	13.0	17.2	5.7	13.4	4.2	14.6	20.1
Other meat	5.1	0.1	3.7	0.5	3.0	2.1	2.2	3.4	1.2	0.2	4.6
Sugar	7.0	0.4	14.0	0.3	10.0	0.6	8.3	15.9	3.8	0.1	23.5
Oils and fats	3.3	0.3	10.3	0.4	11.9	7.2	3.1	12.6	2.7	-0.2	22.6
Whey	1.5	0.2	10.3	0.3	11.9	6.7	2.3	8.7	1.1	-0.2	17.8
Powdered milk	2.7	2.5	13.1	0.2	10.2	29.1	-10.1	11.3	2.2	-0.2	23.3
Butter	1.5	0.4	10.6	0.2	9.8	3.2	-8.2	9.1	0.9	4.8	13.3
Cheese	2.0	2.7	10.3	5.1	13.0	26.1	5.4	3.9	14.8	6.1	14.8
Other dairy	1.7	-4.2	10.5	0.2	10.8	4.6	9.7	9.0	1.9	-2.9	18.8
Other food	6.9	8.7	20.7	0.2	18.7	13.9	9.2	20.0	7.2	7.6	38.6
Labor-int. mfg	18.4	22.7	39.7	15.7	38.2	30.3	24.4	42.5	16.8	19.7	57.8
Capital-int. mfg.	19.0	23.0	43.0	15.3	36.5	31.3	25.3	47.5	17.8	20.3	61.9
Services	19.5	24.3	49.3	16.5	42.1	35.8	27.5	51.7	18.6	20.6	76.2

Note: TPP refers to the Trans-Pacific Partnership; mfg. stands for manufacturing.

Source: USDA, Economic Research Service, TPP model.

Appendix 5 – Effects of Tariff and Quota Elimination in a TPP on Global Trade of TPP Members

Table A5.1

Percent change in quantity of global exports in 2025 with tariff and tariff-rate quota elimination in a TPP, compared with 2025 in the baseline

Commodity	Austra-lia	Cana-da	Chile	Japan	Malay-sia	Mexico	New Zea-land	Peru	Singa-pore	United States	Viet-nam
Rice	40.5	0.4	-1.9	1.1	-1.2	0.0	-0.3	-2.5	-5.0	33.2	4.3
Wheat	-2.2	-0.5	-3.6	2.9	-2.5	2.2	-3.8	-3.1	-11.0	2.7	13.0
Corn	160.7	13.2	-0.2	5.0	0.0	0.4	-3.0	-2.0	-7.4	0.2	-4.5
Other grains	16.9	6.7	-0.4	0.5	0.2	0.1	-0.9	-2.5	-3.6	-5.8	-2.9
Fruits/vegetables	-0.3	3.1	0.3	1.8	0.0	0.1	-0.2	0.7	-4.0	1.8	-1.8
Oilseeds	-2.7	-0.2	0.0	1.3	-0.4	0.8	-1.8	0.0	-6.5	-0.3	-2.5
Sugar cane/beet	-2.6	0.0	-0.4	1.4	0.0	0.7	-2.4	0.2	-8.5	0.2	-3.6
Fibers	-3.0	0.2	-0.1	4.0	0.1	0.3	-2.2	0.1	-2.3	-0.2	-0.9
Other crops	-2.5	-0.3	-0.9	3.6	-0.2	0.6	-0.1	0.4	6.6	0.1	-3.2
Bovines	0.4	0.3	-0.1	4.7	1.7	0.6	3.3	-0.3	-4.1	-1.4	-2.7
Pigs	-0.5	0.2	-0.4	0.4	0.0	-0.6	-1.6	-0.4	-2.1	0.0	-0.4
Poultry	-1.7	0.1	-0.6	1.1	0.1	-0.1	-1.1	-0.2	-2.2	1.6	-0.4
Other animals	-1.5	0.1	-0.4	1.8	0.2	0.3	-1.5	3.4	1.0	0.1	0.4
Resources	-0.1	0.0	0.0	-0.1	-0.3	0.1	-0.8	0.1	0.1	0.0	-2.0
Bovine meat	19.0	3.1	7.7	18.9	-1.4	15.5	7.4	2.5	-0.5	3.9	7.9
Pork	-1.4	2.3	1.3	3.9	0.6	3.0	-2.3	13.4	-0.6	1.9	-2.3
Poultry meat	17.5	45.9	-6.0	12.2	3.9	2.0	0.7	1.3	0.7	12.2	3.3
Other meat	6.1	66.9	34.7	4.9	0.9	54.0	5.2	4.7	2.5	34.4	5.9
Sugar	22.6	110.4	-2.3	10.6	0.7	-14.5	8.4	161.7	-15.0	-0.3	3.9
Oils and fats	-1.3	1.4	2.2	6.9	0.0	0.0	-0.2	0.2	1.4	0.7	-3.0
Whey	2.2	25.5	1.1	3.7	1.4	0.2	3.2	0.3	4.0	5.2	-0.4
Powdered milk	17.3	13.1	3.8	5.8	4.0	7.3	4.3	0.5	2.4	8.0	0.0
Butter	13.9	21.6	2.0	3.8	4.5	0.5	5.0	-0.4	14.9	39.1	-0.4
Cheese	4.1	18.6	34.9	3.9	2.4	0.8	8.2	3.6	1.4	16.2	0.6
Other dairy	26.9	17.9	5.3	4.1	5.4	14.7	6.8	0.2	3.5	32.5	0.0
Other foods	1.9	0.4	0.4	4.0	3.8	0.2	1.6	0.2	8.4	1.1	2.7
Labor-int. mfg	0.1	0.0	0.0	1.3	0.5	0.1	-0.8	0.4	-0.2	0.1	6.1
Capital-int. mfg.	-0.2	0.1	-0.1	0.7	0.6	0.2	-0.6	0.2	1.1	0.2	0.1
Services	-0.3	0.1	-0.1	-0.4	-0.3	0.2	-1.9	0.3	-0.3	0.1	-3.3

Note: TPP refers to the Trans-Pacific Partnership; mfg. stands for manufacturing.

Source: USDA, Economic Research Service, TPP model.

Table A5.2

Percent change in quantity of global imports in 2025 with tariff and tariff-rate quota elimination in a TPP, compared with 2025 in the baseline

Commodity	Austra-lia	Cana-da	Chile	Japan	Malay-sia	Mexico	New Zea-land	Peru	Singa-pore	United States	Viet-nam
Rice	0.9	0.9	0.2	110.7	2.8	-0.1	0.6	0.0	3.0	0.1	1.6
Wheat	2.1	0.0	0.5	14.2	0.5	-0.1	2.0	0.2	1.3	0.3	0.4
Corn	2.6	0.1	0.3	0.4	0.2	-0.3	3.9	0.1	0.5	0.2	0.5
Other grains	1.8	0.2	0.3	-1.2	0.2	-0.2	2.3	0.1	-0.2	0.2	-0.1
Fruits/vegetables	0.9	0.1	1.0	3.8	0.1	-0.1	1.1	0.5	0.0	0.1	4.6
Oilseeds	1.6	0.1	0.2	-0.5	0.1	0.0	0.5	0.3	0.0	0.3	0.6
Sugar cane/beet	3.1	7.0	0.4	-0.5	0.2	-0.3	2.5	0.8	5.1	0.3	1.9
Fibers	1.6	2.4	-0.1	0.3	0.2	-0.2	0.5	0.1	-0.1	0.1	1.1
Other crops	1.9	3.8	0.3	-1.1	0.5	-0.1	0.9	0.1	3.0	0.2	1.2
Bovines	2.3	-0.1	0.5	-0.1	-0.1	2.1	1.8	0.1	0.5	0.4	1.1
Pigs	1.0	0.5	0.3	-0.6	0.0	-0.1	0.7	0.0	0.1	0.1	-0.1
Poultry	1.1	17.2	0.1	-0.1	-0.1	-0.1	0.8	0.4	0.1	0.1	-0.8
Other animals	0.6	1.9	0.3	0.3	0.1	0.0	0.5	1.2	-0.1	0.2	-1.0
Resources	-0.6	0.0	0.0	0.1	0.1	0.0	-0.3	0.0	0.9	0.0	2.7
Bovine meat	1.8	10.5	0.0	31.0	0.0	0.7	1.5	-0.1	0.0	4.8	1.0
Pork	1.2	0.5	0.4	2.5	0.0	-0.2	1.1	1.0	1.1	0.3	11.0
Poultry meat	2.7	33.7	0.5	2.4	-0.1	7.7	3.8	0.8	1.2	2.2	13.7
Other meat	3.1	1.9	0.3	2.2	15.7	-0.1	3.1	1.3	0.3	0.4	-1.5
Sugar	1.4	0.6	0.5	9.1	0.0	6.2	0.9	0.0	1.5	21.8	2.6
Oils and fats	1.0	1.5	0.2	0.3	0.2	0.0	0.6	0.2	1.6	0.3	0.8
Whey	0.8	24.1	0.4	3.2	-0.4	1.4	0.2	2.0	1.6	11.6	5.9
Powdered milk	0.0	23.7	0.8	40.8	-0.8	24.2	1.9	8.8	1.5	6.6	1.6
Butter	-0.2	28.3	0.1	52.0	-0.3	12.4	1.3	12.0	1.5	11.6	0.6
Cheese	0.3	24.8	1.0	5.0	-0.2	11.6	1.3	2.2	1.4	8.1	4.5
Other dairy	1.0	24.8	0.8	19.6	0.1	2.9	3.4	-0.2	2.0	2.6	1.5
Other food	0.3	0.0	0.3	0.3	3.1	0.0	0.8	1.3	0.7	0.2	5.7
Labor-int. mfg	0.9	0.1	0.2	0.5	0.3	0.1	1.5	0.8	0.0	0.2	2.9
Capital-int. mfg.	0.1	0.0	0.1	0.6	1.0	0.0	0.7	0.5	0.4	0.1	2.1
Services	0.2	0.0	0.1	0.5	0.2	-0.1	1.3	-0.2	0.2	0.0	2.4

Note: TPP refers to the Trans-Pacific Partnership; mfg. stands for manufacturing.

Source: USDA, Economic Research Service, TPP model.

Appendix 6 – Effects of Tariff and Quota Elimination in a TPP on Output Quantities

Table A6.1

Percent change in output quantity with tariff and tariff-rate quota elimination in a TPP, compared with 2025 in the baseline

Commodity	Austra-lia	Cana-da	Chile	Japan	Malay-sia	Mexico	New Zea-land	Peru	Singa-pore	United States	Viet-nam
Rice	7.0	0.1	0.1	-2.6	-0.6	0.0	0.0	0.1	0.0	8.7	1.4
Wheat	0.8	-0.5	0.2	-32.3	-1.8	0.9	1.8	0.1	0.3	2.1	4.4
Corn	3.6	0.9	-0.1	-13.6	0.1	0.1	1.0	0.2	-3.0	0.3	0.2
Other grains	3.1	3.0	0.0	-7.6	0.2	0.0	1.9	0.0	0.1	-1.5	-1.5
Fruits/vegetables	0.0	2.5	0.2	-0.5	0.0	0.0	0.4	0.1	-4.7	0.3	-0.9
Oilseeds	-0.2	-0.1	0.1	0.0	-0.1	0.3	-1.5	0.1	-3.0	0.0	-3.1
Sugar cane/beet	1.7	0.9	0.2	-2.4	0.4	-0.6	0.2	1.7	-1.2	-2.2	-0.1
Fibers	-0.5	0.0	-0.1	2.9	0.1	0.1	-0.7	0.2	-2.2	-0.1	3.4
Other crops	0.2	-0.3	-0.8	-1.1	-0.3	0.0	0.0	0.1	2.8	0.0	-3.0
Bovines	6.7	0.0	0.7	-10.7	0.4	0.5	3.3	0.1	-2.4	0.2	0.0
Pigs	0.4	0.4	1.0	-1.0	0.2	0.3	1.0	0.2	-2.3	0.1	-0.2
Poultry	0.7	-1.0	-1.5	-0.8	0.3	-0.7	0.6	0.1	-2.4	0.6	-0.8
Other animals	-0.2	0.6	12.5	1.0	0.2	3.5	-0.5	1.2	0.9	0.6	0.2
Resources	-0.1	0.0	-0.1	-0.1	-0.2	0.1	-0.5	0.0	0.5	0.0	-1.0
Bovine meat	7.3	-0.2	0.8	-14.8	0.1	1.0	4.1	0.1	0.2	0.1	-1.5
Pork	-0.2	1.7	0.9	-1.4	0.1	0.6	0.0	0.3	0.0	0.2	-4.1
Poultry meat	0.7	0.9	-2.3	-1.6	0.6	-1.6	0.0	0.1	-0.2	0.9	-11.8
Other meat	5.0	9.6	25.6	-0.8	-0.5	9.1	1.5	4.2	1.5	5.3	4.4
Sugar	8.9	15.9	0.1	-2.4	0.7	-1.1	0.2	2.8	-7.4	-2.4	-0.1
Oils and fats	-0.4	0.2	0.3	-0.3	0.0	0.0	-0.1	0.0	1.5	0.2	-3.2
Whey	0.6	-0.2	0.2	-3.7	0.9	-0.7	3.2	-0.1	-2.2	0.3	-10.4
Powdered milk	5.7	-13.2	0.9	-13.2	2.1	-8.4	3.3	-1.8	0.8	0.5	-1.8
Butter	4.9	-11.9	0.3	-35.2	2.9	-2.2	4.5	-0.2	0.5	1.1	-0.6
Cheese	1.0	-3.8	6.6	-3.5	1.5	-1.8	6.2	-3.8	0.4	0.1	-4.0
Other dairy	1.9	-1.8	0.5	-2.6	2.9	-0.4	3.2	0.0	0.7	0.7	-0.7
Other foods	0.3	0.1	0.2	-0.1	0.6	0.0	0.7	0.0	5.9	0.1	0.4
Labor-int. mfg	-1.1	-0.1	-0.2	0.3	0.3	0.0	-1.3	-0.2	-0.2	-0.1	4.1
Capital-int. mfg.	-0.2	0.0	-0.1	0.0	-0.2	0.1	-0.5	0.0	0.9	0.0	-2.3
Services	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.4

Note: TPP refers to the Trans-Pacific Partnership; mfg. stands for manufacturing.

Source: USDA, Economic Research Service, TPP model.

Appendix 7 – Effects of Tariff and Quota Elimination in a TPP on U.S. Bilateral Trade Quantities

Table A7.1

Percent change in quantity of U.S. exports in 2025 with tariff and tariff-rate quota elimination in a TPP, compared with 2025 in the baseline

Commodity	Austra-lia	Cana-da	Chile	Japan	Malay-sia	Mexico	New Zea-land	Peru	Singa-pore	Viet-nam	Rest world
Rice	0.8	0.8	0.1	208.5	34.6	-0.1	0.7	-0.1	3.1	19.8	0.0
Wheat	1.9	-0.2	-0.2	25.9	1.0	-0.1	3.3	-0.6	1.5	3.9	-0.3
Corn	2.7	0.1	0.0	1.9	-0.2	-0.3	3.7	-0.1	0.2	14.1	-0.3
Other grains	1.8	0.2	0.0	-11.5	0.2	-0.3	2.8	-0.1	-0.4	5.3	-0.2
Fruits/ vegetables	1.4	0.0	-0.7	12.8	3.4	-2.9	1.5	-0.7	0.0	73.5	-0.3
Oilseeds	1.3	0.0	-0.3	-0.5	-0.1	-0.1	1.3	-0.2	-0.3	13.1	-0.3
Sugar cane/beet	2.5	6.4	-0.2	-1.1	-0.4	-0.8	2.1	0.3	4.9	1.3	-0.7
Fibers	1.3	2.4	-0.2	0.6	0.1	-0.2	0.1	0.0	-0.3	0.9	-0.3
Other crops	1.8	3.4	-1.0	-0.6	14.5	-1.2	1.6	-0.5	2.5	78.7	-0.6
Bovine animals	3.5	-0.2	-0.2	-6.9	1.8	-3.8	3.5	-0.2	1.9	0.7	-0.1
Pigs	0.8	0.4	-0.6	1.9	0.0	-0.1	1.0	0.0	0.0	-0.3	-0.2
Poultry	1.0	21.9	0.0	5.1	0.7	-0.1	1.0	-0.4	0.0	-0.4	-0.2
Other animals	1.1	2.1	0.3	5.0	1.2	-0.2	0.8	-1.5	-0.1	-1.3	0.0
Resources	0.5	0.0	-0.1	0.4	1.0	0.0	0.0	-0.2	1.1	4.3	0.0
Bovine meat	5.7	-10.3	0.8	35.1	1.3	-3.2	4.8	-0.2	1.8	73.6	0.1
Pork	1.4	0.5	0.4	3.1	16.2	-0.2	8.7	-1.2	1.7	127.4	-0.1
Poultry meat	-0.5	44.6	0.3	22.4	0.0	-16.9	6.8	-0.9	1.1	52.1	-0.2
Other meat	4.0	1.9	-0.1	81.4	30.8	-0.5	74.8	-1.3	0.3	32.6	-0.1
Sugar	3.9	2.7	3.0	-20.9	2.9	-2.3	4.4	2.4	4.5	40.1	2.5
Oils and fats	0.8	1.7	-0.3	4.1	2.3	-0.2	1.0	-0.8	1.7	44.7	-0.3
Whey	1.1	35.3	0.3	8.0	0.0	-1.2	11.2	-0.6	1.9	46.8	0.0
Powdered milk	1.6	52.8	0.2	179.0	0.7	-12.1	15.8	-4.2	2.4	58.1	0.1
Butter	1.5	56.9	0.3	299.4	2.1	-3.8	2.1	-1.6	2.7	30.6	0.1
Cheese	1.3	78.6	0.9	34.5	3.0	-3.3	2.2	-6.8	2.5	43.0	0.0
Other dairy	1.8	83.9	0.7	126.5	1.4	-0.7	12.6	-0.1	2.3	8.9	-0.1
Other foods	0.4	-0.2	0.1	3.9	28.5	-0.1	5.2	-0.8	0.7	24.9	0.0
Labor-int. mfg	-1.5	-0.3	-0.4	1.1	2.3	-0.2	3.8	-0.8	0.0	35.5	0.0
Capital-int. mfg.	-0.1	-0.1	-0.1	2.5	9.9	0.0	4.5	-0.5	0.5	8.1	0.0
Services	0.2	0.0	0.1	0.5	0.3	-0.1	1.3	-0.2	0.2	2.4	0.0

Note: TPP refers to the Trans-Pacific Partnership; mfg. stands for manufacturing.

Source: USDA, Economic Research Service, TPP model.

Table A7.2

Percent change in quantity of U.S. imports in 2025 with tariff and tariff-rate quota elimination in a TPP, compared with 2025 in the baseline

Commodity	Austra-lia	Cana-da	Chile	Japan	Malay-sia	Mexico	New Zea-land	Peru	Singa-pore	Viet-nam	Rest world
Rice	-0.3	0.5	-0.3	6.2	7.7	0.0	5.8	-0.1	-0.2	3.7	0.0
Wheat	-0.3	0.3	-0.3	1.6	1.1	0.7	-3.2	0.3	-8.7	15.0	0.6
Corn	-2.6	0.4	-0.1	2.6	3.3	0.8	-1.8	0.4	-7.5	-2.0	0.6
Other grains	-1.1	0.2	-0.1	1.2	1.6	0.4	-0.9	0.1	-3.2	-0.8	0.3
Fruits/ vegetables	-1.9	0.1	-0.3	16.6	4.1	0.3	-0.4	0.1	-5.5	-2.0	0.2
Oilseeds	-2.5	0.3	0.3	1.5	0.0	0.6	-1.5	0.2	-5.8	-2.3	0.5
Sugar cane/beet	-3.1	0.0	-0.5	1.3	-0.1	0.5	-2.5	0.1	-8.6	-3.6	0.4
Fibers	-3.2	0.1	-0.2	14.4	-0.1	0.2	-2.4	0.0	-2.5	-1.2	0.1
Other crops	-2.9	0.0	-0.8	5.0	4.6	0.5	4.4	0.0	-5.0	-3.0	0.3
Bovine animals	-2.0	0.3	-0.3	5.7	1.1	0.6	2.2	0.2	-5.8	-1.8	0.4
Pigs	0.0	0.1	-0.1	1.2	0.0	0.1	-0.3	0.0	-1.9	0.0	0.1
Poultry	-0.8	0.1	-0.2	1.3	2.1	0.3	-1.0	0.0	-1.9	-0.4	0.2
Other animals	-1.5	0.1	-0.4	4.6	3.7	0.4	0.0	0.0	0.2	4.4	0.2
Resources	-0.2	0.0	-0.1	-0.1	-0.1	0.1	-0.3	0.2	-0.2	-2.7	0.0
Bovine meat	11.5	-2.5	-4.3	29.9	0.0	-2.2	8.6	-3.3	0.0	0.0	0.0
Pork	-3.1	0.5	-1.2	3.6	0.0	0.1	-1.4	-0.4	0.0	0.0	0.0
Poultry meat	-3.9	10.9	-3.0	17.5	10.7	-1.9	2.1	-2.3	-3.0	95.1	-2.2
Other meat	-3.4	3.5	-1.2	15.0	43.1	0.2	4.3	-0.1	-1.6	612.3	-0.3
Sugar	185.3	188.7	-15.9	208.4	186.8	-15.4	182.7	187.9	-15.9	177.3	-15.5
Oils and fats	-2.2	1.0	-0.1	1.5	-0.3	-0.2	5.7	0.1	0.0	-4.8	0.0
Whey	23.5	61.3	7.8	84.4	-0.8	-1.7	27.1	-1.8	28.4	-2.4	-1.7
Powdered milk	11.1	24.9	4.9	49.0	-0.5	-1.1	17.0	-1.4	18.8	-2.0	-1.3
Butter	15.0	33.5	6.5	50.1	-0.9	-1.8	26.6	-1.9	24.8	-3.3	-1.8
Cheese	18.3	31.9	5.8	58.9	0.1	-0.6	27.6	14.3	11.2	-2.0	-0.8
Other dairy	7.6	24.1	7.4	50.3	1.0	0.2	8.1	0.1	11.4	-0.7	0.1
Other food	0.8	0.0	0.0	7.9	3.4	0.0	4.6	0.0	2.6	2.1	-0.1
Labor-int. mfg	-0.1	-0.1	-0.2	1.6	1.0	-0.1	1.0	0.0	-0.4	18.2	-0.2
Capital-int. mfg.	-0.3	0.0	-0.1	2.9	5.0	0.0	1.8	0.1	-0.1	3.8	-0.1
Services	-0.3	0.0	-0.2	-0.7	-0.5	0.2	-2.1	0.3	-0.5	-3.5	0.0

Note: TPP refers to the Trans-Pacific Partnership; mfg. stands for manufacturing.
Source: USDA, Economic Research Service, TPP model.