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Do Free Trade Agreements Benefit Developing Countries? An Examination of U.S. Agreements

Kayode Ajewole, Jayson Beckman, Adam Gerval, William Johnson, Stephen Morgan, and Ethan Sabala

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Abstract

The United States has 14 free trade agreements (FTAs) in force across 20 countries—the majority of which are lower- or middle-income countries—what the authors of this report consider to be developing countries. FTAs are generally described as beneficial to a country as they generally lower prices; however, countries might be hesitant to enter into an agreement with a more economically developed country such as the United States. This report uses trend analysis to see whether movements in trade, production, and gross domestic product (GDP) data are consistent with the notion that FTAs produce beneficial effects for developing countries—focusing on FTA agreements between developing countries and the United States. Agricultural trade for U.S. imports and exports generally increased in the FTAs analyzed for this report. Given that many U.S. FTA partners have similar production profiles, data indicate that specialization occurs when a country switches production (and trade) to products where the countries own a comparative advantage in production (e.g., Colombia coffee). An increase in agricultural imports from the United States and a switch to specialization might impact individual commodities, but the data indicate that developing countries largely improved agricultural trade after implementing an FTA with the United States.

Keywords: free trade agreement, FTA, specialization, trade, production

About the authors

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Errata
On February 15, 2023, a calculation error in figure 18 was corrected for post-CAFTA-DR sugar production. No other aspects of the report were affected by the error.

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A report summary from the Economic Research Service *September 2022*

Do Free Trade Agreements Benefit Developing Countries? An Examination of U.S. Agreements

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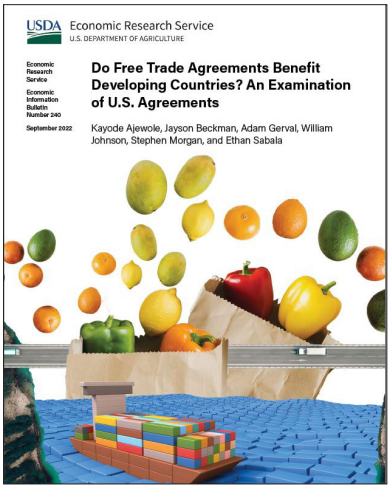
What Is the Issue?



Free trade agreements (FTAs) (in general) increase trade, lower prices for consumers, and provide export opportunities for producers. As such, FTAs are usually described as beneficial to a country as a whole; however, gains from FTAs are not always shared equally within the country. For instance, some industries are not able to compete with imports—and production might decrease in that country and lead to job losses. Given that developed countries might be more productive, developing countries might hesitate to enter into an FTA with a developed country if they believe they cannot compete with the developed country's imports. Previous literature examined the impacts of FTAs on trade and other macroeconomic factors, but these studies are often outdated and/or are not specific to the United States and its FTAs. This report examines whether developing countries' FTAs with the United States are beneficial to those countries by providing a comparison of trade and other macroeconomic indicators before and after the implementation of the FTAs.

What Did the Study Find?

FTAs are generally associated with an increase in aggregate trade flows. Our trend analysis was found to be generally supportive of this point, in the context of agricultural trade with U.S. FTAs, including those with developed countries.

- U.S. FTA partners (with the exception of Australia) showed annual increases in agricultural exports to the United States, ranging from 5 percent (Canada) to 46.2 percent (Singapore) in the 5 years following their respective trade agreements.
- U.S. agricultural exports to FTA partners also increased annually, from a low of 4.8 percent (Canada) to a high of 82.7 percent (Bahrain) in the 5 years following their respective trade agreements.

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

Trends in U.S. agricultural trade with FTA partners are consistent with trade being supported by FTAs.

- From 1989 to 2020, U.S. agricultural imports from FTA partners increased from $16.5 billion (a 48.9-percent share of total imports) to $101.9 billion (53.7-percent share of total imports).
- In the same period, the value of U.S. agricultural exports to these same partner countries increased from $11.8 billion (22.5-percent share of total exports) to $67.5 billion (41.7-percent share of total exports).
- The share of U.S. imports from developing FTA partner countries rose from 21.6 percent in 1989 to 31.4 percent in 2020.

As countries specialize in the production of goods for which they maintain a comparative advantage relative to member FTA countries, specific commodities often see the largest changes in trade. This finding is especially true for developing countries in Central and South America.

- Since the accession of the U.S.-Peru Trade Promotion Agreement (PTPA), U.S. imports of Peruvian fruit commodities more than tripled, with Peru becoming the third largest supplier of fresh fruit to the United States in 2021.
- Nicaraguan sugar exports to the United States increased an average of 102.7 percent in the 5 years following the Dominican Republic-Central America-United States Free Trade Agreement (CAFTA-DR).
- In the 5 years following the implementation of the North American Free Trade Agreement, Mexico's beef exports to the United States increased annually by an average of 38.2 percent.

How Was the Study Conducted?

This report provides information on the trends following FTAs, focusing on FTAs between the United States and its lower- and middle-income partners—noted as developing countries for purposes of this report and by the United Nations. Background information is provided on tariffs, both those tariffs available to all members of the World Trade Organization (WTO) and those negotiated in FTAs. To illustrate some of the benefits from FTAs, changes in agricultural trade (both imports and exports) are provided by using statistics from 5 years before and 5 years after the trade agreement. The average year-over-year changes are compared with the statistics from 5 years before the trade agreement to 5 years after, which allows any distortionary effects to be mitigated from large trade volume changes in a single year. For instance, a large jump in exports in any year prior to a trade agreement, followed by several years of no growth (or even a slight decline) in exports, would lead to 5-year average export volumes that indicate exports increased after the trade agreement. In several instances of this report's trade data, there is a long phase-in period for tariffs to be lowered—and for countries to respond to those changes—which provides a longer time period for the trade numbers. This report only provides a descriptive empirical analysis and does not use statistical inference. It is also important for readers to note there are many other factors influencing the previously mentioned development indicators (such as other trade agreements or other policy factors) beyond market openness due to an FTA.

Introduction

Economists generally conclude that more and freer trade is beneficial to society (Gasiorek et al., 2019; Wolla and Esenther, 2017). For the importing country, consumers[1] often benefit from more variety and lower prices[2] while the exporting country gains export opportunities for producers. In addition, (in terms of agriculture) more trade may improve food security—through more food availability or by providing farmers with new market opportunities. One way that more and freer trade can occur is through free trade agreements (FTAs). Stevens et al. (2015) examined 19 primary studies that estimated trade growth and found that an FTA created a positive effect in at least 18 cases (the other showed no effect) (see box, "Does a Free Trade Agreement Increase Trade? What About Other Factors?").

Does a Free Trade Agreement (FTA) Increase Trade? What About Other Factors?

One of the central research questions surrounding the formation of FTAs is whether and to what extent FTAs promote trade between member countries. Baier and Bergstrom (2007) used 5-year panel data for 96 countries from 1960 to 2000 and found that FTAs increase trade by an approximate average of 100 percent over 10 years. In more recent work, Baier et al. (2019) analyzed FTAs from 1986 to 2006 and found an FTA increases the value of trade flows by an average of 34 percent. For U.S. FTAs, agreement-specific effects for the North American Free Trade Agreement (NAFTA) and the U.S.-Chile FTA are estimated at 94 and 33 percent, respectively. However, effects can vary across FTAs based on distance, market size, comparative advantage, and other factors.

For agriculture, Grant and Lambert (2008) found that trade agreements increase agricultural trade by an average of 72 percent, compared with 27-percent gains for nonagricultural trade. When accounting for phase-in periods across 12 years, the average increase for agricultural trade was 149 percent.[3] Volrath et al. (2009) found no effect of FTAs on agricultural trade flows in 2005 but found negative effects in 1995 and 2000; however, that report does not account for the phase-in period. Volrath et al. (2009) found that trade flows from non-FTA members to FTA members were significantly reduced for some commodities—the equivalent of a 15-percent tariff for rice and red meat trade flows. Lambert and McKoy (2009), however, found FTAs increased intra-FTA agricultural product trade and food trade for most agreements. This includes NAFTA, which Lambert and McKoy (2009) estimate increased agricultural trade by 145 percent beyond what was expected from the World Trade Organization (WTO) alone in a pooled sample.

FTAs can also factor into the global economy in other ways. Bailé et al. (2019) found FTAs are positively correlated with direct domestic value-added exports, as well as forward and backward participation in global value chains (GVCs) in the food sector but not the agricultural sector. In contrast, higher tariffs hamper participation in both food and agricultural value chains.

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[1] This definition includes households, restaurants, hotels, and institutions.

[2] In addition, given that the United States exports a lot of bulk agricultural products, producers in the importing country could benefit from availability of raw materials and ingredients, which could result in exports of higher added-value products to the United States and other export markets.

[3] Many FTAs have phase-in periods in which existing trade barriers are phased out over time. This is generally done so that producers in the importing country can adjust to import competition. This typically occurs over 10 to 15 years after ratification of the FTA (Besedes et al., 2020).

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When focusing on sub-Saharan Africa, the negative effect of tariffs on value chain participation also applies to the food sector, but there is weaker evidence on the role of FTAs (Bailé et al., 2019). The formation of trade agreements can also affect the agricultural policies of nonmember countries. He (2021) measured the effects of new FTAs on the nominal rate of assistance nonmember countries provide to their agricultural producers, finding an average of 1-percentage-point increase in a trading partner's average preferential import share decreases the excluded countries' nominal rate of assistance (the extent to which a set of agricultural policies affects the market price of a commodity) by nearly 0.3 percentage points. Additionally, developing countries were found to reduce protection for their less-protected agricultural producers when other trading partners liberalize (He, 2021).

Some studies raised concerns about changes in a developing country's consumer behavior after new trade agreements were ratified, especially regarding the consumption of goods linked to negative health. Stuckler et al. (2012) analyzed developing countries that enter into FTAs with the United States and found those agreements are associated with a higher level of soft drink consumption per capita. In a descriptive analysis of the Dominican Republic-Central America-United States Free Trade Agreement (CAFTA-DR), Thow and Hawkes (2009) argued that liberalization and foreign direct investment (FDI) associated with the FTA lowered prices and increased the availability of meat and processed foods, which could affect individual nutrition outcomes in the future.

However, gains—either measured by more trade, gross domestic product (GDP), or welfare (societal well-being)—are not always equal. Rather, the gains depend on a variety of factors—such as the level of tariff reduction, the presence of tariff-rate quotas (TRQs),[4] the ability of the exporting country to export more versus just redirecting existing trade, and the market size of the importing country.[5] In addition to these unequal gains, developing countries might be hesitant to enter into an agreement with a more economically developed country if the developing countries believe they cannot compete with imports.

There is a large and growing amount of literature evaluating the effects of individual trade agreements (see box, "Methods for Estimating the Impacts from FTAs"). Appendix 1 provides a summary of what studies have found for several U.S. FTAs, while appendix 2 provides background information on the FTAs that the United States has in place. While many effects are specific to agreements, several key themes emerge from these individual analyses—along with the general finding that FTAs increase trade. First, net welfare gains are generally positive for the parties of the FTA. While there may be sectors that gain or lose based on comparative advantages, overall increases in trade and declines in consumer prices tend to outweigh any losses.

[4] TRQs are a two-tiered tariff scheme that charges a lower tariff on import volumes that are under a defined quota and a higher tariff charged on volumes above the quota (Beckman et al., 2021). TRQs are often negotiated under an FTA, essentially expanding the quota for a country; however, TRQs are not often fully liberalized, which could limit imports (Beckman and Arita, 2016).

[5] The gains also depend on the commitments associated with these FTAs, in what has become known as deep trade agreements (Beckman et al., 2017). Along with trade, deep trade agreements often cover additional policy areas, such as the international flows of investment and labor, and the protection of intellectual property rights and the environment.

In addition, long phase-in periods associated with the liberalization of certain commodities are commonly used to prevent immediate shocks associated with the implementation of a new FTA.[6] Although there are several instances of research investigating the impacts of signing an FTA with the United States over the long run, many of these instances are outdated or do not encompass all the agreements. This report reviews trends in trade, production, and macroeconomic factors to examine whether FTAs were beneficial for the United States and its partners, with a focus on developing countries.[7]

Methods for Estimating the Impacts from Free Trade Agreements (FTAs)

There are several different approaches for estimating the impacts that may arise from FTAs, such as those between the United States and developing countries. This report uses a trend analysis to compare key outcome variables (e.g., agricultural exports) before and after the implementation of the FTA. Because there is a relatively small number of U.S. FTAs in force, and some FTAs were implemented relatively recently, the trend analysis permits a focus on a narrow sample of agreements that may not be possible econometrically. However, the patterns found when comparing trends are not causal. In other words, the isolation of the changes in trends pre- and post-U.S. FTA are not discernible from other factors that might be driving these changes or even trends which began before an FTA was conceptualized. These changes could be driven by numerous factors—including other trade agreements, changed domestic policies, improved technologies, rising incomes, and weather patterns.

A literature review indicates that researchers have used other approaches to analyze the prospective and retrospective effects of FTAs. Computable general equilibrium (CGE) models are often used to examine the possible gains from an FTA by simulating the possible changes in trade and other outcomes, using a system of structural parameters and elasticities. CGE models are advantageous because they can be conducted using data from before an FTA is implemented and can evaluate a wide range of possible scenarios. Drawbacks of CGE models are that the selected structural parameters and elasticities may not fully capture the dynamic effects of an FTA.

Researchers have also widely used gravity models to analyze the retrospective effects of FTAs because the models use observed data from before and after an FTA was implemented and a country pair structure (Yotov et al., 2016). Econometric methods can control for other factors beyond an FTA that may affect trade between two countries. However, FTAs are dynamic in nature, and the duration of trade responses may take up to 10 years to implement, meaning they require a sufficient amount of observed data to permit an estimation of short- and long-run effects (Eggers et al., 2022). This suggests that gravity model estimates conducted shortly after FTA implementation may bias estimates. Additionally, gravity models focus primarily on bilateral relationships, and the trade costs between third parties do not affect trade between two partners (Lundmark, 2018). Gravity analysis would require a large sample of FTAs, likely larger than the existing sample of U.S. FTAs, for analysis.

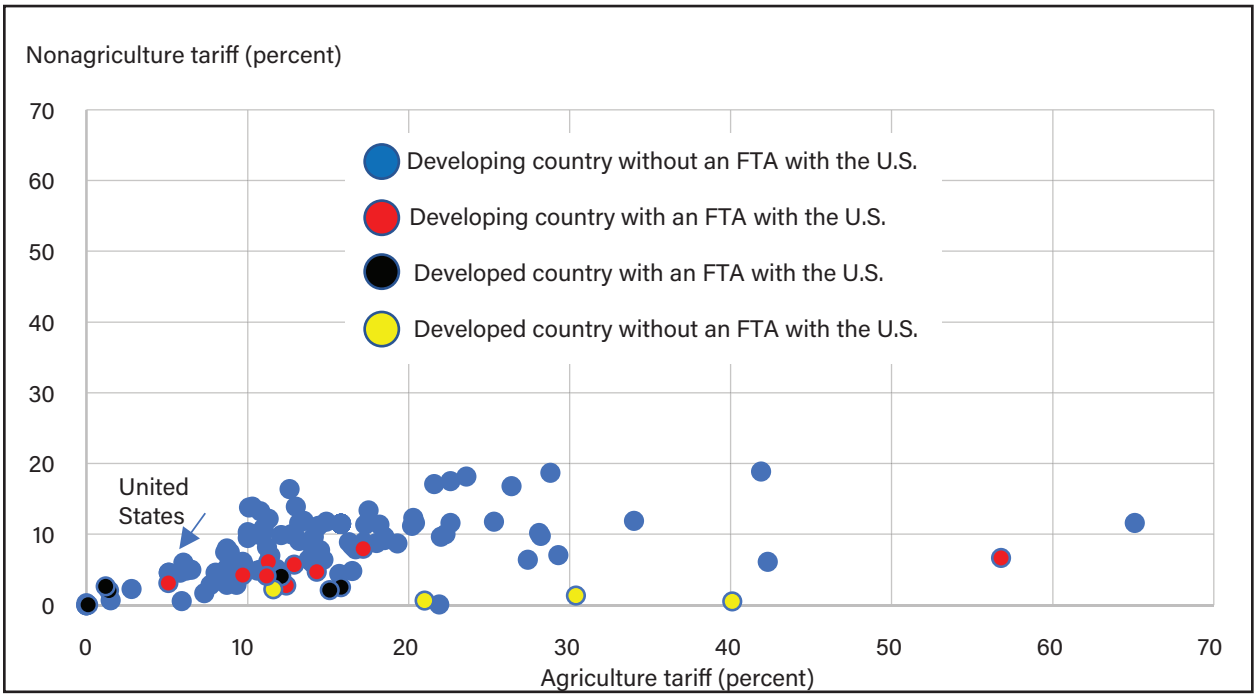
[6] For example, under both NAFTA and CAFTA-DR, liberalization of previously protected corn markets was expected to lead to lower corn prices and reduced demand for agricultural labor (e.g., Robinson et al., 1993; Taylor et al., 2010). However, long adjustment periods (combined with growth in other sectors) were expected to provide opportunities for displaced labor. Additionally, De Janvry et al. (1995) argued that many small-scale corn producers in Mexico were producing for their own household consumption and would not be affected by price declines.

[7] Developing countries are defined as lower- and middle-income countries, which corresponds to the definition used by the World Bank. The countries include Bahrain, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Honduras, Israel, Jordan, Korea, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, and Singapore. Countries considered as developed are Australia, Canada, and Japan. Japan is not included in this report because the country's agreement with the United States is too recent to analyze properly.

Background on Agricultural Tariffs

Despite its small share of total global trade, agriculture is very important (both politically and for food security)—as can be ascertained by the heavy protection it is given and the difficulty with reforming it in trade negotiations. Figure 1 indicates that tariffs on agriculture tend to be much larger than those for nonagricultural goods which is the case for 90 percent of countries notifying these rates to the WTO (a total of 134).[8] And agricultural tariffs tend to be much higher in many instances, particularly in developing countries. For example, seven countries place a tariff averaging 30 percent or more on agriculture: Egypt (65 percent), South Korea (57 percent), Turkey (42 percent), Bhutan (42 percent), Norway (40 percent), India (34 percent), and Switzerland (30 percent). Conversely, the respective average tariff on nonagricultural goods for these countries is less than 20 percent. The developed countries with the lowest average tariffs for both agriculture and nonagricultural goods are New Zealand, Australia, and the United States (in that order).[9]

Figure 1
Average tariffs on agriculture and nonagricultural products for World Trade Organization countries



Notes: FTA = free trade agreement. U.S. = United States. Tariffs represent the average of the most favored nation (MFN) applied tariff for the last reported year. The classification of a country is self-reported to the United Nations.

Source: USDA, Economic Research Service using data from the World Trade Organization, 2021.

Countries that join FTAs face lower tariffs in the trade agreement compared with the most favored nation (MFN)[10] tariff rates in many agricultural products. Figure 2 highlights differences in MFN and FTA rates for a group of developed countries: Australia, Canada, Germany (used to represent the European Union), Japan, New Zealand, and the United States. As mentioned before—Australia, New Zealand, and the United States tend to place lower tariffs on agricultural products—whether it is FTA or MFN rates. And these three coun-

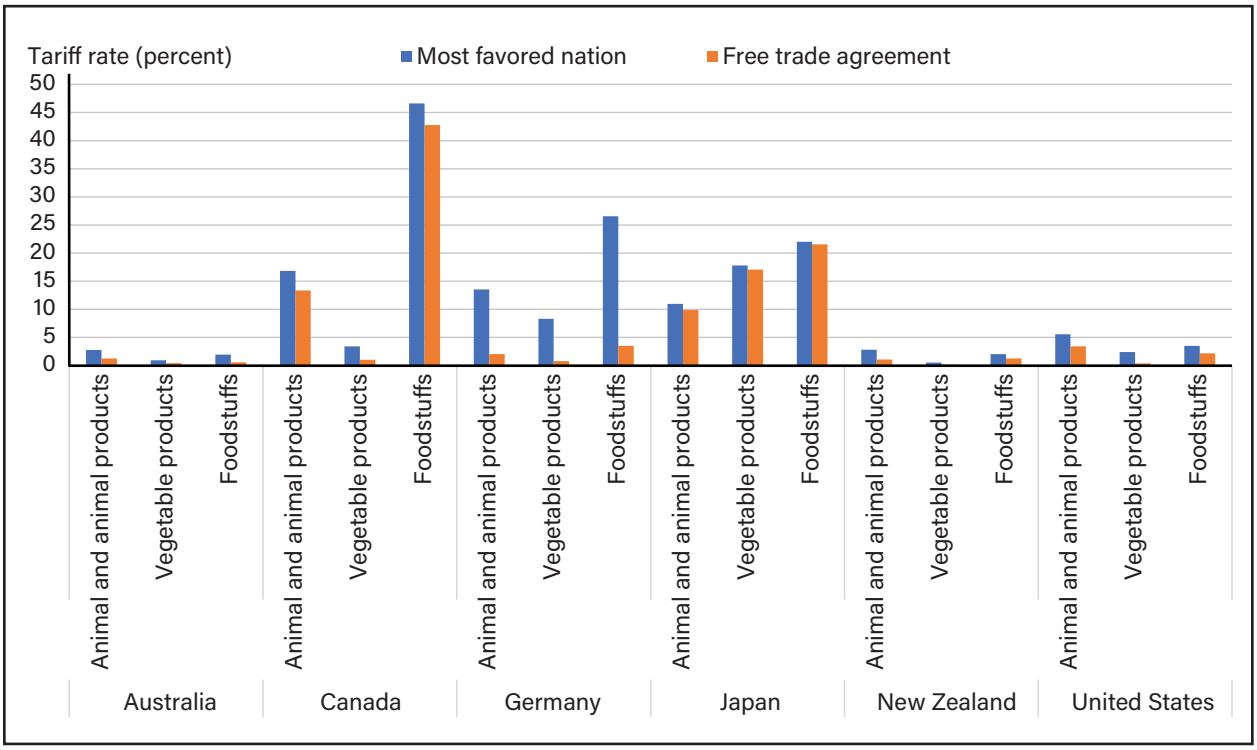
[8] Note that the axis for the figure is drawn to scale to illustrate the vast difference between agriculture and nonagricultural tariffs.

[9] Beckman and Arita (2016) pointed out that the United States has much lower tariffs on agricultural products than the European Union (EU) and uses TRQs on sensitive products less frequently than the EU in FTAs.

[10] This is the standard tariff that a country that is part of the WTO would face absent any trade agreement (Beckman, 2021).

tries tend to give lower tariffs to FTA partners—about half of the MFN rate. Of the developed countries studied, Canada and Japan place the highest MFN tariffs on agricultural products, with small reductions in tariffs for FTA partners. Germany, on the other hand, does tend to give preferential access through lower tariff rates to FTA partners, but these rates are still higher than they are for Australia, New Zealand, and the United States.

Figure 2
Comparison between most favored nation (MFN) and free trade agreement (FTA) tariff rates for selected developed countries

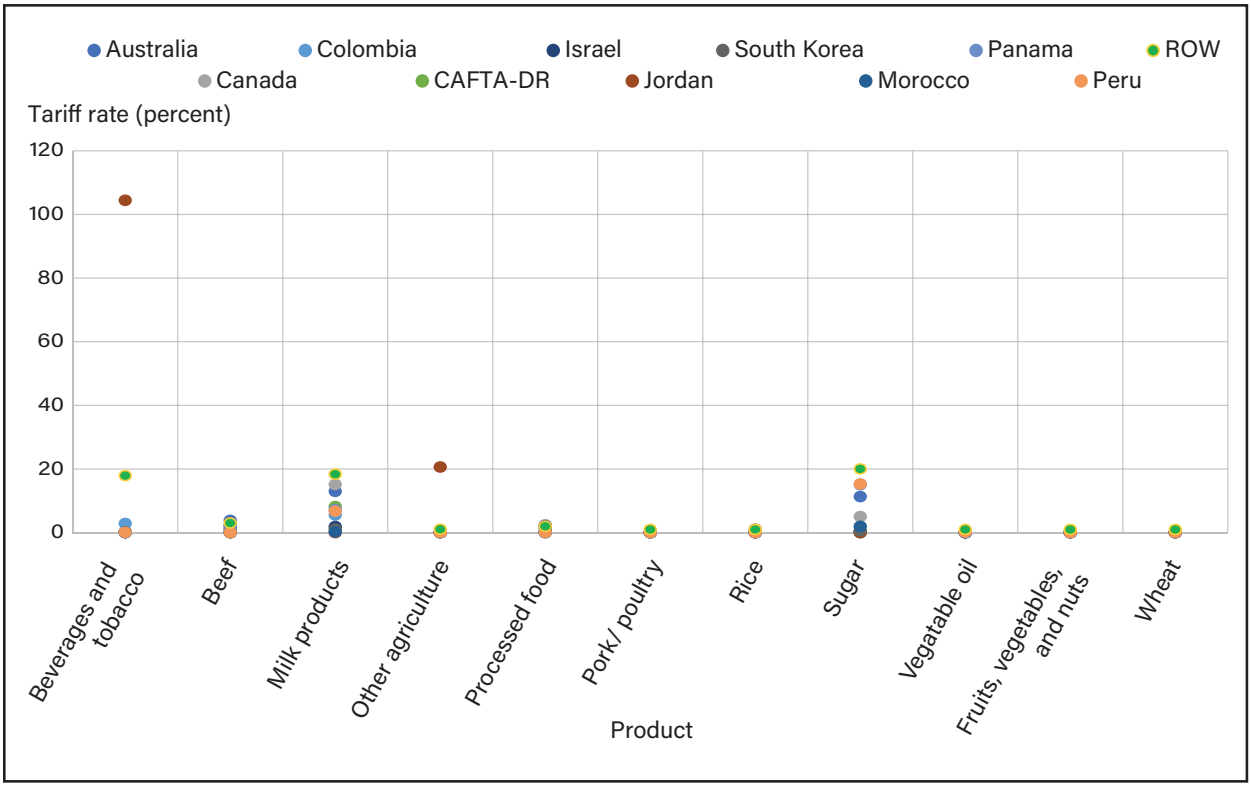


Notes: The data are gathered from the Harmonized System (HS), which is an international nomenclature that allows participating countries to classify traded goods on a common basis. Animal and Animal Products represent Harmonized System (HS) Chapters 1–5, Vegetable products represent HS Chapters 6–15, and Foodstuffs represent HS Chapters 16–24.

Source: USDA, Economic Research Service using data from the World Trade Organization, 2021.

Figure 3 presents the average applied tariff faced by countries with an FTA with the United States. The figure compares the access these countries receive versus the rest of the world (ROW)—which is approximately the MFN rate. In all instances, except those involving tobacco (beverages and tobacco include processed tobacco, and other agriculture includes unprocessed tobacco), the FTA partners enjoy favorable access to the U.S. market. This access includes U.S. imports of sugar, which are governed under a TRQ, and milk products (e.g., butter and cheese)—where the average tariff for the ROW is 11 percent, compared with a high among FTA partners of 3 percent for Canada.

Figure 3
Tariffs faced by countries exporting agricultural products to the United States



Notes: CAFTA-DR = Dominican Republic-Central America-United States Free Trade Agreement; ROW = rest of the world. Data are from 2020. Products are grouped by Global Trade Analysis Project (GTAP) sector. Tariffs on imports are effectively zero from Bahrain, Chile, Mexico, Oman, and Singapore and are not presented in the figure. The United States did not negotiate tariffs on alcohol and tobacco products with Jordan, as such, tobacco products caused the high tariff on other agriculture.

Source: USDA, Economic Research Service using data from the International Trade Centre, 2021.

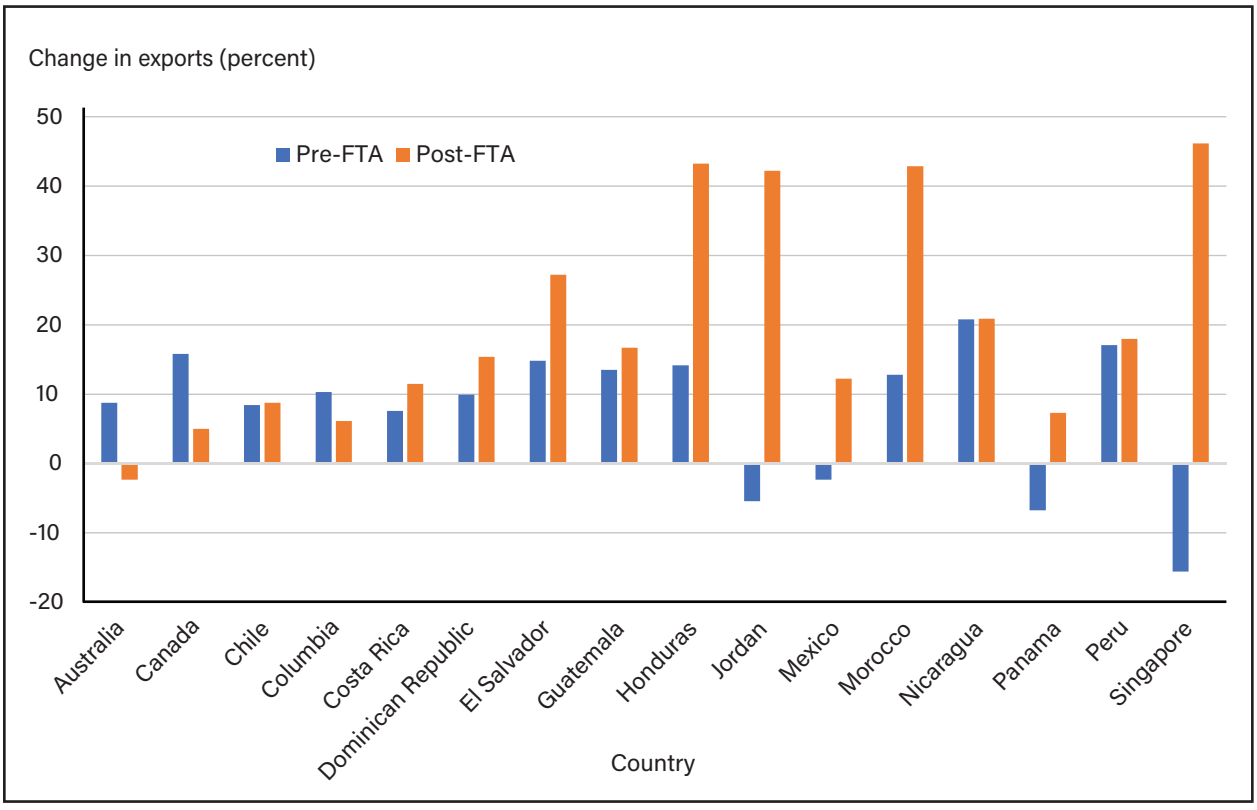
Changes in Exports

Following the implementation of FTAs, bilateral trade between participating countries changes as exporters and importers respond to the removal of trade barriers. The direction and magnitude of these trade changes depend on the pre-existing trade barriers, reduction of trade barriers outlined in the FTA, comparative advantages of participating countries, and the market size of participating countries.

Changes in Exports to the United States

Figure 4 illustrates changes in FTA partner agricultural exports to the United States before and after the FTA was implemented. Mexico's agricultural exports to the United States decreased by an average of 2.3 percent in the 5 years prior to the implementation of the FTA and increased by an average of 12.2 percent in the 5 years after FTA implementation. This indicates that NAFTA not only increased Mexico's agricultural exports to the United States but also reversed a negative trend from prior years.[11]

Figure 4
Average agricultural export growth rate to the United States by free trade agreement (FTA) partners, 5 years pre- and post-agreement



Notes: Bahrain and Oman are excluded due to missing data. Due to possible anticipatory effects of the FTA, the year prior to FTA signing is included in the post-FTA column for Jordan and the 2 years prior to FTA signing is included in the post-FTA column for Panama and Singapore.

Source: USDA, Economic Research Service calculations using data from Trade Data Monitor (2021).

Though many of the countries shown in figure 4 increased agricultural exports more quickly in the post-FTA years (Chile, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jordan, Mexico, Morocco, Nicaragua, Panama, Peru, and Singapore), the exports of several countries grew more slowly or decreased

[11] Data for all partners are presented here, but a focus on the developing countries is in the next section.

(Australia, Canada, and Colombia). However, many factors affect these exports that are not necessarily indicative of the FTAs. For instance, comparative advantages that shift production in these countries away from agriculture and toward other sectors (e.g., manufacturing, services, technology) might create changes to their agricultural production and exports. In addition, agricultural producers that shift resources to new products—which could take considerable time—can lead to slower agricultural export growth.[12] Therefore, the years immediately following the implementation of an FTA could show decreases in production and exports preceding more growth once resources and inputs are fully allocated to commodities that are grown most efficiently. Furthermore, some countries had deviations in the years surrounding their FTAs that led to these outcomes. For instance, Jordan, Panama, and Singapore showed large jumps in their agricultural exports to the United States a year before their respective FTAs were implemented. Given the possibility of anticipatory effects of the FTAs, then these jumps would be a direct result of the FTAs and should be considered "post-FTA." Consequently, the year prior to FTA implementation was included in the post-FTA period for Jordan, (and the 2 years prior to FTA implementation was included for) Panama, and Singapore in figure 4.

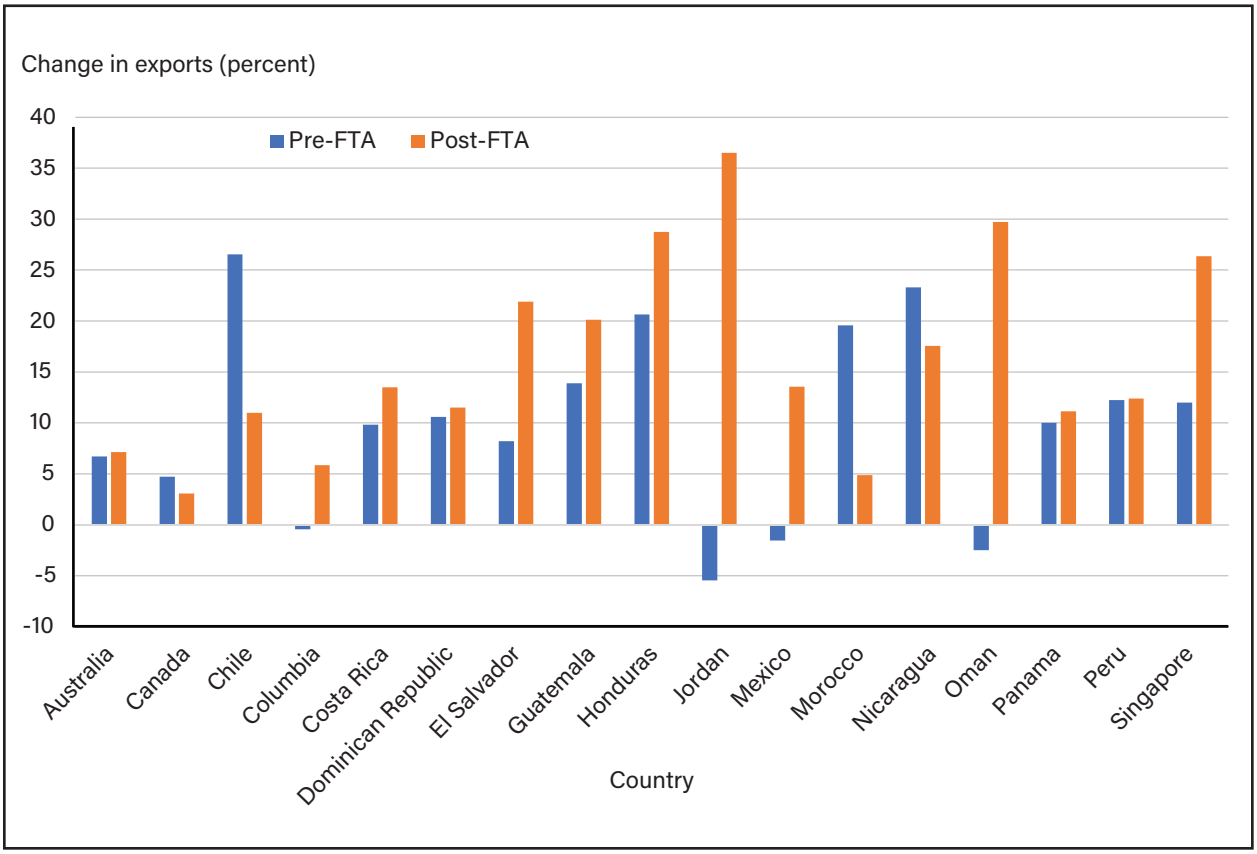
The trade changes shown in figure 4 also affect trade for nonparticipating countries. Specifically, countries that do not participate in FTAs often see reductions in trade, as trading partners divert trade to their FTA partners with lower or no trade barriers. For instance, in the 5 years preceding the CAFTA-DR treaty, Honduras' average agricultural export growth to CAFTA-DR countries was 13.2 percent. In the 5 years after the implementation of the CAFTA-DR treaty, growth accelerated to 31.7 percent. This growth rate compares with Honduras' agricultural export growth to non-CAFTA-DR countries of pre- and post-CAFTA-DR 5-year averages, reaching 65.4 percent and 28.6 percent, respectively. These averages suggest that Honduras possibly diverted agricultural exports from non-CAFTA-DR countries to CAFTA-DR countries once trade barriers were removed after CAFTA-DR ratification.

Changes in Total Agricultural Exports

Figure 5 shows changes in total agricultural exports pre- and post-FTA. The market opportunities provided by a new FTA may incentivize a trading partner to increase exports of new products and to reallocate existing export flows to different trading partners. Figure 5 illustrates export growth in the agricultural sector of U.S. FTA partner countries, following implementation of their respective trade agreements.

[12] In addition, some countries have faced difficulty expanding their agricultural production and exports. For example, a reviewer notes that Panama has not taken advantage of the export opportunities to the United States due to a lack of the sustained production of competitive food products and a lack of technical assistance from the Panamanian government to the small and medium producers.

Figure 5
Average total agricultural export growth rate by U.S. free trade agreement (FTA) partner, 5 years pre- and post-agreement



Notes: Bahrain was considered an outlier and excluded from the data because of small base trade. Bahrain had pre- and post-FTA year-over-year averages of 63.1 percent and 976.5 percent, respectively. Due to possible anticipatory effects of the FTA, the year prior to FTA signing is included in the post-FTA column for Singapore and the 2 years prior to FTA signing is included in the post-FTA column for Colombia, Panama, and Oman.

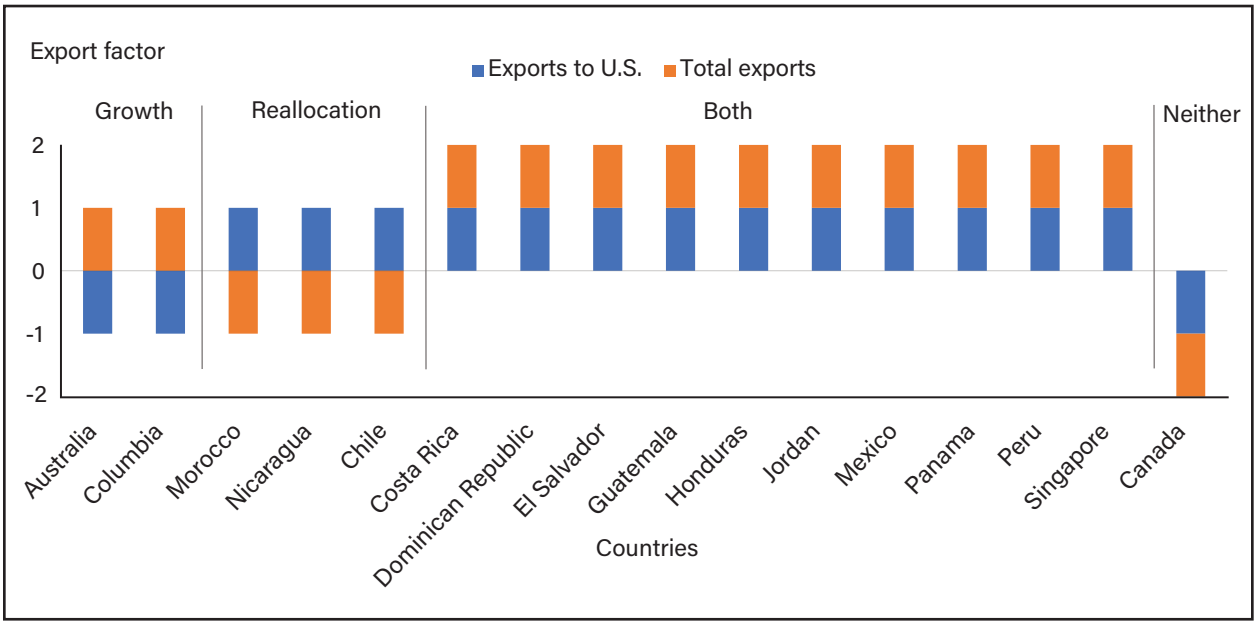
Source: USDA, Economic Research Service calculation using data from Trade Data Monitor, 2021.

Figure 5 shows Mexico's total agricultural exports were shrinking by an average of 1.5 percent in the years prior to NAFTA and growing by an average of 13.6 percent in the following years. However, in addition to the implementation of NAFTA, other domestic and international factors also possibly affected growth in agricultural exports during this same period. Many countries experienced faster growth in total agricultural exports in the post-FTA period compared with the pre-FTA period (Australia, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jordan, Mexico, Oman, Panama, Peru, and Singapore). However, several countries experienced slowing agricultural export growth (Canada, Chile, Morocco, and Nicaragua), which may indicate that resources in these countries were diverted to be used more efficiently in other sectors of the economy. It may also be the result of any number of external factors and not necessarily be indicative of the FTAs. For instance, Nicaragua entered into an FTA with the United States 2 years before the global economic downturn of 2007 and 2008, which profoundly affected Nicaragua's economy and 5-year post-FTA period. The anticipatory effects of FTAs seen in Panama and Singapore's agricultural exports to the United States also occurred for total agricultural exports for Colombia, Oman, Panama, and Singapore. Consequently (the year prior to FTA), implementation was included in the post-FTA average for Singapore and the 2 years prior to FTA implementation for Colombia, Oman, and Panama (figure 5).

Export Growth or Reallocation

Trade agreements often lead to more trade with countries that are FTA partners but not necessarily to an increase in the total levels of exports. That is, a country might export more to the FTA partner but does so by diverting trade from other countries, rather than increasing total exports. To determine whether FTAs with the United States led to export growth or reallocation,[13] the changes in each country's agricultural exports to the United States and total agricultural exports are examined. These changes are grouped into four categories: (1) export growth, (2) export reallocation, (3) both, and (4) neither. Figure 6 presents this information. A country's exports to the United States are shown in blue, and if they are in the upper portion of the graph, then exports accelerated in the 5 years following FTA implementation. It is important to note that "accelerated" does not necessarily mean a country's exports increased. For instance—if a country's exports decreased by an average of 10 percent during the 5 years before the FTA and decreased by an average of only 5 percent in the 5 years following the FTA—then that would still be considered accelerating, and that country's exports would appear in the upper portion of the graph.[14] If a country's exports to the United States—or total exports—are in the lower portion of the graph, then exports slowed after the FTA was implemented. This change in exports can be positive or negative as long as the annual change in exports is slower post-FTA then it was pre-FTA.

Figure 6
Agricultural export growth versus reallocation



Notes: For each U.S. Free Trade Agreement (FTA) partner, agricultural exports to the United States (blue) and total agricultural exports (orange) are classified as either accelerating (+1) or slowing (-1). A 2 or -2 means that the direction of the change is the same for both exports to the United States and total exports.

Source: USDA, Economic Research Service calculation using data from Trade Data Monitor, 2021.

[13] These terms are not to be confused with trade creation and diversion, which require empirical estimation. See Magee (2008), Sun and Reed (2010), and Clausing (2001) for examples of empirical estimation of trade diversion and creation.

[14] Therefore, "accelerating" exports could indicate either a smaller decrease in exports or a larger increase in exports. Additionally, accelerating could indicate that exports were decreasing prior to the FTA and began increasing after the FTA was implemented. For example, Mexico's exports to the United States decreased by an average of 2.3 percent in the 5 years leading up to NAFTA. However, for the 5 years after NAFTA was implemented, Mexico's agricultural exports to the United States increased 12.2 percent annually.

If a country's total agricultural exports accelerated following the FTA, but exports to the United States slowed, then trends suggest that exports were not diverted and grew. Figure 6 shows this occurred in Australia and Colombia. Australia's total agricultural exports averaged annual increases of 6.7 and 7.1 percent in the pre- and post-FTA periods, respectively. In the same periods, Australia's exports to the United States slowed from an average annual increase of 8.7 percent pre-FTA to an average annual decrease of 2.3 percent post-FTA.

Conversely, if exports to the United States accelerated post-FTA, but exports to all countries slowed or stagnated, then it is reasonable to conclude the increase in exports to the United States came from existing trade that was diverted from other countries. Figure 6 indicates that this occurred for Morocco, Nicaragua, and Chile. Using Morocco as an example, note that in the 5 years prior to implementation of the FTA, Morocco's agricultural exports increased to the United States by an average of 12.8 percent per year. In the 5 years after the FTA, Morocco's agricultural exports to the United States increased by an average of 42.9 percent per year. Therefore, Morocco's agricultural exports to the United States increased more rapidly after the implementation of the FTA than in the prior 5 years. Morocco's total agricultural exports increased by an average of 19.6 percent pre-FTA but slowed to an average annual increase of 4.9 percent post-FTA. This change indicates that Morocco diverted existing exports to the United States but slowed overall agricultural export growth as Morocco imported U.S. agricultural goods.[15]

If both total exports and exports to the United States accelerate, then trends suggest that both export growth and reallocation were possible. However, more information is needed to determine if both occurred. This is because, when total exports also increase, it is possible that there was an increase in exports to the United States without any corresponding decreases in exports to other countries. Therefore, no export reallocation occurred. If the U.S. share of total agricultural exports increases following the trade agreement, then it is reasonable to conclude that both export growth and reallocation occurred. This was the case for Costa Rica, El Salvador, Honduras, Jordan, and Peru—in which the U.S. share of agricultural exports increased by an average of 1, 2.5, 0.2, 3.4, and 1.5 percentage points in the 5 years following FTA implementation, respectively. Conversely, the U.S. share of agricultural exports from the Dominican Republic, Guatemala, Mexico, Panama, and Singapore fell following their corresponding trade agreements by an average of 8.6, 6.1, 8.7, 15.1, and 1.5 percentage points, respectively. However, these countries were parts of simultaneous and/or multilateral trade agreements that allowed for additional export opportunities outside of the United States. Therefore, though the U.S. share of agricultural exports fell, these countries probably did divert exports from non-FTA partners to the United States but at a lower rate than for other FTA partners. For example, the average annual increase in Mexico's exports to the United States following NAFTA was 12.2 percent, while for Canada, it was 24.6 percent. Therefore, if Mexico diverted exports to both the United States and Canada, but diverted them more quickly to Canada, then the U.S. share of Mexican agricultural exports would fall as Canada's share grew. Because of this dynamic, it is reasonable to conclude that Chile, the Dominican Republic, Guatemala, Mexico, Panama, and Singapore both created and diverted trade following their FTAs.

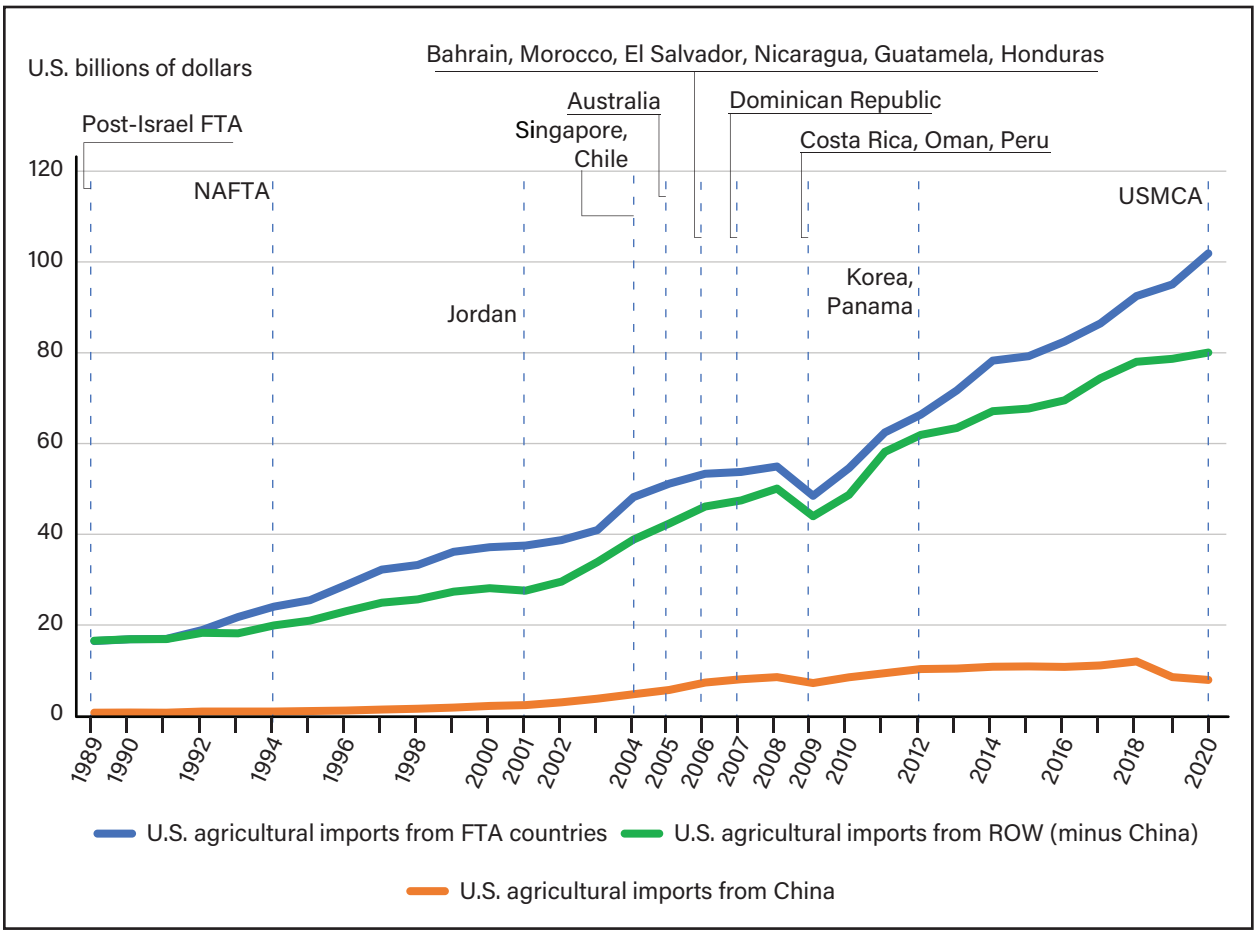
Lastly, if both total exports and exports to the United States by a country slowed post-FTA, then that country showed neither growth nor reallocation to the United States in their agricultural exports. Figure 6 indicates this was the case for Canada. This could be because NAFTA is a multilateral agreement, so Canada possibly increased agricultural exports to Mexico and not the United States. Other factors that could lead a country to not show export growth or reallocation include simultaneous FTAs with other countries, increases in imports of agricultural goods from the United States, shifts in production and exports to other sectors of the economy, and economic shocks unrelated to the FTA.

[15] U.S. agricultural exports to Morocco increased 34.01 percent annually in the 5 years following FTA implementation, up from 16.81 percent prior to the FTA.

Phase-in Periods

Many FTAs include phase-in periods in which existing trade barriers are phased out over time (typically 10 to 15 years after ratification of the FTA). Figure 7 illustrates U.S. imports of agricultural goods from FTA partners over time, highlighting when different U.S. FTAs were implemented. U.S. agricultural imports from China (and all other countries which do not have FTAs with the United States) are also presented for comparison.

Figure 7
U.S. agricultural imports from free trade agreement (FTA) partners, China, and the rest of the world (ROW)



Note: NAFTA = North American Free Trade Agreement; USMCA = United States-Mexico-Canada Agreement.

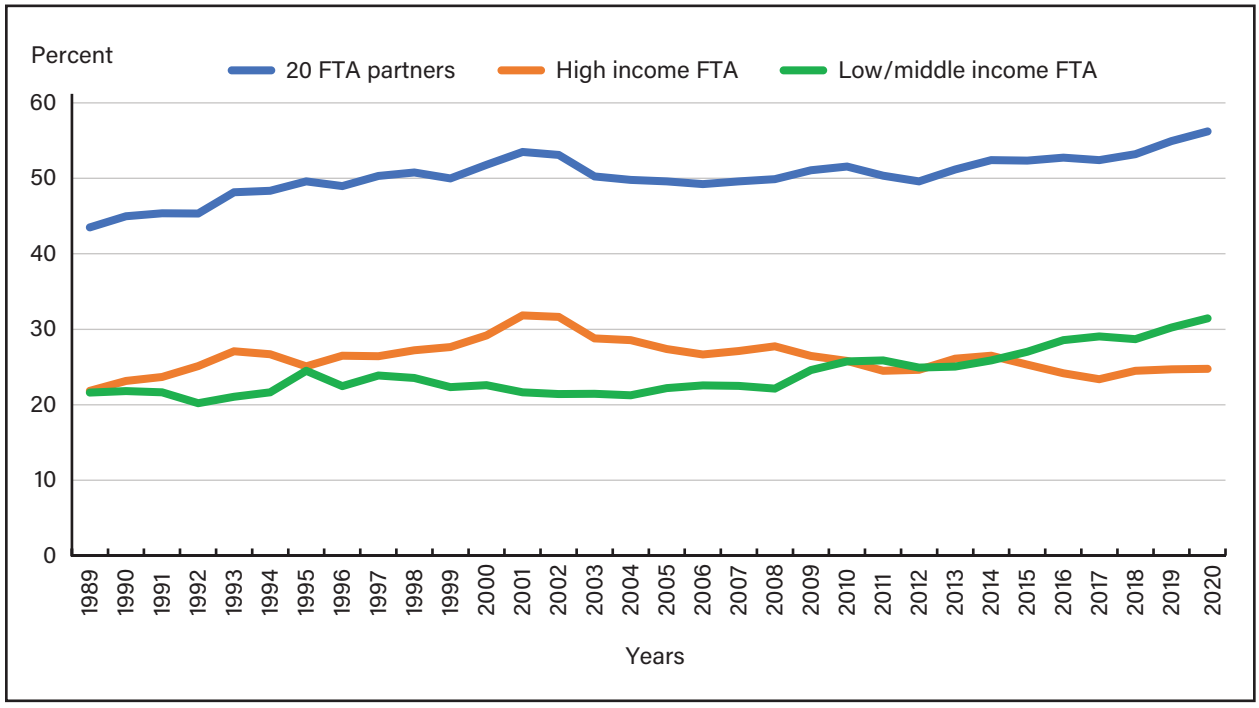
Source: USDA, Economic Research Service using U.S. Department of Commerce, Bureau of the Census trade data from USDA, Foreign Agricultural Service.

Since 1989, U.S. imports of agricultural goods steadily increased—apart from a small drop in 2009 when there was an economic downturn caused by the Great Recession. Additionally, the gap between U.S. imports from FTA partners and non-FTA partners increased over time.[16] The gap did narrow around 2009 but widened consistently over the last decade.

[16] Note that China is separated from the rest of the world (ROW). The gap between trade with FTA and non-FTA partners narrows if China is added to the ROW.

Along with the widening gap between imports from FTA partners versus non-FTA partners, U.S. agricultural imports—among FTA partners—also shifted to originating more from low- and middle-income countries than high-income countries. Since 1989, the share of U.S. imports of agricultural products from low-income countries continued to rise (figure 8).

Figure 8
Share of U.S. agricultural imports by origin



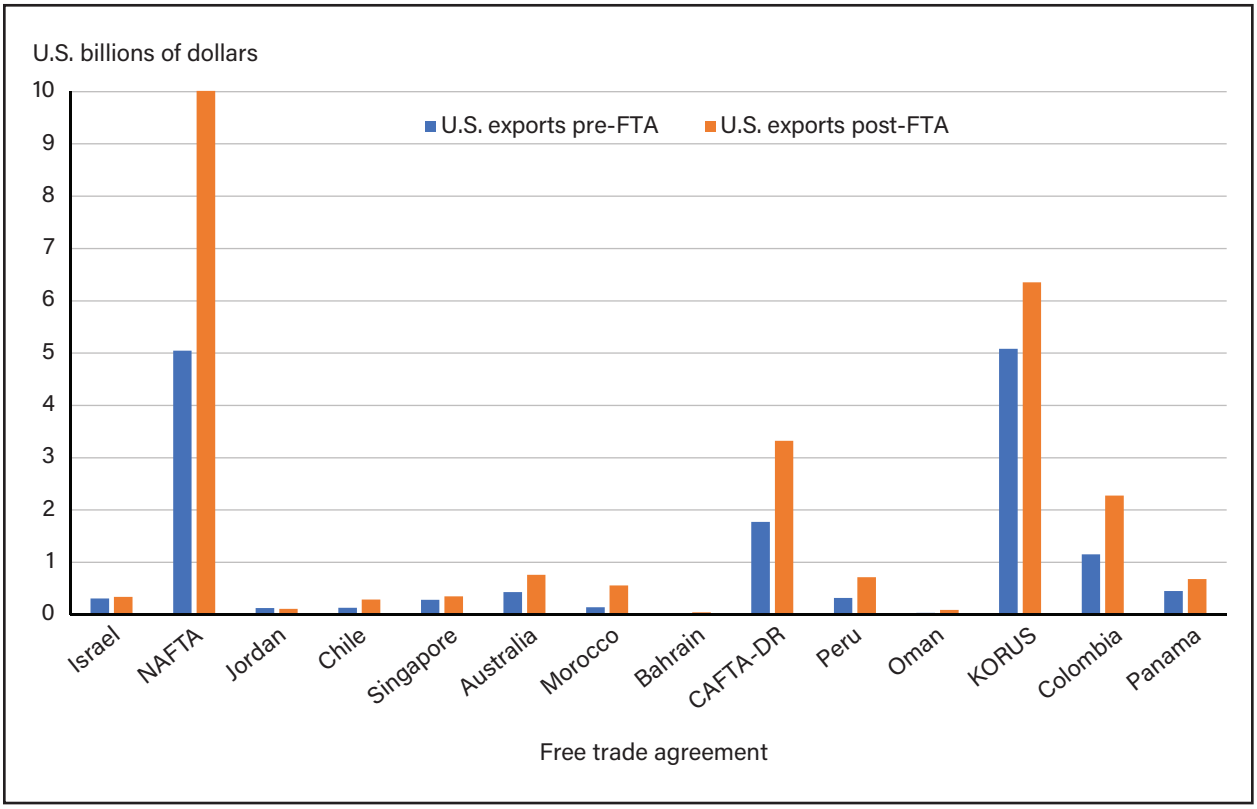
Note: FTA = free trade agreement.

Source: USDA, Economic Research Service calculation using data from USDA, Foreign Agricultural Service's Global Agricultural Trade System and Trade Data Monitor, 2021.

Have Trade Agreements Benefited U.S. Exporters?

FTAs also increased market access for U.S. agricultural producers. Figure 9 shows the average value of U.S. agricultural exports to FTA partners increased from the 5 years before to the 5 years after implementation of each of its trade agreements, with the exception of Jordan.[17] U.S. agricultural exports to Canada and Mexico nearly doubled from the 5 years pre-NAFTA to the 5 years post-NAFTA, increasing by almost $5 billion (figure 9).

Figure 9
U.S. exports of agricultural products (5-year average) pre-free trade agreements (FTAs) and post-FTAs



Note: NAFTA = North American Free Trade Agreement; CAFTA-DR = Dominican Republic-Central America-United States Free Trade Agreement; KORUS = U.S.-Korea Free Trade Agreement.

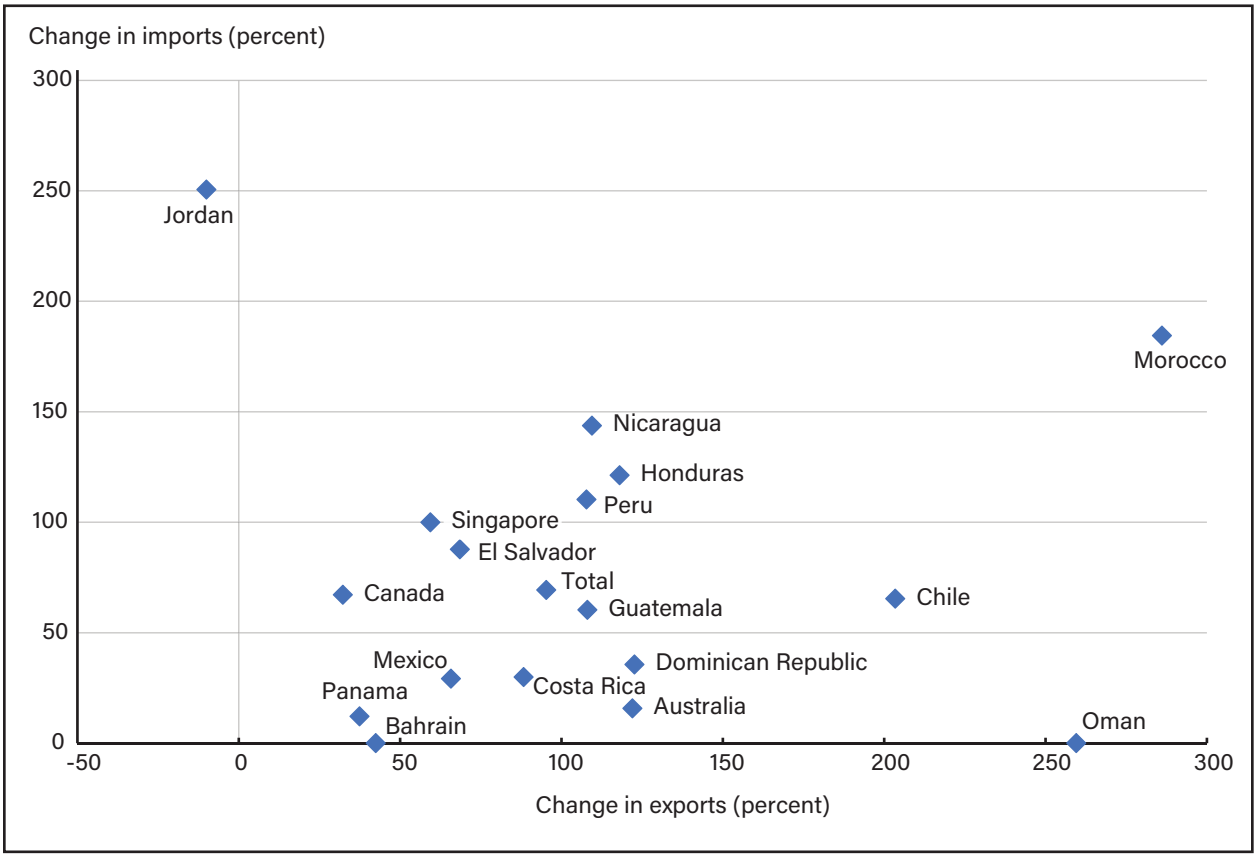
Source: USDA, Economic Research Service calculation using data from Trade Data Monitor, 2021.

Trade data show that FTAs are beneficial to all parties involved. Out of the 20 countries in which the United States has an FTA, 17 show both entities increase their agricultural exports to the partner country. Three countries had one directional benefit for agricultural trade—i.e., increased U.S. exports only (Bahrain and Oman) or increased U.S. imports only (Jordan) (figure 10).

[17] However, when expanding the comparison to 10 years pre- and post-FTA, U.S. agricultural exports to Jordan increased 13.7 percent. Also, U.S. agricultural exports to Jordan increased by an average of 23.7 percent annually in the 10 years following implementation of the U.S.-Jordan FTA.

Figure 10

Changes in exports and imports of agricultural products using a 5-year annual average after implementation of a free trade agreement (FTA)

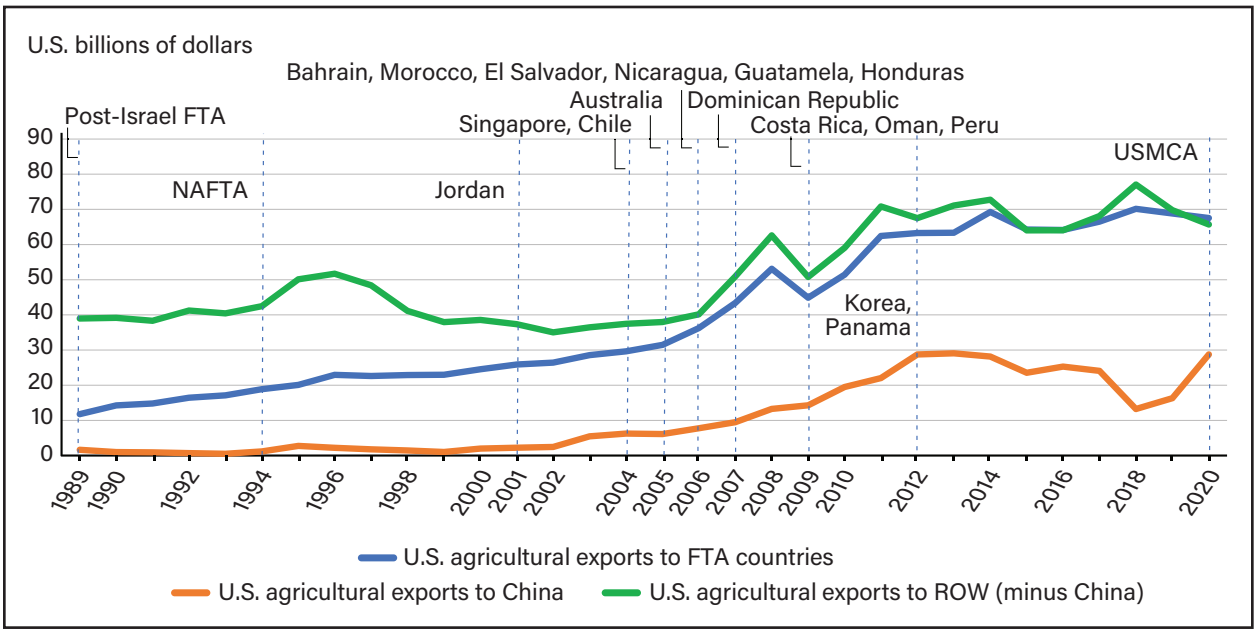


Notes: Data for Israel imports (before the Israeli FTA with the United States) are not available. Bahrain and Oman did not export agricultural products to the United States prior to their respective FTAs.

Source: USDA, Economic Research Service calculation using data from Trade Data Monitor, 2021.

Figure 11 shows the value of U.S. agricultural exports flowing to FTA partners steadily increased and, more recently, surpassed the value of non-FTA partners (excluding China). Figure 11 highlights not only the benefits of FTAs to U.S. agricultural producers and exporters but also to consumers in the destination countries. Lower priced agricultural imports from the United States could decrease domestic food prices and increase the welfare of consumers (Beckman, 2021).

Figure 11
U.S. agricultural exports to Free Trade Agreement (FTA) partners, China, and the rest of the world (ROW)



Note: NAFTA = North American Free Trade Agreement; USMCA = United States-Mexico-Canada Agreement; ROW = rest of world.

Source: USDA, Economic Research Service using U.S. Department of Commerce, Bureau of the Census trade data from USDA, Foreign Agricultural Service

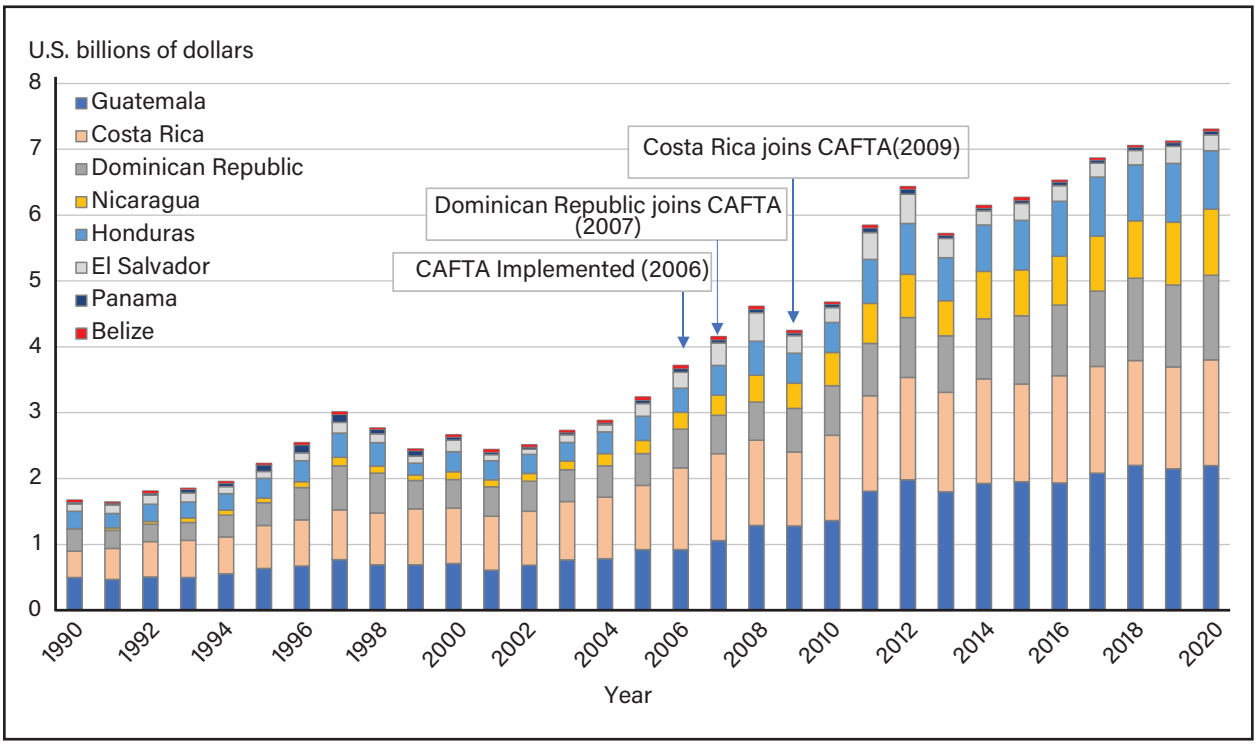
Production and Trade Analysis for Central and South American FTA Partners

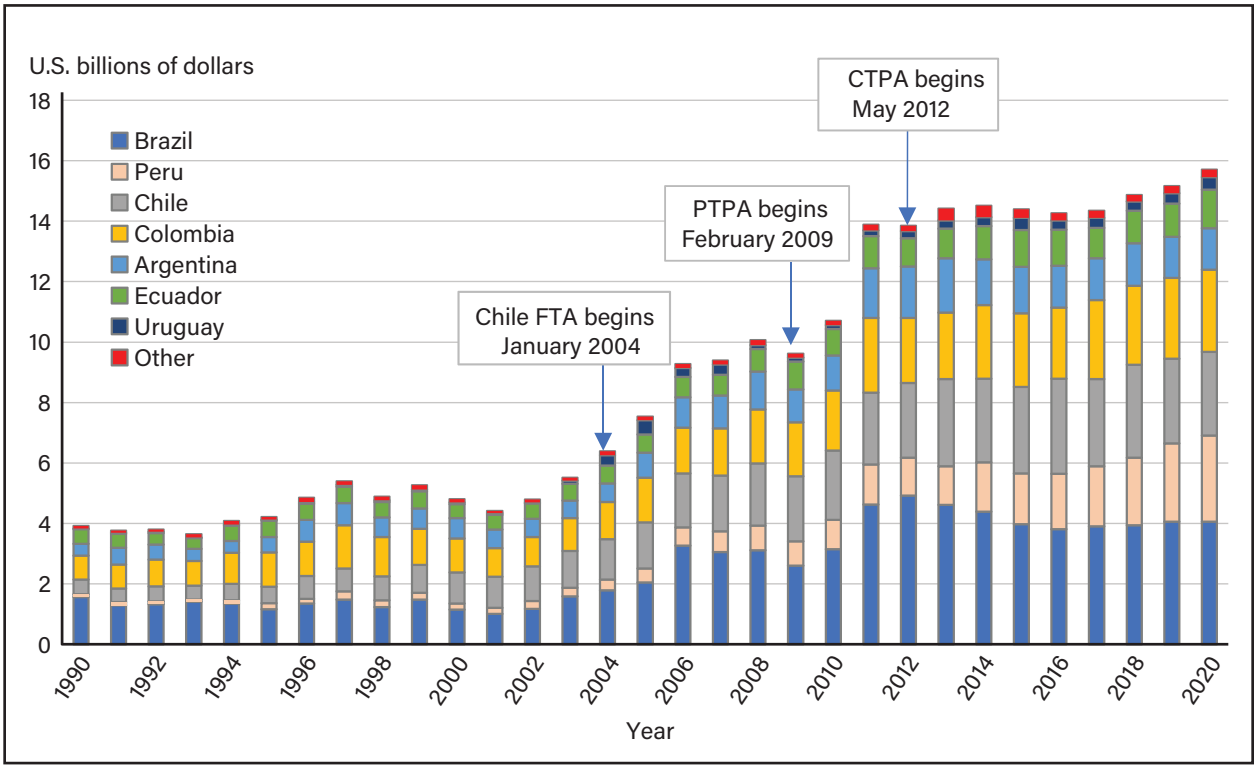
Among FTA trading partners, the CAFTA-DR accord represents the largest bloc of developing countries with a trade agreement with the United States. In addition, the United States' three South American FTA partners (Chile, Colombia, and Peru) comprise a collection of emerging markets and major agricultural producers with substantial market shares in major commodities imported by the United States. Since the accession of their respective trade agreements, CAFTA-DR countries increased their export volume to the United States by an average of 58 percent since 2012, while during the same period, imports from Chile, Colombia, and Peru rose by an average of 63 percent.

The production makeup of agricultural goods produced in the Central and South American FTA partners is very similar. Primary commodities produced in these countries mainly comprise fruit and vegetable produce, sugar, and coffee products. Likewise, many of these countries signed trade agreements with the United States that went into effect at roughly similar times. Therefore, given the similarity in the production makeup of these countries—as well as the timeline of their respective agreements—specialization among these countries can be expected as they allocate resources to commodities that are produced most efficiently. As such, shifts in production could have occurred in part to U.S. demand for certain agricultural products.

Figure 12 presents data on U.S. imports from Central America in the top pane and South America in the bottom pane. Brazil is consistently the largest exporter of agricultural products to the United States, totaling more than $4 billion from 2012 to 2020. However, imports from South American trading partners increased precipitously in recent years, with U.S. imports from Peru increasing by 145 percent from 2012 to 2020, particularly due to imports of fresh fruits. In contrast, imports from Brazil remained stagnant since reaching their peak in 2012, declining by 4 percent. Likewise, U.S. imports from the block of Central American countries, including the Dominican Republic—via the CAFTA-DR—continued to grow since Central America's accession in 2006. Over the last decade, imports from CAFTA-DR countries continued to rise, increasing by 31 percent.

Figure 12
U.S. imports from Central (top) and South American countries (bottom), 1990–2020





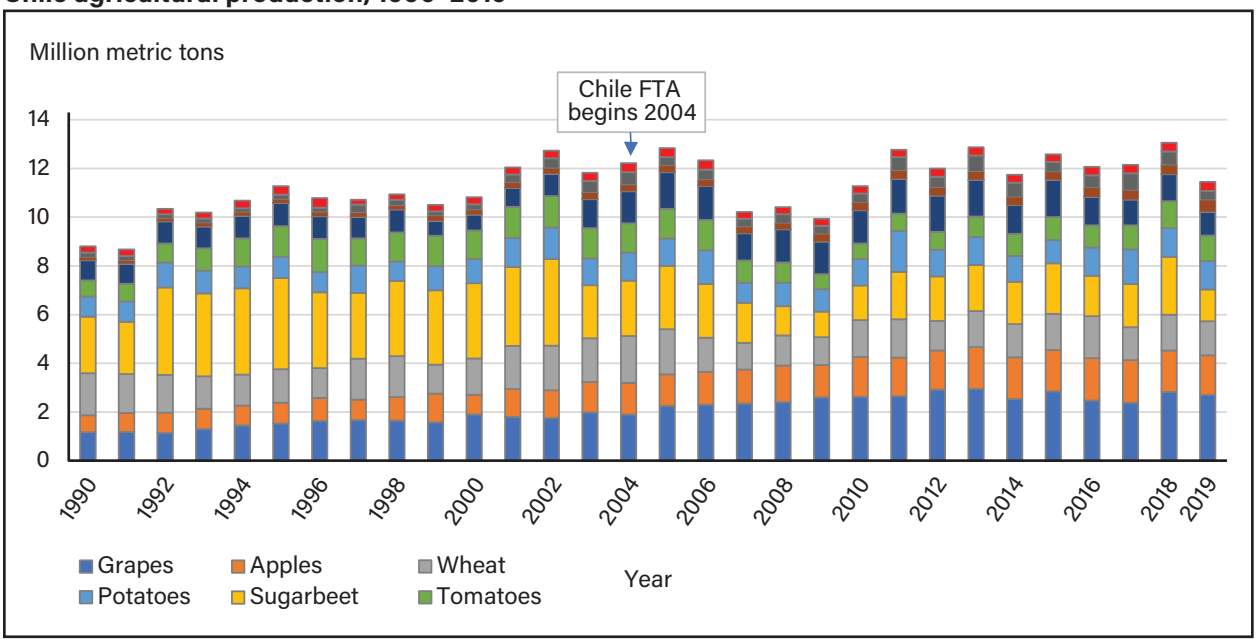
Note: CAFTA = Central American Free Trade Agreement; FTA = Free Trade Agreement; PTPA = Peru Trade Promotion Agreement; CTPA = Colombia Trade Promotion Agreement.

Source: USDA, Economic Research Service using U.S. Department of Commerce, Bureau of the Census trade data from USDA, Foreign Agricultural Service.

Chile

U.S. imports from Chile increased from $1.35 billion in 2004 when the FTA was implemented to $2.77 billion in 2020 (although imports reached $3.14 billion in 2016).[18] Fresh fruits account for two-thirds of all U.S. agricultural imports from Chile, making them the second largest source of U.S. fresh fruit imports behind Mexico. Grapes account for approximately one-third of all U.S. fresh fruit imported from Chile, and grape cultivation remains a significant portion of all agricultural production (by quantity). But, since 2004, only a few commodities increased in production (figure 13), while grapes and other fruits (apples, plums) decreased in production. The largest increase in production was cherries, which grew by an average of 53 percent annually since 2011, primarily due to expanding market demand in China (TDM, 2021). Tangerines are the lone exception among commodities imported by the United States, with production growing annually by an average of 18 percent since 2004. The United States accounts for more than 90 percent of Chilean tangerine exports by value.

Figure 13
Chile agricultural production, 1990–2019



Note: FTA = Free Trade Agreement.

Source: USDA, Economic Research Service using data from the Food and Agriculture Organization, 2021.

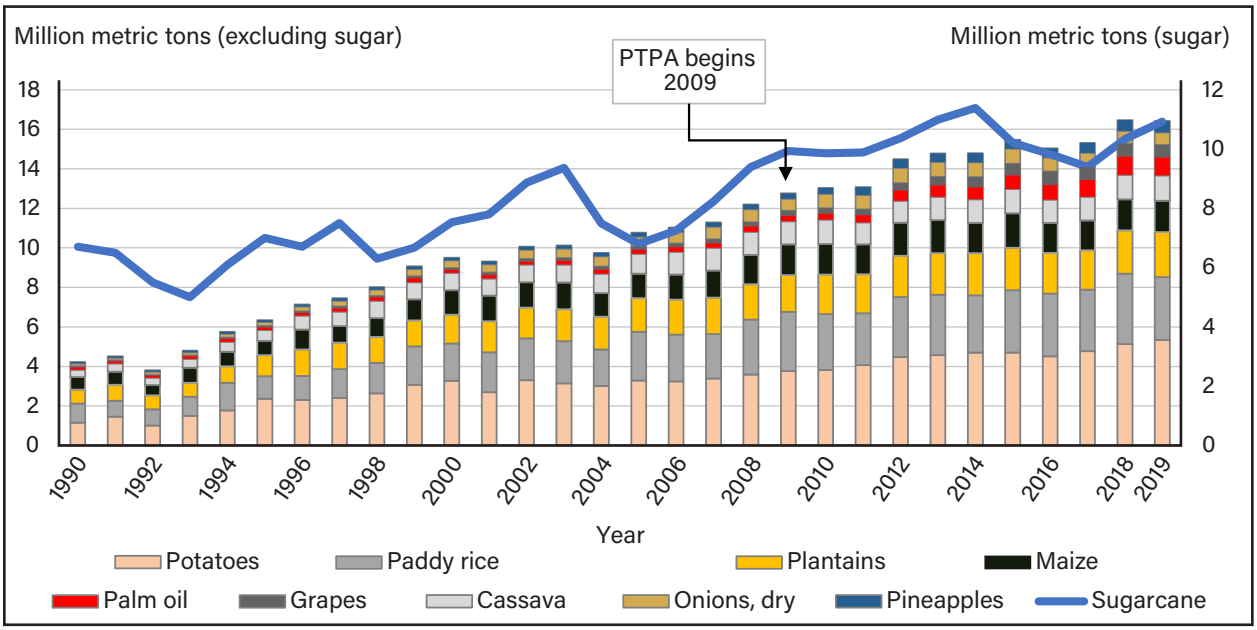
Chile is a much smaller producer of oranges (by volume) compared with other Central and South American U.S. trading partners—such as Peru, Colombia, and Honduras. Chile produces less than half of the volume of oranges as Colombia and Honduras and less than a quarter of Peru's production. As the dominant exporter to the U.S. orange market, Chile accounted for 43 percent of all U.S. orange imports in 2021, surpassing even Mexico. This percentage surged following the introduction of the FTA in 2004, with remedies to phytosanitary restrictions clearing the way for U.S. imports of Chilean oranges. The precipitous increase of oranges traded began in 2009, rising from 20.3 million metric tons to 96.2 million metric tons in 2021.

[18] Many of these countries, especially Chile, have FTAs with other countries that could also impact the reported trade and production patterns.

Peru

Since 1990, imports of Peruvian fruit rose by an average of 31.7 percent annually, and the country became the third largest supplier of fruit to the United States in 2020.[19] Like many other Central and South American U.S. FTA partners, sugarcane is the largest commodity (by quantity) produced in Peru, with the United States as the destination for 51 percent of total Peruvian sugar exports (USDA, FAS, 2021). U.S. imports from Peru increased at a fast pace following the FTA's implementation and figure 14 shows that total agricultural production also increased as well.

Figure 14
Peru agricultural production, 1990–2019



Notes: PTPA = Peru Trade Promotion Agreement. Sugar production, represented by the blue line, is included with the commodity total and measured with the right axis only.

Source: USDA, Economic Research Service using data from the Food and Agriculture Organization, 2021.

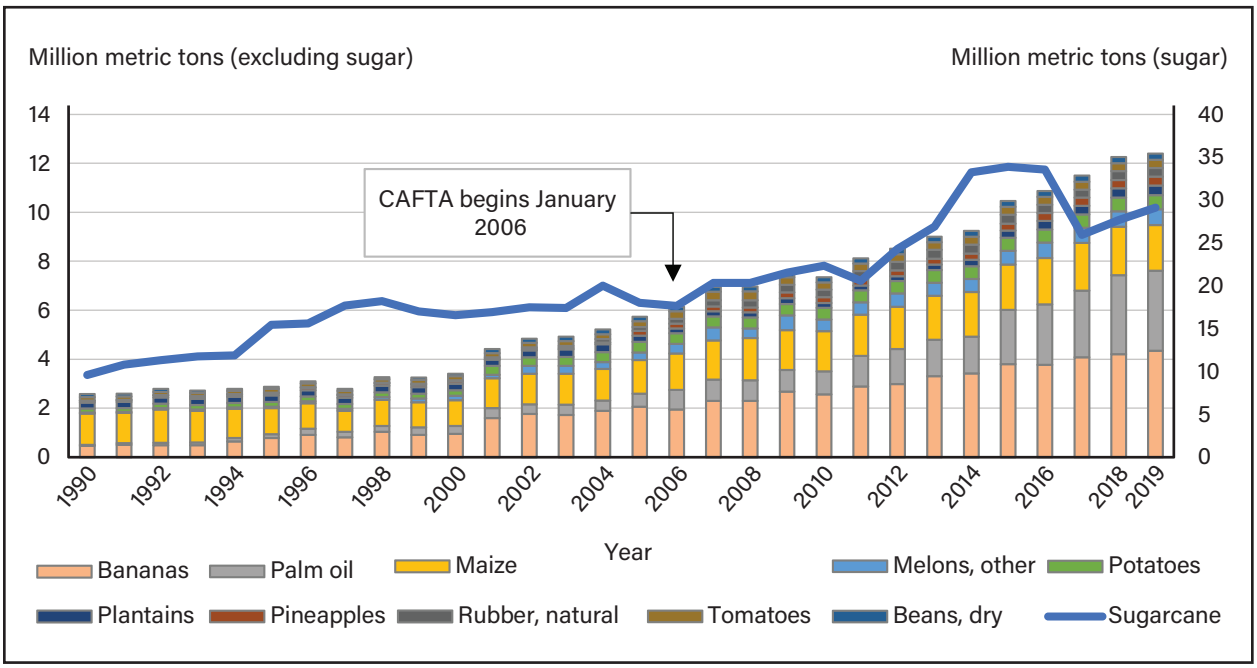
Exports of fruit and vegetable commodities, in particular, rose significantly since the accession of the U.S.-Peru Trade Promotion Agreement (PTPA). Since 2010, the value of U.S. imports from Peru has more than tripled, with fruit and vegetable exports accounting for 82 percent of all Peruvian exports to the United States. In many ways, PTPA is the most mutually beneficial trade agreement in recent years, with Peru capturing significant market shares across a number of commodities imported by the United States, including from longstanding suppliers of various commodities to the United States. Since PTPA went into effect in 2009, for example, imports of Peruvian cranberries increased from 0.8 metric ton to 111,416 metric tons in 2021, becoming the largest supplier of cranberries to the U.S. market during this time and providing 36 percent of all U.S. cranberry imports. Likewise, Peru shaved off Chilean market share in fresh grapes. In 2009, Chile supplied 75 percent of fresh grapes to the United States, while Peru supplied only 2 percent. Since then, this disparity shrunk considerably, with Peru now supplying 30 percent of fresh grapes to Chile's 40-percent share. In addition, Peru is also carving out large shares of popular consumer commodities in the United States, like avocados and asparagus. Since 2000, Peru provided an average of 46 percent of U.S. imports of asparagus annually. This comes as U.S. per capita consumption of asparagus continues to rise and domestic production fell by 73 percent since 2000 (by quantity). Peru became the second largest supplier of avocados to the United States, although it provides only 7 percent of total imports.

[19] Imports of fruits consistently remained the second largest commodity group imported by the United States, rising by more than six-fold since 1990 (by value: $3.1 billion to $19.9 billion).

Guatemala

Among CAFTA-DR countries, Guatemala is by far the largest U.S. trading partner, with total agricultural trade—both imports and exports—reaching $3.48 billion in 2020. U.S. imports from Guatemala are largely fresh fruit and vegetables, as well as coffee. Imports of fresh fruit increased from 35 percent of all U.S. agricultural products imported from Guatemala in 2000 to 60 percent by 2016. Banana imports are the driving force of U.S. fruit imports from Guatemala (70.4 percent in 2020), representing 38.8 percent of all agricultural imports from Guatemala. Bananas comprise the largest share of all Guatemalan exports since CAFTA-DR was introduced, rising from 5.73 percent of all Guatemalan exports in 2005 to 9.84 percent in 2019. To keep up with the increase in exports, banana production increased (figure 15). Additionally, Guatemala is the world's sixth largest producer of palm oil and is second only to Colombia in Latin America. Guatemalan palm oil production increased by an average annual rate of 19.2 percent since 1990.

Figure 15
Guatemala agricultural production, 1990–2019



Notes: CAFTA = Dominican Republic-Central America-United States Free Trade Agreement. Sugar production, represented by the blue line, is included with the commodity total and measured with the right axis only.

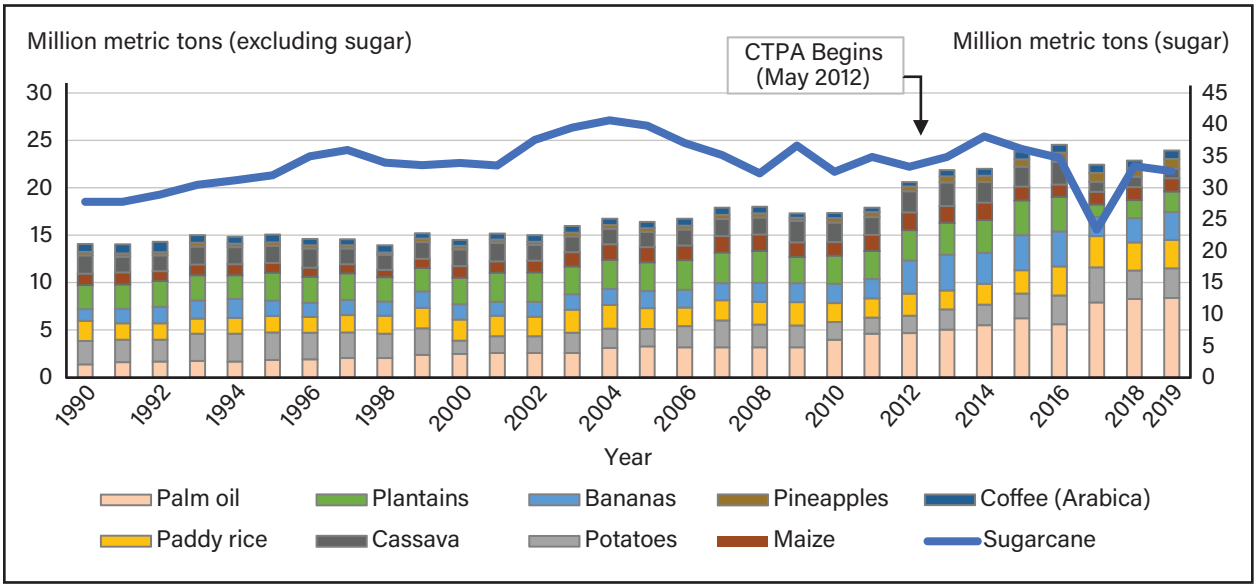
Source: USDA, Economic Research Service using data from the Food and Agriculture Organization, 2021.

Colombia

U.S. imports of Colombian agricultural products are concentrated among a few commodities. Coffee consistently accounted for nearly half of all products imported from Colombia. Nursery products—primarily made up of fresh cut flowers—continuously accounted for a third of all products, and fresh fruit declined from 20 to 10 percent since 1990.[20] Along with Brazil, Colombia has long been one of the top suppliers of coffee products to the U.S. market. Since the accession of the U.S.-Colombia Trade Promotion Agreement (CTPA) in May 2012, imports of Colombian coffee products increased by 3 percent annually. Since 2016, Colombia is the largest supplier of coffee products to the U.S. market. After CTPA, coffee production increased annually by an average of 9 percent (figure 16).

[20] Note that fresh cut flowers are not shown in figure 16 because the FAO does not collect data on their production.

Figure 16
Colombia agricultural production, 1990–2019



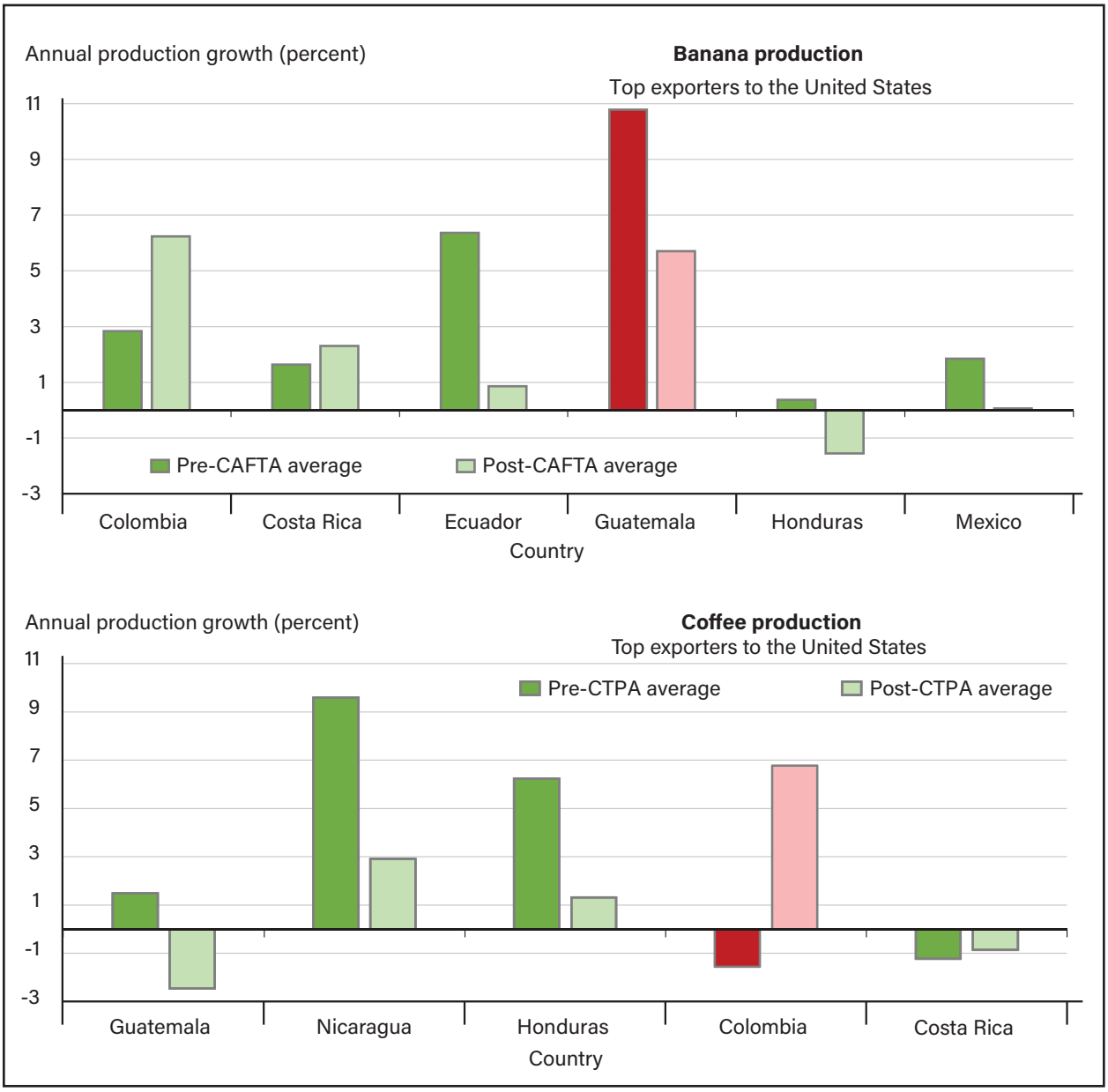
Notes: CTPA = Colombia Trade Promotion Agreement. Sugar production, represented by the blue line, is included with the commodity total and measured with the right axis only.

Source: USDA, Economic Research Service using data from the Food and Agriculture Organization, 2021.

Specialization

The increase in competition from broadening markets encourages greater efficiency, leading to increased specialization across countries. The time between the accession of the CAFTA-DR (2006) and the CTPA (2012) trade accords, for example, coincided with severe constraints in Central American coffee production—encouraging a consolidation of resources and a gravitation of Central American producers toward banana production. Likewise, with depressed international prices, Central American countries expanded production into more profitable commodities such as palm oil, which was detrimental to coffee cultivation. Since the accession of CTPA, U.S. imports of coffee products from other Central and South American countries declined, mirroring the declining production across these countries. However, as Colombian coffee production increased, so did U.S. imports of Colombian coffee. This is reflected in production and trade data for each country (figure 17). It is important to note, however, that the Central American coffee crop faced significant challenges over the last two decades beyond competition. Since 2011, Central American coffee producers have faced a severe coffee rust epidemic, in addition to high rainfall variability. These constraints have led to a loss of market share in the U.S. coffee market over that same period.

Figure 17
Coffee and banana production among competitors, following the introduction of free trade agreements (FTAs)



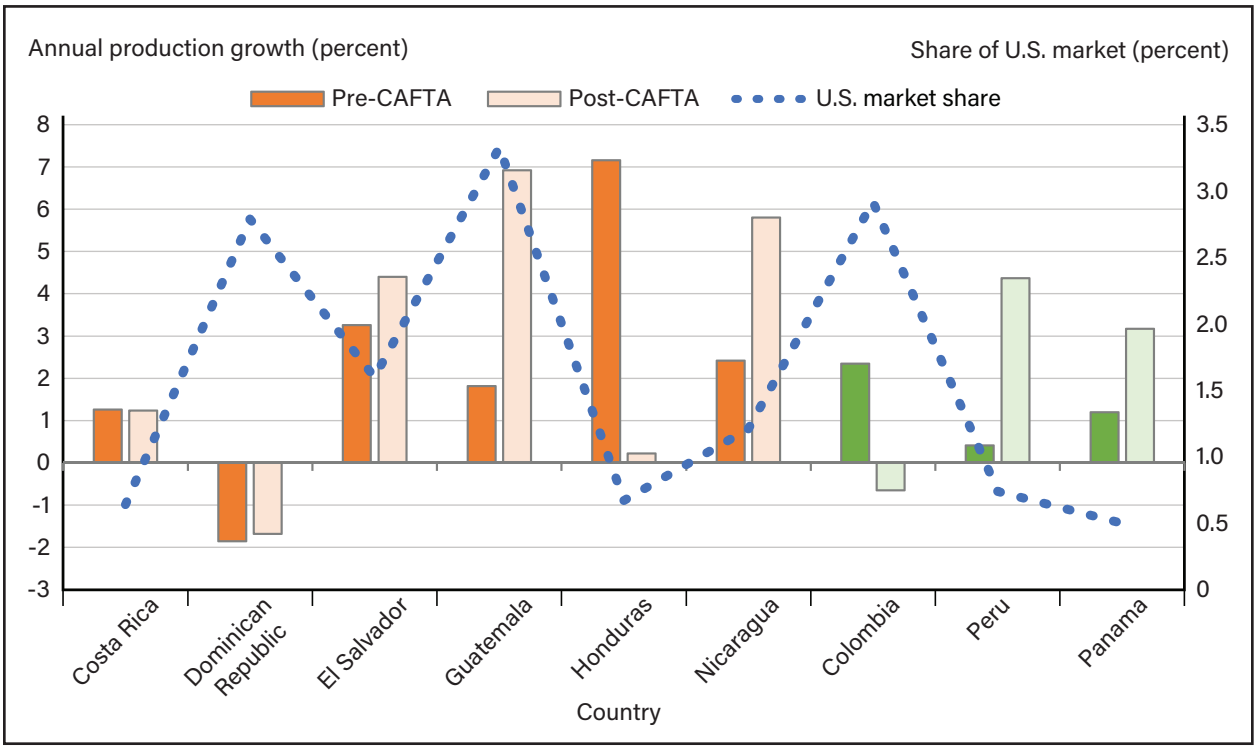
Notes: CAFTA = Dominican Republic-Central America-United States Free Trade Agreement; CTPA = Colombia Trade Promotion Agreement. Guatemala is the largest exporter of bananas for countries in the figure. Colombia is the largest exporter of coffee for the countries in the figure. These figures are in red in each graph.

Source: USDA, Economic Research Service using data from the Food and Agriculture Organization, 2021.

Similarly, the surge in Guatemalan banana exports came at the expense of other Central and South American banana exporters, such as Ecuador and Honduras (figure 17). Guatemala increased its pre-CAFTA share of the U.S. banana export market from 16.5 percent to 35.9 percent, following the implementation of the agreement in 2006. The United States remains the largest importer of Guatemalan bananas in the world. Like coffee production, however, the cultivation of bananas in these countries faces significant constraints. For example, it has been noted by Varma and Bebber (2019) that a changing climate has increased banana yields; but they find that these gains could disappear under future climate scenarios. Likewise, banana crops face a series of threatening diseases, namely Tropical Race 4 (a fungal disease which devastates various banana crops across Latin America) (Staver et al., 2020).

Sugar is the largest commodity, by volume, produced in 9 out of 10 Central and South American FTA partners (excluding Chile) of the United States. Collectively, CAFTA-DR/South American FTA trading partners accounted for 21 percent of all U.S. sugar imports in 2021, with Guatemala and Colombia representing the 2 largest producers of this group. However, since the accession of CAFTA-DR, average annual sugar production of the two leading sugar suppliers to the United States show disproportionate trends in production. Since the accession of CAFTA in 2006, sugar production in Colombia fell by 0.7 percent, while Guatemalan sugar production rose by an average of 7 percent annually (figure 18). Chile's decrease in production is partly due to the allocation of sugarcane for ethanol production, while in Guatemala, the land area dedicated to sugarcane cultivation steadily increased since CAFTA-DR was introduced.

Figure 18
Sugar production among competitors following the introduction of the Dominican Republic-Central America-U.S. Free Trade Agreement (CAFTA-DR)



Source: USDA, Economic Research Service using data from the USDA, Foreign Agricultural Service, 2021b.

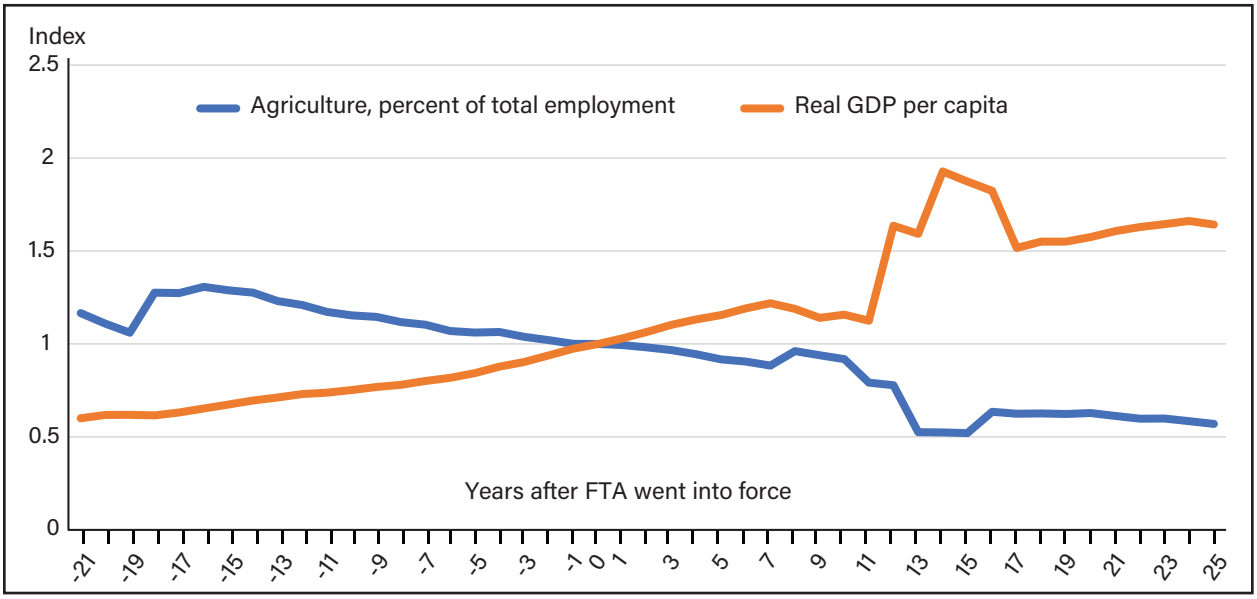
Macroeconomic Impacts

Products from developing countries could be at a disadvantage in the global market because of diseconomies of scale, higher production costs, and a limited domestic market (Patterson, 2003). This could especially be the case for smaller economies, which face the prospect of job and income loss through tariff elimination on sensitive products. With market openness, local producers face competition from international suppliers, especially those with FTAs. But an increase in market access may lead to production changes that build on an existing comparative advantage for a developing country. The previous section showed trends that suggest most countries that share an FTA with the United States (including developing countries) generate trade gains. Given the opposing views on how beneficial these agreements are on agricultural (and total economy) development, some developmental indicators are worthy of the following examination, to include employment and income (through GDP per capita).

Agriculture in the Economy

The impacts from an FTA in terms of production and trade changes ultimately find their way to impacts at the macro level and other development indicators. One of these impacts is the share of the economy associated with agriculture. Among developing countries in Latin America (comprising Central and South America), the period after enacting an FTA with the United States is associated with a reduction in the share that agriculture maintains in a country's overall economy. This finding holds true both in terms of both employment and GDP, as depicted in figures 19 and 20, respectively. As noted before, these changes are particularly strong, starting 10 years after an FTA goes into effect—but these changes also occur even before an FTA goes into force, which suggests there are other forces besides the signing of FTAs in which these changes can at least partly be attributed.[21] Also, it is worth noting that there can be important heterogeneity across countries not present in these data, as these figures are averages across countries.

Figure 19
Percent employed in agriculture and GDP per capita in constant 2015 U.S. dollars, averaging across all Latin American countries with whom the United States shares a free trade agreement (FTA)

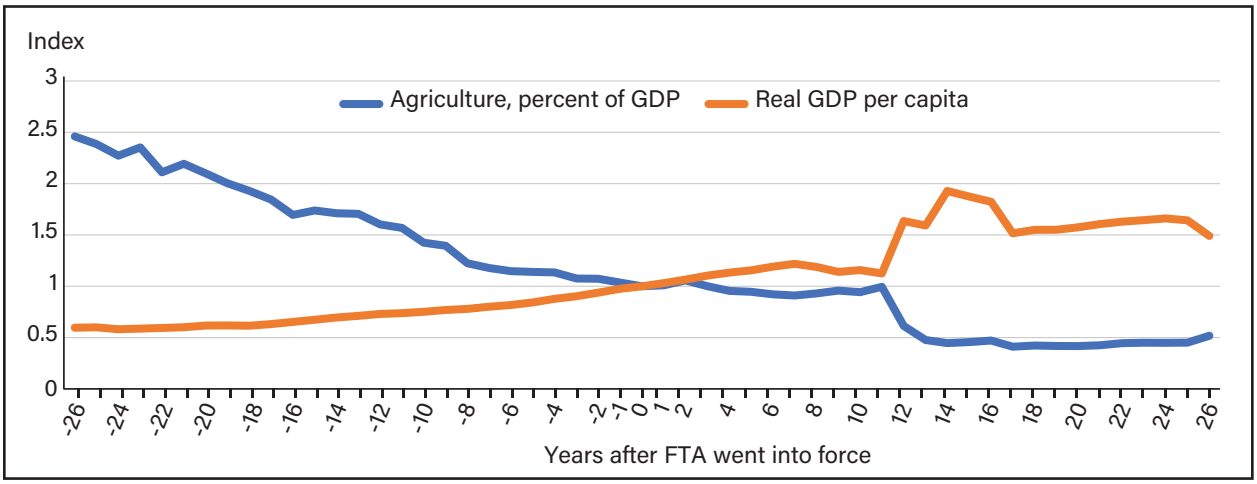


Notes: GDP = gross domestic product. Each time series is normalized for each country so that it equals 1 during the year in which that country's FTA with the United States went into force. These figures are calculated using data from the World Development Indicators (WDI), taking an unweighted average of the following Latin American countries, with the years in which their FTA with the United States took effect, as indicated in parentheses: Mexico (1994); Chile (2004); Peru (2007); Panama and Colombia (2012); and Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua (2009).

Source: USDA, Economic Research Service using data from the World Bank, 2021b.

[21] In addition, remittances have continued to grow in countries such as Guatemala, which affects the GDP calculation.

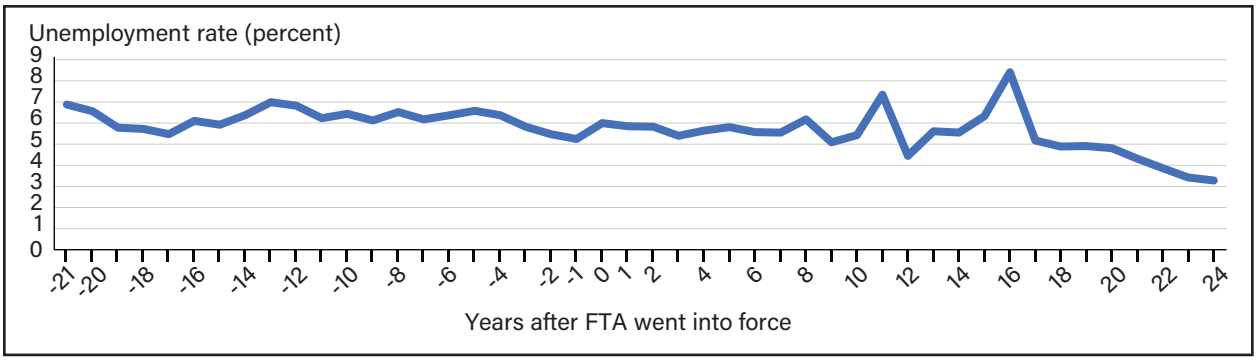
Figure 20
Percent of GDP in agriculture and GDP per capita in constant 2015 USD, averaging across Latin American countries with whom the United States shares a free trade agreement (FTA)



Notes: GDP = gross domestic product; USD = U.S. dollars. Each time series is normalized for each country so that it equals 1 during the year in which that country's FTA with the United States went into force. These figures are calculated using data from the World Development Indicators (WDI), taking an unweighted average of the following Latin American countries, with the years in which their FTA with the United States took effect, as indicated in parentheses: Mexico (1994); Chile (2004); Peru (2007); Panama and Colombia (2012); and Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua (2009).
Source: USDA, Economic Research Service using data from the World Bank, 2021b.

The decrease in agricultural employment is not associated with any increase in unemployment, as demonstrated in figure 21. Instead, employment and economic production are likely moving from agriculture to manufacturing and services. This sectoral reallocation is illustrated for Chile and Mexico in figures 22 and 23, respectively.[22] The movement of labor and other factors of production out of agriculture is generally regarded as a key component of economic development and structural transformation in dual-sector models (Herrendorf et al., 2014). And it could be the case that the movement of labor out of agriculture could be a result of higher agricultural productivity or other factors. Also, figure 21 suggests the unemployment rate might become more volatile post-FTAs, although one must be careful in attributing this finding entirely to the trade agreements.

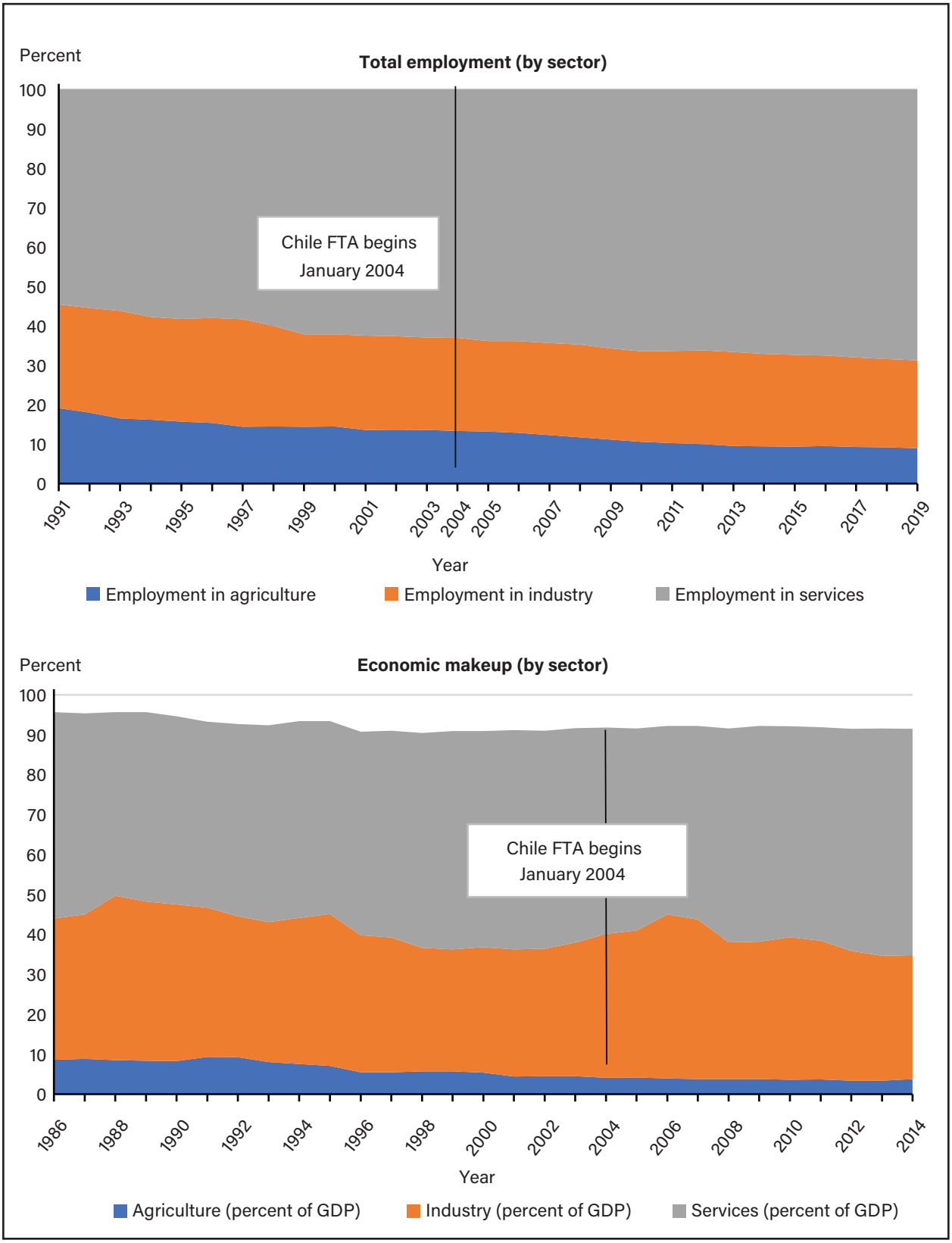
Figure 21
Unemployment as a percentage of the total labor force, averaging across Latin American countries with whom the United States shares a free trade agreement (FTA)



Source: USDA, Economic Research Service using data from the World Bank, 2021b.

[22] Mexico and Chile are used as examples because they have shifted resources to their export-oriented sectors.

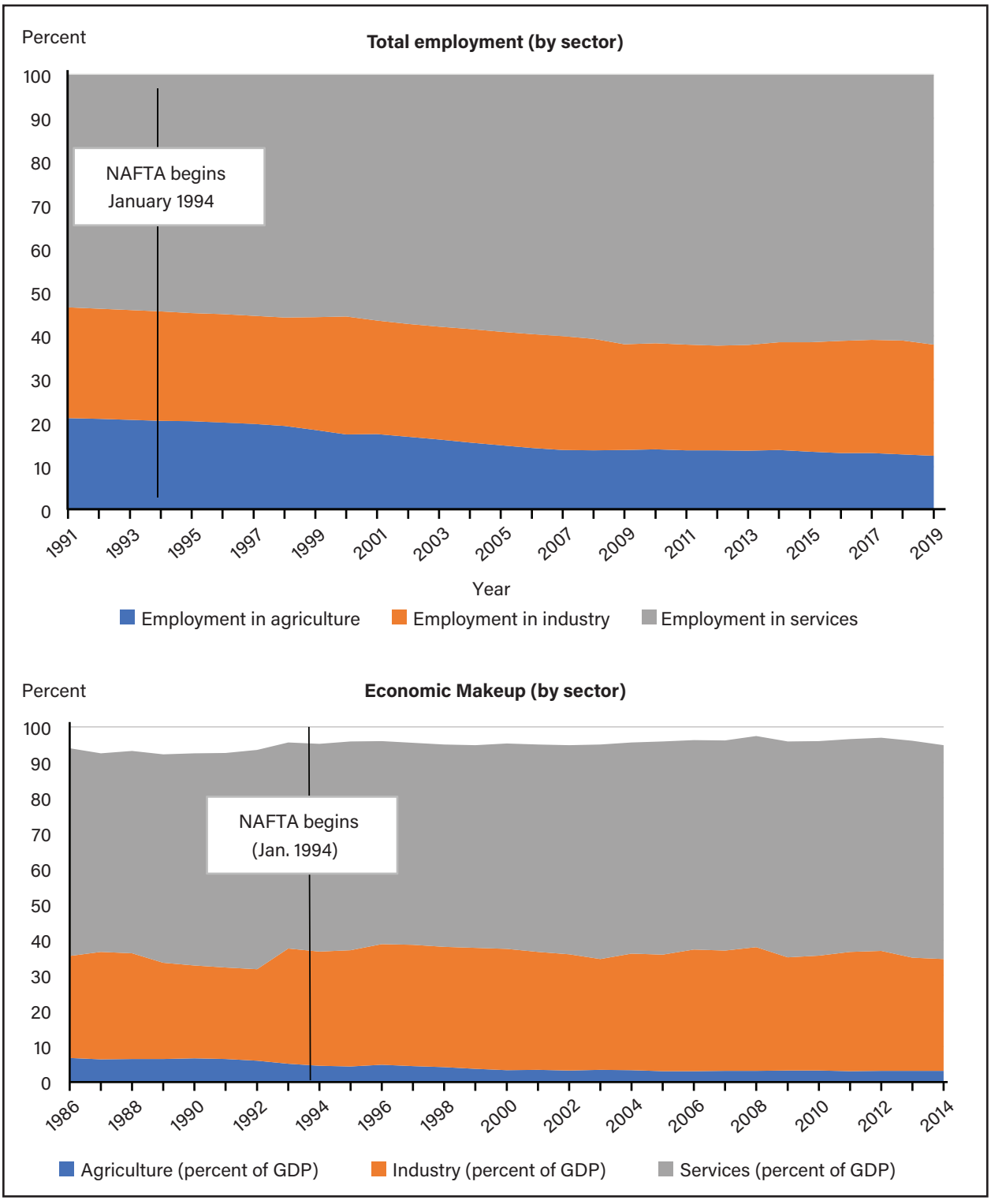
Figure 22
Employment and GDP by sector for Chile, 1991–2019



Note: FTA = Free Trade Agreement; GDP = gross domestic product.

Source: USDA, Economic Research Service using data from the World Bank, 2021b.

Figure 23
Employment and GDP by sector for Mexico, 1991–2019

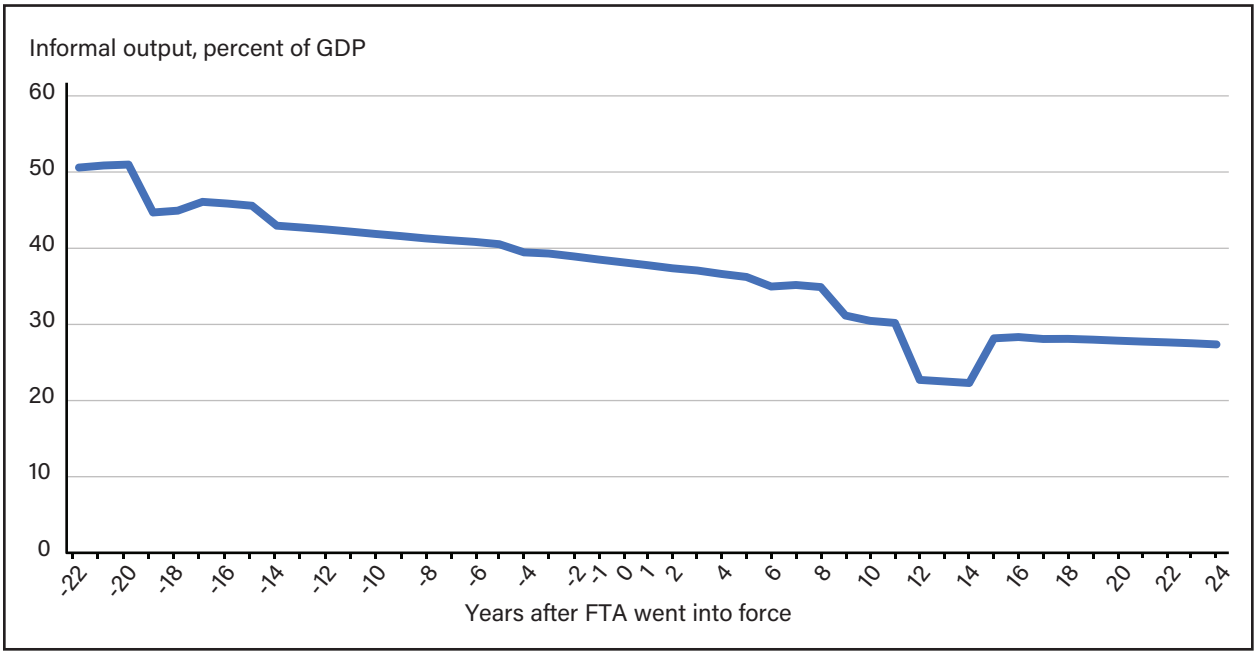


Note: NAFTA = North American Free Trade Agreement; GDP = gross domestic product.

Source: USDA, Economic Research Service using data from the World Bank, 2021b.

The shrinking agricultural sector in these Latin American countries also does not seem to be associated with an increase in the size of the informal sector, as can be seen for Mexico in figure 23.[23] To the contrary, output in the informal sector (as a share of GDP) among these Latin American countries is decreasing after the enaction of FTAs with the United States. A decline in the informal sector is widely emphasized as another key component of development (La Porta and Shleifer, 2014).

Figure 24
Output in the informal sector, as a percentage of GDP, averaging across Latin American countries with whom the United States shares a free trade agreement (FTA)



Note: GDP = gross domestic product.

Source: USDA, Economic Research Service using data from the World Bank, 2021c.

[23] The informal sector is any job or activity not incorporated or registered (ILO, 2007). Of importance here is that the informal sector tends to absorb most of the expanding labor force that cannot find employment.

Conclusion

Free trade agreements (FTAs) are intended to lower tariffs and increase cooperation between the trading partners—often resulting in more trade, lower prices for consumers, and more export opportunities for producers. A review of the literature indicates there is a positive relationship between trade agreements and trade. This relationship includes trade in agricultural products, although there is often a phase-in period where countries adjust to the lower trade barriers and often turn to specialization in certain products. This adjustment leads to a reallocation of labor and can cause unemployment for certain products—but the general consensus is that trade agreements are beneficial.

The United States is a member of 14 FTAs, cutting across 20 countries—the majority of which are with lower- and middle-income countries. In this report, data are used to examine some impacts of these FTAs on these countries. Trends suggest that agricultural trade largely increased for many of these countries. Another change was a move toward specialization in certain products. Colombia, for example, became the predominate source of U.S. coffee imports in terms of South and Central American countries. While most countries were already experiencing declines in agricultural employment—but with a general increase in productivity—the move to specialization seemed to accelerate the impacts to that kind of employment. But the data show that overall unemployment was not affected by the move out of agriculture, and overall GDP per capita increased. Thus, it seems the FTAs with the United States (and other countries) are correlated with an acceleration in the move to more productive agriculture in developing countries, which ultimately leads to overall economy-wide benefits, as pointed out in the literature. That is, there is a noted move of labor and resources from agriculture, to manufacturing, to services that coincide with increasing levels of GDP—and this move is often done through productivity and specialization of production (in this report's case, certain agricultural products).

Outside of an FTA, further trade liberalization through the reduction of tariffs can be beneficial for developing countries. For example, South Africa shows a long history of applying tariff and nontariff barriers to U.S. poultry exports; however, further liberalization of the bone-in poultry rate was projected to yield only minor effects on production and increase consumption in South Africa (Cochrane et al., 2016). Similarly, India's barriers to imports of oilseeds led to underutilized crush capacity and higher costs in the soybean processing sector (Persaud, 2019).

Ultimately, the information presented in this report shows trends in data. More specifically, comparisons of trends pre- and post-FTAs allow a review of a smaller sample of U.S. FTAs—some of which were signed relatively recently—than might otherwise be possible using other econometric approaches. However, the trends analysis used should not be interpreted as causal effects and could be driven by other contemporaneous shocks (e.g., other trade agreements, domestic policies, improved technologies, rising incomes). This analysis raises several important areas for future research. The first is to apply more advanced econometric techniques to identify the causal effects of U.S. FTAs on trade flows and other indicators. Additionally, this line of analysis would be useful to compare with the prospective analysis (e.g., CGE model) of the anticipated effects of an FTA calculated before signing. A second area of future research would be to better understand the dynamics of FTAs. Before an agreement is signed, private sector actors may anticipate changes in market access and make decisions accordingly. These anticipatory effects, combined with long phase-in periods, suggest there may be different short-, medium-, and long-run effects of FTAs on different sectors and outcomes of interest. Third, future research could better address the different impacts of trade agreements across trade, employment, food security, environmental, and other dimensions. FTAs increasingly incorporate deeper provisions beyond tariff reduction that can affect a host of outcomes. Incorporating analysis of outcomes beyond trade flows is important to better understand the full benefits and costs associated with any agreement.

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Appendix A: Literature Review

Table A-1
Selected literature on the effects of individual U.S. free trade agreements (FTAs)

Agreement	Authors	Time of study	Positive	Negative	Sample	Method	Time
NAFTA/ USMCA	Burfisher et al. (1992)	Ex-ante	Under full trade liberalization, Mexican agricultural exports to the United States grow by 10 percent, which includes increased production and export expansion of fruits and vegetables.	Output declines in corn production and the expansion of other crops cannot absorb displaced labor.	3 countries; 28 sectors	General equilibrium	1987 (U.S.) and 1988 (Mexico) base years
NAFTA/ USMCA	Robinson et al. (1993)	Ex-ante	Full liberalization projected to increase U.S. corn exports to Mexico by 150 percent and Mexican fruit and vegetable exports to the United States by 16 percent.	Labor displacement from Mexican corn production.	3 countries; 11 sectors	General equilibrium	1987 (U.S.) and 1988 (Mexico) base years
NAFTA/ USMCA	Taylor et al. (1999)	Ex-ante	Subsistence farmers experience income increases and gains from lower prices because the farmers are marginal producers of maize.	Simulating a 40-percent decrease in the price of maize decreases maize output by 28 percent. Total labor demand falls by around 6 percent.	Village in rural Mexico	General equilibrium	1989 base year
NAFTA/ USMCA	Abler and Pick (1993)	Ex-ante	FTA with United States expected to increase land devoted to tomatoes, peppers, and cucumbers by 50 percent and increase technology use in agriculture.	None listed	Sinaloa, Mexico	Panel analysis	1967–1987
NAFTA/ USMCA	De Janvry et al. (1995)	Ex-ante	Most small-scale maize production was for household consumption and would not be highly exposed to price declines for corn.	Net-sellers of corn would need access to credit, marketing channels, and technical assistance to pursue diversification or increase yields to stay competitive.	Michoacá, Sinaloa, and Veracruz, Mexico	Cross-sectional analysis	1990
NAFTA/ USMCA	Levy and van Winjvergen (1992)	Ex-ante	Trade liberalization of the Mexican corn market would increase total welfare by $154 million, with large gains to net-buyers of corn and landless rural workers.	Net-sellers of corn would receive lower prices.	Mexico	Partial equilibrium	1989
NAFTA/ USMCA	Levy and van Winjvergen (1994)	Ex-ante	Net welfare gains expected from an FTA. Owners of irrigated land and urban capital owners gain from maize liberalization under an FTA, due to lower labor costs and labor reallocation.	Declining maize prices and rural wages lead to net welfare declines for subsistence farmers, rain-fed land owners, and landless rural workers.	Mexico	General equilibrium	1991 base year
NAFTA/ USMCA	Kennedy and Rosson (2002)	Ex-post	NAFTA affected commodity competitiveness. U.S. share of the Mexican beef, corn, and wheat markets increased. Mexico's share of the U.S. tomato and sugar market increased by 73.5 percent and 35 percent, respectively.	None listed	3 countries; 5 commodities	Descriptive analysis	1989–2000
NAFTA/ USMCA	Zahniser et al. (2002)	Ex-post	Growth in trade between the United States and Mexico primarily associated with liberalization in the 1980s, but NAFTA helped lock in those reforms.	None listed	Members of NAFTA and MERCOSUR	Gravity model	1980–1999
NAFTA/ USMCA	Zylkin (2015)	Ex-post	Mexico received a 171-percent increase in market access due to NAFTA, the United States received an 85-percent increase. Mexico experienced the largest welfare gains among NAFTA partners, especially in paper, metals, and machinery sectors.	None listed	40 countries	Gravity model	1990–2002
NAFTA/ USMCA	Zahniser et al. (2015)	Ex-post	NAFTA increased market integration between the United States and Mexico for most commodity groups—including grains, livestock, fruits, and vegetables. Mexico's beef exports to the United States increased by more than $500 million from 1993 to 2013.	None listed	3 countries	Descriptive analysis	1990–2013

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Agreement	Authors	Time of study	Positive	Negative	Sample	Method	Time
NAFTA/ USMCA	Schmitz and Lewis (2015)	Ex-post	Full implementation of NAFTA resulted in large increases in producer surplus for Mexican producers of $405 million–$833 million/year.	Mexican consumer experienced an average loss in consumer surplus of $376 million–$766 million/year due to higher sugar prices.	2 countries	Partial equilibrium	2008–2013
NAFTA/ USMCA	Undar-Munguia et al. (2019)	Ex-post	None listed	Consumption of sugars and sweeteners in Mexico increased an average of 10.34 kcal/capita/day each year following full NAFTA implementation.	1 country	Time series/ synthetic control	1961–2013
DR-CAFTA	Morley (2006)	Ex-ante	Average level of pre-CAFTA protection in agriculture was low outside of rice and corn, suggesting small effects on domestic producers in CAFTA-DR partners from liberalization.	Simulating a 40-percent decrease in the price of maize decreases maize output by 28 percent. Total labor demand falls by around 6 percent.	Village in rural Mexico	General equilibrium	1989 base year
DR-CAFTA	Francois	Ex-ante	FTA with United States expected to increase land devoted to tomatoes, peppers, and cucumbers by 50 percent and increase technology use in agriculture.	None listed	Sinaloa, Mexico	Panel analysis	1967–1987
DR-CAFTA	USITC (2004)	Ex-ante	U.S. imports from CAFTA-DR would increase by 12.4 percent, driven by textiles ($3.1 billion) and manufactured sugar ($113 million), while U.S. grain exports to Central America would increase by $157 million.	None listed	15 regions; 23 sectors	General equilibrium	2005 baseline
DR-CAFTA	Taylor et al. (2010)	Ex-ante	Under the most extreme liberalization scenarios, food prices fall by more than income, driving net welfare increases in three countries.	Liberalization reduces grain production and agricultural labor demand.	4 countries	Disaggregated rural economy-wide model (general equilibrium)	2000–2003
DR-CAFTA	Filipski et al. (2011)	Ex-ante	Female-headed households fare better than male households, due to gender segmentation of rural labor markets.	Declines in agricultural prices and incomes. Evidence of a net welfare loss for all household groups, including nonagricultural households.	Dominican Republic	Disaggregated rural economy-wide model (general equilibrium)	2003 income/
DR-CAFTA	Pörtner (2003)	Ex-ante	Overall positive welfare gains expected from CAFTA.	Welfare losses concentrated among rural households impacted by maize liberalization.	Guatemala	Partial equilibrium	2000
DR-CAFTA	Spilker et al. (2018)	Ex-post	Firms exporting differentiated products were able to export more and newer varieties of products, compared with firms producing homogenous products, suggesting gains at the extensive margin.	Gains for firms producing homogenous products (e.g. primary commodities) accrued mainly to firms who had already been exporting prior to CAFTA-DR.	Costa Rica	Cross-sectional analysis	2000–2014
U.S.-Chile	Harrison et al. (2002)	Ex-ante	Expected net welfare gains. FTA with NAFTA would see the Chilean milk, nongrain crops, and textile sectors expand by more than 10 percent. NAFTA offered more market access than other alternatives.	None listed	11 regions	General equilibrium	1996
U.S.-Chile	Brown et al. (2000)	Ex-ante	Tariff removal increases Chilean welfare by $102 million. Chile's agricultural exports to the United States would increase by 12 percent.	None listed	8 countries	General equilibrium	1990

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Agreement	Authors	Time of study	Positive	Negative	Sample	Method	Time
U.S.-Chile	Brown et al. (2003)	Ex-ante	Accession of Chile to NAFTA would increase global welfare by $5.9 billion with $840 million accruing to Chile. Increased employment in agriculture, mining, and metal products for Chile.	Decreased employment in textiles and apparel.	20 countries	General equilibrium	1995 projected to 2005
U.S.-Chile	USITC (2003)	Ex-ante	Chilean exports to the United States were expected to increase by 6–14 percent after liberalization was fully phased in—with the largest increases among dairy products, textiles, apparel, leather, fruits, vegetables, and nuts.	None listed	13 regions, 22 commodities	General equilibrium	1997 projected to 2004
U.S.-Chile	O'Ryan et al. (2010)	Ex-ante	FTAs with the United States and European Union are estimated to increase real income for all income quintiles by 1.4-2.3 percent and increase Chilean fish and fruit production. Small reductions in PM-10 and CO2 emissions	None listed	3 regions	General equilibrium	1996–2005, projections to 2020
U.S.-Colombia	IIE (2006)	Ex-ante	Net welfare gains for the United States and Colombia. U.S. imports from Colombia rising by 37 percent, and U.S. exports to Colombia increasing by 44 percent. Colombia increases exports of crops other than grains, vegetables, and fruits. U.S.-Colombia trade expands between 38–140 percent.	Some displacement of low-skilled workers. Colombia's grain production falls.	GTAP: 30 regions; Gravity: 178 countries	General equilibrium/	1967–1987
U.S.-Colombia	USITC (2006)	Ex-ante	U.S.-Colombia FTA would result in increased U.S. imports of several food and agricultural products—including sugar ($105 million), crops n.e.c (not elsewhere specified) ($73 million), as well as dairy products ($5 million). Possible growth opportunities for Colombian beef and pork with export certification.	None listed	8 countries/ regions	General equilibrium	2001 projected to 2007
U.S.-Panama	USITC (2007)	Ex-ante	Expected increase in trade flows, but small values, due to Panama's market size. Panama may increase exports of beef to the higher value U.S. market. U.S. imports of sugar from Panama could increase by 23 percent.	Decline in domestic beef prices in Panama.	2 countries/ regions	Partial equilibrium	2006
U.S.-Peru	Baker et al. (2016)	Ex-post	Per capita FDI inflows in Peru increased from $103 million to $270 million after ratification of the FTA. Increase in domestic soft drink production in Peru.	None listed	2 countries/ regions	Panel data	1990–2013

Note: NAFTA = North American Free Trade Agreement; USMCA = United States-Mexico-Canada Agreement; FDI = foreign direct investment; CAFTA-DR = Dominican Republic-Central America-United States Free Trade Agreement; CAFTA = Central American Free Trade Agreement; GTAP = Global Trade Analysis Project; TRQ = tariff-rate quota; GDP – gross domestic product; EU = European Union; n.e.c. = not elsewhere classified; CO2 = carbon dioxide; PM-10 = particulate matter (aerodynamic diameter less than or equal to 10 micrometers).

Source: USDA, Economic Research Service.

Appendix B: Detailed Information on U.S. Free Trade Agreements (FTAs)

The United States is part of 14 FTAs, cutting across these 20 countries: Australia, Bahrain, Canada, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Israel, Jordan, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, Singapore, and South Korea. These agreements involve multiple sectors of the U.S. economy. Depending on the type of country involved, agreements are in place to increase bilateral trade and encourage economic development, especially in the case of low- and middle-income countries. FTAs encourage trade expansion through preferential tariff treatments and reducing other nontariff barriers among countries involved. In addition, the Dominican Republic-Central America-United States Free Trade Agreement (CAFTA-DR) included a capacity building component that improved the export abilities of the countries that are a part of that agreement (USTR, 2011).[24]

A brief summary of the agreements is in table A-2.

Table B.1
Summary of the U.S. free trade agreements (FTAs)

Agreement	Implementation date	Duty phase-out	Third country transportation	Rules of origin
Australia (AUSFTA)	January 2005	January 2022 (18 years)	Third country transportation: May leave customs' control; may not undergo further production in a third country.	Wholly obtained or produced; exclusively from originating materials; tariff shift and/or regional value content.
Bahrain (BHFTA)	August 2006	January 2015 (10 years)	Imported directly: May leave customs' control; may not undergo further production in a third country; limited operations specified.	Wholly the growth, product, or manufacture; or value content or product-specific tariff shift.
CAFTA-DR	El Salvador: March 2006 Nicaragua: April 2006 Honduras: April 2006 Guatemala: July 2006 Dominican Republic: March 2007 Costa Rica: January 2009	January 2025 (20 years)	Transit and transshipment: May not leave customs' control nor undergo further production in a nonparty.	Wholly obtained or produced; tariff shift and/or regional value content; exclusively from originating materials; qualifying goods.
Chile (CLFTA)	January 2004	January 2015 (12 years)	Transit and transshipment: May leave customs' control; may not undergo further production in a third country.	Wholly obtained or produced; exclusively from originating materials; tariff shift and/or regional value content.
Colombia (COTPA)	May 2012	January 2028 (17 years)	Transit and transshipment: May not leave customs' control nor undergo further production in a third country.	Wholly obtained or produced; tariff shift and/or regional value content; or exclusively from originating materials.
Israel (ILFTA)	September 1985	January 1995 (10 years)	Imported directly: May not enter the commerce of a third country except for nonretail sale where the importation is the result of the original transaction; may not undergo further production in a third country.	Growth, product, or manufacture; or value content plus substantial transformation.
Japan (JPTA)	January 2020	January 2030 (10 years)	Third country transportation: May not leave customs' control and may not undergo further production in a third country.	Wholly obtained or produced entirely; substantial transformation; or product specific tariff shift.
Jordan (JOFTA)	December 2001	January 2010 (10 years)	Imported directly: May not enter the commerce of a third country except for nonretail sale where the importation is the result of the original transaction; may not undergo further production in a third country.	Wholly the growth, product, or manufacture; or value content plus substantial transformation.

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[24] In addition, the FTA also forced the region to harmonize regulations and increase intra-regional trade.

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Agreement	Implementation date	Duty phase-out	Third country transportation	Rules of origin
Singapore (SGFTA)	January 2004	January 2013 (10 years)	Third country transportation: May leave customs' control; may not undergo further production in a third country.	Wholly obtained or produced; tariff shift and/or regional value content; Integrated Sourcing Initiative (ISI).
NAFTA/USMCA	January 1994/July 2020	January 2008 (15 years)	Transshipment: May not leave customs' control nor undergo production in a third country.	Wholly obtained or produced; exclusively from originating materials; tariff shift and/or regional value content.

Note: CFR = Code of Federal Regulations; AUSFTA = Australia-United States Free Trade Agreement; BHFTA = Bahrain Free Trade Agreement; CAFTA-DR = Dominican Republic-Central America-United States Free Trade Agreement; CLFTA = Chile Free Trade Agreement; COTPA = Colombia Trade Promotion Agreement; ILFTA = Israel Free Trade Agreement; JPTA = Japan Trade Agreement; JOFTA = Jordan Free Trade Agreement; KORUS = Korea Free Trade Agreement; MAFTA = Morocco Free Trade Agreement; OMFTA = Oman Free Trade Agreement; PATPA = Panama Trade Promotion Agreement; SGFTA = Singapore Free Trade Agreement; NAFTA = North American Free Trade Agreement; USMCA = United States-Mexico-Canada Agreement.

Source: USDA, Economic Research Service using information from U.S. Customs and Border Protection, 2017.