



# US Farm Policy and Trade

THE INCONSISTENCY CONTINUES

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**AGRICULTURAL POLICY IN DISARRAY**  
**REFORMING THE FARM BILL**

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# Executive Summary

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Trade has always been important for US agriculture, but over the past 50 years, US producers and consumers have become increasingly linked to global markets. This paper provides an overview of US international trade policies and discusses the trade implications and economic consequences of these policies. This paper also outlines policy reforms, many due to trade agreements and the World Trade Organization's (WTO) influence, which have lowered tariffs, increased trade, and fostered income growth for farms and lower prices for consumers. Despite such

progress, distortions remain, notably in high tariffs for a handful of commodities, price and income subsidies, government-sponsored crop insurance, and dairy subsidy programs. These policies continue to transfer billions of dollars from taxpayers and consumers to farms and agribusinesses, distort crop prices in global markets, and expose the United States to challenges under WTO rules. As Congress prepares for the 2018 Farm Bill, the impact of farm policies on international markets should be a central concern to help build prosperity for producers and consumers.



# US Farm Policy and Trade

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*The propensity to truck, barter, and exchange one thing for another is common to all men.*

—Adam Smith, *The Wealth of Nations*<sup>1</sup>

Trade is natural. Humans (and other species) trade with other individuals and groups trade with other groups because the natural gains from trade are so compelling. International trade is simply the result of trades that cross national boundaries.<sup>2</sup> There is nothing special about international trade except that national governments seem to be more attune to taxing and regulating such trade—and nowhere more than in agriculture.

As longtime students of agricultural and trade policy may have noticed, our title refers back to D. Gale Johnson's famous 1950 study of the inconsistencies between agricultural and trade policy. In this paper we show that, while specifics have changed in the past 70 years, US farm policy remains inconsistent with the sort of open international markets that Johnson envisioned and that would most benefit US and world agriculture and the economy more broadly.

In 2016, US agricultural exports totaled \$130 billion, and US agricultural imports totaled about \$113 billion (Figure 1). The United States Department of Agriculture (USDA) estimates that the share of agricultural production value that was exported rose from 13 percent in 1990 to 20 percent in 2013.<sup>3</sup> For field crops such as cotton, rice, soybeans, and wheat and for many horticultural, fruit, and nut crops, the percentage exported is higher still.

For example, more than 70 percent of upland cotton and two-thirds of all almond production

is exported. In the US, agricultural productivity is growing faster than domestic demand for farm commodities. At the same time, global demand growth is accelerating due to the increase in global population, income growth, and rapid urbanization. Thus, US exports are expected to expand and account for a larger share of future domestic production.

A large portion of the \$113 billion of agricultural imports are products not produced commercially in the United States due to seasonality, climate, and other natural conditions. Some products are imported for further processing because the United States has natural advantages at that stage of production. For example, the United States imports feeder pigs from Canada and feeder cattle from Mexico because of the availability of low-cost animal feed and efficient meat processing facilities in the United States.

Since the earliest days of the Republic (and even during the colonial period before that), policies have attempted to augment agricultural exports or impede imports. For example, in 1789, duties were imposed on imported sugar in part to raise government revenues.<sup>4</sup> In more recent times, tariffs have been used mostly to protect domestic producers from import competition. While today US agricultural tariffs are some of the lowest in the world, high tariffs and other import impediments remain for many commodities, including sugar, orange juice, fresh tomatoes, and selected dairy products.

US policies have also encouraged agricultural exports to raise prices for domestic producers. Such policies have directly subsidized exports, provided subsidized credit (or credit insurance) for foreign importers, or dumped surplus US production into foreign markets in the guise of food aid. In some cases, all three policies have been used to shift products out of US domestic markets.

In addition to explicit trade subsidies and barriers, the United States has long subsidized domestic production of tradable products through price- and income-support policies and input subsidies such as crop insurance. To the degree that such policies increase production of favored commodities, they also encourage exports and suppress imports. The form and function of today's policies affect production patterns less than before. Nonetheless, the support provided to farm output, and especially to some politically favored commodities, is currently about \$15 billion a year.

Since passage of the Uruguay Round Agreements Act (URAA) in 1994, US agricultural policies have been subject to disciplines under the World Trade Organization (WTO) and its rules-based negotiated agreements. The URAA's Agreement on Agriculture (AoA), for example, specifies quantitative limits on production-distorting domestic support policies. US domestic support levels have remained below WTO bindings since reporting began in 1995. Apart from cases Canada and Brazil brought against the US in 2007 (later suspended), no one has challenged whether US subsidies (or those of any other major agricultural trading partner) have exceeded the URAA limits. This may be a sign that such limits were designed to be loose enough that no realistic policy options have been precluded.

The URAA also placed limits on export subsidy programs, bound nontariff barriers, and reduced allowable tariffs on agricultural products. These policies have directly affected trade of specific commodities and have occasioned challenges that refined their interpretations and emphasized the binding nature of the restrictions.

Importantly, the URAA also brought agricultural trade under the general WTO rules and disciplines

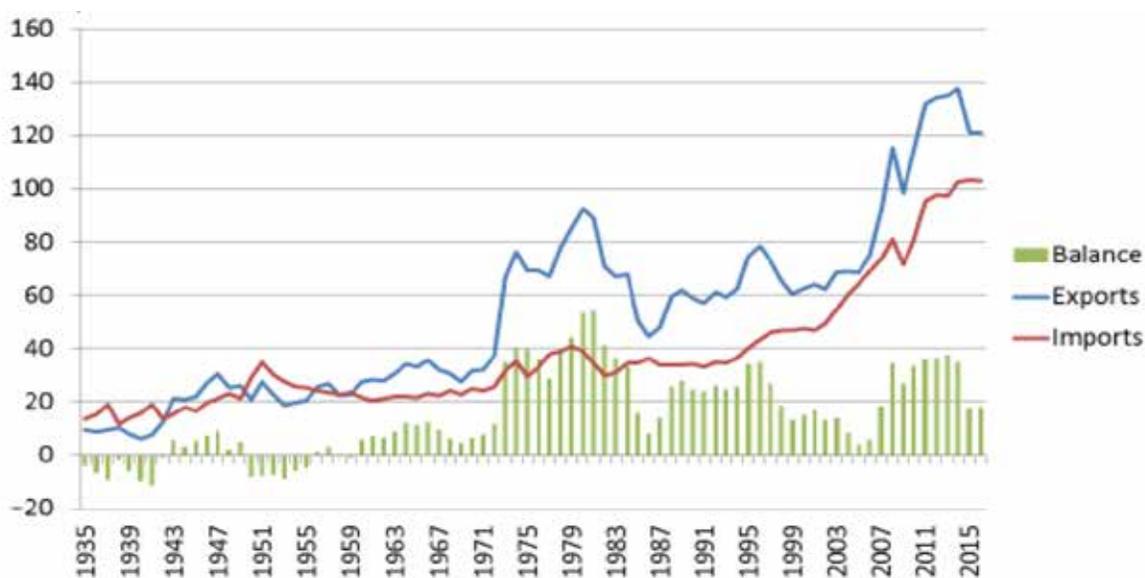
that apply to other trade in goods. Under these provisions, US agricultural policies have been challenged several times, and the United States, as with other members, has attempted to defend its policies under WTO dispute settlement procedures.

For example, Brazil successfully challenged US cotton subsidies by claiming that those policies stimulated US production, thereby causing substantial price depression or suppression in world markets. In that case, Brazil also successfully argued that the US export credit subsidy programs for other commodities and cotton were export subsidies subject to disciplines. More recently, Mexico and Canada successfully challenged—under provisions related to technical barriers to trade—specific features of the US government's implementation of country-of-origin labeling laws that required retailers to provide certain country-of-origin labels for muscle cuts of beef and pork.

Here, we examine the international trade implications of US farm policy and how international trade agreements affect trade and consequences of trade policy. The analysis follows in the intellectual tradition of D. Gale Johnson's seminal research, *Trade and Agriculture: A Study of Inconsistent Policies and World Agriculture in Disarray*,<sup>5</sup> which identify how agricultural policies distort both domestic and international markets, as well as numerous American Enterprise Institute studies, several by Johnson, which examine the topic. Since then, several of the specific policy concerns these studies highlighted have been partially remedied, in part because of the intellectual efforts of Johnson and others.

## Trends in US Agricultural Trade Since the 1930s

Trade has always been important for US agriculture, but over the past 50 years, US producers and consumers have become increasingly tied to global markets. Figure 1 shows US agricultural imports and exports since 1935, adjusted for inflation. After rising slowly and steadily before 1970, the value of US agricultural exports jumped sharply with the commodity price

**Figure 1. US Agricultural Trade Since 1935 (Million USD 2009)**

Source: Foreign Agricultural Service, "Global Agricultural Trade System," US Department of Agriculture, <https://www.fas.usda.gov/data>.

spikes of the early 1970s. That increase accompanied large grain purchases by the former Soviet Union, jumps in nonfarm commodity prices, and a change in monetary policy that allowed the dollar to float against major currencies. Exports continued strong throughout the 1970s, but in the early 1980s, with tightening monetary policy and domestic support prices above marketing clearing world prices, exports fell sharply, especially for US commodities with price supports.

The 1985 Farm Bill lowered support prices. These reductions in support and a weakening dollar against major currencies allowed exports to rise from 1985 to 1996. The Asian financial crisis in the late 1990s and successive record global grain harvests contributed to a fall in world prices and a decline in exports in the latter half of the 1990s.

From 2004 to 2014, the value of agricultural exports doubled, even after adjusting for general inflation. The sharp growth was due to a strong global demand for agricultural commodities, particularly in emerging economies, a weaker dollar, which enhanced US competitiveness, and higher agricultural prices

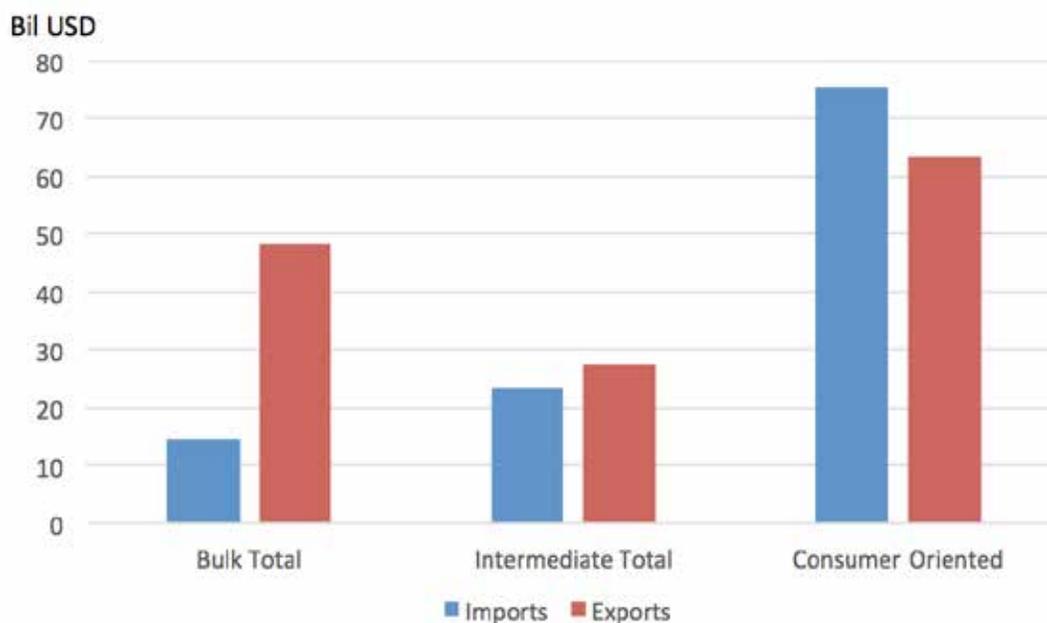
driven in part by strong demand for energy products, including biofuels.

Exports reached a record \$137.8 billion (2009 dollars) in 2014. A stronger dollar and lower commodity prices pushed export values lower in 2015 through 2017. Exports totaled almost \$121 billion in 2016, down \$17 billion from 2014 levels but more than 60 percent higher than 10 years earlier.

Imports since 1935 have exhibited less variability than exports, but their growth has been equally impressive. From 1996 to 2015, adjusting for inflation, annual imports grew by 4.4 percent. Imports in 2016 were near record levels at \$103 billion.

The United States has had a positive trade balance in agriculture since 1960. In 2016, the agricultural trade balance was \$18 billion, adjusted for inflation. While down almost 50 percent from 2014 levels, the trade balance was higher than in 2015 and above the average trade balance during the previous decade (2000–09).

The United States is a large net exporter of bulk commodities, particularly soybeans, corn, wheat,

**Figure 2. Composition of US Agricultural Trade, 2014–16 Average**

Source: Foreign Agricultural Service, "Global Agricultural Trade System," US Department of Agriculture, <https://www.fas.usda.gov/data>.

and cotton. Cotton is complex because the United States exports raw cotton and imports processed cotton products in the form of textiles and apparel. The United States is a major exporter of tree nuts, processed tomato products, and other storable and bulk horticultural products, but it is generally a net importer for consumer-oriented agricultural goods such as wine and beer, fresh fruits and vegetables, and snack foods (Figure 2).

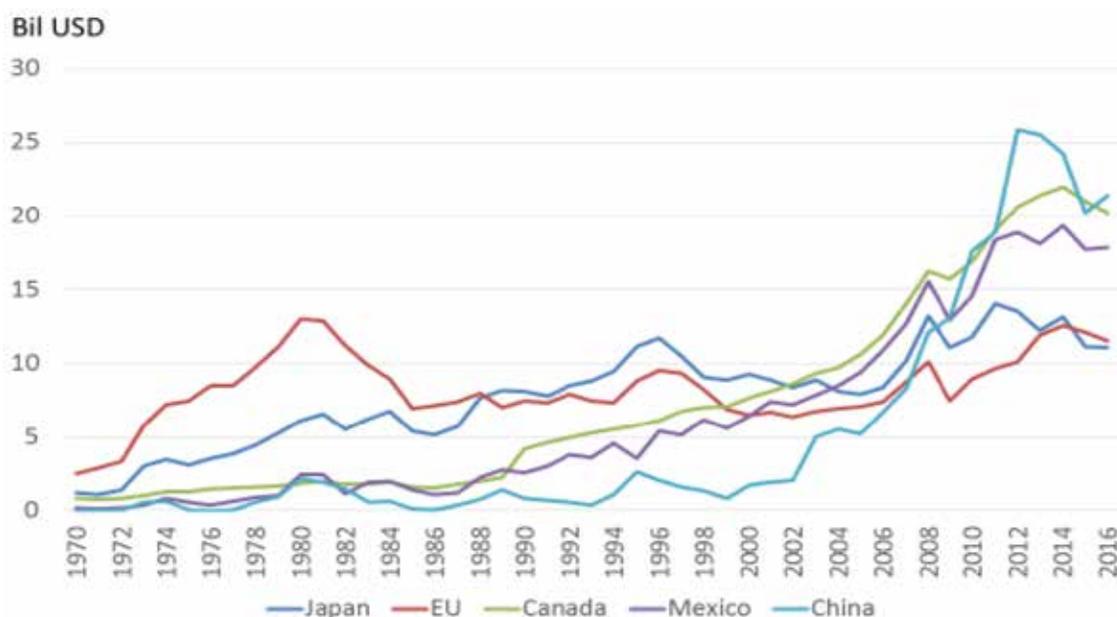
The US is both a large exporter and large importer of intermediate agricultural goods that are used in food processing. For example, Mexico imports malting barley and hops from the United States for beer production (some of which are exported to the United States). The US imports cattle and pigs from Canada, brings them to slaughter weight, and then processes them into meat products (some of which are sold back to Canada). The US is a net exporter of beef and pork products.

**Detailed Export Trends.** The top five markets for US exports are currently China, Canada, Mexico,

Japan, and the European Union. Those five markets account for about 60 percent of US agricultural exports. Figure 3 shows the growth of exports to those markets and how their relative positions have changed since 1970.

For most of the 1970s and 1980s, Europe was the top destination for US agricultural exports. With the growth of subsidies, increases in external barriers, and trade diversion caused by their Common Agricultural Program in the late 1970s and early 1980s, as a bloc, the EU member countries became more insular for many commodities, so US exports to Europe fell. Japan eclipsed the EU as the major importer of US agricultural products starting in the late 1980s. Negotiated trade agreements such as the 1984 US-Japan Beef-Citrus Understanding and the 1988 Japanese Beef Market Access Agreements<sup>6</sup> helped partially open the Japanese market to these commodities, augmenting an already-strong market for US soybeans and other products.

The Canada–United States Free Trade Agreement (CUSTA) in 1987 eliminated tariffs for all but a few

**Figure 3. US Agricultural Exports by Destination**

Source: Foreign Agricultural Service, "Global Agricultural Trade System," US Department of Agriculture, <https://www.fas.usda.gov/data>.

notable agricultural products (e.g., dairy, sugar, and poultry). The North American Free Trade Agreement (NAFTA), completed in 1992, saw the phase out of all agricultural tariffs between the US and Mexico by 2008. By 2003, Canada and Mexico were respectively the number one and two destinations for US agricultural exports.

Since 2010, China has been the top destination for US exports in all but one year (2015) when it was a close second to Canada. In the past, China was a sporadic customer for US grain and oilseeds, largely importing when yields were affected by drought or other adverse weather (e.g., in 1980, 1989, and 1995). After accession to the WTO in 2001 and with growing meat, dairy, and poultry sectors driven by an emerging middle class, China began importing large quantities of soybeans and later feed grains and other feedstuffs.

Textile, shoe, and apparel production stimulated demand for cotton and other inputs such as hides and skins. The US has become a major supplier for those raw materials, and China is now the largest import

market for those export commodities, although export volumes to China for individual crops are often constrained by tariff-rate quota. China is also a major market for horticultural products such as tree nuts, oranges, grapes, raisins, and wine.

Table 1 documents that field crop exports are a significant percentage of production exported for corn, cotton, soybeans, rice, and wheat and have been important for a long time. Over most of the period since 1960, about half of rice and wheat production is typically exported. The share of soybean and cotton production that is exported has increased, particularly since 2000. In the case of cotton, the increase is largely due to the collapse of the domestic milling industry in the late 1990s when many domestic mills closed and cotton was diverted to markets in Mexico, Latin America, and Asia. From about two-thirds of cotton being milled in the US in the 1960s, currently about one-quarter of cotton production is milled in the United States.

The growth of soybean exports reflects the growth of animal feeding in China. China currently imports

**Table 1. Average Share of US Production Exported for Selected Crops and Share of World Exports, by Decade, Since 1960**

Decade	Corn	Cotton	Soybeans	Rice	Wheat
Percentage of Production					
1960–69	12.2%	34.1%	30.0%	56.7%	53.9%
1970–79	24.6%	43.9%	38.0%	57.7%	57.6%
1980–89	26.3%	47.8%	38.8%	52.7%	58.9%
1990–99	20.8%	40.2%	33.9%	46.5%	48.7%
2000–09	17.9%	68.5%	37.9%	49.2%	48.5%
2010–17f	13.0%	75.4%	46.6%	49.9%	48.2%
Percentage of World Trade					
1960–69	52.8%	26.3%	91.4%	18.9%	37.5%
1970–79	73.0%	19.7%	90.4%	22.0%	43.0%
1980–89	73.8%	20.9%	74.0%	20.4%	37.9%
1990–99	70.0%	25.6%	63.8%	13.7%	29.9%
2000–09	59.7%	37.4%	45.0%	11.3%	23.9%
2010–17f	35.9%	30.3%	39.8%	8.2%	17.6%

Source: US Department of Agriculture, "Production, Supply and Distribution Online (PS&D)," <https://www.fas.usda.gov/databases/production-supply-and-distribution-online-psd>.

more than 60 percent of the world soybean exports. For the US, this means about one in every four acres planted to soybeans is exported to China. Corn exports typically accounted for 20–25 percent of domestic production until 2000 when biofuel production began to grow.

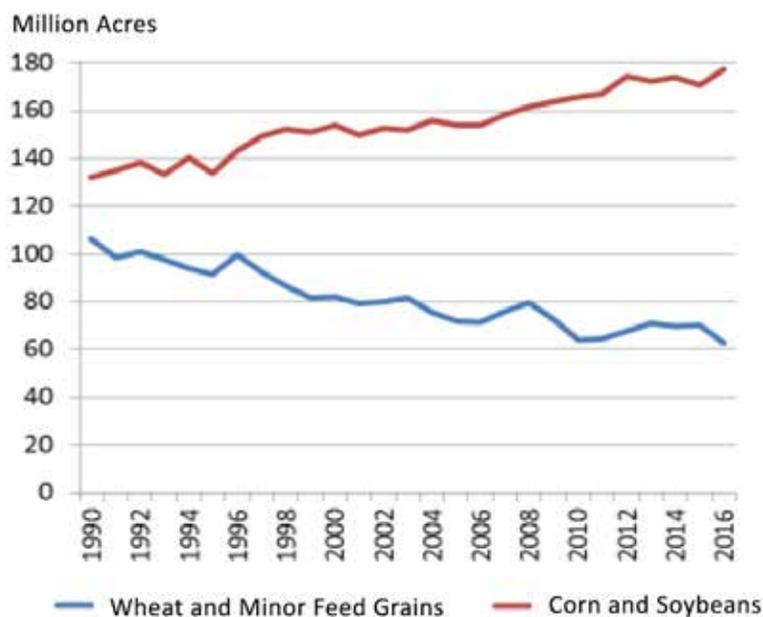
In 2000–01, corn use for ethanol accounted for about 6 percent of domestic production. Corn exports that year totaled 1.94 billion bushels and accounted for 19 percent of production. By 2014–15, 5.2 billion bushels of corn were used for ethanol—about 35 percent of corn production that year—while corn exports accounted for about the same quantity as in 2000–01, but only 13 percent of production.

Table 1 also represents the US share of world trade for selected commodities since 1960. For all crops but cotton, US market share has declined. Market shares for corn, wheat, and rice are about half of what the US share was in the 1970s. The market share for soybeans has declined from more than 90 percent in the 1960s and 1970s to less than 40 percent since 2010. US cotton exports as a share of world trade have increased

since 2000, reflecting the decline of the domestic milling industry discussed above, but that market share has fallen back to 30 percent since 2010.

Recent media reports<sup>7</sup> have raised concerns that declining world market shares indicate that US field crops have become less competitive in world markets. But evidence points to the contrary. First, the US continues to export a large share of production. If the US were truly uncompetitive, exports would fall both in absolute and relative terms (that is, as a share of production). Second, for crops such as corn, exports as a share of production have fallen but only because alternative domestic uses such as for biofuel production have been more profitable.

With growth of corn use for ethanol projected to stop over the next 10 years, the USDA projects that corn exports will grow both in absolute volume and relative to production, which is also projected to keep growing.<sup>8</sup> One factor that could change that would be expanded exports of pork or poultry meat, which would allow more corn to be fed here, while that corn would be implicitly exported as meat.

**Figure 4. Change in Planted Acres Since 1990**

Source: National Agricultural Statistics Service, "Quick Stats," US Department of Agriculture, <https://quickstats.nass.usda.gov/>.

One of the major reasons why US export share has fallen for many commodities is limits on US production and slower productivity growth in the United States relative to other places. To meet growing global consumption (and to maintain its share of the global market), US planted area must increase, yields must rise, or production must be diverted from other domestic uses to exports (or a combination of these factors).

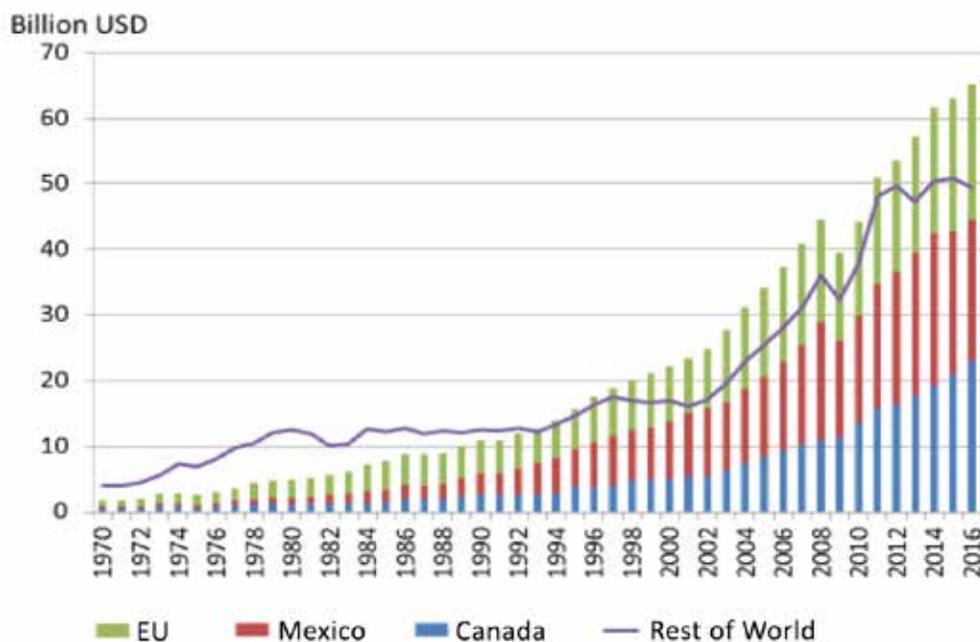
Cropland in the US is limited, but higher prices led to large shifts in the crop mix after 1990. Figure 4 shows that wheat and minor feed grains acreage declined by about 43.5 million planted acres from 1990 to 2016, which was almost completely offset by an increase of 45.5 million acres planted to corn and soybeans.

Part of the shift in area reflects changes that occurred in the 1990 and 1996 farm bills.<sup>9</sup> Before 1990, producers faced steep penalties if they under- or overplanted their crop-specific acreage base. With planting flexibility, producers made cropping decisions largely based on market prices (and

per-unit subsidies), which favored corn and soybeans over wheat and minor feed grains. Thus, US wheat became less competitive with corn and soybeans than wheat in other countries.

Outside the United States, much additional field cropland has been brought into production worldwide over the past 30 years. Harvested area in the rest of the world increased by more than 100 million hectares.<sup>10</sup> For wheat, much of the growth in exports has come out of the Black Sea, where countries of the former Soviet Union now account for about 30 percent of world wheat trade.

Russia and Ukraine produce substantial quantities of corn as well. In Brazil, soybean production, and to a lesser extent corn production, have expanded as yields have increased and more land has been brought into production. Thus, while US field crop production remains competitive in world markets, the US share of exports has fallen partly because of expanded domestic demand (ethanol) and partly because of land capacity limit and relatively slow productivity growth.

**Figure 5. US Imports by Source**

Source: Foreign Agricultural Service, "Global Agricultural Trade System," US Department of Agriculture, <https://www.fas.usda.gov/data>.

**Detailed Import Trends.** Mexico, Canada, and the European Union are the top three import suppliers to the US market, accounting for about 55 percent of total US agricultural imports in 2016 (Figure 4). The growth of Canada and Mexico largely parallels the export picture. In the mid-1980s, they accounted for about 20 percent of US exports. With the passage of CUSTA and then NAFTA, imports increased to the extent that their combined share of the US market has almost doubled.

The United States generally imports consumer-oriented products such as fresh fruits and vegetables, processed dairy products, meats, snack foods, and beer and wine. Of total imports from Mexico, Canada, and the EU, almost 72 percent were consumer oriented (Figure 5). Another 23 percent of imports were intermediate products used in further food processing in the United States, such as live animals, sugars and sweeteners, essential oils, and cocoa paste. About 5 percent of imports were bulk commodities, largely small quantities of grain from Canada, raw

cane sugar and coffee from Mexico, and coffee and tea from the EU.

To summarize, few of the raw agricultural commodity imports directly compete with US production either because of seasonality or because the US produces little of the product (bananas and coffee). Other products are processed and are often branded products that give consumers access to variety. Wine is an example in which the United States is both a major importer and a significant exporter. Wine brands from the United States are found in markets around the world while wine from many nations compete for consumers in the United States. Other imports include largely raw materials to be processed in the United States.

This classification does leave a few imported commodities, such as orange juice, sugar, and fresh market tomatoes, that do compete directly with US production, and in those cases the United States has attempted to put restrictions in place and tariffs on other imports.

**Table 2. Average and Maximum US-Bound Tariff Levels for Selected Product Groups (ad Valorem)**

Product Group	Average Tariff	Maximum Tariff
Animal Products	2.3%	26%
Dairy Products	16.8%	188%
Fruit, Vegetables, and Plants	4.9%	132%
Coffee and Tea	3.3%	44%
Cereals and Preparations	3.5%	44%
Oilseeds, Fats, and Oils	4.4%	164%
Sugars and Confectionery	12.3%	55%
Beverages and Tobacco	14.8%	350%
Cotton	4.8%	18%
Other Agricultural Products	1.1%	52%
Fish and Fish Products	1.0%	35%

Source: World Trade Organization, "Merchandise Trade Statistics," accessed May 22, 2017, [https://www.wto.org/english/res\\_e/statis\\_e/merch\\_trade\\_stat\\_e.htm](https://www.wto.org/english/res_e/statis_e/merch_trade_stat_e.htm).

## Effects of US Agricultural Policies on Trade

Many US agricultural policies may affect trade. Those policies include border measures such as tariffs that raise consumer prices and insulate producers from global competition, export subsidies that divert production to foreign markets at the expense of domestic consumers and foreign producers, and domestic support policies that distort production decisions and insulate producers from market signals.<sup>11</sup>

**Policies That Restrict Imports.** Although tariffs on agricultural imports date back to the early years of the United States, today, because of unilateral and multilateral rounds of liberalization, US agricultural tariffs have fallen substantially and are among the lowest in the world. The current trade-weighted bound tariff average is 3.8 percent, and the simple (unweighted) bound average tariff is 4.8 percent.<sup>12</sup> Of course, trade-weighted averages give a misleading picture when tariffs themselves may dramatically reduce the imports for products with high tariffs.

Further, there are important exceptions. Tariffs are relatively high for sugar, peanuts, orange juice, and selected dairy products, which limit imports and

insulate domestic prices from lower world prices. The tariff picture is also complicated when considering imports of raw materials because much of the processed product is subsequently exported. In this case, a duty drawback means the effective tariff is much lower (as in the case of tobacco and wine). Table 2 shows the pattern of average and maximum tariffs across product categories.

The United States also makes use of domestic trade remedy laws such as antidumping measures and countervailing duties to protect selected agricultural products against imports from countries. Countervailing duties apply on a handful of products, including raw and roasted in-shell pistachios from Iran, fresh garlic from China, pasta from Italy and Turkey, honey from China, and numerous fresh fish and seafood products from China, Vietnam, India, Thailand, and Brazil.<sup>13</sup>

The United States has also used safeguard provisions under the URAA that allow countries to impose temporary tariffs on imports in the event of domestic price declines or import surges.<sup>14</sup> While in recent years their use has declined, under the URAA, the United States has the right to impose safeguards on 189 narrowly defined agricultural and food products (mostly covering dairy and sugar tariff lines). The

United States' most recent use of safeguard provisions was in October 2015, when it imposed prohibitive tariffs on butter and sour cream imports for the rest of the 2015 calendar year.<sup>15</sup>

Nontariff barriers such as country-of-origin labeling requirements, quality standards, and sanitary and phytosanitary standards can also create effective barriers to imports and raise domestic food and sometimes farm prices. Although such barriers are often intended to deal with concerns such as food safety or plant health, their effect on import flows and prices can bring challenges under the WTO. The United States has often pressed importing countries to relax such barriers that limit US farm and food exports.

Countries that wish to ship products to the United States similarly complain that our measures are sometimes used for protection from competition rather than from some legitimate safety or other public good. For example, in 2015, under threat of retaliation from Canada and Mexico, the United States announced an end to mandatory country-of-origin labeling for certain muscle cuts of beef and pork after the WTO found such regulations violated agreements to avoid undue trade barriers related to agreements on technical barriers to trade.<sup>16</sup>

**Policies That Promote Exports.** The United States has a long history of using export enhancement tools to augment exports, including direct export subsidies, subsidized credit for buyers who import US farm products, food aid, and subsidized promotion of US farm products in export markets. In the 1950s, support prices that exceeded world market prices stimulated production and reduced domestic use, causing government-held surpluses that were disposed of in world markets as direct food aid or concessional sales.<sup>17</sup>

Subsidized export credit guarantees encouraged importers to purchase US commodities. By the early 1990s, almost all wheat exports were shipped abroad either as food aid or marketed with export subsidies, including export credit guarantees. Export subsidies rose and fell inversely with global prices and totaled as much as \$1.3 billion for wheat in 1993.<sup>18</sup>

Under the URAA, the United States agreed to discipline its use of export subsidies. By 1995, US export subsidies, except those for dairy, were largely discontinued. After years of disuse, the Export Enhancement Program was eliminated by the 2008 Farm Act, and the parallel Dairy Export Incentives Program was terminated by the 2014 Farm Act. The recently concluded Nairobi Declaration under the WTO prohibits using export subsidies by developed countries by 2020 and limits the tenor on subsidized export credit guarantees to 18 months.<sup>19</sup> The United States had already agreed to tenor limits of 24 months as part of the settlement with Brazil in the United States—Upland Cotton dispute.<sup>20</sup>

US foreign food aid under Pub. Law 480 (also known as the Food for Peace program) has moved from primarily long-term commodity procurement for distribution as development aid (Title I) to primarily emergency and disaster food assistance and developmental programs to improve food security (Title II). Average spending on US international food aid programs during fiscal years 2006–13 was about \$2.5 billion annually, with Title II activities averaging nearly \$1.9 billion (76 percent) of annual outlays.<sup>21</sup> Food aid issues are treated in greater detail in the AEI paper by Erin Lentz, Stephanie Mercier, and Christopher Barrett.<sup>22</sup>

The United States also provides about \$200 million annually for promoting US commodities overseas under the Market Access Program and several smaller related programs. Similar to generic advertising (checkoff) programs, the extent of increased demand for US products overseas because of these programs is limited.<sup>23</sup> USDA-sponsored studies often find positive impacts on exports, but even a positive impact on exports of promoted products does not demonstrate a positive national return on the investment of taxpayer funds.

**Domestic Support Programs.** Market price support policies and associated land set aside to reduce production were the primary vehicle for supporting US producers from the early days of New Deal legislation through the early 1970s. Nonrecourse loans were originally the vehicle for market price support

for grains, sugar, cotton, and oilseed producers. These loans have been redesigned for most commodities to provide direct income support to producers when prices fall below government-set minimums. Market price support is generally considered a highly distorting form of commodity support because it encourages production and maintains prices at artificially high prices for consumers. Of course, to operate some way to limit output or deal with the surplus production is a natural consequence of price supports.

Cash payments, to farmers from the government, supplement producer revenue directly rather than through higher market prices. Currently, the United States provides two types of direct payments: (1) nonrecourse loans with marketing assistance loan provisions paid on actual production and (2) the Agriculture Risk Coverage (ARC) and Price Loss Coverage (PLC) programs with payments paid on historical production. Marketing loans support the effective price received by producers at the loan rate while allowing market prices to fall to market-clearing levels. Marketing loans have not provided income support for more than a decade because loan rates are low relative to prices in the marketplace.

Price-based PLC payments and revenue-based ARC payments are the main subsidies the 2014 Farm Bill introduced and are the field crop subsidy programs currently under consideration for continuation in the next farm bill. These programs link payments to a history of production of specific program crops and tie payments to annual realized prices or crop revenues.<sup>24</sup>

While payments are not tied directly to crop plantings, they encourage planting the “program” crops eligible for PLC and ARC payments as they provide direct safety net benefits only to the extent that the payment recipient produces the crop covered by the program for which payments are received. The degree of production stimulus has not been estimated for these programs specifically, but that stimulus is likely in the range of earlier programs that tied payments to historical production.<sup>25</sup>

As discussed below, cotton is a special case among the field crops in that it is not eligible for PLC and ARC payments. Cotton continues to participate in the crop insurance program and is eligible for a “shallow

loss” area-based revenue insurance program that has not attracted much participation despite an 80 percent premium subsidy.

**Crop Insurance.** The US crop insurance program has witnessed dramatic growth over the past 25 years.<sup>26</sup> With an annual premium volume of more than \$9 billion, it is the largest agricultural insurance program in the world. For major row crops such as corn, wheat, soybeans, and cotton, participation is particularly high—producers typically insure more than 85 percent of eligible acreage and generally at high coverage levels. Participation is also extensive for many additional crops, ranging from dry beans and peas to several fruits and processed vegetable crops.

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**With an annual estimated cost to taxpayers of about \$8.5 billion, the US crop insurance program is the largest domestic support program in the United States.**

The program has also involved developing a myriad of products, including revenue products that insure against both price and yield declines, area-based products, and more recently, margin products that insure against declines in revenue or increases in input costs. The 2014 Farm Bill also authorized supplemental coverage options that augment existing subsidized insurance coverage for some producers. With an annual estimated cost to taxpayers of about \$8.5 billion, the US crop insurance program is the largest domestic support program in the United States.<sup>27</sup>

Insurance is delivered by private companies, but the USDA approves the insurance products offered, sets premiums, offers substantial premium subsidies (more than 50 percent of the actuarially fair premium for the most popular products), pays administrative and operations costs for insurance companies, and covers substantial reinsurance costs. In addition to products with subsidized farmer-paid premiums, catastrophic loss policies are offered, for which taxpayers cover the full premium.

When crop insurance is available and priced so that farms acquire coverage, farms produce more. But the pure subsidy impact also matters. Recent papers by Bruce Babcock<sup>28</sup> and Xiaodong Du, Hongli Feng, and David Hennessy<sup>29</sup> point out that if producers are participating in the crop insurance program primarily to “harvest” subsidies, farms do not seem to buy enough insurance. However, over time, producers have tended to sign up for higher coverage levels in which the per-unit subsidies tend to be higher. Joseph Glauber<sup>30</sup> shows that the average coverage levels for most row crops have grown significantly and continuously since the late 1990s, when subsidies were increased for higher coverage levels.

Empirical evidence shows that the US crop insurance program has increased planted area of the covered crops. Barry Goodwin, Monte Vandever, and John Deal<sup>31</sup> examined midwestern corn and soybean producers and wheat and barley producers in the northern plains and found that a 30 percent decrease in premium costs were likely to increase barley acreage by about 1.1 percent and corn acreage by about 0.5 percent. Soybean and wheat acreage showed no statistically significant impact.

Goodwin and Vincent Smith point out that earlier studies used data before significant subsidy increases and expansion of coverage with new products.<sup>32</sup> More recently, Jisang Yu, Aaron Smith, and Daniel Sumner find that increased crop insurance subsidy rates have had significantly positive impacts on production of major field crops. They find the acreage elasticity to crop insurance subsidies to be about 1.2, much larger than the equivalent area elasticity to market price.<sup>33</sup>

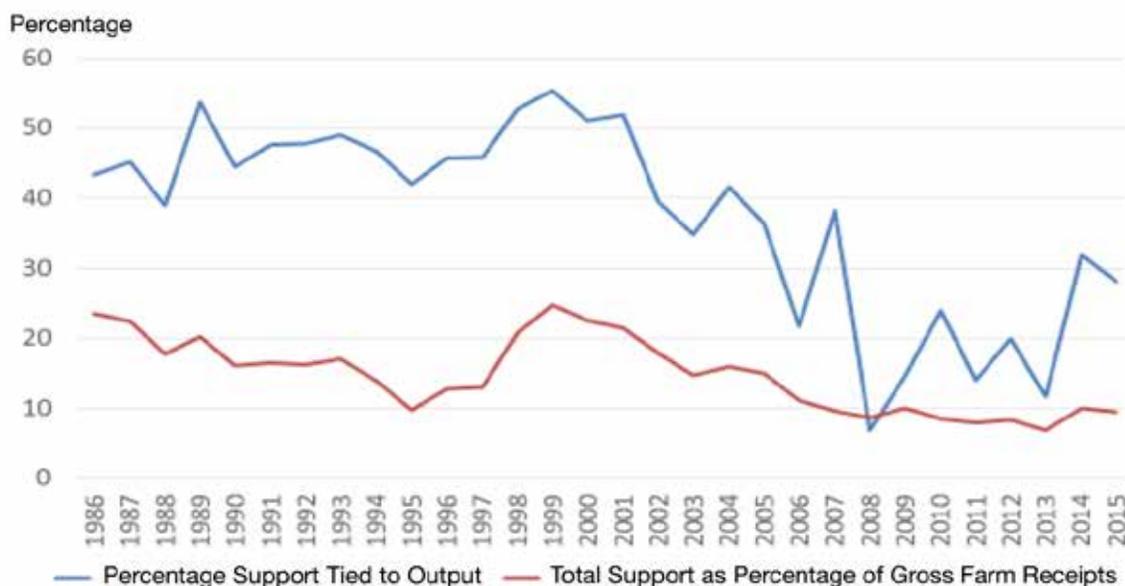
Nonetheless, they showed that the magnitude of the impact on overall acreage of each of the field crops

is likely small. For example, their estimates imply that a 20 percent increase in crop insurance subsidy for corn caused an increase in corn acreage of about 0.8 percent. Given the large increase in crop insurance subsidies and expansion coverage that has occurred in the past, this suggests that the impacts are moderate but not negligible.

Crop insurance subsidies have likely had small impacts on production for crops and in areas where insurance is broadly available across crops. Crop insurance likely has larger impacts on crop choice when insured crops compete against uninsured crops, or when crops in which revenue insurance is available compete against crops in which only yield insurance is available.<sup>34</sup>

**Dairy Subsidy Policy.** The 2014 Farm Bill suspended long-standing price support programs for milk and a direct payment program tied to milk prices. The replacement, a payment tied to the national average margin between milk price and an index of feed prices, has not attracted much farmer participation at the coverage levels that require farmer-paid premiums. Although milk prices have been low by historical standards, low feed prices have limited the anticipated (and actual) payouts from the program. The impact on milk production remains positive because the long-term expected value of subsidy is positive, but the magnitude of the effect is subject to much debate because it depends on the accuracy of long-term forecasts about milk and feed prices, given that premiums, which were thought to have had substantial subsidy, were written into the farm bill.

Milk marketing orders could also affect trade. These policies, operated by the federal government and also by a few states (including California, which produces almost 20 percent of US milk), raise the price of beverage milk and other products that are mostly not traded internationally (price discrimination) and use that revenue to raise the average revenue per unit of milk produced (price pooling). The result is more production of traded products such as dry milk powder, butter, cheese, and whey. Hence, marketing orders have the potential to stimulate US dairy exports and suppress imports. The policy parameters and impacts are

**Figure 6. Trends in US Domestic Support**

Source: Organisation for Economic Co-operation and Development, "Producer and Consumer Support Estimates Database," accessed May 22, 2017, <http://www.oecd.org/tad/agricultural-policies/producerandconsumersupportestimatesdatabase.htm>.

regional, and no recent national estimates of the quantitative impacts on trade are available.

In summary, US domestic support, as measured by the Organisation for Economic Co-operation and Development's (OECD) Producer Support Estimate, has declined more than 50 percent since 1986 (Figure 6). However, since many of the US domestic support programs are tied to price or revenues, they vary substantially from year to year. For example, US support levels declined to about 10 percent of gross farm receipts in the mid-1990s, but as world prices fell in the late 1990s, support levels more than doubled by the early 2000s. The percentage of support tied to production has also fallen since 1986, but the degree to which subsidies are tied to production rose with the passage of the 2014 Farm Bill.

### US Farm Policy and the WTO

Agricultural subsidies have long been criticized for their distortionary impacts in world markets.<sup>35</sup> During

the 1950s and 1960s, US price supports resulted in large inventories of grains and cotton. Those surpluses were often dumped on world markets as concessional food aid<sup>36</sup> or through direct export subsidies.<sup>37</sup> Food aid recipients may have gained through lower food prices and increased food availability, but foreign producers were hurt through lower prices, and in many instances, commercial exports were displaced by subsidized sales. High price supports also insulated US producers from market signals, which distorted production decisions and depressed world prices.<sup>38</sup>

As US agricultural supports have evolved away from direct price support based on actual plantings to income-support programs decoupled from production, the distortionary effects are less clear. However, Goodwin, and Ashok Mishra<sup>39</sup> and Nathan Hendricks and Daniel Sumner<sup>40</sup> have questioned whether payments are truly decoupled from production, even if the effects are less commodity specific than payments tied to planted acreage.

Since 1995, the United States has been obligated to report agricultural subsidies to the WTO under

**Table 3. Classification of Selected US Domestic Support Policies for WTO Reporting Purposes**

Type of Support	Examples	Classification for WTO Reporting Purposes
Conservation Acreage Set Asides	Conservation Reserve Program	Green
Conservation Cost Share Programs	Conservation Stewardship Program; Environmental Quality Incentives Program	Green
Nutrition Programs	Supplemental Nutrition Assistance Program; National School Lunch Program; Women, Infants, and Children Program	Green
Market Price Support	Sugar Loan Program	Product-Specific Amber
Output-Based Income Support	Marketing Assistance Loan Program	Product-Specific Amber
Crop Insurance Premium Subsidies	Federal Crop Insurance Program	Product-Specific Amber
Decoupled Price-Linked Countercyclical Program	Price Loss Coverage	Non-Product-Specific Amber
Decoupled Revenue-Linked Countercyclical Program	Agricultural Risk Coverage	Non-Product-Specific Amber
Margin Insurance	Dairy Margin Protection Plan	Product-Specific Amber
Biofuel Programs	Biomass Crop Assistance Program	Non-Product-Specific Amber

Source: World Trade Organization, "Agriculture Management Information System," accessed May 22, 2017, <http://agims.wto.org/Pages/SearchNotifCirculated.aspx?ReportId=1201&Reset=true&ReportType=12>.

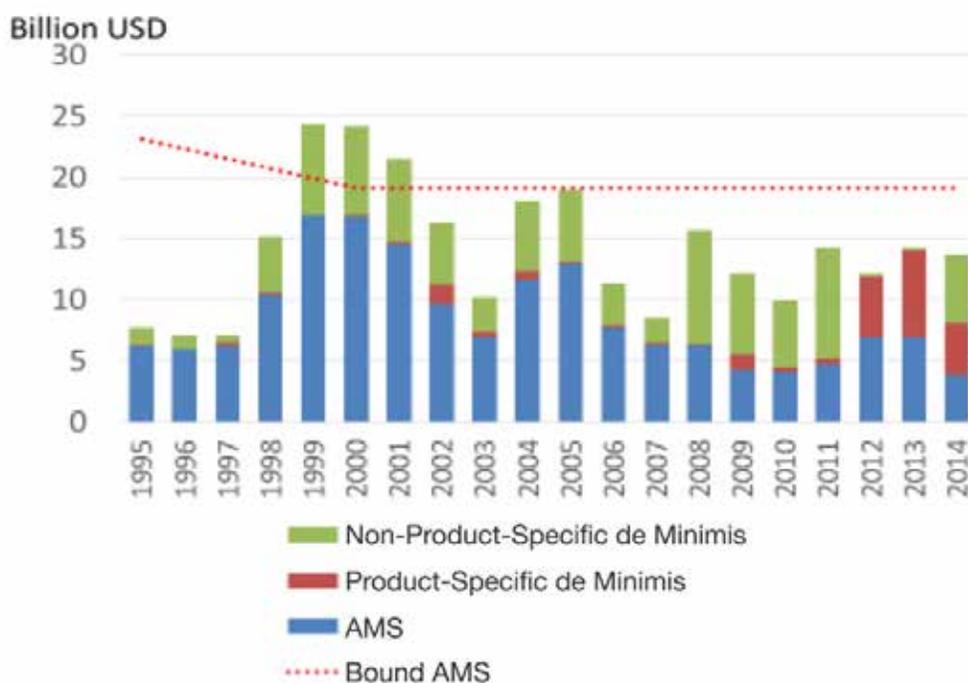
the URAA. Domestic support disciplines under the URAA distinguish among programs that are viewed as minimally trade distorting and those that are not. Green box subsidies are judged to have only minimal trade-distorting effects and are exempt from reduction under the URAA. To be included in the green box, programs must not be tied to current production or current market prices and must meet specific policy criteria spelled out in Annex 2 of the URAA.<sup>41</sup>

Amber box subsidies are classified as having more than minimal trade-distorting effects and are capped under the terms of the AoA. Amber box support includes payments to producers that are tied to current production levels, market price support programs, and other policies that make payments based on current output and current market prices such as crop insurance programs. These subsidies are converted into an aggregate measurement of support

(AMS) using a set of predetermined and prescribed accounting rules. Under the AoA, each country commits to maintain its total current AMS below an agreed level. For the United States, the AMS cap on amber box program subsidies is \$19.1 billion.

Amber box subsidies are further classified into two groups—product-specific and non-product-specific support—and both categories are subject to de minimis tests that exempt support below a specific share of the value of production from the reported AMS. For developed countries such as the United States, if the estimated level of support is less than 5 percent of the value of current production, support is considered de minimis and excluded from calculations of the total current AMS.

Table 3 reflects how the United States has self-notified selected agricultural domestic support programs to the WTO. Most of the programs that provide

**Figure 7. US Total Trade Distorting Support**

Source: World Trade Organization, "Agricultural Information Management System," <http://agims.wto.org/>.

price or income support to producers are reported as amber unless they meet criteria to qualify for Annex 2 (green box) designation. Environmental programs such as the Conservation Reserve Program and Conservation Stewardship Payments are reported as green box as were fixed historical payments under the 1996–2008 farm bills.

US domestic support levels, as measured by the reported AMS, have remained below WTO bindings since reporting began in 1995 (Figure 7). If de minimis support was included, the total AMS would have exceeded limits in 1999–2001. Because of the countercyclical nature of many US farm programs, outlays and AMS levels can fluctuate year to year based on prices, which has raised concerns that new programs could breach AMS bindings if prices for major commodities were to fall to low levels.<sup>42</sup> Since 2002, farm bills have included authority for the US secretary of agriculture to cut agricultural spending if it appeared

that WTO limits would be breached; however, as this situation has never arisen, it is unclear how such remedies would be imposed.

Moreover, countries have raised concerns with how the United States has classified domestic support. In 2007, Canada and Brazil brought separate cases to the WTO Dispute Settlement Body arguing that the United States had misclassified several programs such as crop insurance and countercyclical payments as non-product-specific support. Had the programs been notified as product-specific amber support, they argued, the US AMS would have exceeded US bindings. The cases were ultimately suspended (likely since support levels had fallen considerably by 2008 due to then-record-high commodity prices). Presumably, such cases could be renewed or new cases could be brought to the WTO that would raise similar concerns if support levels were to rise again and seem likely to remain above the limits for an extended period.

## Implications of WTO Dispute Settlement Cases for Agricultural Policy

Since 1995, more than 500 disputes have been brought to the WTO, and more than 350 rulings have been issued.<sup>43</sup> As of May 2017, the US has brought 114 cases against other countries, of which 26 were for alleged violations of the AoA. The US has been the respondent in 129 cases, of which 10 were for alleged violations of the AoA. Many of the cases brought by the United States have involved agricultural products, although in some cases the claim did not involve violations of the AoA.

For example, in 1999, the United States challenged the European Union over using geographic indications (EC—Trademarks and Geographical Indications) under the Trade-Related Aspects of Intellectual Property Rights Agreement. In fact, complainants in WTO disputes will often cite violations in several agreements, so even if a measure is challenged under the AoA, challenges under other agreements may be more relevant and important. Several WTO cases involving US policies have influenced WTO precedent and US laws and regulation affecting agricultural commodities.

The Brazil cotton case (US—Upland Cotton) is probably the most prominent agricultural subsidy dispute to be settled at the WTO. In 2003, Brazil claimed that a wide range of US cotton programs were stimulating additional US cotton production and exports, causing serious prejudice to Brazil cotton producer interests by suppressing and depressing world cotton prices. In addition, Brazil charged that both the US export credit programs (for cotton and other commodities) and the cotton Step 2 program, which paid exporters a competitiveness payment, constituted prohibited export subsidies and should be withdrawn.

The serious prejudice charge was brought, not under the AoA, but under the Subsidies and Countervailing Measures (SCM) Agreement. Under the SCM agreement, the relevant question for the dispute settlement panel was whether in the absence of US cotton subsidies, US cotton production would have been lower and therefore world market prices substantially higher.<sup>44</sup>

In September 2004, a WTO dispute settlement panel ruled that (1) certain US agricultural support payments for cotton suppressed and depressed cotton prices enough to cause serious prejudice and should be either withdrawn or modified to end the serious prejudice, and (2) US Step 2 payments and agricultural export credit guarantees for cotton and other unscheduled commodities were prohibited subsidies under WTO rules and should be withdrawn.<sup>45</sup> Brazil won several additional rounds of appeal and was finally awarded the right to retaliate by withdrawing trade concessions that benefited the United States.

After a few hundred million dollars in payments from the US government to the Brazilian cotton industry, in 2014 Brazil agreed to suspend the WTO retaliation in return for changes made to the cotton program as part of the 2014 Farm Bill. However, dissatisfaction with the resultant program (known informally as the Stacked Income Protection Program), a revenue insurance program that replaced the direct and countercyclical programs, has prompted the US cotton industry to argue for subsidy payments for cottonseed production in the 2018 Farm Bill. Such a program could trigger a WTO challenge by Brazil and perhaps other cotton market participants.

The US—Upland Cotton dispute dealt with specific policies and market issues and may not provide a template for challenges to other crop programs as some have argued.<sup>46</sup> Indeed, no other major case has followed this path, although some proposed cases with similar elements have been settled at the early stages. Table 4 shows how US farm subsidies have changed between the 2013 reporting year (the 2008 Farm Bill and market conditions during that period) and the 2015 reporting year (2014 Farm Bill and 2015 market conditions). ARC and PLC payments are included in support levels for 2015.<sup>47</sup> Each of the selected crops shows an increase in domestic support measured as a percentage of that crop's production value.

Furthermore, crop insurance subsidies are not included in these calculations. Table 4 also shows that export market shares have increased for all crops shown except wheat since the passage of the 2014 Farm Bill. While a successful challenge under the SCM agreement would require far more rigorous

**Table 4. Support Levels as Percentage of Revenue and US Share of Global Exports, Before and After the 2014 Farm Bill**

Crop	Domestic Support as a Percentage of Production Value		US Exports as Percentage of World Exports	
	2013	2015*	2011–13	2014–17
Corn	4.9	12.8	31.0	34.9
Cotton	9.2	17.6	26.4	33.7
Peanuts	3.5	48.6	14.5	16.6
Rice	1.4	24.2	7.8	8.1
Soybeans	3.5	6.8	38.6	39.3
Wheat	9.0	20.6	19.1	14.4

Note: \*2015 support levels include payments for ARC and PLC but does not include crop insurance subsidy.

Source: US Department of Agriculture, "Production, Supply and Distribution Online (PS&D)," <https://www.fas.usda.gov/databases/production-supply-and-distribution-online-psd>; World Trade Organization, "Agriculture Management Information System," accessed May 22, 2017, <http://agims.wto.org/Pages/SearchNotifCirculated.aspx?ReportId=1201&Reset=true&ReportType=12>; and Foreign Agriculture Service, "PSD Online," US Department of Agriculture, accessed May 22, 2017, <https://apps.fas.usda.gov/psdonline/app/index.html#/app/home>.

analysis, the Brazil cotton dispute resolution suggests that there likely remains some vulnerability of US programs to challenge and should send a cautionary note to advocates of higher subsidies.

## Conclusions

US agricultural trade has grown significantly over the past 25 years. That trend is anticipated to continue as larger shares of projected US productivity gains are expected to be exported, and import growth is likely to continue reflecting global trends toward more diverse diets. While the United States will continue as a major exporter of food and fiber, its share of world trade will likely diminish as production growth slows relative to that in other places.

The symptoms of disarray in world agriculture that Johnson addressed in the early 1970s have been mitigated somewhat. Policy reforms stimulated in part by trade agreements and formation of the WTO have reduced production and export subsidies and have lowered tariffs to facilitate market-driven trade. Moreover, income gains, in part because of such liberalization, have fueled demand growth, which has further stimulated trade.

Despite progress, distortions remain. After more than 80 years, New Deal farm programs remain fixtures in domestic and global agricultural markets. Farm programs may have been viewed in the 1930s as temporary, emergency measures, but they have so far proved impervious to attempts to eliminate them and the market distortions they create. And while program specifics have been altered, they continue to transfer billions of dollars from taxpayers and consumers to favored industries, thereby modifying production patterns and affecting market prices. The policies continue to have serious consequences for not only world markets and international relationships but also domestic consumers and taxpayers.

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# Notes

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2. We emphasize the compelling nature of trade at the outset to help clarify that when governments attempt to impede trade, such policy takes substantial effort. International trade conventionally means trade between individuals or other entities located in different nation-states. International trade seldom refers to trade between nations. It may even refer to shipments from one division of a company to another as when raw materials are shipped by a company for further processing across a border. Here we will use conventional shorthand and sometimes refer to trade between the United States and some other country to refer to shipments that are from some person or company located in the United States to some individual or company located in some other country. For example, we will use the term “US exports” to mean shipments to buyers located elsewhere from locations in the United States.
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12. The bound tariff rate is the most-favored-nation tariff rate resulting from negotiations under the General Agreement on Tariffs and Trade and incorporated as an integral component of a country’s schedule of concessions or commitments to other World Trade Organization members. World Trade Organization, “Merchandise Trade Statistics,” accessed May 22, 2017, [https://www.wto.org/english/res\\_e/statis\\_e/merch\\_trade\\_stat\\_e.htm](https://www.wto.org/english/res_e/statis_e/merch_trade_stat_e.htm).
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43. World Trade Organization, “Agriculture Management Information System.”
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