United States Department of Agriculture

Economic Research Service

Economic Information Bulletin Number 184

November 2017

The Evolving Distribution of Payments From Commodity, Conservation, and Federal Crop Insurance Programs

Jonathan R. McFadden and Robert A. Hoppe

United States Department of Agriculture

Economic Research Service
www.ers.usda.gov

Recommended citation format for this publication:

McFadden, Jonathan R. and Robert A. Hoppe. *Evolving Distribution of Payments From Commodity, Conservation, and Federal Crop Insurance Programs,* EIB-184, U.S. Department of Agriculture, Economic Research Service, November 2017.

United States Department of Agriculture

Economic Research Service

Economic Information Bulletin Number 184

November 2017

The Evolving Distribution of Payments From Commodity, Conservation, and Federal Crop Insurance Programs

Jonathan R. McFadden and Robert A. Hoppe

Agricultural policies—through Federal commodity, conservation, and crop insurance programs—aim to mitigate the financial risks faced by farmers and the environmental risks posed by agricultural production. The programs also provide support to farmers through direct financial assistance, in the case of commodity and conservation programs, and through premium subsidies in the case of crop insurance. Changes in the structure of agriculture have changed the distribution of income support over time. Specifically, commodity program payments, some conservation program payments, and Federal crop insurance indemnities have shifted to larger farms as U.S. agricultural production continues to consolidate. Since the operators of larger farms have higher household incomes than those of smaller farms, commodity program payments and support through Federal crop insurance have also shifted to higher income households. This study details the extent of that shift over 25 years from 1991 through 2015.

Keywords: Commodity program payments, Federal crop insurance payments, conservation program payments, structural change, Agricultural Resource Management Survey, commodity price changes, risk in agriculture, Agricultural Act of 2014

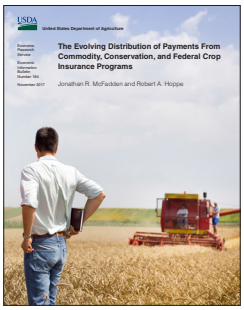
Acknowledgments

The authors thank technical peer reviewers Joe Cooper (USDA-ERS); Keith Coble (Mississippi State University); Joe Glauber (International Food Policy Research Institute); Joy Harwood and Edward Rall (USDA, Farm Service Agency); Thomas Worth (USDA, Risk Management Agency); Douglas Vik, Kalven Trice, and Noel Gollehon (USDA, Natural Resources Conservation Service); and Anne Effland (USDA, Office of the Chief Economist). We thank Jim MacDonald (USDA, ERS) for providing valuable comments and assistance on earlier drafts of the research, and Dale Simms and Cynthia A. Ray (both USDA, ERS) for editorial and design assistance.

Contents

United States Department of Agriculture

A report summary from the Economic Research Service November 2017



The Evolving Distribution of Payments From Commodity, Conservation, and Federal Crop Insurance Programs

Jonathan R. McFadden and Robert A. Hoppe

What Is the Issue?

Federal support to U.S. agriculture takes many forms. For example, the U.S. Department of Agriculture (USDA) administers programs designed to support agricultural productivity growth through scientific research, to control the damages done by agricultural pests and diseases, to improve agricultural market performance through information and reporting programs, and to support small and beginning farmers through credit and educational programs.

USDA also aims to mitigate the financial risks faced by farmers through commodity and crop insurance programs and to maintain and improve natural resources through conservation programs. These programs, through direct financial assistance to farmers in commodity and conservation programs and through premium subsidies paid to insurance companies for Federal crop insurance, provided $16.9 billion in assistance to producers and landowners in 2015. Commercial farms face financial risks from sharp fluctuations in commodity and input prices, and from weather- and pest-related production shocks. These risks may be mitigated in livestock operations that feed animals in controlled-climate facilities under stable contracts with processor/integrators, but they can be substantial for other livestock and crop producers.

The amount of direct financial assistance provided to the farm sector, and its allocation among producers, varies with changes in the design of programs, enrollment decisions of farmers, and the overall state of the farm economy. Changes in farm structure also affect the allocation of support among producers. This report tracks the effect of changes in farm structure on the allocation of support, while taking account of developments in the overall farm economy and program design.

What Did the Study Find?

The composition of direct financial support has shifted. In 1999, commodity programs accounted for 89 percent of commodity and conservation program payments and crop insurance premium subsidies. By 2015, commodity programs amounted to just 43 percent, as the shares of spending from conservation and crop insurance support increased.

Swings in commodity prices affected program payments and household incomes. Crop prices rose generally after 2002, with sharp fluctuations, reaching historic highs in 2008 and 2011-13. While higher prices limited commodity program outlays, they also contributed to sharp increases in household incomes for producers of field crops, including recipients of commodity program payments. Falling crop prices in 2015 led to reduced household incomes.

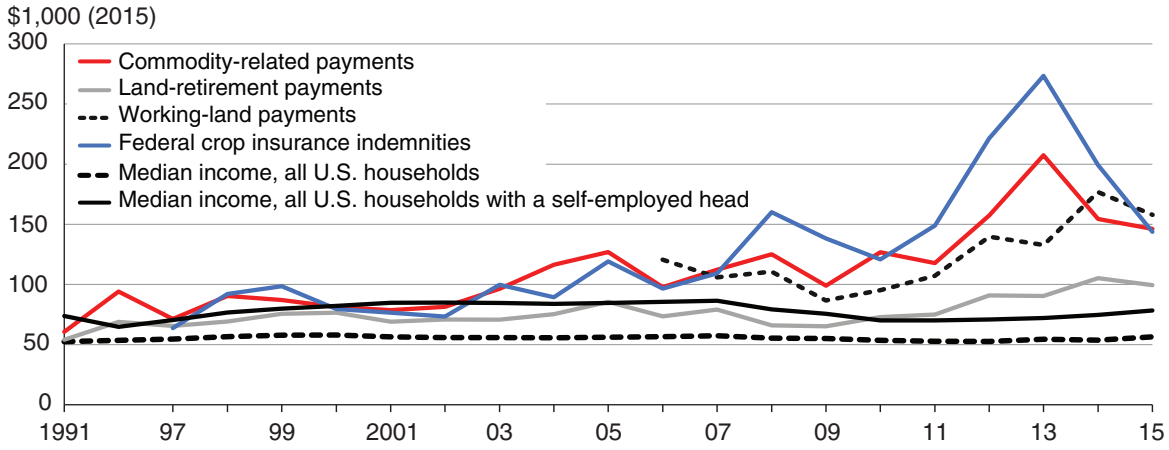
Agricultural production shifted to larger farms, along with commodity program payments and insurance indemnities, between 1991 and 2015. Large farms—those with gross cash farm income before expenses of $1 million or more (in inflation-adjusted 2015 dollars)—increased their share of agricultural production from 23 to 41 percent.

Payments also shifted to farms with higher household incomes, mainly because larger farms tend to be operated by people with higher household incomes. In 1991, half of commodity program payments went to farms operated by households with incomes over $60,717 (in constant 2015 dollars); however, in 2015, half went to households with incomes over $146,126. For context, the median income of U.S. households in 2015 was $56,516, and payments shifted further from the U.S. median throughout 1991-2015. Insurance indemnity payments follow a similar trend but with more interyear variability.

Conservation program payments also shifted to higher income households, but more slowly. In 1991, half of land retirement payments (payments to farmers for retiring environmentally sensitive farmland from production) went to households with incomes no higher than $54,000 (2015 dollars); by 2015, that median value had risen to $99,000. Half of working-land payments (payments to farmers for conserving natural resources on farmland in production) went to households with incomes no greater than $121,000 in 2006 (when our working-lands series starts), and that value increased modestly to $158,000 in 2015.

A dollar of Government payments does not necessarily become a dollar of net benefits to farmers. Program participation can raise farmers' costs (e.g., some conservation programs require adoption of costly practices). Payments can also raise farmland rental rates and land values.

Farm household income at the 50th percentile[1] of Government payments—by type of program—and Federal crop insurance, 1991 and 1996-2015



Note: Household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers. Detailed data on Government payments are not available for 1992-95. Also, crop insurance indemnities represent gross indemnities and do not subtract farmer-paid portions of the premium.
[1]The 50th percentile line for each program shows the farm household income level at which half of the payments went to households with income above that value and half of payments went to households with income below that value. Median incomes for all U.S. households are reported for context. See Appendix B for underlying data in table format.
Source: USDA, Economic Research Service and National Agricultural Statistics Service, 1991 Farm Costs and Returns Survey and 1996-2015 Agricultural Resource Management Survey for farm households. U.S. Bureau of the Census, Current Population Survey for all U.S. households. Federal Reserve Board, Survey of Consumer Finances (SCF) for all U.S. households with a self-employed head. The SCF is conducted every 3 years. Data points between SCF survey years were interpolated.

How Was the Study Conducted?

We use data from four USDA sources to summarize trends in the distribution of payments. ERS Farm Sector Accounts data provide estimates of commodity and conservation program payments to the farm sector, while USDA's Risk Management Agency provides data on Federal crop insurance premium subsidies and indemnities. Farm-level Agricultural Resource Management Survey (conducted jointly by ERS and USDA, National Agricultural Statistics Service) data are used to track flows of program payments and insurance indemnities to different types of farms, and to track flows of farm business income to households. Finally, Census of Agriculture data track changes in crop production and acreage, which are not available from ARMS or administrative data.

The Evolving Distribution of Payments from Commodity, Conservation, and Federal Crop Insurance Programs

Introduction

The Federal Government provides support to agriculture in various direct and indirect ways. USDA agencies perform or support agricultural research and extension, provide timely market information and statistics to improve market functioning and assist farmer decisionmaking, and act to control agricultural pests and diseases. USDA also supports credit programs for farmers, primarily aimed at small and beginning farmers, through the direct provision of farm real estate and operating loans and guarantees provided to non-Government lenders.[1]

Federal crop insurance programs aim to mitigate the substantial yield and revenue risks faced by farmers, while commodity programs also seek to reduce farm financial risks. USDA conservation programs halp farmers conserve natural resources and ameliorate the environmental costs associated with farming activities.

These programs, through payments made directly to farmers under conservation and commodity programs and through premium subsidies provided under crop insurance programs, tend to support farm incomes, a historic goal of commodity programs (Dimitri et al., 2005). When Federal agricultural programs were introduced in the 1930s, farm households averaged lower household incomes than nonfarm households, and poverty was more prevalent among farm than non-farm households, conditions that were not overcome until the mid-1980s (Gardner, 2002). Since then, policy discussions have moved more in the direction of helping farmers address the financial risks of farming. Policy debates continue to focus on the effect of various program designs on income support, risk mitigation, and conservation effectiveness; one specific manifestation of those debates arises in recurrent proposals to cap commodity and conservation payments above a certain level and to set income limits on eligibility for the programs.

In this report, we examine the level and distribution of payments to farmers, through commodity, conservation, and crop insurance programs, and track changes in the distribution over time. In particular, we track trends in the distribution of payments and crop insurance indemnities by farm household income.[2]

[1]Other USDA programs provide new, beginning, small, and limited-resource farmers with outreach and training, expanded cost-share assistance for conservation practices, and assistance in transitioning land from retiring farm operators. Non-USDA Federal activities—including renewable fuel programs, beneficial tax provisions and bankruptcy protection, trade negotiations, and investments in public infrastructure—provide indirect support for farms.

[2]The surveys underlying our analysis do not elicit data on Federal crop insurance premium subsidies from farmer-respondents, who may not know the value of the subsidies. However, the surveys do collect farm-level information on gross indemnities, which we use in this report.

Independent of changes in the design of Federal programs, an ongoing consolidation of farm production has brought about a shift in the distribution of Federal support to agriculture—whether through direct payments or crop insurance—to larger farms. Since operators of larger farms generally have higher household incomes, there has been a simultaneous shift in the distribution of commodity program payments and indemnity payments to higher income farm households. We track the magnitude of that shift over time, and distinguish the long-term effects of structural change from the effects of changes in program design and movements in the farm economy.

This report updates two earlier Economic Research Service (ERS) studies, MacDonald et al. (2006) and White and Hoppe (2012). We extend their analyses through the most recent year for which data are available, 2015. We do not, however, discuss the impact of income eligibility caps and payment limitations, which are covered in White and Hoppe (2012).[3] The 2014 Farm Act introduced changes in the rules, but not enough time has passed to include an evaluation of their impact in this report.

Data Sources

The data for this report are taken from four primary sources: USDA's Farm Sector Accounts, the Agricultural Resource Management Survey (ARMS), the Census of Agriculture, and administrative data from RMA's Federal Crop Insurance Business Summary Reports. The Farm Sector Accounts provide detailed information on program payments by source between 1996 and 2015. These are drawn from administrative data, thus giving relatively complete estimates of all payments from commodity and conservation programs.

ARMS is an annual farm survey administered jointly by USDA's National Agricultural Statistics Service (NASS) and ERS. The survey has collected information on farm finances, production, production practices, and on farm household attributes and finances since 1996. Consistent data collected through a precursor to ARMS, the Farm Costs and Returns Survey (FCRS), are available for 1991. These data allow us to link program payments to farm and farm household attributes (including household incomes and wealth); administrative data generally contain only limited information on farms and none on farm households. The ARMS also elicits information on crop insurance indemnities, and we use that data to track the distribution of indemnity payments in the absence of farm-level data on premium subsidies. Indemnity payments from ARMS data are gross indemnities since they do not net out the farmer-paid portion of the premium costs.

The Census of Agriculture, administered every 5 years, provides comprehensive data on changes in crop production and acreage. This level of detail does not exist in the administrative data or ARMS. RMA's Federal Crop Insurance Business Summary Reports are used to compile data related to Federal crop insurance. Specifically, these reports provide annual information about total policies, premiums, subsidies, liabilities, indemnities, and insured acreage.

The ARMS collects data on program payments as reported by farmers, while the Farm Sector Accounts report data on program payments as reported by the agencies making the payments. Some payments are made to nonfarmers, and hence do not appear in ARMS, and some ARMS respondents underreport the payments that they do receive. These differences, as well as the advantages of using one dataset over another, are explored further in the box, "Differences Between Administrative Data and ARMS Data."

[3]The payment limitation sets the maximum amount of program benefits a person can receive, by law. The income eligibility cap restricts participation in farm programs to individuals with adjusted gross income (AGI) below a certain level. No payment limitation or income eligibility cap exists for Federal crop insurance.

Differences Between Administrative Data and ARMS Data

We use two sources of data on Government payments and Federal indemnity payments—ARMS and administrative data from the USDA program agencies responsible for the payments. The USDA Farm Service Agency (FSA) administers the commodity-related programs that provide payments directly to farmers. Conservation programs are administered by USDA's FSA and Natural Resources Conservation Service. Federally subsidized crop insurance programs are administered by USDA's Risk Management Agency (RMA), with summaries of indemnity payments provided by the Federal Crop Insurance Summary of Business Reports.

The two types of data have different strengths and weaknesses. Administrative data are comprehensive and report actual Federal Government payouts. The ARMS data are based on information provided by respondents to a sample survey, so they are not comprehensive and are only as accurate as the respondents' records or recollection. But ARMS data have one big advantage over administrative data. Because the survey collects detailed data on farm and farm household attributes, ARMS allows us to examine relationships that cannot be studied with administrative data alone, such as the distribution of payments by farm size and household income.

Other important differences should be kept in mind when comparing results based on ARMS and administrative data. ARMS collects information on the farm business and the principal farm operator's household, while administrative data typically report information for individual beneficiaries or other administrative units. Administrative data are often reported on a fiscal-year basis, while ARMS data are for calendar years. As a result, estimates of total program outlays will differ, and we rely on administrative data adjusted to cover the calendar year—if possible—whenever we report such information. Estimates of the average size of payments can also differ widely since the units of observation in ARMS and administrative data are different. Since we are interested in payments to farms and farm households, we use ARMS data for all estimates of average payment size and the distribution of payments in this report.

While ARMS' coverage of Government program payments and crop insurance indemnities varies by program and over time, in general the survey captures a fairly high percentage of payments. This study uses the ARMS Phase III surveys for information on the types of farms that receive Government payments and insurance indemnities. Since the beginning of the survey in 1996, estimates of Government payments from ARMS are generally between 70 and 80 percent of the corresponding estimates from calendar-year administrative data, and the average capture rate over the period is 76 percent. The administrative data, however, include payments made to share-renting landlords—who are entitled to receive payments in proportion to their share agreement—that are not collected by ARMS.

Comparing Federal crop insurance indemnities from ARMS with administrative data from the RMA is more difficult, because RMA uses crop years instead of calendar years. A crop year starts with the month when the harvest of a given crop typically begins. For example, the 2015 crop year for wheat began on June 1, 2015, and ran through May 30, 2016. Events triggering an indemnity payment in crop year 2015 may not have occurred until calendar year 2016, and the indemnity may not have been received by the farmer until after calendar year 2016. For example, RMA was still recording indemnities paid for the 2015 crop year in its August 21, 2017, Summary of Business Report. In contrast, the 2015 ARMS data record receipt of indemnities in calendar year 2015, regardless of the crop year that generated the payment.

Despite these issues, we calculated the ARMS capture rate[4] for indemnities for each year from 1997 to 2015—the years of ARMS data we used to analyze indemnities. In 2 years (2012 and 2013), the capture rate exceeded 100 percent; in 4 years (1999, 2007, 2014, and 2015), it was roughly 50 percent. In the remaining 13 years, the capture rate ranged between 60 and 80 percent. Averaging the capture rates over the whole 17-year period, however, evens out the differences between calendar and crop years. The average of the capture rates over all 17 years was 72 percent, similar to the 76-percent average for the Government payments capture rate.

[4] The ARMS capture rate for indemnities was calculated by dividing the ARMS estimates of indemnities in a given calendar year by the RMA total indemnities for the corresponding crop year. For example, the 2015 ARMS capture rate divides the 2015 ARMS estimate of indemnities by RMA's total indemnities from the 2015 crop year.

Time Period, Market Fluctuations, and Inflation Effects

This study begins in 1991, when FCRS data were consistent with the ARMS concepts used in 1996-2015, and allows us to track trends over 25 years. For ease in expressing the major trends, we generally focus on 5 years, each of which are 6 years apart—1991, 1997, 2003, 2009, and 2015.[5] However, because of swings in crop prices during 2007-15, which affected the level and distribution of program and indemnity payments, it is more informative to show annual data for certain trends. This helps to reiterate the importance of market fluctuations for partially determining Federal crop insurance payments and certain program payments, and their impact on measures of farm household income.

To account for price changes between 1991 and 2015, we adjust nominal U.S. dollar amounts using three distinct price indices, and express all financial statistics in constant 2015 dollars.[6] However, since payments, farm sales, and household income are related to different parts of the U.S. economy, it is inappropriate to adjust using a single price index. Price adjustments are discussed in more detail in the box, "Adjusting Nominal Data for Price Changes."

Farm Classification and Gross Cash Farm Income

For the purposes of this report, a farm is defined as any place that produces, or normally would produce, at least $1,000 of agricultural commodities. The definition—used by the USDA for statistical purposes—has been in place since 1974, is not adjusted for inflation, and encompasses many very small places with very little agricultural production.

The ARMS reports household income for family farms, which ERS defines as those in which the principal operator and people related to the principal operator by marriage, blood, or adoption own more than 50 percent of the farm business (Hoppe and MacDonald, 2013). A farm operator makes day-to-day decisions on the farm, and a principal operator is the person who is primarily responsible for onsite day-to-day decisions. Family farms may have any form of legal organization—limited liability company (LLC), sole proprietorship, partnership, or corporation.

Nonfamily farms are those in which the operator and relatives do not own a majority of the business. Examples of nonfamily farms include farms owned equally by multiple unrelated business partners, farms operated for a family of absentee owners by a hired manager, and farms operated by publically held corporations. In 2015, family farms represented 99 percent of all farms and 98 percent of those receiving program payments or crop insurance indemnities.

[5]Unless otherwise noted, all trends illustrated in the figures and tables are for calendar years, rather than agricultural marketing or crop years.

[6]Commodity prices illustrated in figures 17 and 18 are expressed in nominal (current-year) U.S. dollars. This is because commodity prices are a major component underlying the Producer Price Index for Farm Products (PPIFP), which would normally be used to inflation-adjust these kinds of prices. Adjusting these figures for inflation would mask large fluctuations in prices.

Adjusting Nominal Data for Price Changes

We examine changes between 1991 and 2015 primarily in:

- The distribution of farms, production, commodity and conservation program payments, and Federal crop insurance indemnity payments by gross cash farm income (GCFI) class;
- The level of program payments and Federal crop insurance indemnities; and
- Income levels of operator households that receive program payments and Federal crop insurance indemnities.

GCFI, program and insurance indemnity payments, and farm household income are measured in dollars. Dollar values are affected by price changes; as our focus is on changes in production and purchasing power, we need to account for price fluctuations between 1991 and 2015.

The importance of accounting for price changes can be seen in a simple example. The average corn yield for Illinois in 1991 was 107 bushels per acre, with a marketing-year price of $2.46 per bushel. Thus, the average corn acre in Illinois in 1991 generated $263.22 in revenues (107 bushels times $2.46). In 2015, the average corn yield in Illinois was 175 bushels per acre with a marketing-year price of $3.69, leading to an average per-acre revenue of $645.75. Most of the revenue increase between 1991 and 2015 reflected greater corn productivity, but roughly one-third of this increase is because of higher prices. Without holding prices constant, using revenue to measure production would overstate production increases.

Adjusting for price changes is complicated by aggregating across farm sales. Since there are many different commodities, other farm products, and other nonfarm products that farms and their households buy, there are many different relevant prices. We therefore use price indices, which are weighted averages of prices for a set of goods or services in a certain time period. Differences in goods and services require different price indices:

- **Producer price index (PPI) for farm products.** The farm PPI captures commodity prices received by farmers. This expresses farm sales in constant dollars so that a shift to a higher sales class captures greater physical production and not commodity price increases. Deflating farm sales by PPI for farm products accounts for farm price changes, which allows us to isolate production changes over time.
- **Gross domestic product (GDP) chain-type price index.** Since program and indemnity payments are funded by taxes or borrowing, the relevant price index should capture the general price level in the overall economy. By using the GDP chain-type price index, we can compare payments over time as if we were comparing how much of the economy's output could be purchased across years.
- **Consumer price index for all urban consumers (CPI-U).** When examining changes in household income over time, we need to measure changes in the household's ability to buy a standard basket of goods (i.e., household purchasing power). The CPI-U prices a "market basket" of goods and services that consumers typically buy, with its cost changes over time. A CPI for farm households would be more accurate for this report, but there is no such index.

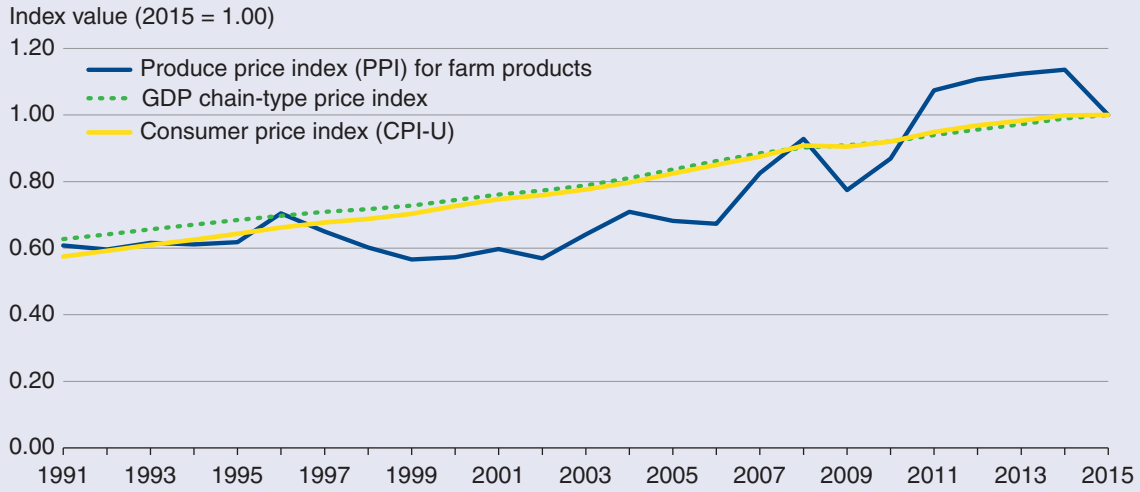
Continued—

Adjusting Nominal Data for Price Changes—continued

All three price indices increased between 1991 and 2015, though the increase was most steady for the CPI-U and the GDP chain-type price index (see figure). There was a drop in all indices in 2009, likely due to contractionary pressure associated with the 2009 recession. The PPI for farm products (PPIFP) experiences more year-to-year fluctuations because of swings in commodity prices. After decreasing during 1996-99, followed by a modest increase in 2002-04, the PPIFP jumped sharply during 2006-08 and again between 2009 and 2011. After a gradual increase from 2011 to 2014, the PPIFP dropped in 2014, reflecting a drop in commodity prices and the beginning of a significant "cooling off" in the farm economy.

Price indices to adjust for price changes, 1991-2015

Consumer and farm product prices have increased, though there is more variability in prices for farm products



Note: GDP is gross domestic product. All indices have been reindexed so that the values for 2015 equal one.
Source: U.S. Department of Labor, Bureau of Labor Statistics for the CPI-U and PPI for farm products (PPIFP); U.S. Department of Commerce, Bureau of Economic Analysis for the GDP chain-type price index.

We further sort family farms according to one of six annual sales classes:

- Less than $10,000
- $10,000-$149,999
- $150,000-$349,999
- $350,000-$499,999
- $500,000-$999,999
- $1 million or more.

The three smallest categories are classified as small farms in the ERS farm typology, which sorts small farms into these categories: *retirement farms* where operators are retired (17 percent of all U.S. farms in 2015), farms where the operators report an *off-farm primary occupation* (42 percent), and *farming-occupation farms* where the operators report farming as their principal occupation (31 percent). The next two classes are classified as *midsize farms* (6 percent), and the million-dollar-plus category is classified as *large-scale farms* (3 percent) (Hoppe and MacDonald, 2016).

We define sales as the gross cash farm income (GCFI) received by the farm business. GCFI includes revenue from crop and livestock sales, fees from contract production, program and indemnity payments, and other farm-related income.[7] GCFI focuses on the revenues received by the farm business and excludes revenues received by other stakeholders, such as the value of farm production flowing to contractors or shared with landlords.

From Farm Sales to Household Income

Farm sales (GCFI) and farm household income are not equivalent. GCFI is the farm's annual total revenue (*before* expenses are deducted). In contrast, operator household income is the income available to the principal operator's household, for consumption or saving, from three distinct sources—farm business net income passed on to the household (*after* expenses are deducted), net income from other farming activities, and off-farm income (see box, "Components of the Principal Operator's Household Income").

Note that a farm household will not necessarily receive income from all sources, and multiple households can share in the net income of the farm business (fig. 1). In our analyses, we track one kind of household: the principal operator's household. Because ARMS questionnaires identify a principal operator and elicit off-farm income for the principal operator's household, ERS is able to develop estimates of household income for principal operator households.[8]

Income sharing with other operator households is not that common because farms generally are family businesses. According to 2015 ARMS data, only 6 percent of all operator households shared net income with another household.

[7]Other farm-related income includes revenues from custom work, machine hire, farmland rentals, livestock grazing fees, timber sales, outdoor recreation, and other items. See Hoppe and MacDonald (2013).

[8]The ARMS questionnaires ask about the number of farm operators. There were 2,059,300 principal operators in 2015—1 per farm—and an additional 917,100 secondary operators, for a total of 2,976,400. Secondary operators share in the day-to-day decisionmaking on the farm operation and are typically family members, usually spouses.

Components of the Principal Operator's Household Income

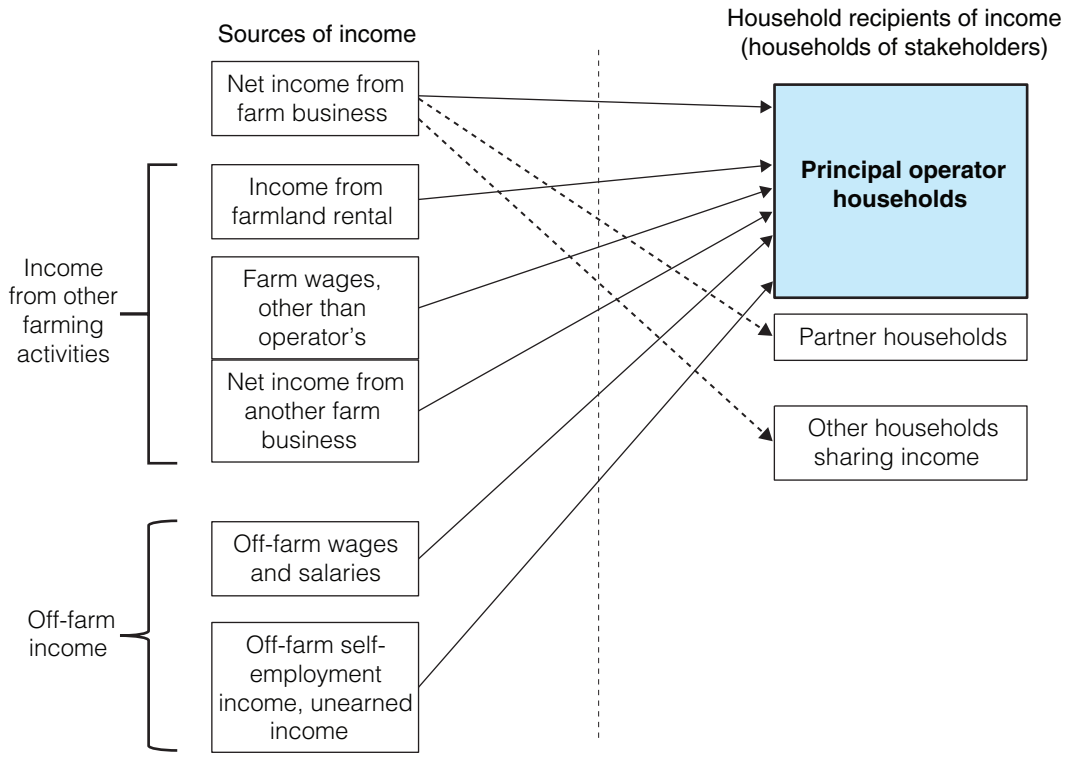
There are three sources of a principal operator's household income: (1) farm business income passed on to the household, (2) income from other farming activities, and (3) income earned off the farm.

Farm business income passed on to the household. This is equal to gross cash farm income (GCFI), less cash expenses, depreciation, and net income from land rentals. The principal operator may not receive all the farm business income. Multiple households—for example, partners in the business or relatives holding a financial interest in the farm—may share in farm business income. For unincorporated farms, farm business income includes the residual return to capital and the operator's labor. For farms organized as C-corporations, the household's farm business income is the dividends that household members receive, plus any wages or salaries they may receive from the farm.

Income from other farming activities. Net income from any other farm business in which the household has an interest, wages paid by the farm business to household members other than the operator (and therefore an expense in farm business income), and net income from farmland rental.

Off-farm income. Income flowing to household members from sources other than farming. It encompasses earned sources, such as wages, salaries, and self-employment income, as well as unearned sources, such as interest, dividends, or transfers (for example, Social Security or employment disability payments). Wages and salaries earned by farm household members from working on other farms are classified as off-farm income because it is not earned on the household's farm.

Figure 1
The flow of income to family farm households



Note: Not all farm households receive income from all sources.
Source: USDA, Economic Research Service.

Farm Programs and Federal Crop Insurance

USDA administers several kinds of programs that make payments to farmers (fig. 2).[9] Some provide payments to producers of specified commodities, generally called "program crops." In our analyses, we aggregate payments under these programs into one category, called "commodity programs." These include:

- **Commodity direct or "fixed" payments** are annual benefits based on a producer's historical acreage ("base acreage") of program crops and historical yields. Between 1996 and 2001, fixed payments were provided as production flexibility contract (PFC) payments before being redesigned in the 2002 Farm Act as direct payments. These direct payments ended as a result of the Agricultural Act of 2014.
- **Countercyclical or countercyclical-type payments** are also based on historical production of program crops, but the payment rates depend on market prices. The countercyclical payment (CCP) program that began with the 2002 Farm Act ended in 2014, as did the countercyclical Average Crop Revenue Election (ACRE) program. Two new countercyclical-type programs have since been established: the Price Loss Coverage (PLC) program and the Agriculture Risk Coverage (ARC) program.
- **Marketing loan benefits** comprise loan deficiency payments (LDPs), marketing loan gains, and certificate exchange gains.[10] Marketing assistance loan programs are based on current production and tend to provide payments when market prices fall below target levels.
- **Disaster, emergency, and other payments** tend to be temporary (until recently), as-needed Government responses to droughts, floods, and other natural disasters. The Supplemental Agricultural Disaster Assistance Program from the 2008 Farm Act replaced previous ad hoc disaster programs. The 2014 Farm Act permanently reauthorized four disaster programs introduced in 2008. We include various other program payments in the "Other Payments" category.[11] These are generally for certain commodities and provide payments based on relevant conditions of the specific program.

We separately report payments made to farmers under USDA conservation programs. For some analyses, we separate conservation program payments into land-retirement programs and working-land programs. Land-retirement programs stipulate that agricultural production cannot occur on land

[9]Throughout the study period (1991 through 2015), there have been many substantive changes to commodity, conservation, and Federal crop insurance programs. A noncomprehensive list of major programs in existence during 1991-2015 is contained in Appendix A. Note that some programs did not make payments in all years in which they were authorized. This could be because market conditions did not warrant payments or there was a lag in payments. For example, not all programs authorized by the 2014 Farm Act resulted in payments to ARMS respondents in 2015. However, the major payment programs discussed above are included in the figures and tables presented throughout the report.

[10]Although farmers did not receive certificate exchange gains from 2012 through 2015, the Consolidated Appropriations Act of 2016 has reauthorized issuance of commodity certificates beginning with the 2015 crop year (USDA/FSA, 2016).

[11]"Other Payments" include payments from the Cotton Transition Assistance Program, Milk Income Loss Payments (which expired with the 2014 Farm Act), the Dairy Margin Protection Program, the Tobacco Transition Payment Program, the Biomass Crop Assistance Program, and miscellaneous programs. Note that the Cotton Ginning Cost-Share Program was in effect during calendar year 2016, so this program's payments are not included in this report.

enrolled in the program.[12] Working-land programs provide payments for maintaining or adopting resource conservation practices on land in production.

We also separately report on Federal crop insurance programs (fig. 3), administered by USDA's Risk Management Agency (RMA). Crop insurance policies are generally designed to protect against either yield losses or revenue losses. The Federal Government bears costs for crop insurance premium subsidies, administrative and operating costs, and underwriting losses (or gains) for programs. Two major insurance programs were implemented in the 2014 Farm Act: the Supplemental Coverage Option (SCO) and the Stacked Income Protection Plan (STAX).

Risk Mitigation

These Federal crop insurance and commodity programs aim to mitigate financial risks faced by farmers. Variability in output prices, input prices, and yields—and thus variability in revenues—are the main sources of these financial risks. In turn, these risks contribute to volatility of farm household income.

A recent ERS study examined the variability of income from farming for households operating commercial farms (GCFI of $350,000 or more) (Key et al., 2017). The authors constructed a panel data set from the 1996-2013 ARMS files, selecting family farms that were surveyed at least twice in the period. The panel data allowed them to follow individual family farms through time.

Farm revenue is highly variable from year to year, fluctuating with output and prices. Aggregate statistics, like the median for all farms, can provide useful insight into how the farm sector as a whole fares from year to year—but can mask considerable variation for individual farms.

Between 2000 and 2014, median farm earnings for commercial farm households as a group ranged from about $70,000 to $180,000, with income fluctuating between consecutive years an average of $20,000 (fig. 4). But this measure averages across farm households and smooths the wide variations that individual households might face. In contrast, a typical or (representative) commercial farm household with the same average income as the median commercial farm household (about $120,000) could see its income fluctuate much more—with an average income swing of $86,000, based on volatility measures generated from the panel data set.[13] A generally profitable commercial farm household will realize negative household income in some years.

Volatility can increase with farm size if households with larger farms receive a larger share of income from farming and a smaller share from off-farm sources, which are generally less volatile than net farm business income. Government payments and Federal crop insurance reduce income volatility for commercial farms.

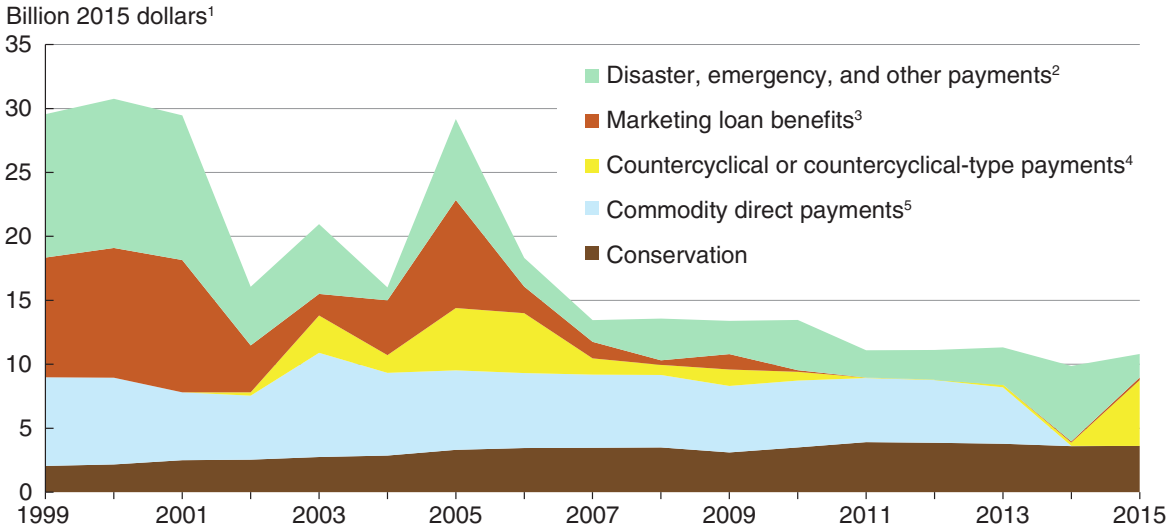
[12]One exception is haying and grazing of acreage enrolled in the Conservation Reserve Program (CRP), either directly managed by the producer or authorized under emergency conditions to provide relief to livestock producers negatively affected by natural disasters. Moreover, the CRP Grasslands program permits protection of pastureland and rangeland while maintaining use for livestock grazing.

[13]Note that the "typical commercial farm" illustrated in fig. 4 is a hypothetical commercial farm. Although the trend line for the typical farm is based directly on ARMS data, it does not represent an actual farm in the dataset.

Figure 2

Government payments by program for calendar years 1999-2015

Conservation payments and direct payments (prior to ending in 2014) are generally stable

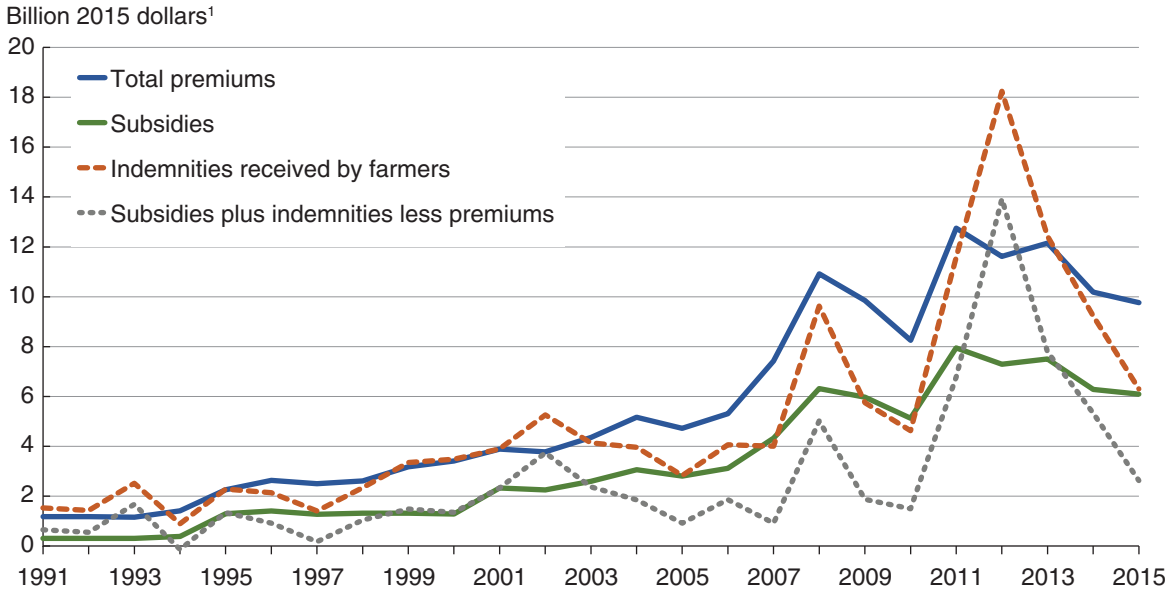


[1]Deflated with the gross domestic product (GDP) chain-type price index.
[2]Includes peanut quota buyout payments, milk income loss payments, tobacco transition payments, cotton transition assistance payments, dairy margin protection payments, biomass crop assistance payments, supplemental and ad hoc disaster assistance, market loss assistance payments (for 1999-2001), and miscellaneous programs.
[3]Includes loan deficiency payments, marketing loan gains, and certificate exchange gains.
[4]Includes countercyclical payments, Average Crop Revenue Election payments, Price Loss Coverage payments, and Agriculture Risk Coverage payments.
[5]Commodity direct payments ended with the 2014 Farm Act.
Source: USDA, Economic Research Service, U.S. and State Farm Income Data (the farm sector accounts).

Figure 3

Federal crop insurance subsidies, indemnities, and premiums for crop years 1991-2015

Subsidies and premiums increased slowly in the 1990s and then rapidly in the mid-2000s before declining between 2013 and 2015

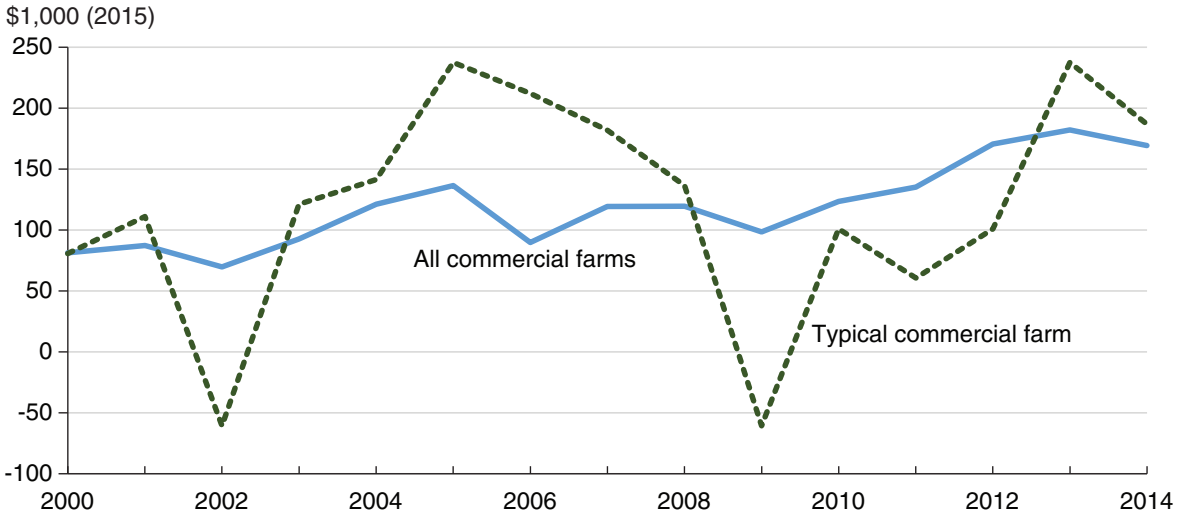


[1]Total premiums, subsidies, and indemnity payments are expressed in 2015 dollars using the gross domestic product (GDP) chain-type price index to adjust for price changes.
Source: USDA, Risk Management Agency, Federal Crop Insurance Corporation, Summary of Business Reports and Data, 1989-93, 1994-2003, 2004-13, and 2014-17 (crop years to date).

Figure 4

Farm income[1] for all commercial farm households and a typical commercial farm household, 2000-2014

Commercial farm households typically experienced wide swings in farm income in recent years



Note: Farm income is expressed in 2015 dollars using the gross domestic product (GDP) chain-type price index to adjust for price changes.
[1]Farm income in this graph is the sum of farm business income passed on to the household and income from other farming activities (see box, "Components of Principal Operator's Household Income").
Source: USDA, Economic Research Service and National Agricultural Statistics Service, 2000-2013 Agricultural Resource Management Survey and USDA, Census of Agriculture, 2014 Tenure, Ownership, and Transition of Agricultural Land Survey. See Key et al. (2017).

Key et al. (2017) also found that income is more volatile for commercial farm households than for nonfarm households; the median change in household income between years is roughly eight times higher for commercial farm households. Income variability, however, seems to be of the same magnitude for farm operators as for the nonfarm self-employed (Congressional Budget Office, 2008).

Government Program Payment Limits and Eligibility Caps

Congress has introduced payment limits and income caps on eligibility for programs in an effort to limit income support for high-income individuals. In the 1970 Farm Act, Congress introduced an upper limit ($55,000) on the annual amount of payments that a producer could receive under certain commodity programs. Payment limits have been adjusted in successive farm bills since then, with separate limits for different commodity and conservation programs, and greater specificity attached to the entity to which a limit was applied (for example, whether to treat married couples as single individuals, for payment limit purposes). The 2014 Act limited total payments to $125,000 to each individual actively engaged in farming, without specific limits on individual programs (with certain exceptions), and allowed a separate $125,000 limit for spouses.

The 2002 Farm Act supplemented payment limits with an income eligibility cap: only individuals or taxable entities with average Adjusted Gross Income (AGI) under $2.5 million would be eligible for farm program payments, unless at least 75 percent of the average AGI was earned from farming,

ranching, or forestry.[14] Subsequent farm bills adjusted the income caps and placed tighter definitions on individuals and taxable entities. Under the 2014 Act, the eligibility cap is set at $900,000, without regard to source, and refers to commodity and conservation programs. No payment limits or eligibility caps apply to Federal crop insurance programs.

The average AGI used for eligibility caps is not strictly comparable to household income, as used in this report. Average AGI is calculated over 3 years, while household income refers to a single year. AGI is calculated on tax forms, and individuals may choose to file separately or jointly (with a spouse), while household income calculates the income flowing to all members of a household. Similarly, payment limits are applied to individuals and entities, but multiple individuals or entities receiving payments may be associated with a given household.

Not enough time has passed to evaluate the impact of changes to the income eligibility cap and payment limits brought about by the 2014 Farm Act. However, past research has found that these caps and limits have not had significant effects on the distribution of Government program payments (Durst, 2007; White and Hoppe, 2012). If agricultural consolidation—and thus the shift of payments to higher income farms—continues, income caps and payment limits may become binding for more producers.

[14]AGI is equal to the household's gross income (e.g., sum of wages and salaries, interest income, dividends, capital gains) minus deductions like contributions to retirement accounts and self-employment taxes. AGI is income that is used to determine the household's income tax liability. For various reasons, AGI can be lower than farm household income calculated from ARMS data used in this report.

Who Gets the Benefits of Government Payments?

In calendar year 2015, the Government provided just over $10.8 billion in payments to the farm sector under commodity and conservation programs and $6.1 billion in crop insurance premium subsidies.[15] Although much of these benefits accrue directly to farmers, one dollar of Government payments does not necessarily become one dollar of net benefits to the farmer because participation in some programs can increase farmers' expenses. Besides flowing directly to farmers, payments can also have significant impacts on markets for land and other productive inputs.

Program payments flow through the farm sector to both farm businesses and farm households (fig. 5). At the business level, payments go to family farms, nonfamily farms, and nonoperator landlords.[16] Because commodity programs are linked to the production of specified field crops, many fruit and vegetable producers and livestock operations do not receive commodity program payments, except insofar as they also produce the specified field crops or have program-eligible base acreage from recent past production of these field crops (Mercier, 2016).[17] Farmers who only produce livestock cannot generally receive commodity program payments, by definition, though assistance is offered through certain conservation programs, dairy programs, and other livestock programs, including the Livestock Indemnity Program and the Livestock Forage Program.

To understand how payments affect farmland rental rates and land values, we first discuss the market for cropland. Other things equal, payments from commodity programs, and in several cases from conservation and Federal crop insurance programs, increase the net returns to farmland since they tend to increase a farm's revenues more than they increase its costs. As with any other long-term asset, an increase in the net returns to farmland will increase the price of that land, through sales prices and/or rental rates. For instance, suppose a landowner rents a plot of land to a farmer and that, for whatever reason, program payments increase. The landowner may realize that the farmer could earn more from the land, and so the landlord could charge a higher rent. Alternatively, other farmers may also realize they can earn higher net returns from the land, and so they may bid higher rents. Through either channel, increases in payments may contribute to bidding up farmland rental rates. When this occurs, some of the benefits of higher program payments accrue to landlords who rent their land through cash leases and who realize higher rents.[18] Over time, higher rents can contribute to increasing land values and land sales prices.

---

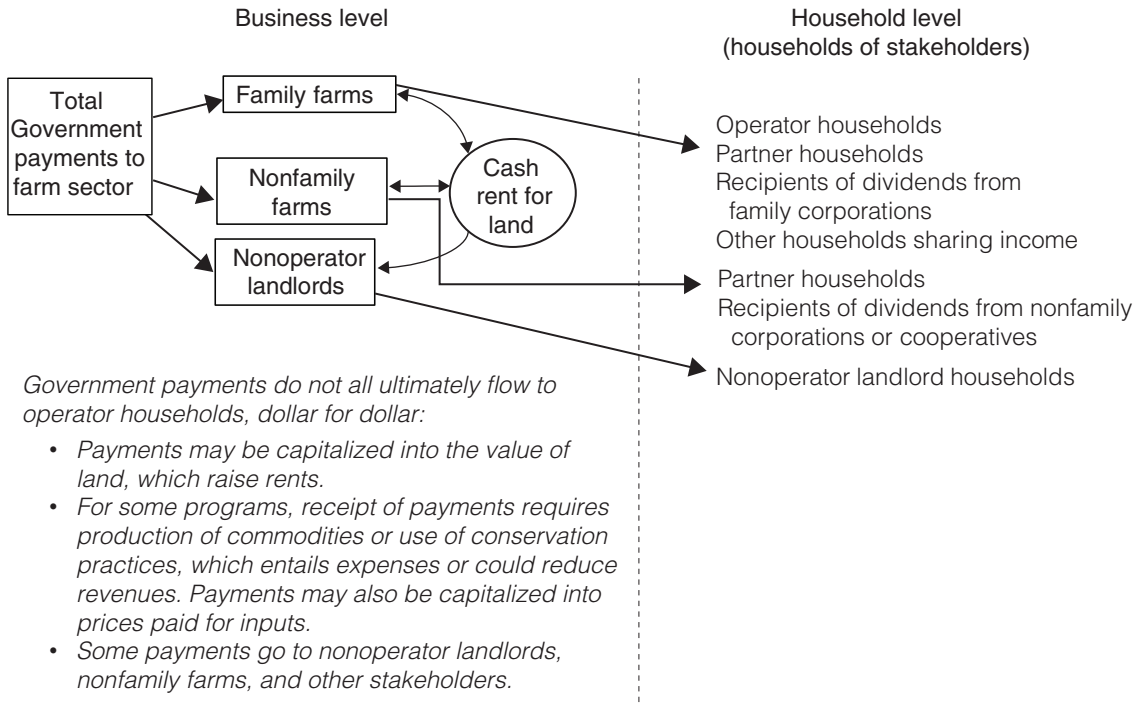
[15]Although Federal crop insurance could impact agricultural input prices, most of the existing research focuses on the effects of other Government program payments on land values.

[16]Landlords with share-rent leases are entitled to receive program payments, reflecting their share agreement, directly from the Government.

[17]Coverage for certain pulse crops began with the 2002 Farm Act. This coverage continues under the PLC and ARC programs of the 2014 Farm Act (USDA/FSA, 2014).

[18]A substantial literature finds that program payments can increase land values and land rents, although there are differences concerning the extent of the increases and the exact split of benefits between landlords and operators. See, for example, Kirwan (2009) and Kirwan and Roberts (2016). Several analyses examine capitalization of fixed direct payments into land values, though a few studies examine the impact of program payments in input markets other than farmland. It should also be noted that farmland prices—as with any other long-term asset—are affected by many supply and demand factors not related to Government programs.

Figure 5
The flow of Government payments through the farm sector



Source: UDSA, Economic Research Service.

Because program payments may increase farmers' expenses as well as their gross income, only part of the benefits from payments *increase* the net income of the farm business. In a simple case, in which a single household operates the farm, the increase in net income then flows from the business to that household. However, there may be other stakeholders, and an increase in a farm's net income may be shared with partners' households, recipients of dividends from family corporations, or other income-sharing households associated with the farm (fig. 5).

Payments From Commodity, Conservation, and Federal Crop Insurance Programs

Federal commodity and conservation payments between 1991 and 2015 were influenced by programs designed and redesigned in six main Farm Acts—in 1985, 1990, 1996, 2002, 2008, and 2014. Federal crop insurance payments resulted from programs established or restructured in the Federal Crop Insurance Act of 1980, Federal Crop Insurance Reform Act of 1994, and the Agricultural Risk Protection Act of 2000. Over this 25-year period, emphasis has shifted from basic, two-tier price and income support systems with production adjustment components to multi-dimensional programs with more planting flexibility, countercyclical support, and options for risk management. Conservation programs have expanded, with greater focus on improving environmental outcomes associated with working lands (Orden and Zulauf, 2015).

To discuss overall trends, we sort Federal expenditures under commodity programs into one of four types (laid out in the section, "Farm Programs and Federal Crop Insurance"), with one aggregate category for conservation programs. Values are adjusted for inflation over time and expressed in 2015 dollars.[19] For purposes of focusing on commodity programs, we chose the period 1999 to 2015 in order to emphasize recent trends, as well as to avoid comparisons of payments before and after the 1996 Farm Act, which brought about substantial changes in commodity farm programs.

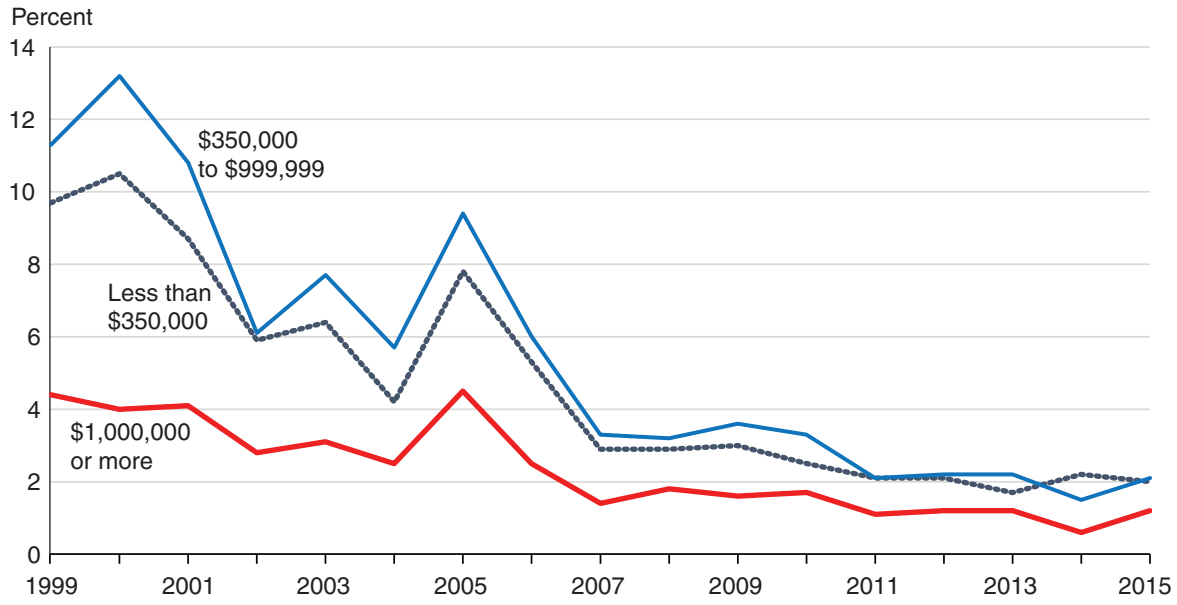
In inflation-adjusted terms, commodity program payments have fallen substantially since peaks in 1999-2001 and 2005, while conservation payments have risen gradually (fig. 2).[20] Prior to their repeal in 2014, fixed Direct Payments (DPs) ranged between $4.4 and $8.1 billion during 1999-2013, approximately 18-45 percent of total Government program payments in this period. During 2002-13, Countercyclical Payments (CCPs) ranged between $35 million and $4.9 billion. These payments during 2011-13 were, in large part, historically low due to historically high real commodity prices (see "Effects of Fluctuations in Commodity Prices," p. 30). Though CCPs were repealed in 2014, payments from the countercyc\lical-type ARC and PLC programs totaled $5.1 billion in 2015.

Commodity payments have fallen, relative to the value of farm production, reflecting reduced real payments, the shift to crop insurance, and increased commodity prices since 1999, regardless of GCFI class. The level of each line in figure 6 reflects the commodities produced by the farms in the GCFI class under consideration. Farms with GCFI less than $350,000 and farms with GCFI from $350,000 to $999,999 both have a larger share of their production in program commodities than farms in the $1,000,000-or-more class, which focus heavily on production of fruit and vegetable crops and livestock. The peaks in 2000 and 2005 reflect large emergency payments in those years. Some of the emergency payments went to farms producing crops and livestock not normally eligible for commodity payments.

[19]We use the chain-type price index for gross domestic product (GDP), an economywide measure of inflation, to reflect changes in the purchasing power of the Federal budget dollar, which could be used to purchase a wide range of goods and services in the economy.

[20]Federal crop insurance is not considered a Government farm program in the ERS data used in this report, so it is excluded from figure 2. Note that we report calendar-year, rather than fiscal-year, payments. For conservation program payments, we do not include the value of technical assistance.

Figure 6
Ratio of commodity-related payments to production by GCFI class, 1999-2015
The ratio dropped for all GCFI classes



Note: GCFI = gross cash farm income. GCFI classes are expressed in 2015 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1999-2015 Agricultural Resource Management Survey.

Disaster, emergency, and other payments fluctuate across years since they have historically been made in ad hoc responses to disasters, like drought, floods, and freezes. Nationally, agricultural production in any given year tends to be negatively impacted by at least one natural disaster, and particularly severe natural disasters could result in large outlays in certain years. This category also captures payments from a number of small and unrelated programs that have begun and ended at different points throughout the period (see notes to fig. 2). In calendar year 2014, these payments were $5.9 billion. Of this total, $4.4 billion (in 2015 dollars) was paid through the Livestock Forage Program to compensate livestock producers who suffered severe losses due to an expansive drought in 2012 (USDA/ERS, 2017b).

Conservation payments increased by 75 percent between 1999 and 2015. In 2015, these payments totaled $3.6 billion, with a nearly equal allocation of payments among land-retirement and working-land programs.

Between 1991 and 1997, the number of Federal crop insurance policies, total premiums, value of insured crops, and insured land roughly doubled (table 1 and fig. 3), a likely consequence of legislative changes that incentivized greater participation. Since 2003, the number of policies has been fairly steady, between 1.1 and 1.2 million, while insured cropland has gradually increased to just under 300 million acres in 2015. Given that harvested cropland (including land with failed crops) totaled 330 million acres in 2015 (USDA/ERS, 2017a), this suggests that the large majority of U.S. cropland is insured. Total subsidies have decreased from a peak of $7.9 billion in 2011 to $6.1 billion in 2015 (fig. 3). After increases during 2010-13, the value of crops insured in 2015 is roughly equal to that in 2009, $103 billion, reflecting the recent decreases in field crop prices. Indemnities are paid

when farmers incur losses, which generally occur at times of natural disasters, so there are no clear trends. Indemnity payments peaked at $18.2 billion in 2012, nearly triple 2015 indemnities of $6.3 billion, due to a widespread and severe drought that affected nearly two-thirds of the contiguous United States in 2012 (USDA/RMA, 2012; Rippey, 2015).

Participation in Federal crop and livestock insurance programs increases with farm size (fig. 7). Though only 16 percent of all farms have Federal crop insurance, farms with greater GCFI are more likely to be insured.[21] Only 1 percent of farms with less than $10,000 were enrolled in crop insurance programs in 2015. Nearly half of farms with GCFI between $150,000 and $349,999 enrolled, while 66 to 71 percent of larger farms enrolled.[22] Farm households operating large farms have far greater income from farming than from off-farm sources, so the cost versus potential benefit of insurance makes it more appealing.

Table 1
Magnitude of Federal crop insurance, 1991, 1997, 2003, and 2009-2015

Crop year	Policies with premiums	Total premiums	Subsidies	Value of crops insured	Indemnities received by farmers	Land insured
	Number		*2015 dollars (billions)[1]*			*Million acres*
1991	706,822	1.2	0.3	18.4	1.5	82.4
1997	1,319,762	2.5	1.3	39.2	1.4	182.2
2003	1,241,468	4.4	2.6	63.3	4.1	217.4
2009	1,171,924	9.8	6	102.8	5.7	264.8
2010	1,139,864	8.3	5.1	89.9	4.6	256.2
2011	1,151,986	12.7	7.9	106.3	11.6	265.2
2012	1,174,007	11.6	7.3	105.8	18.2	282.9
2013	1,224,238	12.1	7.5	110.2	12.4	295.4
2014	1,207,144	10.2	6.3	96.8	9.2	294.5
2015	1,204,642	9.8	6.1	102.5	6.3	295.9

Note: Data accurate as of June 14, 2017.
[1]The producer price index (PPI) for farm products was used to adjust for price changes in the value of crops insured (e.g., liabilities).
The gross domestic product (GDP) chain-type price index was used to adjust premiums, indemnities, and subsidies.
Source: USDA, Risk Management Agency, Federal Crop Insurance Corporation, Summary of Business Reports and Data, 1989-93, 1994-2003, 2004-2013, and 2014-17.

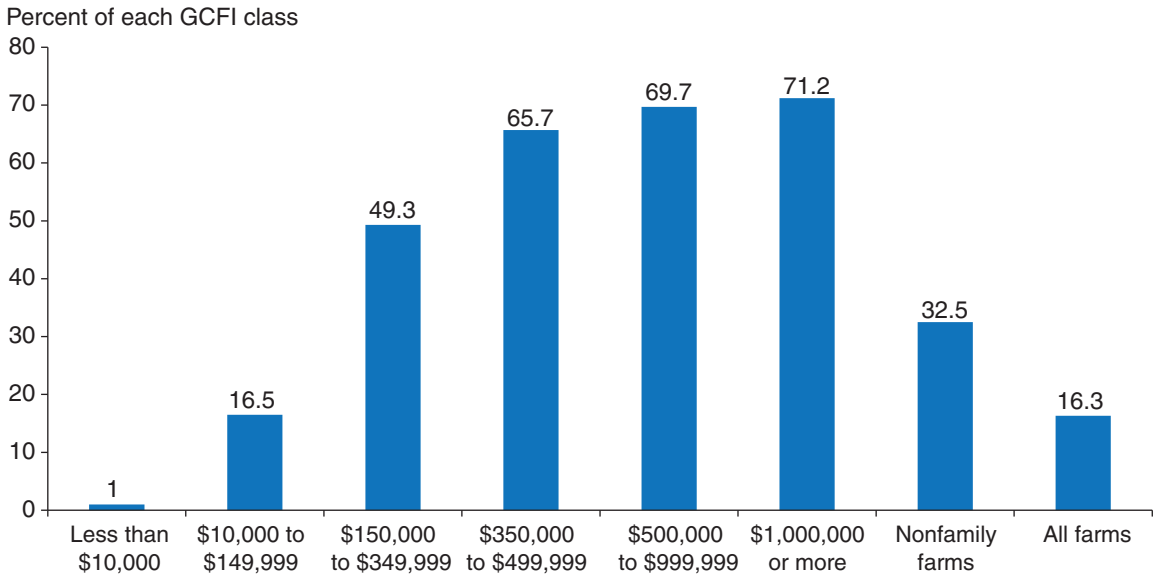
[21]Federal crop insurance is not available for all crops, and it may be unavailable in some regions for covered commodities. If crop insurance is unavailable, producers can enroll in the Noninsured Crop Disaster Assistance Program (Hungerford et al., 2017). However, since operators of smaller farms tend to receive a larger share of their household income off the farm (see fig. 15), they tend to have lower demand for farm business risk management tools.

[22]Note that the Livestock Risk Protection Insurance Plan for feeder cattle and Livestock Gross Margin Insurance for dairy cattle are two RMA-administered risk management programs for livestock producers. However, these products cannot be sold after annual expenditures on total premiums, administrative, and operating subsidies exceed an annual cap.

Figure 7

Farms participating in Federal crop and livestock insurance, 2015

Participation increases with farm size



Note: GCFI = gross cash farm income. Participants in Federal crop and livestock insurance are defined as farms paying premiums.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2015 Agricultural Resource Management Survey.

Agricultural Production Shifts to Larger Farms

Price fluctuations, weather and natural disasters, and changes in farm policy and eligibility requirements affect who receives commodity, conservation, and insurance indemnity payments in a given year. Yet, even without such changes, the composition of payment recipients can shift over time because of structural change in agricultural production. There was substantial postwar agricultural consolidation during the 1950s and 1960s (Peterson and Brooks, 1993), and concentration of production on larger farms resumed—and has continued—since at least the early 1980s.

Farm consolidation since the early 1980s has featured a complex set of shifts. Average farm size (the mean), in terms of land area, has changed little. As MacDonald et al. (2013) note, this seeming stability encompasses a major and continuing shift of cropland and production to larger operations (i.e., operations with at least 2,000 cropland acres), a sharp decline in midsize crop farms, and an increase in the counted number of very small farms with very limited amounts of land and production (i.e., farms with fewer than 50 cropland acres). Because commodity and insurance indemnity payments follow production, they have also shifted to larger farms.

Figure 8 illustrates the distribution of agricultural production by GCFI class for selected years between 1991 and 2015. Production has clearly shifted to larger farms. By 2015, large farms (GCFI of at least $1,000,000 in 2015 dollars) accounted for 42 percent of production, up from 23 percent in 1991. Midsize family farms, with sales of $350,000-$999,000, saw a small increase in their share of production, while the share held by small family farms fell sharply. Family farms with less than $350,000 in GCFI accounted for 24.2 percent of the value of commodity production in 2015, down from 46.4 percent in 1991.

Figure 8 focuses on all agricultural production, while commodity programs focus heavily on certain field crops. However, production of program crops—generally receiving payments on base acreage—has also shifted sharply to larger operations (fig. 9).[23] The large-farm share of production of program crops rose from 11 percent in 1991 to 40 percent in 2015. The share accruing to midsize farms also grew, with production shifting to larger farms in that class (those with at least $500,000 in GCFI). Production shifted away from small farms (less than $350,000), whose share fell from 58 percent in 1991 to 21.9 percent by 2015.

Midpoint Acreages Increase

Figures 8 and 9 focus on the value of production; other data show crop acreage shifting to larger farms. In particular, Census of Agriculture data are used to report midpoint acreages in 1987 and 2012 for 10 different field crops (fig. 10).[24] Midpoints more than doubled on each of the 10 crops during this period. In 1987, half of national harvested acreage of corn was on farms with at least 200 harvested corn acres; by 2012, that midpoint had risen to 633 acres, more than triple the 1987 value.

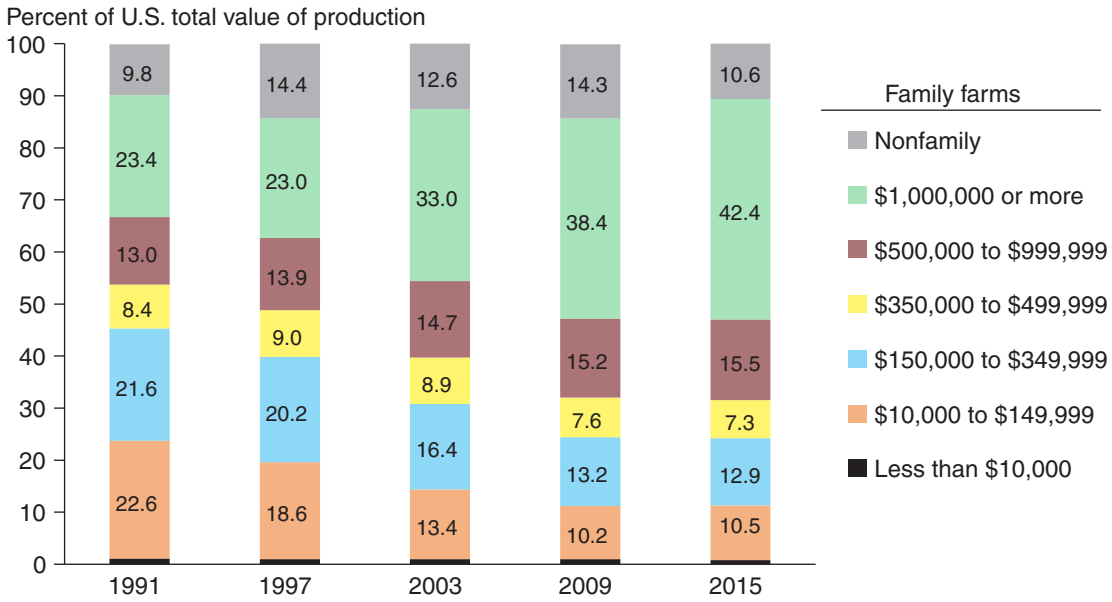
[23]We track the value of production for nine crops in figure 9: barley, corn, cotton, oats, peanuts, rice, sorghum, soybeans, and wheat. Beginning with the 2014 Farm Act, upland cotton is no longer a "program crop" covered by Title 1 commodity programs, but producers with historical cotton base could participate in commodity programs by planting covered commodities on their former cotton base, now termed generic base (Hungerford and O'Donoghue, 2016).

[24]The midpoint is a median: half of all harvested acreage of a crop is on farms with at least the midpoint acreage, and half is on farms with no more than the midpoint. For example, in 1987 half of all harvested corn acreage came from farms that harvested at least 200 acres of corn, while half came from farms that harvested no more than 200 acres.

Figure 8

Value of production by GCFI class, 1991, 1997, 2003, 2009, and 2015

The share of production from farms with GCFI at least $1 million reached 42 percent by 2015

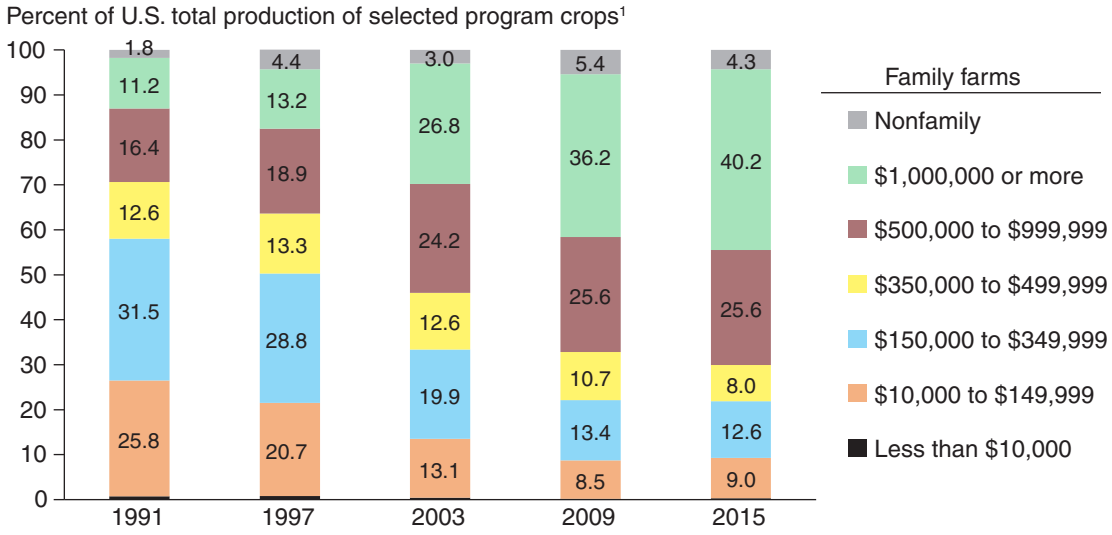


Note: GCFI = gross cash farm income. GCFI classes are expressed in 2015 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 1997, 2003, 2009, and 2015 Agricultural Resource Management Survey.

Figure 9

Value of production of selected program crops[1] by GCFI class, 1991, 1997, 2003, 2009, and 2015

Production of program crops shifted to family farms with GCFI greater than $500,000

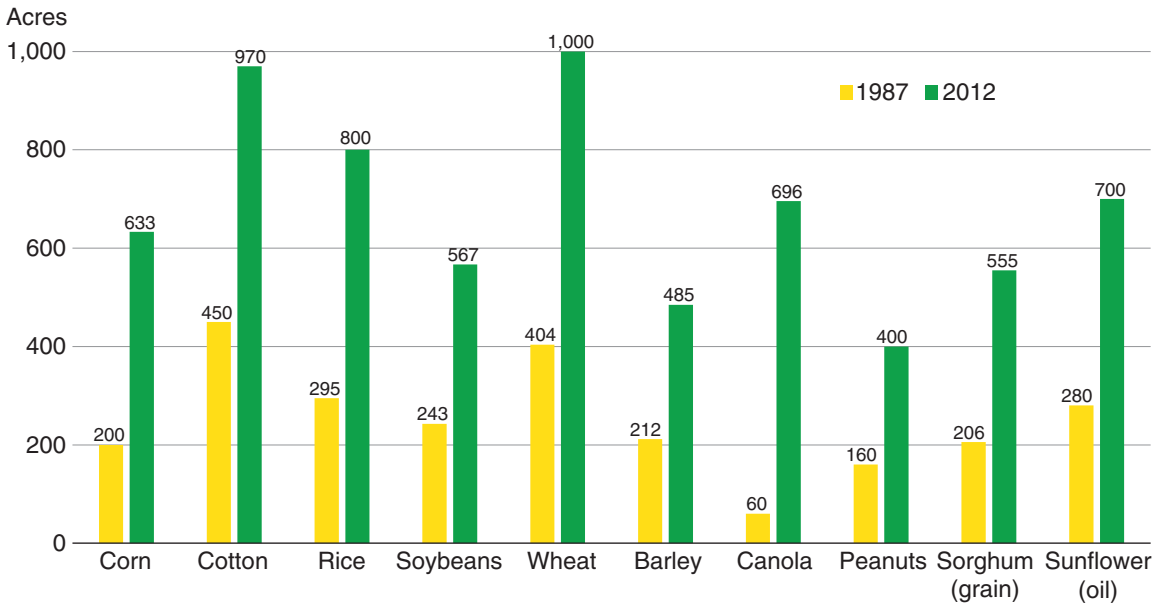


Note: GCFI = gross cash farm income. GCFI classes are expressed in 2015 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes.
[1]Barley, corn, cotton, oats, peanuts, rice, sorghum, soybeans, and wheat. Note that cotton is no longer considered a program crop under the 2014 Farm Act. Also note that Title 1 commodity programs do not require production of these crops to receive commodity-related payments.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 1997, 2003, 2009, and 2015 Agricultural Resource Management Survey.

Figure 10

Midpoint acreage for selected major and minor program crops, 1987 and 2012

Midpoint acreages more than doubled on all major and minor program crops between 1987 and 2012



Note: Half of cropland acres are on farms with more than the midpoint, and half are on farms with less than the midpoint. Note that cotton is no longer considered a program crop under the 2014 Farm Act.
Source: ERS calculations using agricultural census data from the U.S. Census Bureau (1987) and USDA, National Agricultural Statistics Service (2012).

Cotton, soybeans, wheat, barley, and sunflower enterprises experienced this same doubling, or near-doubling, of midpoint acreages. Rice, peanuts, and sorghum enterprises had midpoint acreages that tripled, while canola's midpoint acreage increased by a factor of 10 as canola production was introduced to a growing number of U.S. farms.

Reasons for the Shift in Production

Why is production shifting to larger farms? For livestock operations, one important driver is the emergence of economies of scale, leading to lower per-unit production costs among larger operations. Several studies have found that scale economies matter for broiler grow-out operations (MacDonald and Wang, 2011), dairying (Mosheim and Lovell, 2009), and hog production (McBride and Key, 2013). These economies arise, in part, because specialized capital equipment, enclosed livestock housing, and other technologies permit livestock farms more control over inputs and less susceptibility to weather and other randomness in growing conditions.

Technology plays an important role in crop operations. Specifically, larger and faster pieces of equipment allow a single farmer or farm family to farm more acres today than they could have in the 1970s. Other technologies—such as genetically engineered crop varieties, tillage practices, and new information technologies—also help to reduce the labor required to manage a certain acreage, and therefore allow farm families to manage more acres with the time available to them. Specialization by crop, relocation of production to regions more suitable for adoption of scale-increasing technologies, and new methods of financing have also played a role (MacDonald et al., 2013).[25]

Larger farms are more profitable for several of these same reasons, and this, in turn, has contributed to increasing farm size (White and Hoppe, 2012; MacDonald et al., 2013). While larger farms are more profitable, on average, agriculture is a risky endeavor. There is a wide range of financial performance among farms of any given size in a given year, and profits can fluctuate sharply from year to year (White and Hoppe, 2012). For example, 46 percent of midsize family farms and 36 percent of large farms had an operating profit margin of less than 10 percent in 2015 (Hoppe and MacDonald, 2016).[26]

[25]Large farms may benefit from "pecuniary" economies of scale – lower input prices per unit as a result of bulk purchases. Although these reflect real scale economies, they do not appear to have been an important driver of farm consolidation in recent decades (MacDonald et al., 2013).

[26]Operating profit margin is defined as 100% X (net farm income + interest paid – charge for operator and unpaid labor – charge for management) ÷ gross farm income. See Hoppe and MacDonald (2016) for more details.

Shifts in Program Payments and Federal Crop Insurance Indemnities

Since commodity program payments are based on current or recent historical production of program commodities, payments will shift to larger farms as they consolidate acreage receiving payments for currently produced or historically produced crops (fig. 11). In 1991, farms with at least $1 million in GCFI (in 2015 dollars) received nearly 11 percent of commodity program payments; by 2015, their share had increased to 34 percent. In 1991, 61.3 percent of commodity program payments went to small operations with less than $350,000 in GCFI, but that share fell to 30.2 percent by 2015. These shifts were similar to the shifts in shares of program crop production values among size classes (fig. 9).

Land-retirement program payments are distributed much differently, largely because of the kinds of farms that receive such payments. Nearly 80 percent of those payments went to farms with less than $150,000 in GCFI in 2015, up from 70 percent in 1991 (fig. 12). These programs target the retirement of environmentally sensitive lands that tend to be marginally productive, so their farm sales for any given acreage are necessarily lower. Moreover, some of these farms have retired all of their land into the Conservation Reserve Program (CRP), with GCFI reflecting only their CRP payments, with no commodity sales.[27] In other words, retirement farms with sizeable CRP acreage tend to drive down the average size (as measured by GCFI) of farms receiving land-retirement program payments.

While working-lands programs have historically had lower funding than land-retirement programs, their share of all conservation payments has been increasing since the 2002 Farm Act. As with land-retirement programs, working-land program payments have a somewhat different distribution because of their focus and eligibility requirements. For example, 60 percent of Environmental Quality Incentives Program (EQIP) payments are legislatively required to go to livestock producers, while 5 percent must go toward improving wildlife habitats.

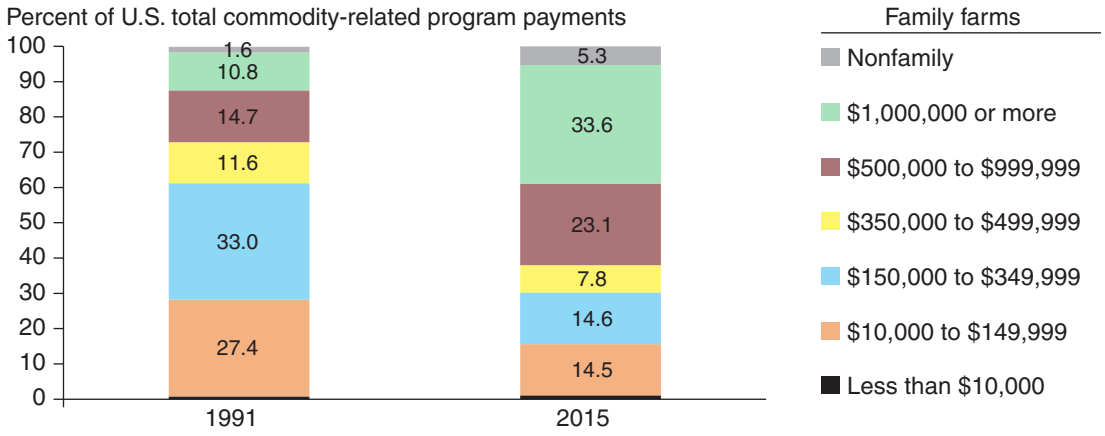
We are unable to examine payment trends for these programs in their early years because participation was low when the programs were established (1996 for EQIP and 2002 for the Conservation Security Program, restructured as the Conservation Stewardship Program in 2008). However, we can accurately depict later trends, for example, between 2006 and 2015 (fig. 13). Working-land payments were nearly equally divided among major sales classes in 2015, with large family farms receiving 32.6 percent, midsize family farms ($350,000-$999,999 in GCFI) receiving 31.9 percent, and small family farms (less than $350,000 in GCFI) receiving 31.4 percent. The data show a shift away from smaller operations in 2006-15 and toward midsize and large operations. This shift is similar to the shifts in commodity production (e.g., farm-size structural changes) between 2006 and 2015 (figs. 8 and 9).

[27]For example, if a 120-acre farm produces 84 bushels of corn per acre (half the average U.S. corn yield in 2015) and sells the crop at $3.71 per bushel (the average U.S. corn price in 2015), then its gross revenue is $37,397. If the entire farm were enrolled in the CRP at the average 2015 CRP rental payment (roughly $70 per acre in 2015), gross revenue would be $8,400.

Figure 11

Commodity-related program payments by GCFI class, 1991 and 2015

Payments shifted to family farms with GCFI greater than $500,000

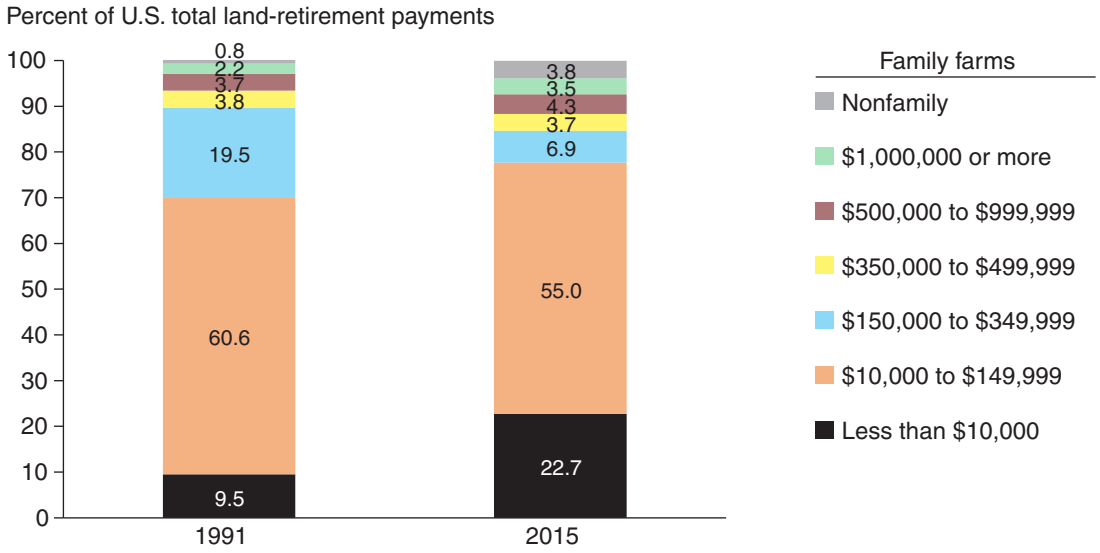


Note: GCFI classes are expressed in 2015 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes.
In 1991, commodity-related programs include those providing deficiency or diversion payments, disaster payments, storage payments, dairy buyouts, Federal emergency feed payments, and others. In 2015, commodity-related programs included direct and counter-cyclical payments and Average Crop Revenue Election programs, cotton transition payments, loan deficiency payments, marketing loan gains, net value of commodity certificates, agricultural disaster payments, Price Loss Coverage program payments, Agriculture Risk Coverage program payments, Margin Protection Program for Dairy payments, and other programs.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 2015 Agricultural Resource Management Survey.

Figure 12

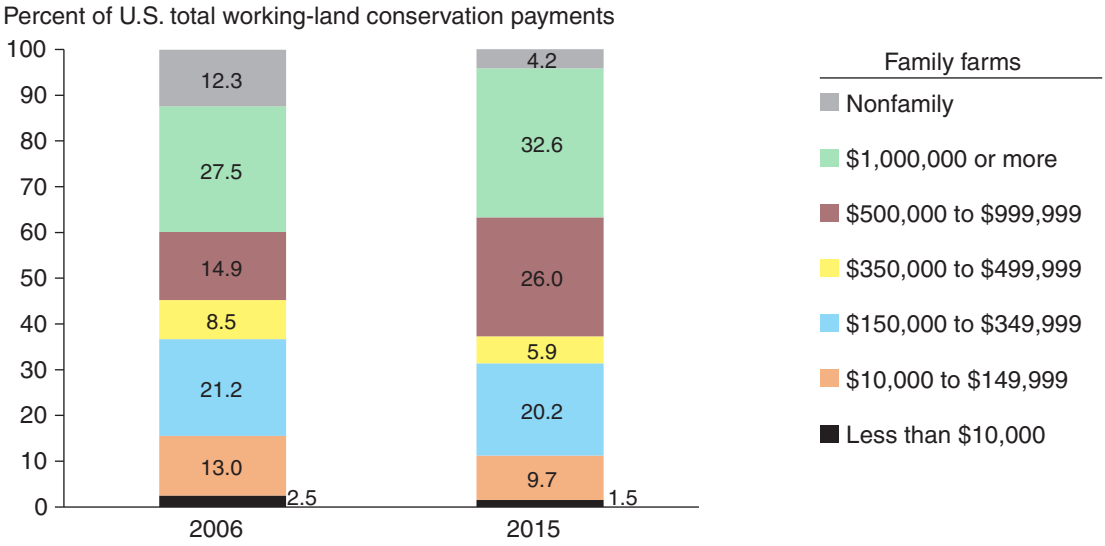
Land-retirement payments by GCFI class, 1991 and 2015

Payments to family farms with GCFI less than $10,000 doubled



Note: GCFI = gross cash farm income. GCFI classes are expressed in 2015 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes.
In 1991, the sole land retirement program was the Conservation Reserve Program (CRP). Land retirement programs included CRP and the Conservation Reserve Enhancement Program in 2015.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 2015 Agricultural Resource Management Survey.

Figure 13
Working-land conservation payments by GCFI class, 2006 and 2015
Payments shifted to family farms with GCFI greater than $500,000



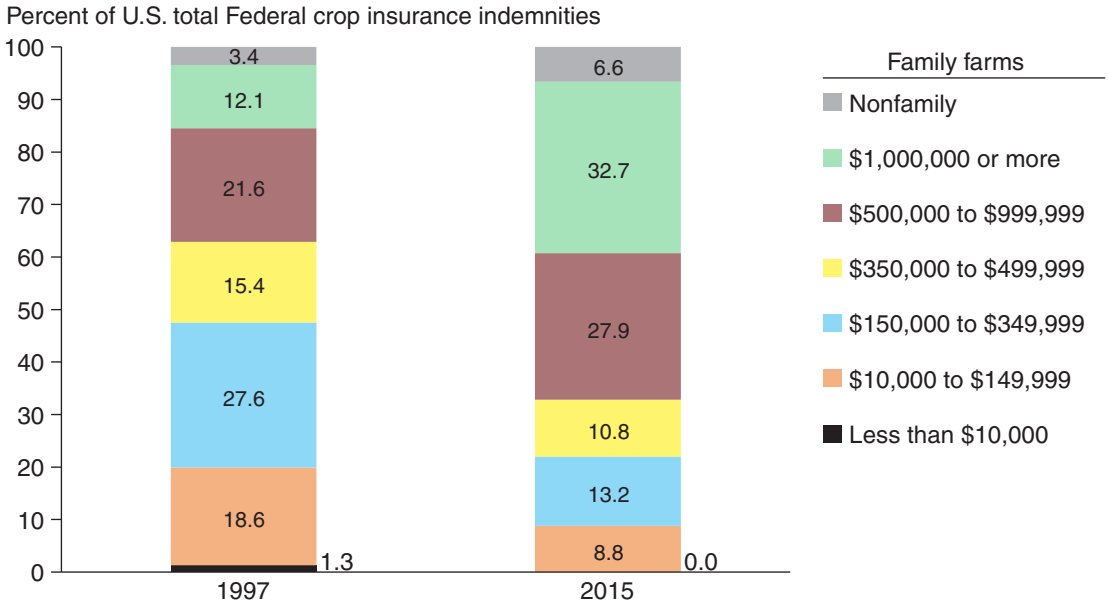
Note: GCFI = gross cash farm income. GCFI classes are expressed in 2015 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes.
Working-land programs included the Environmental Quality Incentives Program (EQIP) and Conservation Security Program (CSP) in 2006 and EQIP, CSP, and the Conservation Stewardship Program in 2015.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2006 and 2015 Agricultural Resource Management Survey.

Federal crop insurance indemnities reflect production of insured commodities, conditioned on annual fluctuations in yields and prices. They have shifted toward larger farms, similar to the shifts of production and commodity program payments toward larger farms (fig. 14). In 2015, about one-third of indemnity payments went to large family farms, while 38.7 percent went to midsize family farms, and 22 percent went to small family farms with GCFI of less than $350,000. In 1997, the earliest year for which we report reliable indemnity flows by farm size, 47.5 percent went to small family farms, while 12.1 percent went to large family farms (defined with GCFI in 2015 dollars).[28] Since production has shifted to larger farms, and these farms have more acreage on which losses could occur, they reasonably should account for a substantial and growing portion of indemnity payments. Apart from structural change, redesigns of Federal crop insurance programs between 1997 and 2015 may have also contributed to the shift of indemnities toward larger farmers.[29]

[28]Federal crop insurance indemnity payments result when farmers experience certain kinds of losses. A better measure of Government support would be Federal crop insurance premium subsidies. However, the ARMS surveys do not ask respondents about their insurance premium subsidies. ARMS contains the only nationally representative data on Federal crop insurance, farm size, and farm financial characteristics. Since ARMS tracks gross indemnities that do not net out the portion of premiums paid by farmers, this could overstate the level of support (relative to net indemnities) over several years, on average. However, a measure that adds indemnities and subsidies and then nets out premiums would generally understate support through Federal crop insurance.

[29]If expanded Federal crop insurance premium subsidies as a result of the Federal Crop Insurance Reform Act of 1994 disproportionately increased crop insurance participation by large farms, then this could partially explain the shift in indemnities toward larger farms, other things equal. This distributional shift is not the result of randomness in weather-related losses that could have disproportionately affected large (or small) farms in 1997 and 2015. The distributions of indemnities in 1998 and 1999 are very similar to the 1997 distribution, and the distributions of indemnities in 2013 and 2014 are very similar to the 2015 distribution.

Figure 14
Federal crop insurance indemnities by GCFI class, 1997 and 2015
Payments shifted to family farms with GCFI greater than $500,000



Note: GCFI = gross cash farm income. GCFI classes are expressed in 2015 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1997 and 2015 Agricultural Resource Management Survey.

Household Income Varies by GCFI Class

While production and program payments have been shifting to larger farms, they have also been shifting to farms with higher household incomes since median household income rises steadily with farm size (fig. 15).[30] Median operator household income for farms with GCFI between $500,000 and $999,999 reached $193,000, and that for the largest farms (GCFI of at least $1 million) was just under $361,000. The median for principal operator households in all GCFI classes also exceeded the $56,516 median for all U.S. households in 2015.

Comparisons with all U.S. households are most relevant for farm households operating farms with GCFI less than $150,000, since most of their income comes from off-farm wage/salary jobs and unearned income like dividends, rent, Social Security, other public programs, and private pensions. Most commercially oriented farm operators rely more heavily on income from their farm businesses. The relevant comparison group for these farmers is U.S. households with a self-employed head, since they also own businesses.[31] Median household income for farm households with GCFI less than $150,000 was slightly less than the median for all U.S. households with a self-employed head. Once

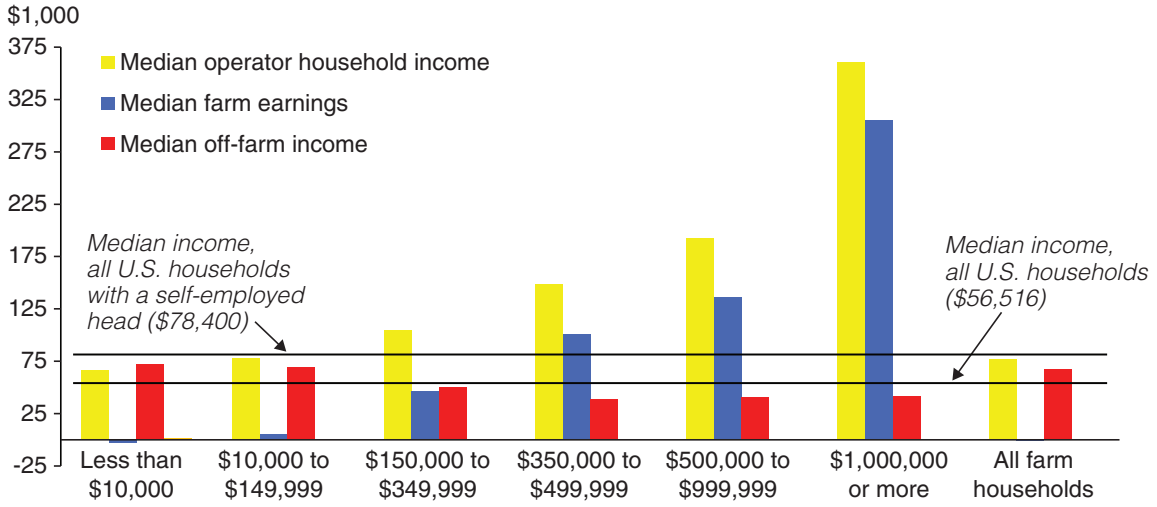
[30]We report median household incomes for each GCFI class because household incomes tend to be highly skewed, with a few very high-income households raising the mean income above most others. The median splits the distribution of household incomes, such that half of all households earn more, and half earn less. It is an effective measure of the average in a skewed distribution.

[31]For different-sex couples, the male is classified as the head. For same-sex couples, the older person is classified as the head. In the case of individuals, that person is the head. For more information, see Bricker et al. (2014).

Figure 15

Median operator household income by source and GCFI class, 2015

Larger farms tend to have higher operator household income



Note: GCFI = gross cash farm income. Half of the households earn less than the median income, while the other half earn more. Medians are often used to summarize household income due to its skewed distribution. Household income is estimated only for family farms. Note that GCFI includes revenue from crop and livestock sales, fees from contract production, program and indemnity payments, and other farm-related income, before expenses.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2015 Agricultural Resource Management Survey, Phase III, for farm households. U.S. Bureau of the Census, Current Population Survey, for all U.S. households. Federal Reserve Board, Survey of Consumer Finances for all U.S. households with a self-employed head.

GCFI exceeded $150,000, however, median income was higher for operator households than for all households with a self-employed head.

Median farm earnings in the lowest sales class were negative, while they were barely positive in the next smallest class. Farms with GCFI below $10,000 will have very little gross farm income to offset farm expenses. In some cases, the operator works off-farm and the farm may not generate enough revenue to cover farm expenses. In other cases, farms may have low GCFI in a particular year because of natural disasters or poor crop conditions; farms could also have incurred expenses during a year in which they realized no sales, either because the crop has been placed in storage or because production takes more than a year. Given the nature of farming, operator household income can be variable from year to year.

Payments Shift to Higher Income Households

In any given year, program payments and insurance indemnities flow to a range of farm households—some to households with high household incomes and some to households with low or even negative incomes. However, on average, we expect payments to shift to higher income households over time because of ongoing structural changes in agriculture. We also expect movements in the farm economy to affect how payments are distributed among households, independent of any long-term structural trends.

We display those trends in the distribution with a set of charts, one each for commodity programs, land-retirement programs, working-land programs, and insurance indemnities. In each chart, we report principal operator household incomes at four percentiles of the distribution of payments: the 25th, 50th, 75th, and 90th percentiles.[32] If payments are shifting to higher income households, we should see incomes at each percentile value increasing over time.

Commodity Program Payments

Commodity program payments have shifted to higher income households over time, although year-to-year changes in the overall farm economy can move the distribution around its trend (fig. 16). In 1991, the 50th percentile value of household income was $60,717 (2015 dollars): half of commodity payments went to farms operated by households with incomes at or above $60,717, and half went to households earning no more than that value. The 75th percentile value was $127,818 (25 percent of payments went to households earning more than that income), and the 90th percentile income was $257,530 (10 percent of payments went to higher income households).

This distribution of commodity-related payments shifted upward over time, took a pronounced upward shift in 2010-13, and then fell off in 2014-15, although to values that were still well above where they had been a decade earlier.[33] In 2013, the 50th percentile income was $207,417—more than three times the value in 1991, while the 75th percentile was $504,984, and the 90th percentile was $1,077,879.[34] By 2015, the 50th percentile income had fallen off to $146,126, while the 75th percentile value fell to $322,551 and the 90th percentile to $618,589. These incomes are still far above those at the beginning of the period, in 1991, and still well above those in 2005 (when the 50th percentile was $126,949, the 75th was $266,718, and the 90th was $561,923).

[32]At the 25th percentile, 25 percent of program payments go to households with incomes at or below that value, and 75 percent go to households with incomes at or above that value. At the 50th percentile value, 50 percent of program payments go to households with incomes at or below that value, and 50 percent go to households with incomes at or above. The 75th and 90th percentiles are constructed similarly.

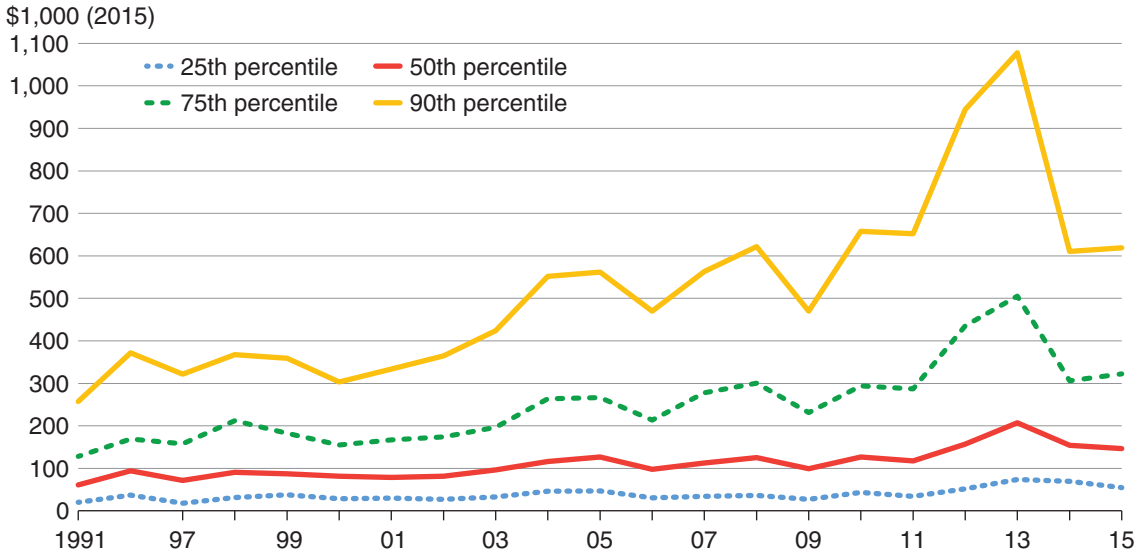
[33]There were nearly zero fixed direct payments and countercyclical payments made in 2014 as a result of the 2014 Farm Act. Payments from the ARC and PLC programs began in 2015.

[34]The high income levels at the 90th percentile are not comparable to the income eligibility cap. The cap is based on a 3-year average of adjusted gross income (AGI)—used to determine taxes—while operator household income is for a single year and estimated from ARMS. Also, the cap is applied to recipients, not households, and there may be more than one recipient associated with a farm household.

Figure 16

Farm household income at selected percentiles of the distribution of commodity-related payments, 1991 and 1996 to 2015

The percentile lines dipped from 2013 to 2014



Notes: Household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. Detailed data on Government payments are not available for 1992 to 1995. See Appendix table B1 for underlying data in table format.
Source: USDA, Economic Research Service and National Agricultural Statistics Service, 1991 Farm Costs and Returns Survey and 1996-2015 Agricultural Resource Management Survey.

Effects of Fluctuations in Commodity Prices

After remaining relatively flat in the 10 years after 1996, the per-bushel (calendar year) price of corn increased from $2.28 in 2006 to $6.67 in 2012, expressed in nominal dollars (fig. 17).[35] Soybean prices followed a similar increasing trend during this time, with a peak of $14.10 per bushel in 2013. Prices for wheat, oats, and barley were also higher during 2008-13, with less pronounced increases. The per-pound upland cotton price rose substantially (2009-11) within the broader commodity boom, while rice and sorghum prices were relatively constant (fig. 18). A historically severe and prolonged drought contributed to high crop prices in 2012 (Rippey, 2015). After several large field crop harvests and increased stocks, prices for many commodities started to fall during 2013 and 2014.

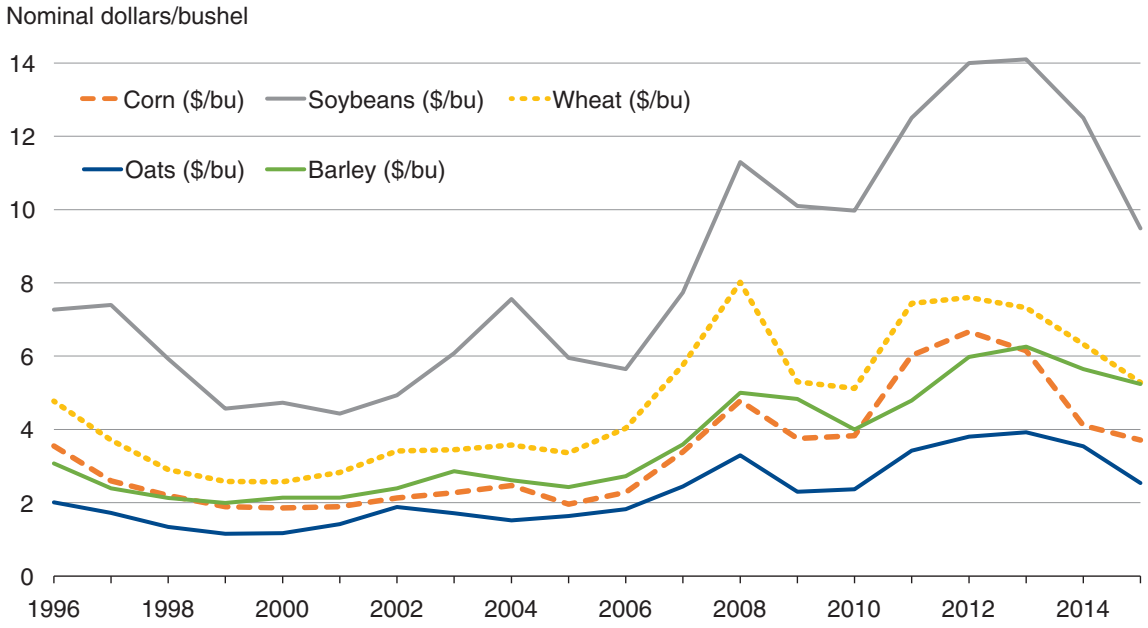
The impacts of these commodity price fluctuations can also be seen in changes to net farm income. After peaking in 2011 and again in 2013, aggregate net farm income decreased in 2014 and 2015 (fig. 19). The relative increases in commodity prices during 2011-13 contributed to increased farm incomes, while more recent farm income declines coincide with lower agricultural prices. Farms receiving commodity-related payments in 2012 and 2013 had very high incomes in those years due to increased prices. For these years, the commodity price boom reinforced the shift of commodity-related payments to farms with higher household incomes because some of these payments accrued to farms whose incomes increased as a result of the commodity price increases. Direct (fixed)

[35]Commodity prices illustrated in figures 17 and 18 are expressed in nominal (current-year) U.S. dollars. This is because commodity prices are a major component underlying the Producer Price Index for Farm Products (PPIFP), which would normally be used to inflation-adjust these kinds of prices. Adjusting these figures for inflation would mask large fluctuations in prices.

Figure 17

Field crop prices, calendar years 1996-2015

Major crop prices were at or near historical highs during 2011-2013 before falling during 2013-2014

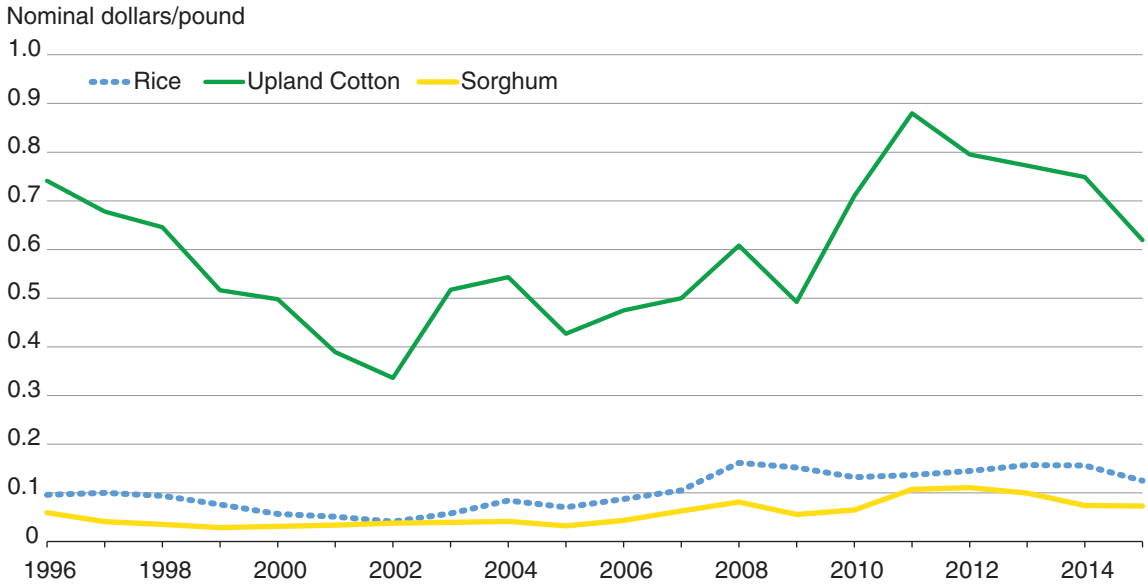


Note: Prices are expressed in nominal (per-year) dollars per bushel. We do not use the Producer Price Index for Farm Products (PPIFP) to adjust for price changes since commodity prices form a major component of this index.
Source: USDA, National Agricultural Statistics Service.

Figure 18

Field crop prices, calendar years 1996-2015

Upland cotton prices increased substantially during 2009-11, while rice and sorghum prices have been relatively stable



Note: Prices are expressed in nominal (per-year) dollars per pound. We do not use the Producer Price Index for Farm Products (PPIFP) to adjust for price changes since commodity prices form a major component of this index.
Source: USDA, National Agricultural Statistics Service.

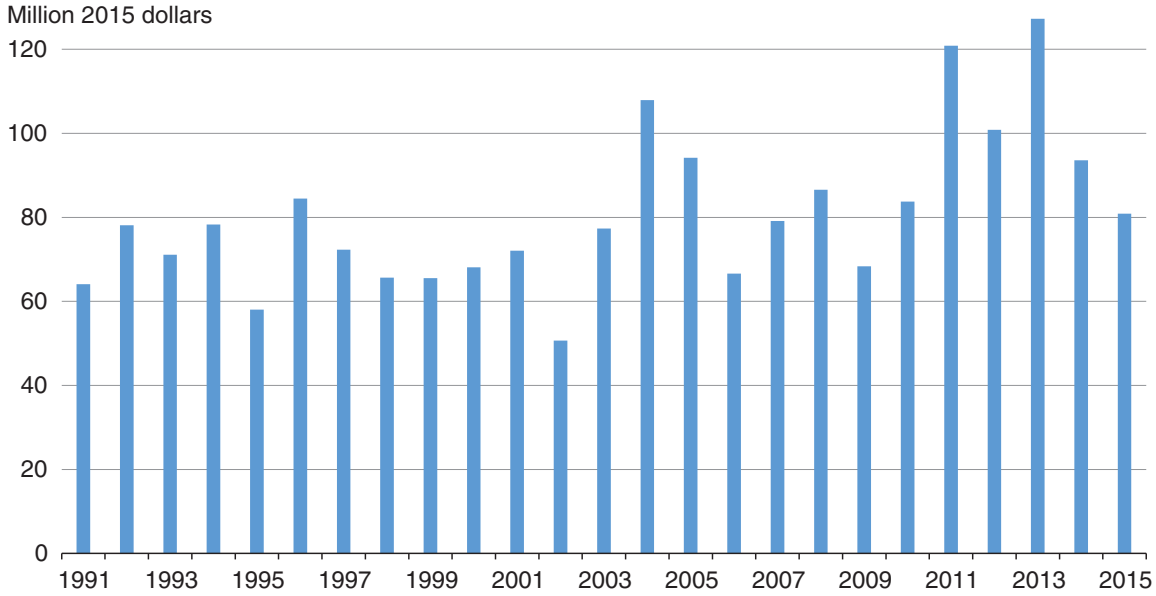
payments continued during this period despite relatively high commodity prices because they were based on individual farm history of production of program commodities, not price levels.

Conservation Payments

Since land-retirement program payments tend to go to farms with lower contributions to agricultural production (fig. 12), they also tend to go to farms with lower household incomes. However, land-retirement payments have shifted over time to farms with higher household incomes (fig. 20), though at more gradual pace and lower level of total payments. For example, in 2015, half of land-retirement payments went to farms with household incomes over $99,392. Though this is substantially higher than the median U.S. household income ($56,516), it is lower than household income accruing to the farm at the 50th percentile of commodity-related payments in 2015 ($146,126). At the upper end of the distribution in 2015, 10 percent of land-retirement payments went to farms with household incomes over $318,199. These values represent a substantial shift over time: in 1991, the 50th percentile income was $54,155 and the 90th was $180,760.

There has been a more significant shift of working-land payments to farms with higher household incomes (fig. 21), consistent with trends in production and farm size and past research (e.g., Lambert et al., 2006). Although there is an inadequate number of observations to accurately track distributional shifts before 2006 (due to low program participation), we again see increases in farm household income over time at the 75th and 90th percentiles of the distribution of working-land payments. In 2006, the 75th percentile income was $213,312, which increased to $351,960 in 2015. After a decline in the 90th percentile between 2008 and 2010, in 2015, the top 10 percent of working-land payments accrued to farms with household incomes greater than $646,576.

Figure 19
Net farm income, 1991-2015
Aggregate net farm income decreased in 2014 and 2015 after peaking in 2011 and 2013

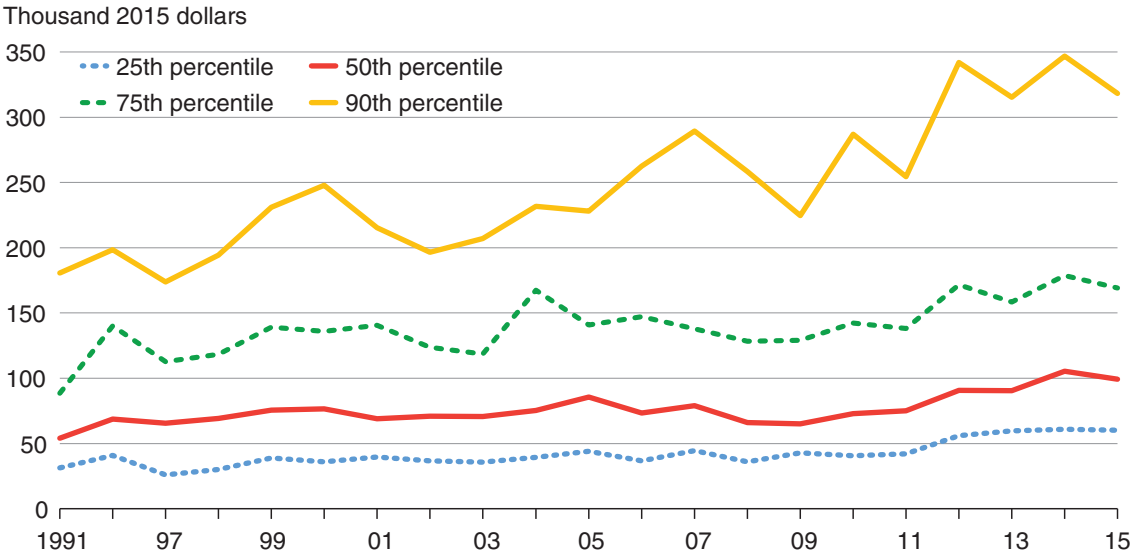


Note: Incomes are expressed in 2015 dollars using the gross domestic product (GDP) chain-type price index to adjust for price changes. Net farm income is the sum of agricultural sector production value less intermediate product expenses and contract labor expenses, plus net Government transactions less capital consumption and factor payments to stakeholders.
Source: USDA, Economic Research Service, Farm Income and Wealth Statistics.

Figure 20

Farm household income at selected percentiles of the distribution of land-retirement payments, 1991 and 1996 to 2015

The percentile lines for land-retirement payments have increased relatively gradually over time

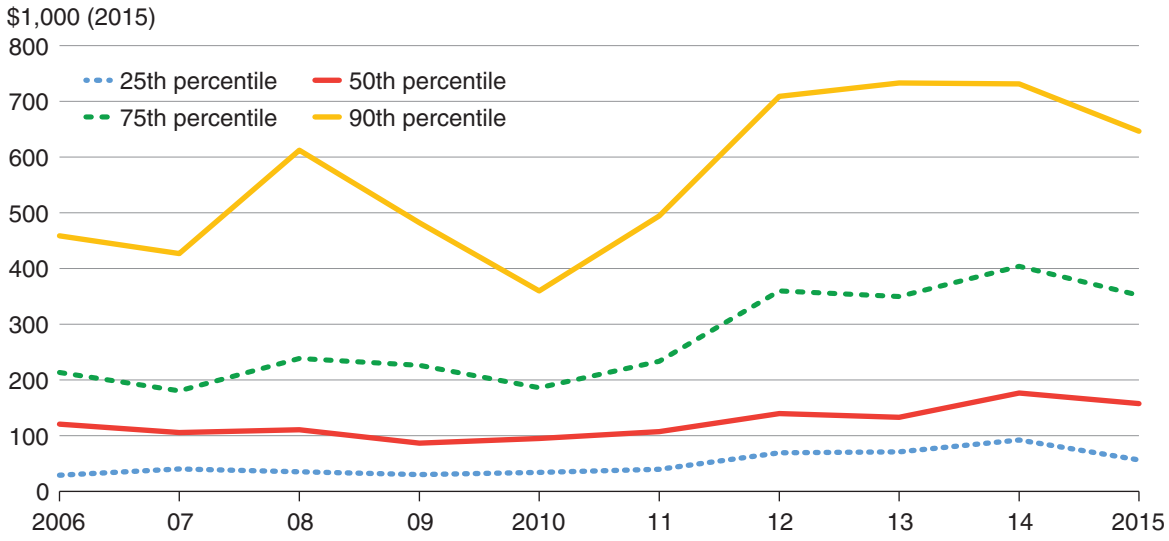


Notes: Household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. Detailed data on Government payments are not available for 1992-95. See Appendix table B2 for underlying data in table format.
Source: USDA, Economic Research Service and National Agricultural Statistics Service, 1991 Farm Costs and Returns Survey and 1996-2015 Agricultural Resource Management Survey.

Figure 21

Farm household income at selected percentiles of the distribution of working-land conservation payments, 2006 to 2015

The percentile lines have shifted upward, similar to trends in commodity payments



Notes: Household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. Prior to 2006, working-land payments were small relative to other Government payments, making it difficult to examine their distribution. See Appendix table B3 for underlying data in table format.
Source: USDA, Economic Research Service and National Agricultural Statistics Service, 2006-2015 Agricultural Resource Management Survey.

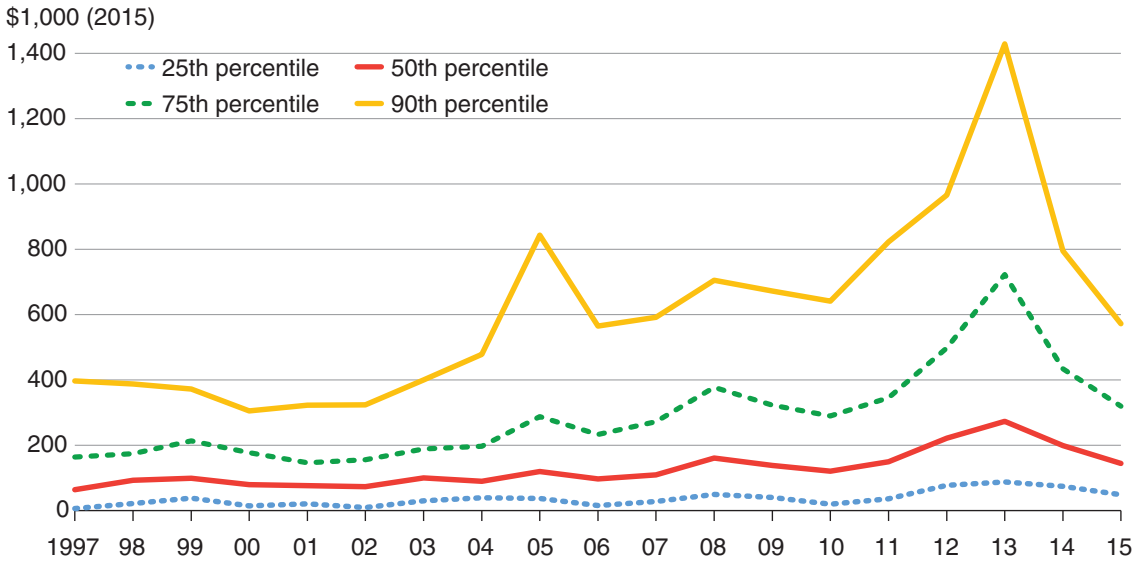
Federal Crop Insurance Indemnities

Movement of Federal crop insurance indemnities to higher income farm households largely mirrors the trends for commodity and conservation payments. However, there is more interyear variability, generally associated with the higher incomes of recipients in years of greater indemnity payouts. In 2013, for example, 10 percent of Federal crop insurance indemnities went to farms with household incomes greater than $1,428,545 (the 90th percentile, expressed in 2015 dollars), and half of indemnities went to farms with household incomes of at least $273,406. This peak is undoubtedly due to substantial indemnities paid to large farms as a result of the 2012 drought and other adverse weather in 2013.

In 2015, the distribution aligns more closely with those of commodity-related payments. For example, 50 percent of indemnities went to farms with household incomes greater than $143,806 in 2015. By comparison, 50 percent of commodity-related payments went to farms with household incomes greater than $146,126 in that year.

As with payments under commodity and conservation programs, crop insurance indemnity payments have shifted to higher income households over time. The 50th percentile in 1997 stood at $63,671, while the 90th percentile was at $395,556 (each in 2015 dollars), both well below the corresponding values in recent years (fig. 22).

Figure 22
Farm household income at selected percentiles of the distribution of Federal crop insurance indemnities, 1997 to 2015
The percentile lines peaked in 2013, following adverse weather from 2011 to 2013



Note: Household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. See Appendix table B4 for underlying data in table format.
Source: USDA, Economic Research Service and National Agricultural Statistics Service, 1997-2015 Agricultural Resource Management Survey.

The shift of indemnities and program payments can be seen more clearly in figure 23, which tracks the 50th percentile values for commodity and conservation program payments and crop insurance indemnities. For comparative purposes, the figure also presents trends in median income for all U.S. households and all U.S. households with a self-employed head.

The 50th percentile values for all three types of program payments and indemnities have clearly shifted away from the median income for all U.S. households and toward higher income households over time. During the 1990s, the 50th percentile values for commodity-related and land-retirement payments, as well as indemnities, were close to the U.S. household median income in some years, and did not exceed twice this median in any year. After 2000, however, they began to diverge more from the U.S. household median. The 50th percentile values for commodity-related payments and indemnities were nearly three times larger than the U.S. median household income by 2015. The working-land 50th percentile showed the same trends, but over a shorter period. The land-retirement 50th-percentile level remained closest to the U.S. median income throughout the period, but nevertheless was 76 percent greater than the U.S. household median. Between 2014 and 2015, however, there appears to have been some convergence in the 50th percentiles.

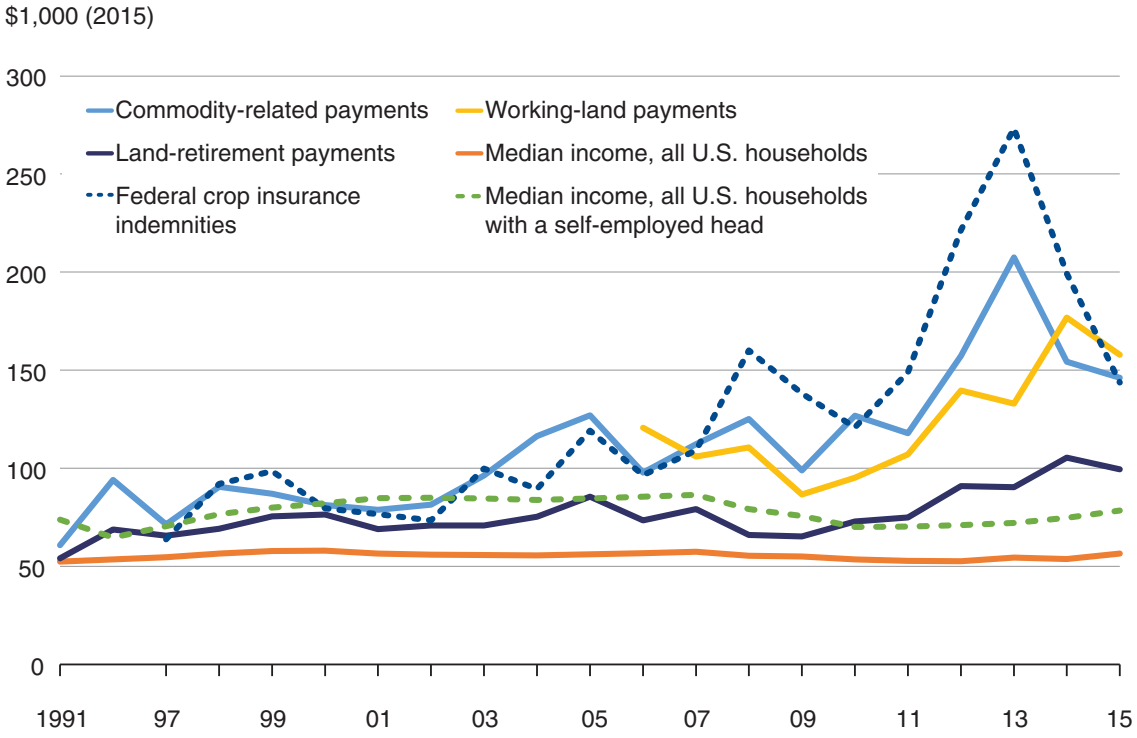
Comparing the 50th percentiles lines with the median income for all U.S. households with a self-employed head yields results similar to those above, since the two U.S. median lines are roughly parallel, with the self-employed line consistently higher. The end result is that by 2015, the 50th percentile values were double the median income for U.S. households with a self-employed head rather than triple for commodity-related programs, working-land programs, and indemnity payments. In addition, the line for land-retirement programs remains below the median for all U.S. households with a self-employed head until the 2010s.

Note the sharp shifts in household incomes, during 2011-14, of recipients of commodity-related payments and crop insurance indemnities (fig. 23). In 2011-14, countercyclical payments and marketing loan benefits fell to very low levels since they are triggered by low crop prices (fig. 2). However, commodity direct payments, which were decoupled from price movements, continued to be paid out and shifted to higher income households. As the resurgent farm economy raised incomes for commercial producers, producers receiving direct payments had higher incomes. A severe drought in 2012 contributed to high crop prices and also led to increased revenue insurance indemnities paid out to farmers who lost production—especially on corn, soybean, and wheat acreage—but realized high incomes from high prices for the production that they did not lose. Also, since indemnities compensate for losses and the value of losses increase as commodity prices rise, farms could continue to be high-income because of indemnities.

Figure 23

Farm household income at the 50th percentile for Government payments—by type of program—and Federal crop insurance, 1991 and 1996-2015

The gap between all U.S. households and farm households is smallest for land-retirement programs



Note: Household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers. Detailed data on Government payments are not available for 1992-95. Also, crop insurance indemnities represent gross indemnities and do not subtract farmer-paid portions of the premium.

[1]The 50th percentile line for each program shows the farm household income level at which half of the payments went to households with income above that value and half of payments went to households with income below that value. Median incomes for all U.S. households are reported for context. See Appendix B for underlying data in table format.

Source: USDA, Economic Research Service and National Agricultural Statistics Service, 1991 Farm Costs and Returns Survey and 1996-2015 Agricultural Resource Management Survey for farm households. U.S. Bureau of the Census, Current Population Survey for all U.S. households. Federal Reserve Board, Survey of Consumer Finances (SCF) for all U.S. households with a self-employed head. The SCF is conducted every 3 years. Data points between SCF survey years were interpolated.

Three Caveats

There are three important caveats to bear in mind when analyzing the increasing household incomes of farms receiving program payments. First, although ARMS tracks Government payments going to farm businesses, it only collects household income for households of principal operators. Those households do not necessarily receive all of farm business income; instead, some of the benefits from payments could be shared with stockholders or more junior partners in the farm business.

While only 2.4 percent of farms with GCFI less than $10,000 share farm business income with other households, more than 30 percent of farms with at least $1 million in GCFI do so (table 2). To the extent that households of increasingly large farms share substantial portions of their farm business incomes, the income-concentration effects of shifting program payments will be somewhat mitigated. Nevertheless, most principal operator households (94 percent) do not report sharing farm business income. Their high ownership interest also suggests that focusing on principal operator households captures the bulk of payment flows.

Second, one dollar of Government payments to a farm business will not necessarily increase household income or spending by one dollar, even if no other household shares in the farm's business income (e.g., Mishra and Cooper, 2017). This is because payments can increase the farm business' cash expenses, and therefore may not increase farm business income dollar-for-dollar. For example, some fraction of payments ultimately flows to landlords through increased cash rents (and expense to the farm business). Payment pass-through will tend to be more significant on large farms since renting prevalence increases with farm size (Bigelow et al., 2016).

Also, increased production expenses and other costs often result from participation in certain Government programs that disburse payments. For example, loan deficiency payments are available only to farms undertaking activities to produce the eligible commodities, which can result in production expenses. Financial assistance payments from EQIP are provided to producers who adopt approved conservation practices, which could be costly to implement. In that sense, commodity and conservation payments are different from transfer payments that do not require their recipients to bear certain costs to receive the payments, such as Social Security payments to individuals or direct Federal subsidies to nonfarm businesses in other sectors.

Table 2
Income sharing and ownership interest, 2015

GCFI class	Households sharing income[1]	Average ownership interest[2]
	Percent of households	*Percent*
All farm households	5.5	96.1
Less than $10,000	2.4	97.8
$10,000 to $149,999	5.3	96.2
$150,000-$349,999	9.5	94.4
$350,000-$499,999	12.6	93.4
$500,000-$999,999	17.0	91.2
$1,000,000 or more	30.8	81.3

[1]Share of principal operator households in each class sharing income with one or more other households.
[2]Average reported ownership interest in the farm held by the principal operarator and his/her household.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2015 Agricultural Resource Management Survey.

Third, we rely on ARMS data to examine the distribution of Federal crop insurance indemnity payments. These are gross indemnities since they do not subtract farmer-paid portions of the premium. A better measure of Government support through Federal crop insurance programs would be crop insurance premium subsidies, but this information is not contained in ARMS. We use ARMS because it is the only nationally representative data that links farms' Federal crop insurance participation, size, and financial characteristics.

References

Bigelow, D., A. Borchers, and T. Hubbs. 2016. *U.S. Farmland Ownership, Tenure, and Transfer.* ERR-161, U.S. Department of Agriculture, Economic Research Service, Aug.

Bowers, D., W.D. Rasmussen, and G.L. Baker. 1984. *History of Agricultural Price-Support and Adjustment Programs, 1933-84.* AIB-485, U.S. Department of Agriculture, Economic Research Service, Dec.

Bricker, J., L.J. Dettling, A. Henriques, J.W. Hsu, K.B. Moore, J. Sabelhaus, J. Thompson, and R.A. Windle. 2014. "Changes in U.S. Family Finances from 2010 to 2013: Evidence from the Survey of Consumer Finances," *Federal Reserve Bulletin* 100(4): 1-41.

Congressional Budget Office. 2008. *Recent Trends in the Variability of Individual Earnings and Household Income*, available online.

Dimitri, C., A. Effland, and N. Conklin. 2005. *The 20th Century Transformation of U.S. Agriculture and Farm Policy.* EIB-3, U.S. Department of Agriculture, Economic Research Service, June.

Durst, R.L. 2007. *Effects of Reducing the Income Cap on Eligibility for Farm Program Payments.* EIB-27, U.S. Department of Agriculture, Economic Research Service, Sept.

Gardner, B.L. 2002. *American Agriculture in the Twentieth Century: How it Flourished and What it Cost*. Cambridge, MA: Harvard University Press.

Hoppe, R.A., and J.M. MacDonald. 2013. *Updating the ERS Farm Typology.* EIB-110, U.S. Department of Agriculture, Economic Research Service, April.

Hoppe, R.A., and J.M. MacDonald. 2016. *America's Diverse Family Farms, 2016 Edition*. EIB-164, U.S. Department of Agriculture, Economic Research Service, Dec.

Hungerford, A., and E. O'Donoghue. 2016. *Federal Crop Insurance Options for Upland Cotton Farmers and Their Revenue Effects.* ERR-218, U.S. Department of Agriculture, Economic Research Service, Oct.

Hungerford, A., G. Astill, and A. Effland. 2017. *Changes to the Noninsured Crop Disaster Assistance Program Under the Agricultural Act of 2014: Their Potential Risk Reduction Impacts.* EIB-172, U.S. Department of Agriculture, Economic Research Service, May.

Key, N., D. Prager, and C. Burns. 2017. *Farm Household Income Volatility: An Analysis Using Panel Data From a National Survey.* ERR-226, U.S. Department of Agriculture, Economic Research Service, Feb.

Kirwan, B.E. 2009. "The Incidence of U.S. Agricultural Subsidies on Farmland Rental Rates," *Journal of Political Economy* 117(1): 138-164.

Kirwan, B., and M.J. Roberts. 2016. "Who *Really* Benefits from Agricultural Subsidies? Evidence from Field-Level Data," *American Journal of Agricultural Economics* 98(4): 1095-1113.

Lambert, D., P. Sullivan, R. Claassen, and L. Foreman. 2006. *Conservation-Compatible Practices and Programs: Who Participates?* ERR-14, U.S. Department of Agriculture, Economic Research Service, Feb.

MacDonald, J.M., R.A. Hoppe, and D. Banker. 2006. *Growing Farm Size and the Distribution of Farm Payments*. EB-6, U.S. Department of Agriculture, Economic Research Service, March.

MacDonald, J.M., P. Korb, and R.A. Hoppe. 2013. *Farm Size and the Organization of U.S. Crop Farming*. ERR-152, U.S. Department of Agriculture, Economic Research Service, Aug.

MacDonald, J.M., and S.L. Wang. 2011. "Foregoing Sub-therapeutic Antibiotics: The Impact on Broiler Grow-Out Operations," *Applied Economic Perspectives and Policy* 33(1): 79-98.

McBride, W.D., and N. Key. 2013. *U.S. Hog Production from 1992 to 2009: Technology, Restructuring, and Productivity Growth*. ERR-158, U.S. Department of Agriculture, Economic Research Service, Oct.

Mercier, S. 2016. "Federal Benefits for Livestock and Specialty Crop Producers," *Choices* 31(4): 1-6.

Mishra, A.K., and J.C. Cooper. 2017. "Impact of Farm Programs on Farm Households in the U.S." *Journal of Policy Modeling* 39(3): 387-409.

Mosheim, R., and C.A.K. Lovell. 2009. "Scale Economies and Inefficiency of U.S. Dairy Farms," *American Journal of Agricultural Economics* 91(3): 777-794.

Organisation for Economic Co-operation and Development (OECD). 2016. *Innovation, Agricultural Productivity, and Sustainability in the United States*, OECD Publishing, Paris.

Organisation for Economic Co-operation and Development (OECD). 2017. "Evaluation of Farm Programmes in the 2014 U.S. Farm Bill: A Review of the Literature," *OECD Food, Agriculture and Fisheries Papers*, No. 104, OECD Publishing, Paris.

Orden, D., and C. Zulauf. 2015. "Political Economy of the 2014 Farm Bill," *American Journal of Agricultural Economics* 97(5): 1298-1311.

Peterson, R.N., and N.L. Brooks. 1993. *The Changing Concentration of U.S. Agricultural* Production During the 20th Century: 14th Annual Report to the Congress on the Status *of the Family Farm*. AIB-671, U.S. Department of Agriculture, Economic Research Service, July.

Rippey, B.R. 2015. "The U.S. Drought of 2012," *Weather and Climate Extremes* 10(A): 57-64.

U.S. Department of Agriculture, Economic Research Service. 2017a. "Major Land Uses" data product, Summary Table 3, available online.

U.S. Department of Agriculture, Economic Research Service. 2017b. "U.S. and State-Level Farm Income and Wealth Statistics" data product, available online.

U.S. Department of Agriculture, Farm Service Agency. 2014. "Base Acreage Reallocation, Yield Updates, Agriculture Risk Coverage (ARC) & Price Loss Coverage (PLC)," *2014 Farm Bill Fact Sheet*, September 2014, available online.

U.S. Department of Agriculture, Farm Service Agency. 2016. "Commodity Certificate Exchange Fact Sheet," Feb. 2016. Available online.

U.S. Department of Agriculture, Risk Management Agency. 2012. *2012 Drought*, Frequently Asked Questions, August 2012. Available online.

White, T. K., and R.A. Hoppe. 2012. *Changing Farm Structure and the Distribution of Farm Payments and Federal Crop Insurance*. EIB-91, U.S. Department of Agriculture, Economic Research Service, Feb.

Appendix A: A Brief Listing of Major Government Commodity Programs, Conservation Programs, and Federal Crop Insurance Programs, 1991-2015

Between 1991 and 2015, the Federal Government administered many different kinds of programs with very different objectives and payment mechanisms. Below, we list each of the major programs during the study period. These programs are generally classified as making either commodity-related or conservation-related payments, as distinct from Federal insurance programs for crop and livestock producers and non-insured commodities.

There are four important caveats. First, this list is not meant to be exhaustive; there are several current or former farm programs and Federal crop insurance offerings that are not mentioned due to space constraints. See the notes to Figures 11, 12, and 13—as well as the body of the text—for information about which program payments are included in the analysis. Second, we rely on the below classification because it is consistent with the earlier research that this report updates, MacDonald et al. (2006) and White and Hoppe (2012), and because it is consistent with ERS' Farm Sector Accounts (USDA/ERS, 2017b). As such, this classification and set of descriptions is similar to, though somewhat different than those of, other sources (e.g., OECD, 2016; OECD, 2017). Third, we do not discuss eligibility criteria or payment mechanisms for space considerations. For details about these or other programs, fact sheets available from USDA/FSA or USDA/RMA should be consulted. Fourth, dates in parentheses refer to calendar years, which may differ from program years for which payments were disbursed.

Commodity Programs

Six "Farm Bills"—enacted into legislation in 1985, 1990, 1996, 2002, 2008, and 2014—have contributed to the design and re-design of payment programs during 1991–2015. These payment programs can be primarily categorized as price support programs, income support programs, and commodity-related risk management programs.

Price Support Programs

Although price support played a major role earlier in the 20th century (Bowers et al., 1984), there have been only two major price support programs in recent years:

- Milk Price Support Program (1949-2007) and Dairy Product Price Support Program (2008-2014)
- U.S. Sugar Program (since 1981, with earlier policies in place during 1948-1974)

Income Support Programs

Marketing Loan Benefits

- Marketing assistance loans (since 1985, revising earlier loan programs) are a form of harvest-time financing to producers of certain commodities. Producers may repay these loans at market prices when those prices fall below the loan rate, a benefit that is referred to as a marketing loan gain.

- Loan deficiency payments (since 1985) are payments equivalent to marketing loan gains that are available to producers who choose not to take marketing loans.
- Commodity certificates exchange gains (since 1985 but with varying availability over time) are a third form of assistance based on producers buying commodity certificates from the Commodity Credit Corporation as a way of settling marketing loans.

Commodity Direct Payments

- Production Flexibility Contract (1996-2002) payments were fixed payments determined by historical acreage and yield for wheat, feed grains, upland cotton, and rice producers.
- Direct Payment program (2002-14) superseded the Production Flexibility Contract program, expanding the set of crops eligible for fixed payments and allowing producers to update base acreage.

Countercyclical-type Payments

- Market Loss Assistance payments (1999-2001) were supplemental payments on base acres in response to low commodity prices.
- Countercyclical Payments (2002-14) were supplemental payments on base acreage triggered when market prices dropped below legislated target prices.
- Average Crop Revenue Election Program (2008-14) was an alternative to the Countercyclical Payment program, offering lower direct payments and a lower marketing loan rate.
- Milk Income Loss Contract Program (2002-14) provided direct payments to dairy producers when milk prices dropped below a legislated target price.
- Price Loss Coverage Program (since 2014) provides direct payments on base acreage when the produced commodity's national average market price drops below a legislated price.
- Agriculture Risk Coverage Program (since 2014) provides revenue protection on base acreage using a revenue guarantee that relies on either county yields or individual farm yields.

Commodity-Related Risk Management Programs

- Noninsured Crop Disaster Assistance Program (since 1994; coverage levels expanded in 2014) protects producers for whom Federal crop insurance is unavailable in their county for their crop against yield losses due to extreme weather, natural disasters, and related conditions.
- Margin Protection Program for Dairy Producers (since 2014) protects against drops in dairy margins and provides payments when milk prices are low relative to feed prices.

Conservation Programs

Conservation payments are administered to producers through either land-retirement programs or working-land programs.

Land-Retirement Programs

- Conservation Reserve Program (since 1985) provides a yearly rental payment to contracted participants who remove environmentally sensitive land from agricultural production.
- Conservation Reserve Enhancement Program (since 1986) provides a yearly rental payment to contracted participants who introduce certain conservation practices and remove environmentally sensitive land from agricultural production.
- Wetlands Reserve Program (1990-2014; consolidated with other programs in 2014) provides assistance, including payments, to protect, restore, and enhance wetlands.
- Grassland Reserve Program (2008-14; consolidated with other programs in 2014) provides assistance, including payments, to conserve and restore grasslands, including rangeland and pastureland.
- Farmland Protection Program (1996-2014; redesigned and consolidated with other programs in various years, most recently in 2014) conserved farm and ranch land through purchases of conservation easements.

Working-Land Programs

- Environmental Quality Incentives Program (since 1996) provides assistance, including payments, to producers implementing conservation practices on agricultural land.
- Conservation Security Program (2002-08) provided assistance, including payments, to participants for promoting the conservation and improvement of soil, water, and other natural resources.
- Conservation Stewardship Program (since 2008) provides annual payments to participants for improving their environmental performance to address resource concerns.

Federal Crop Insurance

Three key pieces of legislation resulted in the design or redesign of federally supported insurance options to crop producers during 1991-2015: the Federal Crop Insurance Act of 1980, the Federal Crop Insurance Reform Act of 1994, and the Agricultural Risk Protection Act of 2000. USDA's Risk Management Agency (RMA) provides insurance to farmers through the Federal Crop Insurance Corporation (FCIC) and works with several private-sector insurance companies to sell and administer the policies. USDA's Farm Service Agency (FSA) has, at times during 1991-2015, administered programs with insurance-like characteristics (see "Commodity-Related Risk Management Programs," above).

Costs to the Government from crop insurance programs include premium subsidies, administrative and operating costs, and underwriting losses (or gains). Several kinds of federally supported yield and revenue insurance policies are available. Note that certain insurance policies are available for livestock producers (not discussed here). There are also insurance policies not subsidized by the Federal Government, but these are limited to hail, wind, and fire coverage.

Yield Insurance

- Actual Production History coverage protects against yield losses from natural causes.
- Area Risk Protection Insurance for yields (similar to the former Group Risk Plan) protects against yield losses using county yields for determining losses.
- Catastrophic Risk Protection Endorsement protects against yield losses at lower coverage levels and at low costs to producers.
- Dollar Plan coverage protects against quantity and quality yield losses but guarantees a dollar amount per acre rather than a specific yield level.
- Supplemental Coverage Option (since 2014) protects against yield losses by supplementing the producer's underlying yield insurance policy with additional area-based coverage.

Revenue Insurance

- Revenue Protection protects against gross revenues for a particular crop falling below some guaranteed level.
- Area Risk Protection Insurance for revenue protects against revenue losses using county revenue for determining losses.
- Whole Farm Revenue coverage (replacing former Adjusted Gross Revenue programs) guarantees a percentage of average gross farm revenue rather than insuring revenue from a particular crop.
- Supplemental Coverage Option (since 2014) protects against revenue losses by supplementing the producer's underlying revenue protection policy with additional area-based coverage.
- Stacked Income Protection Plan (since 2014) protects against revenue losses for upland cotton producers.

Disaster and Emergency Programs

During 1991-2008, funding for emergency scenarios and disaster relief was provided by ad hoc Government payments in response to floods, droughts, and other natural disasters. However, natural disasters tend to recur in U.S. agriculture. The 2008 Farm Act established several disaster programs, four of which were permanently re-authorized by the 2014 Farm Act (listed below).

Permanent Disaster Response Programs

- Supplemental Revenue Assistance Payments Program (2008-14)
- Livestock Indemnity Program (since 2008; made permanent in 2014)
- Livestock Forage Program (since 2008; made permanent in 2014)
- Tree Assistance Program (since 2008; made permanent in 2014)
- Emergency Assistance for Livestock, Honey Bees, and Farm-Raised Fish Program (since 2008; made permanent in 2014)

Other Programs

There are several other Government programs that have provided payments to farmers during 1991-2015. Although not limited to the following, more recent programs have included:

- Peanut quota buyout program (2002-06)
- Tobacco Transition Payment Program (2005-14)
- Biomass Crop Assistance Program (since 2008)
- Cotton Transition Assistance Program (paid on cotton base acres in 2014 during the transition to the Stacked Income Protection Program) and Cotton Ginning Cost-Share Program (for the 2015 cotton crop)

Appendix B: Selected Income Data for Farm Households and All U.S. Households

Appendix tables B1, B2, B3, and B4 display farm household income data at the 25th, 50th, 75th, and 90th percentiles of the distribution of commodity-related payments, land-retirement payments, working-land conservation payments, and Federal crop insurance indemnity payments, respectively. Appendix table B5 displays median household income for all U.S. households and U.S. households with a self-employed head.

Appendix table B1
Farm household income at selected percentiles of the distribution of commodity-related payments, 1991 and 1996-2015 (2015 dollars)

	Farm household income (2015 dollars)			
Year	25th percentile	50th percentile	75th percentile	90th percentile
1991	20,112	60,715	127,818	257,530
1996	37,068	94,128	169,173	371,548
1997	17,771	71,339	157,901	321,486
1998	31,203	90,461	212,063	367,478
1999	37,418	87,065	182,740	359,027
2000	28,674	81,243	155,019	303,569
2001	29,971	78,740	166,778	333,700
2002	27,269	81,351	174,121	364,803
2003	32,426	96,342	196,485	424,319
2004	46,059	116,421	263,344	551,943
2005	46,792	126,949	266,718	561,923
2006	30,434	97,808	213,553	470,161
2007	34,419	112,276	277,568	562,993
2008	36,051	125,139	300,683	622,045
2009	27,372	98,932	231,139	469,580
2010	43,375	126,759	293,724	657,547
2011	33,859	117,839	286,737	652,147
2012	51,530	157,316	435,123	944,104
2013	73,633	207,417	504,984	1,077,879
2014	69,538	154,403	306,106	610,600
2015	55,000	146,126	322,551	618,598

Note: Farm household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. The Farm Costs and Returns Surveys (FCRS) for 1992-1995 asked a single question about receipt of Government payments. Consequently, we cannot estimate payments by program for 1992-1995. For a particular year, a cell in the 50th percentile column is the farm household income level at which half of commodity-related payments went to farm households with income above that value and half of payments went to farm households with income below that value. In 1991, commodity-related programs include those providing deficiency or diversion payments, disaster payments, storage payments, dairy buyouts, Federal emergency feed payments, and others. In 2015, commodity-related programs included direct and counter-cyclical payments and Average Crop Revenue Election programs, cotton transition payments, loan deficiency payments, marketing loan gains, net value of commodity certificates, agricultural disaster payments, Price Loss Coverage program payments, Agriculture Risk Coverage program payments, Margin Protection Program for Dairy payments, and other programs.

Source: USDA, Economic Research Service and National Agricultural Statistics Service, 1991 FCRS and 1996-2015 Agricultural Resource Management Survey.

Appendix table B2

Farm household income at selected percentiles of the distribution of land-retirement payments, 1991 and 1996-2015 (2015 dollars)

	Farm household income (2015 dollars)			
Year	25th percentile	50th percentile	75th percentile	90th percentile
1991	31,294	54,155	88,515	180,760
1996	40,855	68,854	140,217	198,575
1997	25,897	65,571	112,719	173,707
1998	30,125	69,166	118,285	194,309
1999	38,882	75,555	139,133	230,958
2000	36,101	76,481	135,898	247,888
2001	39,775	68,976	140,557	215,473
2002	36,649	70,835	123,622	196,595
2003	35,837	70,768	118,541	207,112
2004	39,328	75,323	167,429	231,798
2005	44,113	85,585	140,768	227,974
2006	36,693	73,489	147,232	262,515
2007	44,542	79,112	138,008	289,454
2008	35,903	65,954	128,317	258,500
2009	42,764	65,189	129,216	224,664
2010	40,659	72,905	142,300	286,932
2011	42,152	74,978	138,164	254,536
2012	56,010	90,851	171,697	342,045
2013	59,609	90,382	158,336	315,390
2014	60,972	105,320	178,797	346,884
2015	60,270	99,392	169,141	318,199

Note: Farm household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. The Farm Costs and Returns Surveys (FCRS) for 1992-1995 asked a single question about receipt of Government payments. Consequently, we cannot estimate payments by program for 1992-1995. For a particular year, a cell in the 50th percentile column is the farm household income level at which half of land-retirement payments went to farm households with income above that value and half of payments went to farm households with income below that value.

In 1991, the sole land retirement program was the Conservation Reserve Program (CRP). Land retirement programs included CRP and the Conservation Reserve Enhancement Program in 2015.

Source: USDA, Economic Research Service and National Agricultural Statistics Service, 1991 FCRS and 1996-2015 Agricultural Resource Management Survey.

Appendix table B3

Farm household income at selected percentiles of the distribution of working-land conservation payments, 2006-2015 (2015 dollars)

	Farm household income (2015 dollars)			
Year	25th percentile	50th percentile	75th percentile	90th percentile
2006	29,206	120,571	213,312	458,556
2007	40,521	106,010	180,465	426,783
2008	35,301	110,684	238,614	612,529
2009	30,105	86,694	226,503	481,945
2010	34,115	95,266	186,325	360,143
2011	39,736	107,165	233,623	494,259
2012	69,558	139,652	359,835	708,298
2013	70,855	132,889	349,781	733,199
2014	92,446	176,886	403,813	731,359
2015	56,552	157,912	351,980	646,576

Note: Farm household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. Before 2006, working-land payments were small relative to other Government payments, making it difficult to examine their distribution. For a particular year, a cell in the 50th percentile column is the farm household income level at which half of working-land conservation payments went to farm households with income above that value and half of payments went to farm households with income below that value.

In 2006, working-land conservation programs included the Environmental Quality Incentives Program (EQIP) and Conservation Security Program (CSP). In 2015, these programs included the EQIP, CSP, and the Conservation Stewardship Program.

Source: USDA, Economic Research Service and National Agricultural Statistics Service, 2006-2015 Agricultural Resource Management Survey.

Appendix table B4

Farm household income at selected percentiles of the distribution of Federal crop insurance indemnities, 1997-2015 (2015 dollars)

	Farm household income (2015 dollars)			
Year	25th percentile	50th percentile	75th percentile	90th percentile
1997	5,988	63,671	163,521	396,556
1998	21,644	92,091	174,175	387,649
1999	37,478	98,563	213,235	372,087
2000	14,389	79,566	176,908	304,813
2001	20,867	76,595	146,518	322,035
2002	9,475	75,341	155,470	323,201
2003	29,856	99,786	188,786	399,491
2004	38,758	89,393	196,906	478,328
2005	36,835	119,178	287,596	843,389
2006	14,798	96,575	233,113	564,307
2007	27,224	109,199	271,753	591,385
2008	49,018	160,138	376,957	704,972
2009	40,177	138,222	322,611	672,075
2010	19,534	120,850	289,784	641,407
2011	35,466	148,955	345,028	822,284
2012	77,511	221,501	497,302	965,231
2013	87,486	273,406	722,730	1,428,545
2014	73,982	199,252	433,837	794,956
2015	47,829	143,806	319,003	572,166

Note: Farm household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. The earliest year for which we can report reliable indemnity flows by farm size is 1997. Crop insurance indemnities represents gross indemnities and do not subtract farmer-paid portions of the premium. For a particular year, a cell in the 50th percentile column is the farm household income level at which half of Federal crop insurance indemnity payments went to farm households with income above that value and half of indemnity payments went to farm households with income below that value.

Source: USDA, Economic Research Service and National Agricultural Statistics Service, 1997-2015 Agricultural Resource Management Survey.

Appendix table B5

Median household income for all U.S. households and U.S. households with a self-employed head, 1991 and 1996-2015 (2015 dollars)

	Median household income (2015 dollars)	
Year	All U.S. households	U.S. households with a self-employed head
1991	52,422	73,785
1996	53,611	64,705
1997	54,643	70,441
1998	56,538	76,631
1999	57,893	79,954
2000	57,791	82,171
2001	56,511	84,716
2002	55,870	84,934
2003	55,795	84,631
2004	55,623	83,815
2005	56,217	84,669
2006	56,665	85,589
2007	57,430	86,534
2008	55,373	79,225
2009	54,998	75,678
2010	53,546	70,109
2011	52,747	70,176
2012	52,661	70,921
2013	54,505	72,034
2014	53,725	74,689
2015	56,516	78,400

Note: Median household income is expressed in 2015 dollars using the Consumer Price Index, All Urban Consumers (CPI-U) to adjust for price changes. These data are reported for context only.

Source: U.S. Bureau of the Census, Current Population Survey, various years, for all U.S. households. Federal Reserve Board, Survey of Consumer Finances (SCF), various years for all U.S. households with a self-employed head. The SCF is conducted every 3 years. Data points between SCF survey years were interpolated.