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**United States Agricultural Policy
Its Evolution and Impact**

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ABSTRACT

This paper examines the development of US agricultural policy and considers how it has affected US consumers and producers, as well as how US programs affect foreign producers and consumers within the context of the United States' obligations under the World Trade Organization. Throughout its history, the United States has supported the farm sector through a myriad of policies affecting prices, production, and farm incomes. Although many of the policies put in place during the New Deal legislation in the 1930s were seen as temporary at the time, most have persisted in one form or another to the present day. And while many would argue that the form and function of today's agricultural programs are less distortionary than before, the level of support provided to the sector is several billion dollars annually.

Keywords: US agricultural policy, crop insurance, subsidies, WTO, farm bill

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1. INTRODUCTION

The United States has supported the farm sector through a myriad of policies affecting prices, production, and farm incomes. While at least some intervention in agricultural markets dates back to the early days of the republic (for example, tariff policies), most farm policies have their roots in the New Deal legislation of the 1930s. Policies that largely began as temporary stabilization measures to improve farm income relative to other sectors of the economy in the 1930s have persisted to the present. Although the evolution of US policy can broadly be characterized as a move away from direct intervention in markets through purchases and supply control to support measures more decoupled from actual production and to insurance programs where producers explicitly contribute to protection through premium payments, many of the types of measures in place during the 1930s continue in some form in 2015.

US policy still depends on some tariffs to provide support to producers. Some US programs have elements that supplement domestic demand, extend export demand, reduce supplies, and provide subsidies for some inputs. And while many would argue that these policies are less distortive to production and trade (Orden and Zulauf 2015), the level of support to the sector remains relatively large. Total spending for producer support programs, conservation programs, and crop insurance is estimated to be more than \$200 billion over fiscal years (FYs) 2016 through 2025 (CBO 2016). For mandatory nutrition programs the estimate exceeds \$1.0 trillion.

This paper examines the development of US agricultural policy and considers how it has affected consumers and producers both within and outside the United States. Section 2 gives a brief historical overview of the development of agricultural policy in the United States. The paper then presents a typology of agricultural support policies with particular emphasis on current US programs. In the fourth section we provide an analysis of how programs have affected producers, consumers, and taxpayers over time. We also give consideration to how US programs affect foreign producers and consumers within the context of the United States' obligations under the World Trade Organization (WTO). Conclusions are offered in the final section.

2. A BRIEF HISTORY OF UNITED STATES AGRICULTURAL POLICY

Although most reviews of US agricultural support policy begin with the price support measures of the New Deal, or perhaps the legislative effort to establish such supports during the 1920s, agricultural support policies, broadly defined, date to the earliest years of the nation, even to its colonial origins. Those earliest policies grew out of the interplay of 18th-century beliefs in the primacy of agriculture as an economic, social, and moral undertaking, or at least as the basis of economic power and commerce, and the legacy of immigrant intentions of securing economic and social independence through land ownership and agriculture. Public land grants and sales, which continued well into the 20th century, supported agricultural development through encouraging extensive settlement by both large-scale plantations and ranches and smaller-scale independent farmers. Early large land grants and sales anticipated further distribution of land for individual settlement, understood to be the foundation for secure national expansion and for developing commerce. Legislation beginning in 1790 and continuing through the 1862 Homestead Act and its revisions as late as 1916 steadily reduced minimum prices, eased credit terms, and expanded maximum land purchases to facilitate settlement on the progressively more marginal lands of the Far West (Effland 2000; Cochrane 1979).

As older lands became less fertile and unfamiliar agronomic challenges faced new settlers in the West, public support for investment in agricultural science increased. The US Department of Agriculture (USDA), established in 1862, quickly became home to a growing array of scientific research bureaus that joined the agricultural research of the state land-grant university system to rapidly expand agronomic knowledge and innovation (Baker et al. 1963). With advancing settlement creating a widely dispersed agricultural landscape, public physical infrastructure development through railroad land grants, road building, rural postal delivery, and drainage and irrigation projects and human and social infrastructure development through improved schools and an elaborate federal, state, and local extension program to transfer new agronomic, farm management, and marketing information together supported agricultural development and productivity growth (Gates 1960; Shannon 1973).

Government intervention expanded to include provision of credit to support expansion and adoption of new technologies as fears of insufficient production to support growing urban populations followed rising commodity prices in the early 20th century. With the surge in global demand surrounding World War I, federal intervention to encourage production and control critical food prices established a tacit compact between agricultural producers and government. When war-related government intervention ended and global food demand collapsed with European agricultural recovery and the widespread use of high tariffs to protect national economies, agricultural prices plummeted (Dimitri, Effland, and Conklin 2005).

Industrial development throughout the late 19th and early 20th centuries had created some imbalances in market information and market power between numerous widespread independent farming operations and consolidated, urban-based, transportation, processing, and marketing interests. Antitrust legislation had begun to regulate railroads, meatpackers, and other businesses involved in agricultural markets, but the collapse of the agricultural economy in the 1920s brought renewed, and stronger, calls for government assistance to improve market conditions for producers after their cooperation with government in support of the war effort. New legislation and programs to regulate input suppliers, handlers, and processors and to provide agricultural market information and opportunities for farmer–business cooperation expanded government support to agriculture in hopes of reestablishing stability in agricultural markets. Efforts to gain direct government intervention to support prices through a plan for government-subsidized exports failed consistently throughout the 1920s (Benedict 1953).

Emergency Price Supports, 1929–1948

As the wider economy joined farmers in a severe depression, intervention to support agriculture gained political support from leaders anxious to sustain the productivity of agriculture and the purchasing power of farmers in the wider crisis. Following a brief effort to strengthen cooperative marketing efforts through

a federal Farm Board, full-scale government price support appeared in 1933 with the Agricultural Adjustment Act, followed by a succession of laws that fine-tuned the policy to meet judicial and legislative objections to early emergency measures and to address additional issues raised by agricultural leaders (Hamilton 1991; Benedict 1953).

Unlike the emergence of agricultural support in many other places, US price and broader agricultural support policies did not arise from a need to encourage production. US farmers, with publicly facilitated access to land and new scientific knowledge and technological innovation, had faced chronic price pressures from increasing production for decades before the collapse of the 1920s and continued to be increasingly productive throughout the 1930s. US agricultural support policy emerged from the need to address surplus production, not food shortages, and focused on restoring farm purchasing power and controlling supply. Producers who would agree to reduce acreage of program crops (commodities in chronic surplus at that time—wheat, corn, hogs, cotton, rice, and tobacco) could receive payments based on a “parity” formula intended to bring commodity prices to the purchasing power equivalent of the 1909–1914 period, considered to represent a time of equivalent farm and urban purchasing power (Bowers, Rasmussen, and Baker 1984).

Nonrecourse loans provided a tool for strengthening prices by allowing producers to sell commodities over a longer period and avoid an immediate postharvest supply surge. The loans also allowed producers to forfeit their commodity rather than repay the loan if market prices fell below the loan rates, which served as price floors. Supplies and prices of perishable commodities, including milk, fruits, vegetables, and tree nuts, were addressed through marketing orders that controlled quantity, quality, and timing of marketing. Sugar and dairy producers were also supported through a combination of price support purchases and supply management (Benedict 1953).

While these systems of price support and supply control seemed to improve farm incomes and market conditions, natural production controls through drought and flood played a role in periodic price recoveries. Productivity improvements continued and threatened to undermine supply control efforts by creating ever-increasing surplus commodity stocks throughout the 1930s, and full recovery waited for the outbreak of World War II in Europe, with its attendant restoration of demand. Surplus government stocks provided a military reserve, and increasing demand for food and fiber to supply the US and allied military forces and civilian populations led to increasingly high price supports and relaxed acreage allotments to encourage greater production of an increasingly long list of commodities—well over 100 commodities by the mid-1940s (Bowers, Rasmussen, and Baker 1984).

Institutionalization of Price Supports and Protectionism, 1945–1973

Fear of a postwar recession like that which had followed World War I led Congress to extend wartime price guarantees through 1948. Thus, even with continued high demand for farm products from expanding industrial employment and relief and rebuilding efforts in war-torn Europe and the Pacific, wartime price guarantees remained in place, eroding the association of price supports with emergency conditions. Moreover, many producers had invested the benefits of New Deal and wartime farm programs in expanding and modernizing their operations. The new machinery, electrical power, and chemical inputs they adopted further boosted their productivity and incomes, helping them acquire a standard of living on par with urban workers and business owners. Not confident that markets alone could sustain this newfound prosperity, increasingly organized agriculture sought to consolidate its gains, not to end emergency government intervention.

Postwar farm policy debates reflected divergent views—between income- and price-based support, whether perishable crops should be included, whether support limitations should be placed on support to large-scale farms, and how tightly conservation compliance and supply control should constrain farmers’ production choices. Price support, however, remained the centerpiece of most proposals, with differences focusing only on whether supports should be high and fixed at the level dictated by the original parity formula or flexible and related to levels of current supply. Flexible supports based on a 10-year moving average parity formula won the day, but the outbreak of the Korean War

triggered the national security provision of the 1949 Farm Act and returned high fixed price supports for the duration. Not until 1954, when surpluses had begun to accumulate again, and after further intense debate, did flexible price supports finally become law. At that point, “emergency” price support policies, implemented as a response to economic depression and then war, had been in place for 20 years. They had become embedded in the business plans and production decisions of the increasingly productive commercial farm operations organized to influence farm policy.

Productivity growth continued to pressure prices, however. Growth rates for machinery and chemical inputs reached their highest levels between 1948 and 1970, as the rate of decline in labor use also peaked, all in the context of declining land in farms. At the same time, crop yields increased steadily—for example, wheat yields grew by more than 50 percent from 1948 to 1978 and corn yields grew nearly 40 percent in the same period (USDA, Economic Research Service 2016a, 2016b). Congress enacted the 1954 Agricultural Trade Development and Assistance Act, familiarly known as Public Law (P.L.) 480, to allow for disposal of surplus agricultural commodities abroad and continued long-standing authority to apply import quotas and fees to relieve pressure on prices of supported commodities. Surpluses held in government storage increased, the result of forfeitures under the nonrecourse price support loan program, raising government costs and weighing on markets. In response, the Agricultural Act of 1954 successfully established flexible price supports, varying payments between 75 and 90 percent of parity and basing them on a new parity formula that used purchasing power over a rolling average of the preceding 10 years, rather than from the high-price 1909–1914 period. Further efforts to adjust price support levels and control surpluses followed for the next two decades, including offering producers the opportunity to choose, by referendum, higher price support levels with mandatory supply controls. Supply controls also included payment-in-kind land diversions that both reduced new supplies and drew down stored commodities and a short-lived conservation land retirement program (Bowers, Rasmussen, and Baker 1984; Cochrane and Ryan 1976).

From Price Supports to Direct Payments, Subsidies, and Risk Management, 1973–2015

The solution to the chronic postwar surpluses and their attendant government costs came not through revised policies, however, but through an improved export market, supported by an unexpected global grain shortage and the declining value of the US dollar. The surprise Soviet grain sale of 1972 doubled grain exports in that and the following year, while total agricultural exports increased by 25 percent (Bowers, Rasmussen, and Baker 1984). Consumer prices also rose rapidly, raising questions about farm programs that tried to limit production. In response to both global opportunity for producers and consumer demands for greater production, the longtime market price supports and acreage controls of US farm policy became a policy of target prices and deficiency payments, removing the cost of price support from consumers to government, and releasing controls on production, at least temporarily. Price support loans continued, but at loan rates far below market prices, to reduce forfeitures and encourage greater market orientation in production decisions. Deficiency payments were made directly to producers when market prices fell below target prices but were above loan rates, leaving producers free to sell commodities at market prices without loss of income. Target prices were set according to an index of production costs, rather than the historical parity formulas of past policy.

Rising commodity prices led to competition for land, raising land prices and farm mortgage debt, and the new reliance on export markets introduced greater vulnerability to global economic disruptions and competition. High prices brought increased worldwide production, pressuring prices lower, while inflation continued to increase the cost of farm inputs. Emergency target price and loan rate increases, and marketing controls through a farmer-owned reserve program, brought some relief, as did the combination of expansion of food donations under P.L. 480, a new export credit program, and export subsidies to compete with those provided by other countries. But a succession of political and weather disasters further disrupted markets, including the 1980 grain embargo against the Soviet Union, the costly 1982 payment-in-kind acreage diversion program, and the following 1983 record drought. Simultaneously, budget restrictions limited government responses, precluding increases in target prices and reducing paid

diversions in favor of unpaid acreage reduction requirements. Widespread farm foreclosures in the face of low commodity prices, high production costs, and tight monetary policies that pressured farmland prices and farm debt eventually led to restructuring of the farm credit system.

Beginning in 1985 and culminating in the 1996 Federal Agricultural Improvement and Reform Act (1996 Farm Act), continuing efforts to reduce government costs and move producers toward a greater orientation to markets brought modifications and finally wholesale change to the design of major commodity support programs. The 1985 Food Security Act allowed producers of wheat, feed grains, oilseeds, upland cotton, and rice to repay price support loans at market prices when they fell below loan rates, to discourage forfeiture of commodities under loan. Producers could repay loans whenever they believed prices were at their lowest, retain ownership of their harvested commodity, then sell that commodity later when market prices rose. In 1990, producers were allowed flexibility to plant up to 25 percent of their program acreage to other crops, with the exception of fruits, vegetables, potatoes, and pulses, on program base acreage, with the loss of deficiency payments on those acres.

The 1996 Farm Act, after succeeding years of tightening program rules and high prices had brought program payments to very low levels, ended the target price/deficiency payments program and replaced it with fixed payments based on historical acreage and yields. The legislation also removed virtually all supply management controls, allowing producers the freedom to plant any commodity, with some exceptions for fruits and vegetables, on historical base, or to plant nothing at all, simply maintaining the land in good agricultural condition (Orden, Paarlberg, and Roe 1999).

Proposed as a transitional program to end government support, the payments had been originally envisioned to end after five years, giving producers time to prepare for a largely market-driven sector. By the time the proposal became law, however, the payments, while decreasing each year, were not specifically terminated at the end of the farm bill period, and as prices began to fall again and ad hoc price disaster payments—market loss assistance payments—became an annual event after 1999, the 2002 Farm Act continued the fixed payments and institutionalized the ad hoc market loss payments into a program that made payments on the same historical base when prices fell below targets—the Counter-Cyclical Payments (CCP) Program. Nonrecourse marketing assistance loans continued under the 1996 Farm Act as well, providing a source of benefits through marketing loan gains when loans were paid back below the loan rate (a frequent occurrence during the low-price years of 1999–2001). Producers could alternatively realize the same benefits without taking out loans by applying for loan deficiency payments.

Still, while producers continued to have access to direct payments providing income support, the movement to historically based payments without production requirements signaled a turn toward a more market-oriented approach, leaving producers free to make planting decisions according to likely market returns. With the 1994 and 2000 revisions to the federal crop insurance program, crop producers were slowly moved from nearly annual ad hoc disaster assistance programs toward management of yield and price risks according to their own risk preferences, albeit with increasingly high premium subsidies to encourage participation and higher levels of coverage (Glauber 2012).

The 2008 Farm Act introduced an alternative revenue-based commodity program, which, although not popular among producers, foreshadowed the revised revenue-based commodity choice, Agriculture Risk Coverage (ARC), offered in the 2014 Agricultural Act (2014 Farm Act). The new Farm Act repealed the fixed historical base payments, offering those holding historical base a choice of the ARC Program or the Price Loss Coverage (PLC) Program. ARC's rolling average revenue benchmark could be expected to bring several years of payments for historical base of commodities experiencing rapid price declines from 2008–2012 peaks. For historical base of other commodities, the PLC Program, with higher target prices than the similar but repealed CCP Program, offered greater support. Both programs remain tied to historical acreage without production requirements. Additional support is offered through expanded crop insurance offerings. These provisions retain much of the market orientation benefits of decoupling of payments from production choices and also extend the risk preference orientation of the crop insurance approach.

3. A TYPOLOGY OF UNITED STATES AGRICULTURAL POLICIES

In this section we examine the range of federal programs that affect agriculture and analyze their impact on commodity and food prices. Programs include import restrictions that protect domestic production from foreign competition; supply management policies that raise market prices by restricting supplies; demand enhancement policies that raise market prices by increasing overall demand; export enhancement policies that raise domestic market prices by increasing exports; direct market price supports that typically raise market prices by taking production off the market; direct payments to producers that raise producer returns but through income transfers; input subsidies that reduce input costs to producers; and loss compensation programs, such as crop insurance and disaster assistance, that assist producers during times of yield or revenue losses and livestock producers during times of forage and mortality losses from natural disasters.

The list of federal policies affecting agriculture examined in this section is hardly comprehensive. Not covered here are western water allocation rights, which have tended to favor agriculture; continued infrastructure development, such as roads and railroads, that lowers costs of transporting agricultural commodities and inputs; food safety laws that protect consumers from food-borne illnesses; animal and plant health regulations that help control plant and animal diseases; and tax, macroeconomic, antitrust, and patent policies that provide the broader economic and legal context for agriculture.

Nor does the analysis examine the federal financing of agricultural research and development that has led to large and sustained agricultural productivity gains (Alston et al. 2010; Alston and Pardey 2014). Those gains have resulted in a significant and steady decline in agricultural prices relative to prices of other goods in the economy over the past 70 years.

Policies That Restrict Imports

Although tariffs on agricultural imports date back to the early years of the United States, today, as a result of both unilateral and multilateral liberalization, US agricultural tariffs are among the lowest in the world. The current trade-weighted average is 4.1 percent, and the simple (unweighted) average is 7.8 percent (WTO 2016a). However, there are key exceptions such as sugar, peanuts, orange juice, dairy products, and certain tree nuts (almonds, hazelnuts, and walnuts) where tariffs remain high and insulate domestic prices from lower world prices (Table 3.1).

Table 3.1 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	16.6	188
Fruit, vegetables, plants	4.9	132
Coffee, 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
Other agricultural products	1.1	52
Fish and fish products	1.0	35

Source: World Trade Organization (2016a).

The United States also makes use of domestic trade remedy laws such as antidumping measures and countervailing duties to protect selected products against imports from some countries. Currently, countervailing duties exist 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 (USITC 2016).

The United States has also made use of safeguard provisions under the WTO Agreement on Agriculture (AoA) that allow countries to impose temporary tariffs on certain imports in the event of price declines or import surges.¹ While in recent years their use has declined, under the AoA, the United States has the right to impose safeguards on 189 products (mostly covering dairy and sugar tariff lines). The United States most recently used safeguard provisions in October 2015, when it imposed prohibitive tariffs on butter and sour cream imports for the rest of the 2015 calendar year (WTO 2016b).

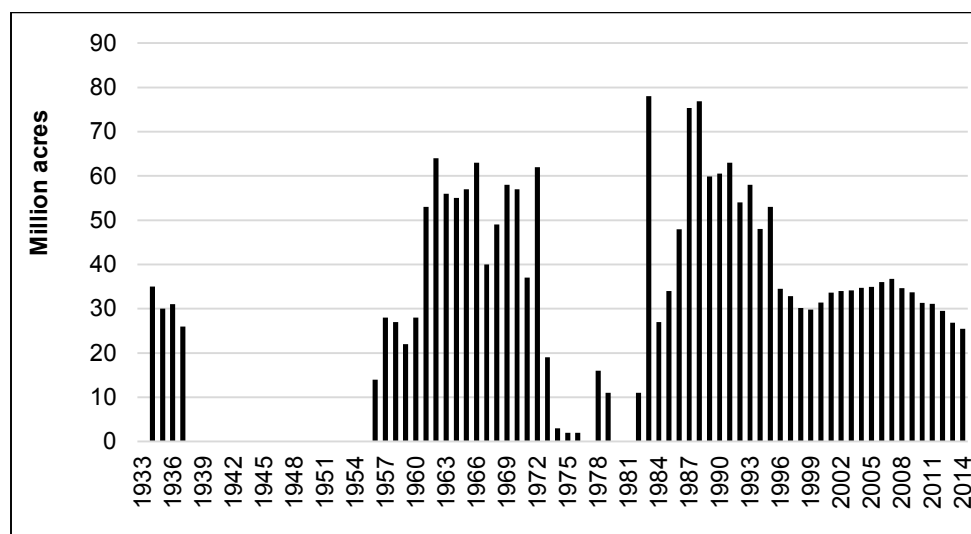
Lastly, nontariff barriers such as country-of-origin labeling requirements, quality standards, and sanitary and phytosanitary standards can also raise effective barriers to imports and raise prices. Although such barriers are generally intended for non-trade-related concerns, their effect of reducing imports can bring challenges under the WTO. 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 (USDA, Agricultural Marketing Service 2016a).

Programs That Restrict Supply through Acreage and Production Controls

One of the traditional instruments used by the United States to raise farm prices dating back to the New Deal legislation of the 1930s has been mandatory and voluntary acreage supply control programs. Acreage control programs have generally been run in tandem with price and income support programs and have been targeted to raise prices or to control costs or both (Gardner 2002).

Mandatory acreage allotments were implemented under the Agricultural Adjustment Act of 1933, and in the first year alone almost 35 million acres were removed from production (Figure 3.1). Production and acreage controls came under sharp criticism from some as reduced production meant reduced economic activity (grain processing, cotton ginning) and many farm tenants and sharecroppers were forced to leave farming (Fishback 2016). Acreage set-aside requirements were removed in the 1938 Act (though allotments and production controls remained), and idled acreage did not come back until the soil bank programs introduced in the mid-1950s reintroduced idled acreage as part of soil conservation programs. Annual crop set-asides were introduced in the 1960s and remained until the 1996 farm bill. Acreage idled under annual and long-term set-asides totaled nearly 80 million acres in the mid-1980s.

Figure 3.1 Cropland idled by federal programs



Source: USDA, Economic Research Service (2016e).

¹ Qualifying products are restricted to those products that were tariffed during the Uruguay Round.

With the repeal of annual crop set-asides by the 1996 Farm Act, the only remaining land set-aside program in the United States is for environmental purposes. The Conservation Reserve Program (CRP) pays a yearly rental payment in exchange for farmers removing environmentally sensitive land from agricultural production and planting species that will improve environmental quality. CRP contracts are competitively awarded on the basis of environmental benefits and typically extend for 10 to 15 years. Since its first year of operation in 1986, the CRP has idled on average 31 million acres annually, but in recent high-price years, contracts matured and many farmers opted to bring land out of retirement. The 2014 farm bill restricts the enrollment of land in the CRP to 25 million acres, and as of October 2015, only 23.4 million acres were enrolled in the CRP, down from 32 million at its peak.

Idled land may have limited effects on production, as much of the land currently enrolled is located in the Great Plains states, land that may be more suitable for fallow cropping rotations and grazing. Between 2007 and 2015, area enrolled in the CRP declined by 13.4 million acres, but land planted to principal crops increased by only 5.3 million acres over the same period, suggesting few CRP acres returned to crop production.

Programs That Restrict Supply through Marketing Quotas and Price Discrimination

Over the past 70 years, the United States has implemented a number of programs that supported prices by limiting the amount of production that could be marketed. The last remaining use of this tool is the sugar program, which limits the amount of sugar that can be marketed at supported prices through the use of marketing allotments. The peanut quota system ended with a buyout of quota rights under the 2002 farm bill and the tobacco quota system ended with a buyout of quota rights under separate legislation in 2004. A different type of supply-limiting system is still available under perishable crop marketing orders that raise product prices by restricting supplies based on quality and, in some cases, through explicit price discrimination between fresh, processed, and export markets. Currently, 29 fruit, vegetable, and tree-crop marketing orders are operating in the United States. All of those orders have quality controls and 10 have volume control options, although volume controls have largely been suspended or are under review due to legal challenge (a recent example is raisins).² Quality controls tend to raise the price of fresh produce in domestic markets by diverting lower-quality produce to processed uses or destruction.

The federal milk marketing order system allows for explicit price discrimination between milk destined for fluid and soft-product uses and more heavily processed products such as milk powder, butter, and cheese. The geographically based federal milk marketing orders set minimum prices paid by milk processors based on end use. These minimum farm milk prices change monthly with shifts in market prices of major dairy commodities. Minimum prices of milk used for fluid beverage products differ geographically, but tend to be about 10 percent to 40 percent above minimum price of milk used for the heavily processed products. In 2014, milk marketed through federal orders accounted for 63 percent of all milk sold and 63 percent of fluid-grade milk sold to US plants and milk dealers (USDA, Agricultural Marketing Service 2016b). A state-run milk marketing order in California that is similar to the federal orders accounted for another 20 percent of US milk production.³

Actual market prices paid to farmers tend to exceed the minimums, and not all regions are covered by marketing orders, so the potential impact of the marketing order system is muted. Chouinard et al. (2010) examined the impact of milk marketing orders and concluded that their elimination would likely result in a 15.5 percent decrease in fluid milk prices while increasing the price of cheese and other dairy products. Their study estimated that the loss from the federal milk marketing orders is equivalent to a loss of income of \$2.94 per week for the average household, or \$153 per year. Moreover, the federal milk marketing orders can disproportionately harm those with lower incomes by raising fluid milk prices, although the program also lowers the prices of manufactured dairy goods such as cheeses.

² Almonds, dates, hazelnuts, prunes, raisins, walnuts, tart cherries, Florida citrus, cranberries, and spearmint oil.

³ California milk producers have recently requested to join the federal system.

Programs That Enhance Domestic Demand

US agricultural policy includes a number of programs that have some impact on demand for agricultural commodities, including commodity checkoff programs that promote products through generic advertising, commodity purchase programs such as those authorized under Section 32 of the Act of August 24, 1935, and nutrition assistance programs (Shields 2014). Policies outside the direct scope of agriculture can also have significant impacts on agricultural demand. For example, during World War II, demand for wool as a strategic commodity (for military uniforms) increased the supply of sheep and as a consequence lamb meat. More recently, the increase in biofuel consumption in part due to mandates under the Renewable Fuel Standard (RFS) has stimulated demand for feedstocks such as corn and soybeans.

While historically nutrition assistance programs were linked to use of surplus commodities, the overwhelming majority of nutrition assistance expenditures now provide low-income households with funds to support retail food purchases through the Supplemental Nutrition Assistance Program (SNAP). The demand enhancement is limited to the additional food purchases made possible by the assistance, and with the likelihood that some of this assistance displaces food expenditures from other income by eligible households, the impacts on food demand will be less than the value of the assistance. Moreover, because the SNAP program does not limit purchases to domestic products, some of that demand enhancement will be shared by imported goods.

Checkoff programs operated by the USDA are implemented at the request of producers of a particular commodity and on the basis of referenda among all producers of that commodity. Once adopted, they are mandatory for all growers. They are grower-funded programs used for a variety of industry enhancement programs including research, market development, and marketing strategies.⁴ Currently, federal checkoff programs are in effect for a wide range of commodities including beef, lamb, pork, soybeans, sorghum, eggs, cotton, dairy, fluid milk, mushrooms, honey, peanuts, popcorn, potatoes, watermelon, cultivated blueberries, raspberries, Haas avocados, and mangos. In addition, federal marketing orders for fruits, vegetables, and nuts are authorized to conduct promotion and research programs.

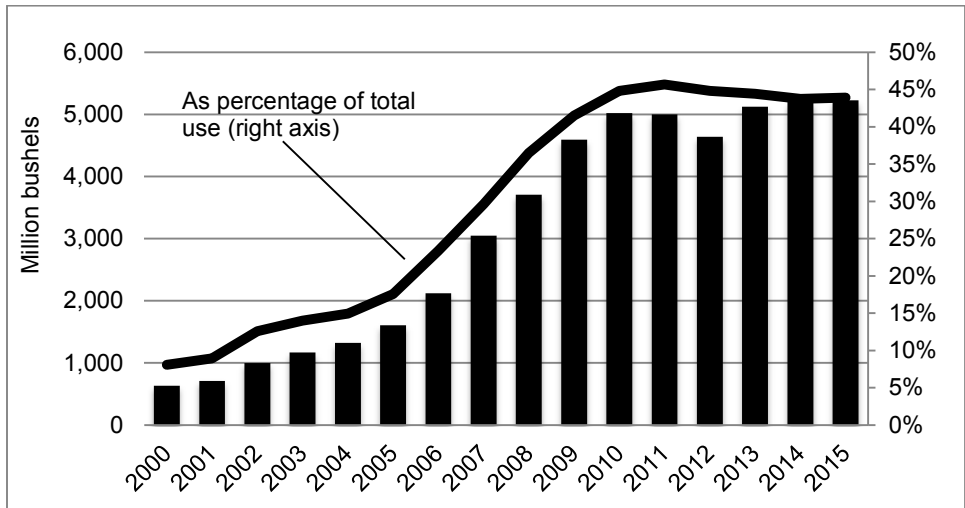
The impact of checkoff programs on commodity prices is likely small (Williams and Capps 2006). Commodity promotion expenditures generally amount to a fraction of 1 percent of the total industry sales each year. Moreover, as Wohlgenant (2006) points out, even if promotion efforts were effective in increasing demand and raising retail prices, little of the benefits may be captured by producers where the farm value of the retail price may be quite low. Checkoff programs, by enhancing consumer demand generally, also benefit imported products.

US biofuel policies have stimulated demand for biofuels and their feedstocks. From 2005 to 2011, US production of corn-based ethanol increased from 3.9 billion gallons to 13.9 billion gallons, at an annual growth rate of almost 24 percent per year. Corn use for ethanol grew by about 3.4 billion bushels, accounting for more than 40 percent of total corn use in 2011/2012 (Figure 3.2a). US biodiesel production rose from just 90 million gallons in 2005 to more than 1.2 billion gallons by 2014. About 25 percent of soybean oil use goes to biodiesel production; other important feedstocks include animal fats and other vegetable oils (Figure 3.2b).

As Babcock and Fabiosa (2011) point out, a number of other factors were critical for ethanol's growth. First, the phaseout of MTBE as a gasoline additive in 2004 and 2005 boosted demand for ethanol as its replacement in oxygenated fuel markets. This growth in ethanol demand combined with existing demand subsidies and a limited supply of ethanol to greatly increase ethanol prices, thus leading to the wide processing margins in 2006 and 2007. Large margins further spurred investment in ethanol production capacity. Second, the rapid rise in oil prices beginning in 2006 encouraged discretionary blending of ethanol as a substitute for gasoline.

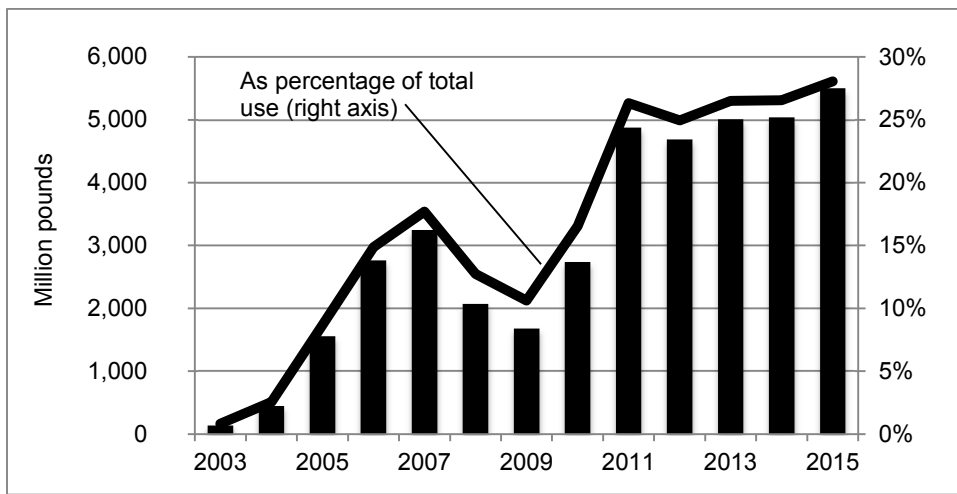
⁴ The Agricultural Marketing Agreement Act of 1937 and several "stand-alone" acts (such as the Beef Promotion and Research Act of 1985) establish the federal statutes for checkoff programs (Williams and Capps 2006).

Figure 3.2a Corn use for ethanol



Source: USDA, Office of the Chief Economist (2016).

Figure 3.2b Soybean oil use for biodiesel



Source: USDA, Office of the Chief Economist (2016).

The rapid rise in corn and other commodity prices in 2007–2008 prompted concerns about the impact of ethanol on food prices both in the United States and abroad. Many critics, like Wright (2014), blamed biofuel production for increased prices and volatility. Condon, Klemick, and Wolverson (2015) review a wide range of studies that considered the impact of ethanol production on corn prices during the period 2007–2010. Their meta-analysis concludes that about one-third of the price increase in corn prices over the period was likely due to increased ethanol production.

Since 2011, corn ethanol production has remained relatively flat at about 13.5 to 14 billion gallons, reflecting automobile performance constraints that limit ethanol penetration in motor fuel use at 10 percent (the so-called blend wall).⁵ Today, the blender tax credits for ethanol have been eliminated as have the high duties on ethanol imports; the RFS mandates established under the Energy Independence

⁵ The US Environmental Protection Agency has approved blends up to 15 percent for conventional automobiles produced after 2001. Automobile engines with flex-fuel capacity can use higher blends of ethanol such as E85. However, sales of higher blends such as E15 and E85 have been sharply constrained by the lack of blender pumps.

Security Act of 2007 have been relaxed reflecting the blend wall constraint. As a result, corn use for ethanol remains at about 5.1 billion bushels per year and is not expected to grow much over the next 10 years (USDA, Office of the Chief Economist 2016).

The RFS's impact on current corn prices is likely small. Ethanol is currently price competitive as an octane enhancer in gasoline production (Irwin and Good 2015). As a result, even with lower oil prices, ethanol production margins remain competitive and ethanol production levels have remained above mandates under the RFS. Thus elimination of the mandates would likely have little impact on ethanol production and hence corn use and prices, at least in the short run. Over the long run, its competitiveness would largely be driven by the relative price difference between corn and petroleum absent consumption mandates.

By contrast, biodiesel production is heavily dependent on the mandates and the current biodiesel tax credit, which provides \$1 per gallon credit for blenders of biodiesel fuel. Under the recent RFS for 2016, mandates for biodiesel were set at 1.9 billion gallons. In the absence of the mandates and tax credits it is unlikely that biodiesel production would be more than one-third of current levels (a number of states and municipalities mandate biodiesel use).

Export Promotion Policies

The United States has long used export enhancement tools to augment exports, including direct export subsidies, subsidized export credit, and food aid. In the 1950s, surplus production acquired through government price support operations (below) was disposed of in world markets as direct food aid or concessional sales (Barrett and Maxwell 2005). Subsidized export credits were used to encourage importers to purchase US commodities. By the early 1990s, most all wheat exports were exported either as food aid or with export subsidies or credits or both. Export subsidies for wheat totaled as much as \$1.3 billion in 1993 (Gardner 1994).

Under the Uruguay Round AoA, the United States agreed to discipline its use of export subsidies. By 1995, the US export subsidies were largely discontinued for most commodities other than dairy. The Export Enhancement Program was eliminated by the 2008 Farm Act, and the Dairy Export Incentives Program was eliminated by the 2014 Farm Act. The recently concluded Nairobi declaration under the WTO prohibits the use of export subsidies by developed countries by 2020 and limits the tenor on subsidized export credits to 18 months. 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 (Schnepf 2014).

US foreign food aid under P.L. 480 has moved from primarily long-term commodity procurement (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 FYs 2006–2013 was about \$2.5 billion annually, with Title II activities averaging nearly \$1.9 billion (76 percent) of annual outlays (Schnepf 2015).

Lastly, the United States provides about \$200 million annually for promotion of US commodities overseas under the Market Access Program and several smaller related programs. Similar to generic advertising (checkoff) programs discussed earlier, the extent of increased demand for US products overseas as a result of these programs is limited.

Market Price Support

Market price support policies were the primary vehicle for supporting US producers from the early days of New Deal legislation to the late 1960s and 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 to low statutory levels (see below). The exception is the sugar price support program, which continues to provide price support through a nonrecourse loan program. This program has maintained domestic sugar prices as high as twice the world price level in recent years. In combination with high external tariffs (see above),

domestic marketing allotments control the supply of sugar that can benefit from high domestic prices. Beghin and Elobeid (2014) estimate that the removal of the sugar program would increase US consumers' welfare by \$2.9 to \$3.5 billion each year. Since 2008, tariffs for sugar coming from Mexico have been zero under the North American Free Trade Agreement, which has put pressure on US domestic sugar prices. In 2013, the United States, at the request of US sugar producers, charged Mexico with subsidizing sugar exports to the United States. In December 2014, a suspension agreement with Mexico was announced whereby Mexico agreed to limit exports to the United States in return for US agreement to suspend its countervailing duty and antidumping investigations.

Market price support is generally considered the most highly distorting form of commodity support, as it encourages production and maintains prices at artificially high prices for consumers.

Support to Producers through Direct Payments

Direct payments supplement producer income through cash (or in-kind) transfers rather than through higher market prices. Currently, the United States provides two types of direct payments, nonrecourse loans with marketing assistance loan provisions and the historically based ARC and PLC programs. Marketing loans support the effective price received by producers at the loan rate while allowing prices to fall to market clearing levels. Unlike the historical nonrecourse loans, marketing loans allow producers to receive a direct benefit, known as a marketing loan gain, by repaying nonrecourse loans at the local market price when that is below the loan rate plus interest. Under a marketing loan, a producer also can benefit from the loan rate without having to take out a loan by applying for a loan deficiency payment that offers a direct payment equivalent to the value of the marketing loan gain. Thus, it is rare to see commodity forfeitures where marketing assistance loan provisions apply.⁶ Marketing loans were first introduced for cotton and rice producers under the 1985 farm bill and by 1996 were available for all grain and oilseed producers. While marketing loan outlays averaged several billion dollars annually over 1998 to 2005, outlays have been negligible more recently as market prices have generally been above loan rates since 2005.

Direct payments through marketing assistance loans and the historically based direct and countercyclical payments before their repeal by the 2014 Farm Act averaged about \$6.6 billion annually over the 2006–2015 period. The impact of direct payments on production and prices largely depends on the degree to which the payments are linked to actual production and prices, though they are less distorting than market price support. Marketing assistance loans are paid based on current production and prices and are generally regarded as highly distorting, particularly when market prices are near or below loan rate levels. Fixed-payment programs based on historical plantings (such as the direct payment program) are generally seen as less distorting because they are decoupled from current prices and production (Young and Westcott 2000; Adams et al. 2001; Goodwin and Mishra 2006). Price-based countercyclical payments tied to historical plantings may have more pronounced production effects for risk-averse producers by providing a hedge against price movements (Anton and Le Mouél 2004). Others researchers have pointed out that the wealth effects of such programs have production-distorting impacts regardless of whether they are directly linked to production (O'Donoghue and Whitaker 2010; Bhaskar and Beghin 2009).

Input Subsidies

Currently, the use of agriculture-specific input subsidies is relatively limited and available only for a small share of farm credit for disadvantaged borrowers, premium subsidies for crop insurance, and cost-share programs for implementing conservation practices that can impose constraints on production, counteracting the production effects often linked to other input subsidies. Approximately 3 to 4 percent of US farm credit is provided through direct and guaranteed operating and farm ownership loans, which

⁶ Forfeitures may occur due to payment limitations (nonrecourse loans are not subject to payment limits unlike marketing loan gains) or when repayment prices do not reflect local market conditions (peanuts).

provide farmers with below-market interest on loans for borrowers whose risks make them unable to secure commercial credit. As part of the federal credit program, these borrowers receive assistance with improving their financial profiles to help them qualify for commercial loans in the future. A share of loan funds under these programs is reserved for beginning, military veteran, and socially disadvantaged farm operators who might otherwise have limited access to credit. Livestock producers who graze cattle, goats, and sheep on public lands benefit from implicit subsidies through grazing land improvement and irrigation infrastructure development, the full costs of which are not always passed through to grazing fees.

Current federal irrigation systems are priced to provide full coverage of operating and maintenance costs (water delivery costs), but low-interest repayments and some loan forgiveness for physical infrastructure have historically provided some relief from full costs.

Cost-share programs for establishing conservation practices on agricultural land have supported implementation of farming practices and structures that reduce loss of fertility through soil erosion; facilitate improved drainage, water storage, and more efficient irrigation; and provide manure storage and assistance with meeting nutrient management regulations. Programs like the Environmental Quality Incentives Program and the Conservation Stewardship Program (CSP) that help cover input costs and income foregone for environmentally friendly practices may reduce productivity or take some years to achieve full production capacity.

The production effects of cost-share programs are difficult to calculate for two reasons. First, the additionality of such programs is likely uncertain—some producers would have adopted such practices without incentive payments or cost-share. Second, although the impact of some of these practices on crop yields may be beneficial over the long run by improving soil fertility, planting conditions, and water availability (thus potentially leading to increased production and lower prices), in the short run the impacts are likely minor and, for some practices, productivity will remain below conventional practices.

Disaster Assistance and Crop Insurance

Disaster assistance programs have provided compensation for losses from weather and other natural events and from market losses through price declines. Losses from disease and disease management may also be compensated by the Animal and Plant Health Inspection Service. In addition to programs triggered by area-wide disasters, the United States has offered crop insurance to producers since 1938 and recently has introduced an insurance-like program for dairy producers.

The US crop insurance program has witnessed dramatic growth over the past 25 years (Glauber 2004, 2012). 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. The program has also seen the development of 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 insurance coverage for some producers. With an annual estimated cost of \$8.5 billion, the US crop insurance program is the largest single domestic support program in the United States (CBO 2016).

When crop insurance is available and priced so that the farm can acquire coverage, risk-averse farms produce more. But the pure subsidy impact also matters. Recent papers by Babcock (2015) and Du, Feng, and Hennessy (2014) point out that if producers are participating in the crop insurance program primarily to “harvest” subsidies, they are not acting optimally (that is, they are not choosing optimal levels of coverage to maximize subsidies). Their studies conclude that farmers’ decisions about how much crop insurance to buy are not generally consistent with either expected profit or simple models taking risk aversion into account. Farmers do not pick coverage levels that maximize expected subsidy nor do they demand full insurance coverage. However, over time, producers have tended to sign up for higher coverage levels where the per-unit subsidies tend to be higher. Glauber (2012) 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.

Measurement of impacts of the US crop insurance program have focused on planted area and the effects of insurance on input use. Goodwin, Vandever, and Deal (2004) 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 less than 0.5 percent. Soybean and wheat acreage showed no statistically significant impact. Ligon (2012) analyzed the impact of crop insurance on specialty crops and concluded that the introduction of crop insurance had a large and positive impact on tree crops, but a negligible impact on non-tree crops. Goodwin and Smith (2012) have questioned whether the results of earlier studies continue to be relevant given that subsidy levels are much higher now than when earlier research was conducted and revenue policies have largely replaced yield coverages. For example, the Goodwin, Vandever, and Deal study examined the effects of insurance subsidies over the period 1986–1993, prior to enactment of major legislation in 1994 and 2000 that dramatically increased subsidy levels, and prior to the introduction of revenue insurance (Glauber 2004). More recently, Yu (2015) finds that increased crop insurance subsidy rates have had significantly positive impacts on production of major field crops, but the magnitude of the overall production increases have been small as a share of total production.

Studies have mostly indicated that crop insurance subsidies have had small impacts on production overall 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 where revenue insurance is available compete against crops where only yield insurance is available.

4. EFFECTS OF UNITED STATES AGRICULTURAL POLICY

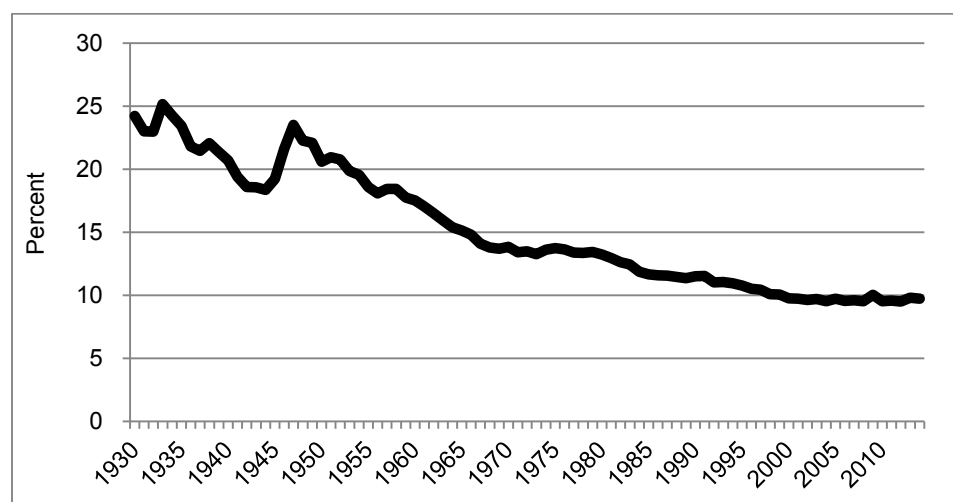
This section begins with an examination of the impact of US agricultural policy on US consumers and taxpayers. It is often argued that the United States enjoys a “cheap food policy.” We also consider the impact on foreign producers and consumers, including US obligations under the WTO. Lastly, we focus on the impact of US agricultural policy on US farmers and ranchers.

Effects on Domestic Consumers

Farmer leaders and members of Congress often promote farm programs as providing Americans with cheap, affordable food. But US farm programs are often criticized by consumer advocates and others for promoting a “cheap food policy” that promotes obesity and other unhealthy dietary outcomes (Tillotson 2004; Franck, Grandi, and Eisenberg 2013). Are there large consumer benefits provided by US agricultural policy and would those benefits be lost if programs were removed?

Food expenditures as a percentage of personal disposable income declined from 25 percent in the early 1930s to about 10 percent by the late 1990s, where it remains today (Figure 4.1). Tweeten (1995) argues that the decline is due to increased agricultural productivity that has lowered food prices and the fact that food purchases are less responsive to changes in income and prices.

Figure 4.1 Food expenditures as percentage of disposable personal income



Source: USDA, Economic Research Service (2016c).

The “cheap food policy” argument has been challenged on several grounds (Miller and Coble 2007; Alston, Sumner, and Vosti 2008; Beghin and Jensen 2008; Rickard, Okrent, and Alston 2013). First, under the current farm legislation, most price and income support policies are decoupled from production and hence likely have small impacts on the amount of land planted to one crop or another (Babcock 2006; Goodwin and Mishra 2006). And while heavily subsidized, crop insurance is generally available across US crops and thus its elimination would not be expected to cause much effect on area or prices.

Second, the farm value of what a consumer purchases in a grocery store is typically quite small and depends on how much processing and marketing costs occur between the farmgate and the grocery shelf. Even for relatively “unprocessed” foods like fresh oranges or fresh pears, the farm value is quite small (Table 4.1). In general, the more highly processed and marketed, the smaller the farm value. For example, while the farm value of whole milk is estimated at 50 percent in 2012, the farm value of cheddar cheese falls to 30 percent and that of ice cream to 15 percent. This is especially significant when considering the retail price impact of a decline in the price of livestock feed components such as corn or

soybeans. Lower feed prices may cause producers to increase the size of their herds or flocks. In the short run that may mean less beef or pork on the market as producers retain stock for breeding purposes. Over the longer run, however, increased beef and pork production will lead to a decrease in beef and pork prices. But feed costs are a small component of livestock production and the farm value of beef and pork prices is small, making the impact of commodity programs on consumer costs for meat also small.

Table 4.1 Farm share of retail price, selected items

Item	Share (%)	Item	Share (%)
Whole milk	50	Bread	7
Cheddar cheese	30	Grapefruit	12
Ice cream	15	Grapes	31
Beef	52	Iceberg lettuce	21
Pork	30	Lemons	16
Apples	32	Peaches	26
Broccoli	24	Pears	22
Flour	26	Potatoes	15
Fresh oranges	15	Strawberries	44
Orange juice from frozen concentrate	24	Sugar	28
Fresh orange juice	15	Tomatoes	27

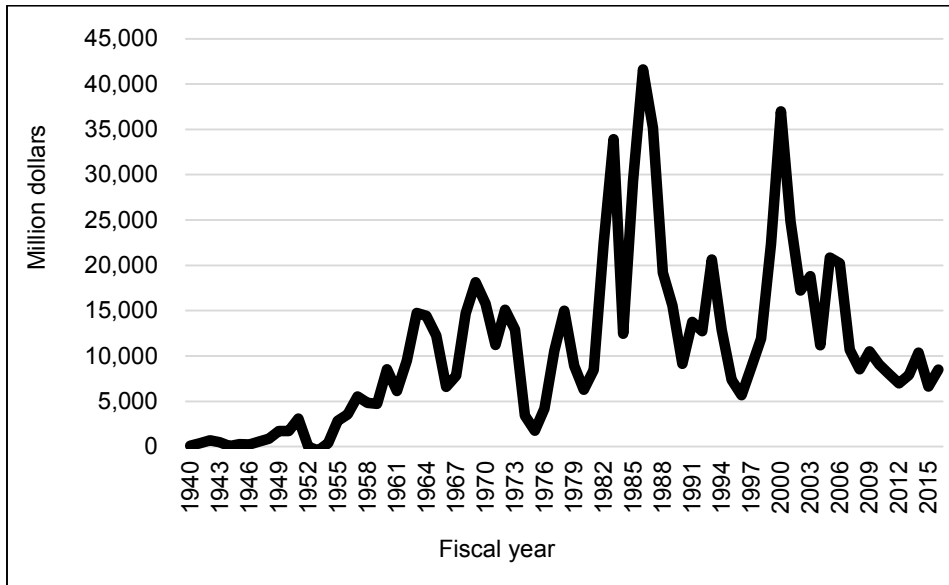
Source: USDA, Economic Research Service (2016c).

Looking at the average basket of food purchased at home, the Economic Research Service estimates that the farm share of the retail food dollar is about 17 percent (Kelly, Canning, and Weersink 2015). The farm share of food eaten at home (which does not include the additional service value of prepared meals) is about 24 percent (USDA, Economic Research Service 2016c). Thus, even large changes in farm prices may have only modest impacts on food prices and consumer expenditures.

Fiscal Costs of Agricultural Programs

Figure 4.2 shows the costs of US price and income support programs since FY 1940. Prior to the 1960s, most federal support was in the form of price support programs, which kept prices high but for which federal outlays were rather modest (Gardner 2002). Adjusting for inflation, outlays have averaged about \$14 billion annually over FYs 1961–2016 (2005 dollars), but with considerable variation. Outlays soared to more than \$40 billion in the mid-1980s amid low world prices and high US support levels and rose again in the late 1990s when world prices fell amid large supplies and the Asian financial crisis. In recent years, commodity supports have been considerably below the long-run average, reflecting higher world prices.

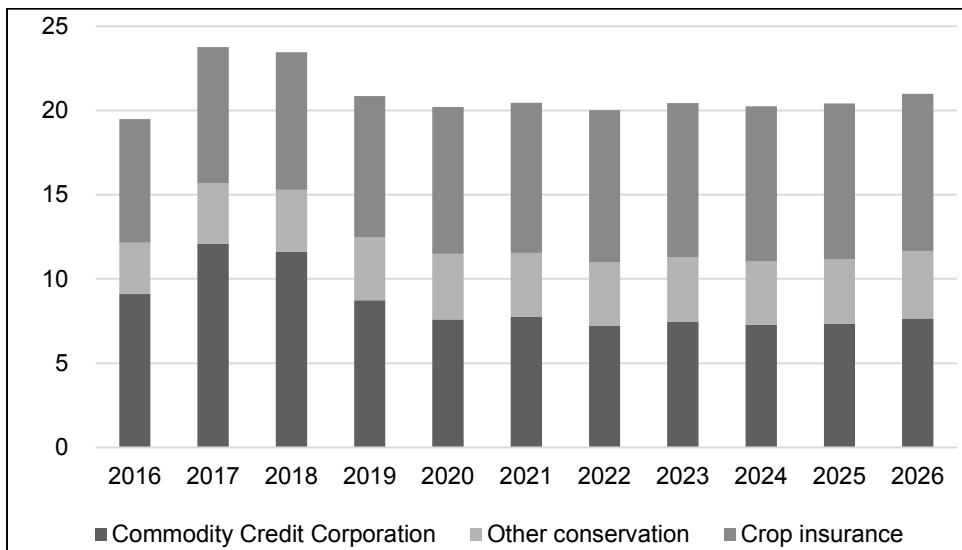
Figure 4.2 Price and income support payments (2005 dollars)



Source: USDA, Farm Service Agency (2016).

The Congressional Budget Office (2016a) projects annual outlays for commodity programs, federal crop insurance, and conservation programs to average \$20 billion over FYs 2017–2026 (Figure 4.3).⁷ While those costs represent transfers from taxpayers to producers and farm landowners, the costs are less than 0.4 percent of total fiscal expenditures and account for about 0.1 percent of total gross domestic product. While transfer payments are generally viewed as less distorting ways of supporting farm income, raising revenues through raising taxes can distort behavior as well (Alston and Hurd 1990).

Figure 4.3 Projected budget outlays for farm programs, FY 2016–2026



Source: Congressional Budget Office (2016a).

⁷ Outlays for nutrition programs are expected to cost another \$100 billion annually (CBO 2016b).

Effects of Farm Programs on Foreign Consumers and Producers

Agricultural subsidies have long been criticized for their distortionary impacts in world markets (Johnson 1973; OECD 1987). During the 1950s and 1960s, US price supports resulted in large inventories of grains and cotton. Those surpluses were often dumped on world markets in the form of concessional food aid (Barrett and Maxwell 2005) or through direct export subsidies (Gardner 1994). While food aid recipients may have gained through lower food prices and increased food availability, foreign producers were hurt through lower prices and, in many instances, commercial exports were displaced by subsidized sales. High price supports also insulated producers from market signals, which distorted production decisions and depressed world prices (Johnson 1973).

As US agricultural supports evolved away from direct price support based on actual plantings to income support programs decoupled from production, the distortionary effects are less clear. Goodwin and Mishra (2005, 2006) and Hendricks and Sumner (2014) 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 the AoA. Domestic support disciplines under the AoA distinguish between 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 AoA. 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 AoA.

Amber box subsidies are judged to have 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 on the basis of 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 like 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.⁸

Table 4.2 reflects how the United States has notified selected agricultural domestic support programs to the WTO. Most of the programs that provide 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 CRP and the CSP are reported as green box as were fixed historical payments under the 1996-through-2008 farm bills.

⁸ A third category of trade-distorting support, called blue box support, is addressed in Article 6.5 of the AoA. Any subsidies and other forms of income transfers that would normally be included in the amber box are placed in the blue box if the program under which those income transfers occur also requires farmers to limit production. Under the AoA, blue box expenditures are not capped and, therefore, not subject to any WTO disciplines. The United States notified its deficiency payment program as blue box in 1995, but that program was eliminated in the 1996 farm bill.

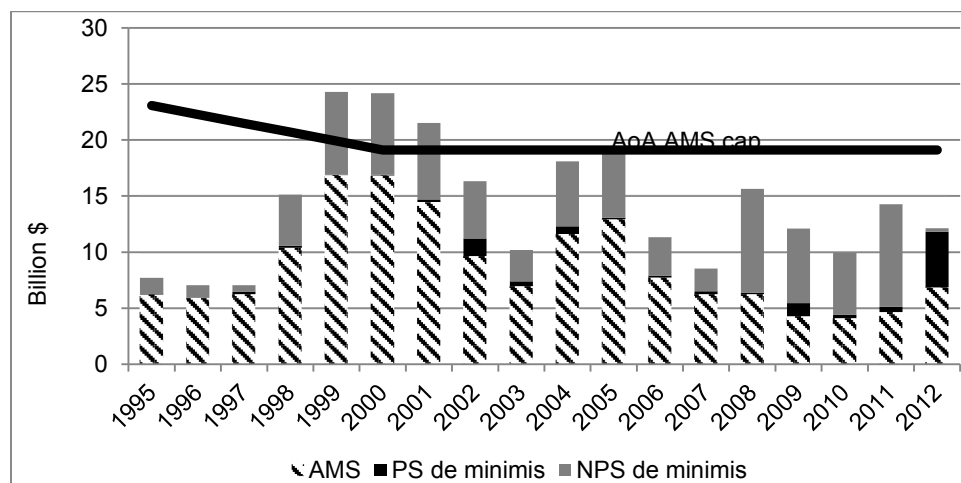
Table 4.2 Classification of domestic support polices for WTO reporting purposes

Type of support	Examples	Classification for WTO reporting purposes
Conservation acreage set-asides	Conservation Reserve Program	Green
Conservation cost-share programs	Conservation Stewardship Program	Green
Nutrition programs	Supplemental Nutrition Assistance Program (SNAP); National School Lunch Program; Women, Infants, and Children	Green
Decoupled payments	Direct payments	Green
Credit programs for disadvantaged borrowers	Direct farm operating loans	Green
Market price support	Sugar loan program	Amber
Output-based income support	Marketing assistance loan program	Amber
Crop insurance premium subsidies	Federal crop insurance program	Amber
Decoupled price-linked countercyclical programs	Price Loss Coverage	Likely amber (not yet notified)
Decoupled revenue-linked countercyclical programs	Agriculture Risk Coverage	Likely amber (not yet notified)
Margin insurance	Dairy Margin Protection Program	Likely amber (not yet notified)
Biofuel programs	Biomass Crop Assistance Programs	Amber

Source: World Trade Organization (2016c).

US domestic support levels, as measured by the reported AMS, have remained below WTO bindings since reporting began in 1995 (Figure 4.4). If de minimis support were 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 (Glauber and Westhoff 2016). Farm bills since 2002 have included authority for the 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.

Figure 4.4 Total US amber support



Source: World Trade Organization (2016c).

Note: AoA = WTO Agreement on Agriculture, AMS = aggregate measure of support, PS = product-specific; NPS = non-product-specific.

In addition, US subsidies have been criticized for lowering global farm commodity prices and thereby lowering incomes of poor farmers who produce commodities that compete with US exports (Sumner 2005). That issue was part of a global controversy over US cotton policy linked to Brazil's successful challenge of US support programs for cotton under the WTO Agreement on Subsidies and Countervailing Measures, which found that US subsidies caused serious prejudice to cotton producers in Brazil (Andersen and Taylor 2009–2010; Glauber 2015; Lau, Schropp, and Sumner 2015).

Environmental Effects

US agricultural policies are often touted as promoting many objectives. In signing the 2014 farm bill, President Barack Obama compared it to a “Swiss Army Knife” calling it “a Jobs Bill, an Innovation Bill, a Research Bill, and a Conservation Bill” (White House 2014). An examination of how US agricultural policies meet all of those objectives is beyond the scope of this chapter, and in the case of rural development, is treated elsewhere in this volume. However, because they account for a significant portion of the agricultural budget, we will mention the effects of conservation programs on the environment.⁹

Conservation programs have been a significant part of US agricultural policies since the 1930s. The Conservation Reserve Program and its predecessor, the Soil Bank, removed millions of acres from production for purposes of soil conservation and other environmental benefits. Federal cost-share programs to promote investments in conservation investments and practices also date to New Deal legislation of the 1930s. Conservation compliance features, such as requiring producers who receive farm program benefits to refrain from draining wetlands or bringing permanent pasture or forestland into production, have been a part of farm legislation since the mid-1980s.

Two issues that complicate measuring benefits of conservation programs are slippage and additionality. Slippage refers to the fact that incentive payments may encourage the adoption of a certain practice while at the same time other practices may negate or partially offset those benefits. For example, putting land into a long-term set-aside raises prices, which, in turn, may encourage farmers to bring new agricultural lands into production (Wu 2000). Additionality refers to the problem of how to reward farmers for adopting beneficial practices beyond what they would have done anyway. For example, Claasen et al. (2014) estimate that whereas additionality rates for cost-share practices such as nutrient management and buffering are above 80 percent, tillage practices are closer to 56 percent.

Critics have suggested that programs such as the CRP are inefficient means of targeting environmental issues like soil erosion and water quality. Empirical analyses of the CRP suggest that early enrollment was more about getting land out of production than maximizing conservation benefits, while recent enrollments have focused on water quality and other environmental benefits. Hansen (2007) points out that wildlife viewing and recreational hunting account for about 60 percent of the estimated environmental benefits in the CRP.

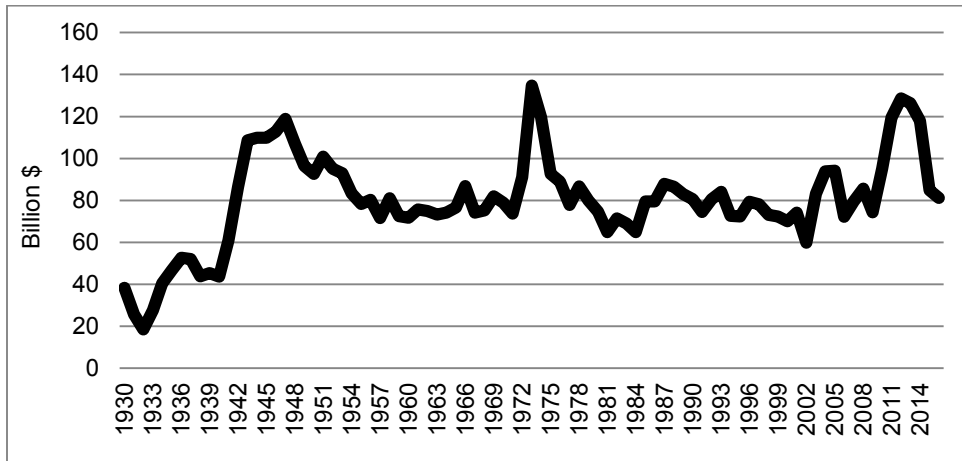
Environmentalists and others also often criticize commodity and crop insurance programs for encouraging overuse of fertilizers and pesticides to maximize production and profits while not fully compensating for environmental damages, such as hypoxia in the Gulf of Mexico caused by nitrogen and phosphate runoff in the Mississippi, Missouri, and Ohio River watersheds (Rabotyagov et al. 2014)

Role of Farm Programs in Farm Income

In the early years of the New Deal programs of the 1930s, the policy emphasis was largely on reducing production and providing measures for the acceleration of the flow of resources into agriculture (Benedict 1953). By the end of the decade, net cash income, adjusted for inflation, had more than doubled, from \$18.4 billion (2009 dollars) in 1932 to \$45.3 billion (2009 dollars) in 1939 (Figure 4.5). By the end of World War II, net cash income had soared to \$112.7 billion (2009 dollars) as demand and commodity prices benefited from wartime demand. Since the mid-1950s, net cash income has averaged \$82.9 billion annually (2009 dollars) with some variation (Figure 4.6).

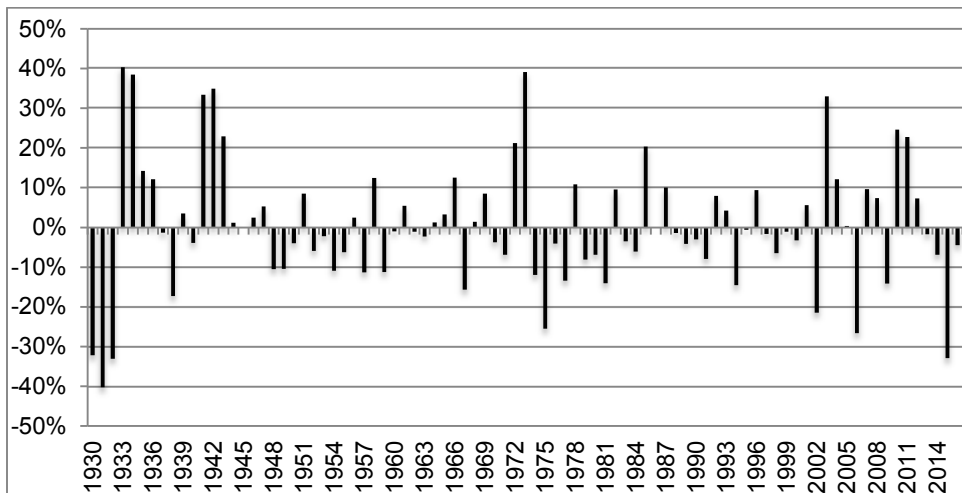
⁹ For a more comprehensive treatment of the environmental effects of the 2014 farm bill, see Lichtenberg (2016).

Figure 4.5 Net cash income (2009 dollars)



Source: USDA, Farm Service Agency (2016).

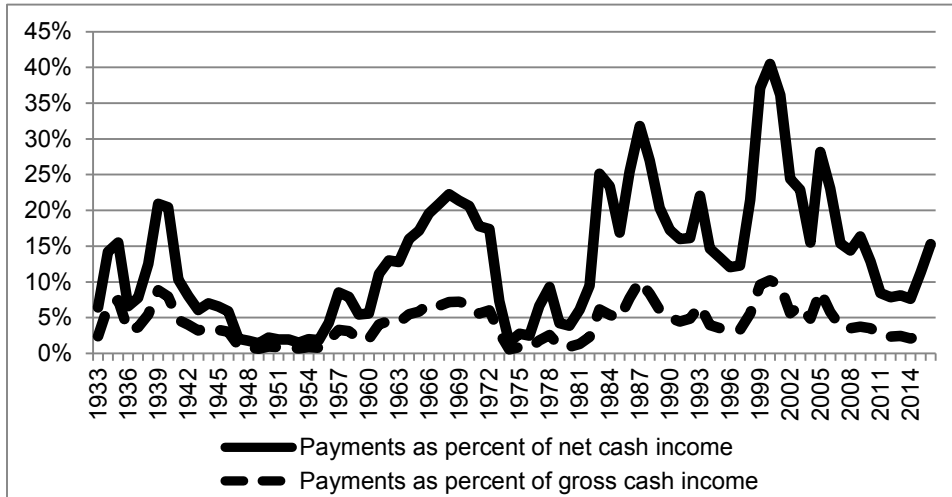
Figure 4.6 Percentage change in net cash income (2009 dollars)



Source: USDA, Economic Research Service (2016).

Over the period 1933–2015, government payments averaged 4.2 percent of gross cash income, and 13.3 percent of net cash income (Figure 4.7). Payments as a percentage of income were generally small in the 1950s as support was provided to producers in the form of market price support through nonrecourse loans. As policy shifted to paid land diversions and other direct income supports in the 1960s, payments as a percentage of cash income grew. With the Soviet grain purchases in the early 1970s, market prices rose and payments fell to only 1.5 percent of net cash income by 1974. However, payments rose from the mid-1970s to a peak of almost 32 percent of net cash income in 1987, and Commodity Credit Corporation (CCC) outlays hit record highs as low prices prompted large price-based deficiency payments. Payments hit new highs in the late 1990s as global markets slumped and Congress passed supplemental income support payments. More recently, higher world prices due to the ethanol boom and strong global demand have made for a sharp decline in payments, but nonetheless payments account for 10 to 15 percent of net cash income.

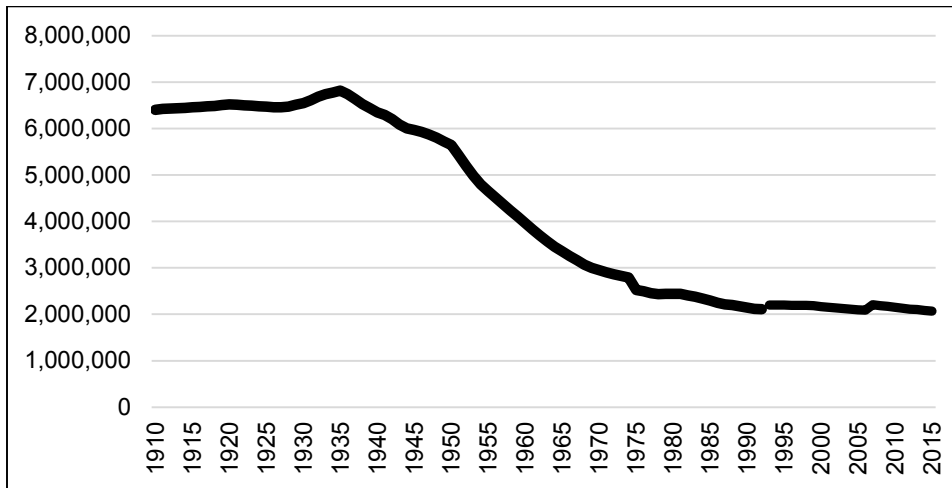
Figure 4.7 Government payments as percentage of gross and net cash income



Source: USDA, Economic Research Service (2016).

Over the period 1935–1975, the number of farms dropped from 6.8 million to 2.5 million, a decline of about 1 million farms per decade (Figure 4.8). While early efforts to reduce acreage and production to boost prices likely contributed to some decline in farm numbers in the early years of the New Deal (Fishback 2016), most research concludes that the sharp decline in farm numbers reflect increased productivity, which favored economies of scale (Gardner 2002) and resulted in farm consolidation and concentration of acreage and production in a smaller percentage of farms (Peterson and Brooks 1993). Writing in 1967, the President’s National Advisory Commission on Rural Poverty expressed concerns over the effects of farm losses and reduced farm labor demand on the “people left behind,” although many rural poor were in areas where mining and forestry, not farming, had been the primary economic activity.

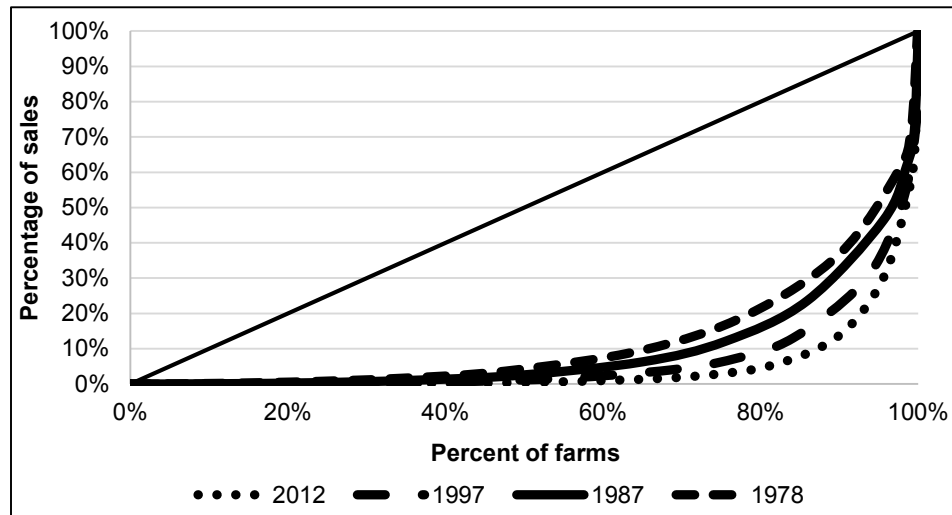
Figure 4.8 Number of farms



Source: USDA, National Agricultural Statistics Service (2016).

The decline in farm numbers slowed in the 1970s, and numbers have remained relatively flat over the past 35 years. The 2012 Census of Agriculture, for example, counted the number of farms at 2.1 million.¹⁰ In large part, the stable numbers reflect changes in farm household income sources. But the stability in farm numbers also masks a growing bipolarity in farm size. The number of small farms with primarily off-farm income sources has been growing, as has the size of commercial farms responsible for most of US commodity production. Commercial farms in the midsize range have either joined the category of farms with primarily off-farm income or grown or been consolidated into larger-size operations. Thus, farm numbers have remained flat despite continued productivity gains and continued trends of concentration of production in fewer and fewer farms (Figure 4.9).

Figure 4.9 Increased concentration of farm sales since 1978

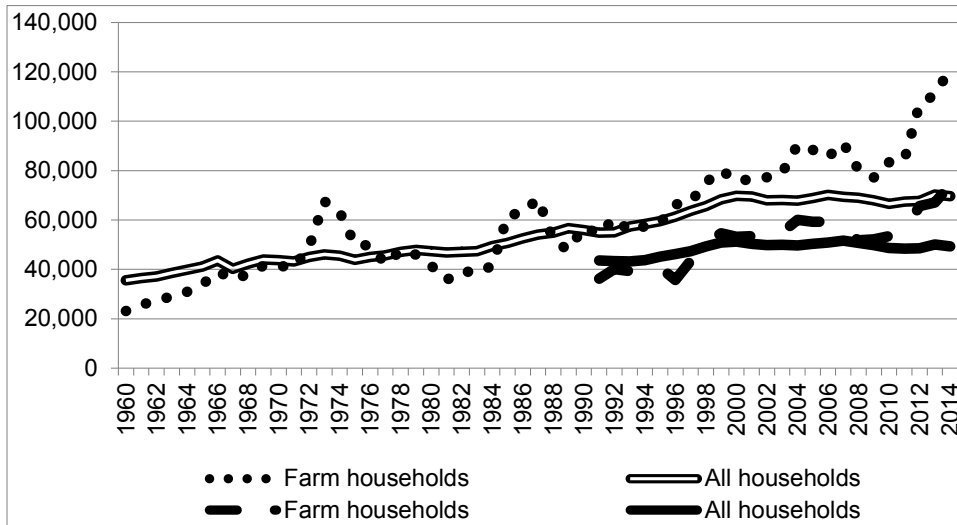


Source: USDA, National Agricultural Statistics Service (2016).

Average farm household income, which had been less than half of the level of all households during the 1930s, and only 65 percent of total households in 1960, increased dramatically in the 1960s and early 1970s such that by 1975, mean farm household income was 114 percent of total household income levels (Figure 4.10). By the mid-1990s, mean and median farm household income exceeded total household income, leading Ahearn, Perry, and El-Osta (1993) to conclude that farm households were no longer a disadvantaged group in income terms and that their mean wealth was significantly larger than that of the nonfarm population.

¹⁰ Exact comparisons between census years are complicated because of changes in farm definitions and different methods of treating nonrespondents.

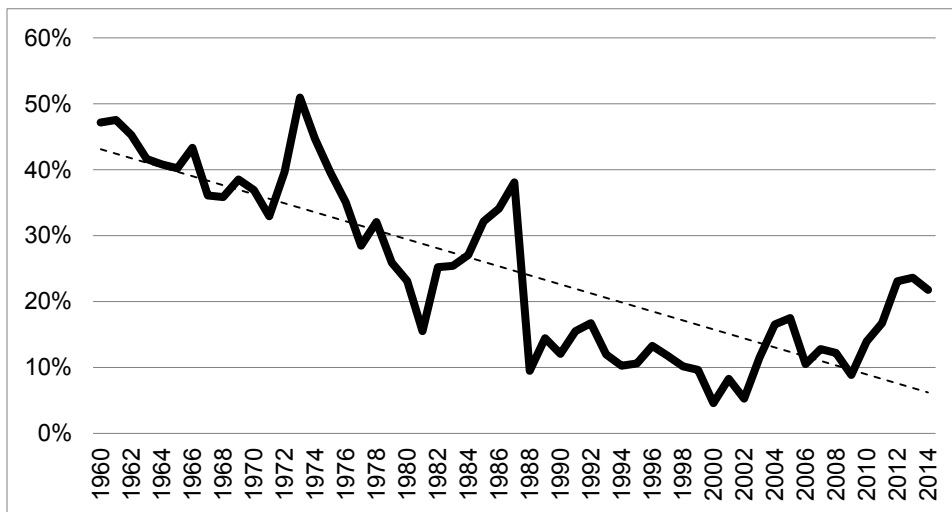
Figure 4.10 Farm household income versus all US household income (2009 dollars)



Source: USDA, Economic Research Service (2016d).

As production and farm income have become more concentrated into a smaller portion of farm households, off-farm income has become an increasingly important source of income for the farm household (Figure 4.11). Roughly half of mean farm household income came from off-farm sources in 1960. By the mid-1990s, farm income accounted for only 10 percent of mean total farm household income. With the rise in farm income levels since 2005, farm income has accounted for about 20 percent of mean total farm household income.

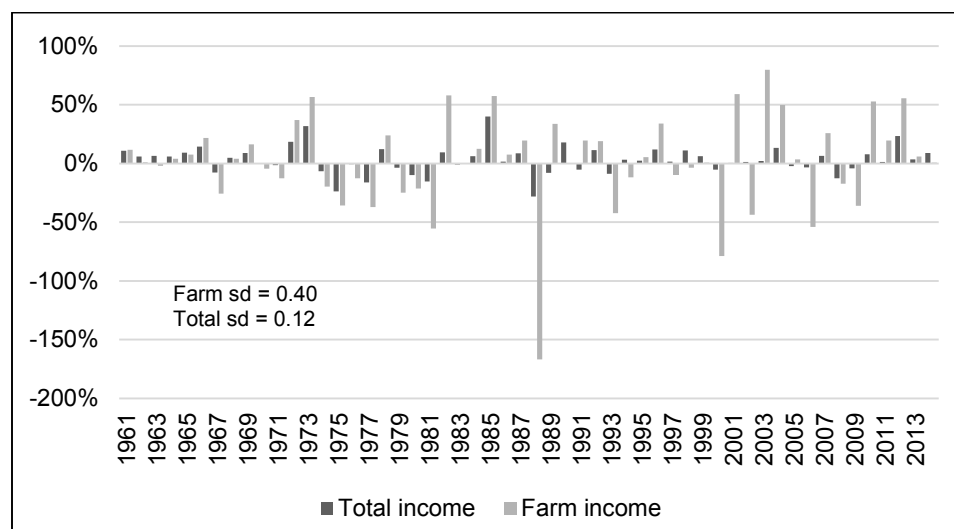
Figure 4.11 Farm income as percentage of total farm household income



Source: USDA, Economic Research Service (2016d).

Off-farm income has also helped to stabilize farm household income because it is less variable than farm income. Figure 4.12 shows the year-to-year percentage change in the portion of farm household income from farming compared to total farm household income. While the annual variation in the farm portion of household income was 40 percent over the period 1960–2015, the annual variation of total farm household income was only 12 percent.

Figure 4.12 Percentage annual change in the farm portion of household income versus total farm household income (2009 dollars)



Source: USDA, Economic Research Service (2016d).

With median farm household incomes in excess of median total household levels, some have questioned why the sector continues to be supported by government price and income support policies (Goodwin 2011). Table 4.3 shows the distribution of farm program payments for various years since 1994. In 1994, for example, 75 percent of commodity payments went to farm households whose total household incomes exceeded \$22,853 (in 2009 dollars). By 2013, 73 percent of payments went to households whose incomes exceeded \$66,581 (in 2009 dollars). Ten percent of commodity payments went to farm households who had total household incomes in excess of \$1.04 million (in 2009 dollars). Not only do the data support the fact that payments have become increasingly concentrated in households with large household incomes, but a larger percentage of payments go to households whose incomes exceed the median level of all (farm and nonfarm) households.

Table 4.3 Distribution of commodity payments (2009 dollars)

Percentiles of the distribution of commodity- related payments	1994	1999	2004	2009	2013
25th percentile	22,853	35,610	41,595	29,723	66,581
50th percentile	63,463	81,062	106,560	100,784	186,671
75th percentile	119,877	170,200	242,698	238,064	457,827
90th percentile	232,718	337,062	498,810	473,685	1,044,977
Median income of all households	43,688	50,829	49,748	49,777	50,110
Percentage of payments paid to households whose income is greater than median of all households	58.9	62.1	69.1	61.2	73.0

Source: USDA, Economic Research Service (2016d).

5. CONCLUSIONS

More than 80 years after passage of the Agricultural Adjustment Act of 1933, U.S. farm programs remain a significant fixture in domestic and global agricultural markets. While farm programs may have been viewed initially as temporary, emergency measures, they have endured and proven impervious to attempts to reduce their scope and magnitude, in part because of a long-lived public inclination to see agriculture as a special kind of economic activity, combining social value and peculiar risks. Policies have evolved from interventionist programs such as market price supports and land set-asides, but current policies such as federal crop insurance and price- and revenue-linked decoupled programs continue to transfer billions of dollars from taxpayers to producers annually, many of whose household incomes and wealth far exceed that of most nonfarm households. At a time when the United States is facing looming budget deficits, and public views toward agriculture seem to be changing, at least toward large commercial farming operations, it would be tempting to conclude that the sustainability of extensive farm budgets may be short-lived. But that would be to ignore 85 years of history, for if nothing else, agricultural programs have shown themselves to be remarkably resilient.

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