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Changing Farm Structure and the Distribution of Farm Payments and Federal Crop Insurance

T. Kirk White and Robert A. Hoppe

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Changing Farm Structure and the Distribution of Farm Payments and Federal Crop Insurance

T. Kirk White and Robert A. Hoppe

Abstract

The distribution of commodity-related payments and Federal crop insurance indemnities to U.S. farmers has shifted to larger farms as more and more U.S. agricultural production is done on those farms. Since the operators of larger farms tend to have higher household incomes than other farm operators, commodity-related program payments and Federal crop insurance indemnities also have shifted to higher income households. By 2009, half of commodity-related program payments went to farms operated by households earning over $89,540, a quarter went to farms operated by households with incomes greater than $209,000 and 10 percent went to farms operated by households with incomes of at least $425,000. Current income eligibility caps and payment limits affect few farm households because most of them have incomes below the income caps or receive payments less than the payment limits. Based on 2009 Agricultural Resource Management Survey (ARMS) data, recent proposals to lower those income caps and payment limits would still affect only a small percentage of U.S. farm households, because their incomes would still fall below the proposed income caps and payment limits. Total Government program payments to U.S. farms were $12.3 billion in 2009. Total Federal crop insurance indemnity payments were $5.2 billion in 2009.

Keywords: farm program payments, Federal crop insurance, Agricultural Resource Management Survey, structural change, income caps, payment limits.

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Contents

Summary iii

Introduction 1

Sources of Data 2
Time Period for Agricultural Resource Management Survey (ARMS) and Farm Costs and Returns Survey (FCRS) 2
Farm Classification 2
Government Payments Programs for Farmers and Federal Crop Insurance 5

Who Receives the Benefits of Government Payments? 7

The Land Market 7
Risk Mitigation 9
Variation by Farm Size and Specialization 9

Changes in Government Payments and Crop Insurance Programs . . . 14

Agricultural Production Shifts to Larger Farms 17

Shifts in Production 17
Increasing Enterprise Size 18

Reasons for the Shift in Production 20

Shifts in Program Payments and Federal Indemnity Payments 22

Payments Shift to Higher Income Households 26

Household Income Varies by Sales Class 26
Commodity-Related Payments 28
Effects of Increases in Commodity Prices 29
Conservation Payments 30
Federal Crop Insurance Indemnities 30
Some Caveats 32

Current and Proposed Income EligibilityCaps and Payment Limits for Receipt of Government Payments 33

Payment Limits 36
Effects of Payment Limits in Practice 40

Conclusions 43

References 44

Appendix: Government Payments Programs for Farmers and Federal Crop Insurance 46

List of Acronyms 52

Summary

What is the Issue?

The Federal Government supports farmers through USDA programs such as commodity-related program payments made directly to farmers and indemnity payments from Federal crop insurance. In the next farm bill, Congress may adjust both the portion of the overall Federal budget going to farm programs and the design of these programs. Even if there are no changes in farm policy, ongoing changes in farm structure are altering the distribution of farm support. We analyze the impact of program design, farm organization, and changes in farm structure on the distribution of farm support as policymakers contemplate future farm-related legislation.

What Are the Study Findings?

Total Federal Government program payments to U.S. farms, which summed to about $12.3 billion in 2009, have ranged from as high as $24.4 billion in 2005 to as low as $7.3 billion in the late 1990s. Indemnity payments from Federal crop insurance have grown larger in recent years. In 1991, total Federal crop insurance indemnity payments to farms were $955 million. By 2009, that figure had increased to $5.2 billion. Not all of the increase in Federal crop insurance indemnity payments represents net benefits to farms, because farms also pay premiums. Similarly, not all Government program payments directly benefit farms, because higher payments can lead to higher production costs, especially for land rentals. Higher payments attached to cropland can lead landowners and farmers to bid up the price of land and rental rates for land. Thus, some of the benefits of Government program payments flow to nonoperator landlords in the form of higher land rents. A significant percentage of U.S. agricultural landlords are not farmers.

A long-term shift in production to larger farms has contributed to a shift in the distribution of commodity-related Government program payments and Federal crop insurance indemnity payments toward larger farms, most of which are family farms. Since operators of larger farms tend to earn higher household incomes, this shift has in turn led to a shift in the distribution of commodity-related Government payments toward higher income farm households. Most commodity-related program payments now go to farms operated by households with annual incomes over $89,000—significantly higher incomes than the typical U.S. household. Federal crop insurance indemnity payments have also shifted toward farms operated by higher income households, although not as much as commodity-related program payments.

Congress has created upper limits on the amount of Government program payments that can be made to an individual, as well as income caps that restrict eligibility to households with income below specified levels. The levels differ, depending on program type and income type (farm or off-farm). The current payment limits and income eligibility caps affect few recipients and only a small share of total payments. Several of the recent proposals to lower payment limits or income eligibility caps would still only affect a few recipients. However, some types of farms—especially rice and cotton farms—could be affected more than others, because they tend to receive

larger payments than others. Nonetheless, given the small number of farms potentially affected by the proposed limits, in most areas these effects would be small. Payment limits do not apply to Federal crop insurance indemnities or premium subsidies.

How Was the Study Conducted?

We used data from four main sources: USDA's Farm Sector Accounts, the annual Agricultural Resource Management Survey (ARMS), the U.S. Censuses of Agriculture, and summaries of business reports from USDA's Risk Management Agency (RMA). We used the Farm Sector Accounts data to estimate total annual Government payments to farms from 1999 to 2009. The ARMS data were used to examine receipt of Government payments and indemnities from Federal crop insurance by different types of farms, the shift of production to larger farms, and changes in the distribution of insurance indemnities and Government payments by the level of operator household income. Note that some of the programs enacted by the 2008 Farm Act, such as the Average Crop Revenue Election (ACRE) program and the Supplemental Revenue Assistance Payments (SURE) program, are not reflected in the 2009 ARMS data. We used the Census of Agriculture for comprehensive data on multi-year changes in acreage and production by crop. Those data are not available in either the ARMS or administrative data. Finally, we use summaries of business reports from the RMA's Federal Crop Insurance Corporation to calculate totals for Federal crop insurance indemnities received by farmers.

Introduction

The Federal Government provides support to farmers in a variety of ways, but most visibly through USDA programs. USDA agencies perform and support research and extension, develop new products, purchase commodities for distribution to school lunch and other feeding programs, and provide services to farmers. This report focuses on Federal crop insurance indemnity payments and Government farm program payments made directly to farmers. Government program payments (hereafter referred to as Government farm payments) to the farm sector include commodity program payments, emergency and disaster relief payments, conservation program payments, and special programs such as the peanut quota buyout. The 2008 Farm Act also introduced a new form of Government payment through the Average Crop Revenue Election (ACRE) program, which protects farmers against revenue risk.

Total Government payments to U.S. farms were about $12.3 billion in 2009. They also vary considerably from year to year, depending on market conditions, the occurrence of natural disasters, and changes in program design. In recent years, total Government payments have ranged from as low as $7.3 billion in 1995 and 1996 to as high as $24.4 billion in 2005.

In addition to Government payments, USDA supports farmers through crop insurance programs. USDA's Risk Management Agency (RMA) reduces risk for farmers by subsidizing commercially provided insurance premiums. Indemnity payments from Federal crop insurance (hereafter referred to as indemnity payments) have grown larger in recent years. In 1991, total Federal indemnity payments to farms were $955 million. By 2009, that figure had increased to $5.2 billion.

Regardless of the level of payments, however, a long-term shift in production to larger farms has contributed to a shift in the distribution of commodity-related Government payments and Federal indemnity payments toward larger farms. Since operators of larger farms tend to earn higher incomes, this shift has, in turn, led to a shift in the distribution of commodity-related Government payments toward higher income farm households. Federal indemnity payments have also shifted toward higher income households, although not as much as commodity-related Government payments.

Congress has created upper limits on the amount of Government payments that can be made to an individual as well as income eligibility limits that restrict eligibility for payments to households with income below specified levels. However, the current payment caps and income eligibility limits affect few recipients and only a small share of total payments.

In this report, we look at both the level and the distribution of payments to farmers and how these payments have changed over time. We examine the distribution of payments across commodity specializations, farm sizes, and farm household income classes, and how structural change in agriculture has shifted payments to larger farms and higher income farm households. We also consider the impacts of payments on land values and land rents, and hence, on landlords. Finally, we evaluate the impact of current and proposed payment limits and eligibility restrictions on the distribution of payments.

Sources of Data

We use data from four main sources: USDA's Farm Sector Accounts, the annual Agricultural Resource Management Survey (ARMS), the U.S. Censuses of Agriculture, and administrative data from RMA's Federal Crop Insurance Business Summary Reports. The Farm Sector Accounts provide data on Government payments back to 1933, with a detailed breakdown of payments by source between 1996 and 2009. The sector accounts are based on administrative data and provide more or less complete estimates of all types of Government payments.

Although the administrative data provide nearly complete coverage of payments, they do not link payments to farm-level data on production and farm operator households. The ARMS provides such a link. The ARMS is jointly designed and administered each year by USDA's National Agricultural Statistics Service (NASS) and Economic Research Service (ERS). Beginning in 1996, ARMS covers U.S. farming operations and their operators in the 48 contiguous States. For earlier years, comparable data are available from ARMS' predecessor, the Farm Costs and Returns Survey (FCRS).

We use the Census of Agriculture for comprehensive data on multi-year changes in acreage and production by crop. Those data are not available in either the ARMS data or the administrative data. Finally, we use RMA's Federal Crop Insurance Business Summary Reports for comprehensive data on Federal crop insurance indemnity payments. Although both the farm sector accounts (based on administrative data) and the ARMS include data on Government payments, there are some disparities between these two datasets that can lead to different estimates, based on the data source. The box "ARMS versus Administrative Data" discusses these differences and the advantages of each data source.

Time Period for Agricultural Resource Management Survey and Farm Costs and Returns Survey

When following trends using ARMS and FCRS data, we start with 1991, the first year that the FCRS and ARMS are fully compatible. The report focuses on selected years—1991, 1997, 2003, and 2009—for ease in presentation. This gives four snapshots of agriculture, each 6 years apart.

Because prices changed between 1991 and 2009, we adjust dollar amounts for price changes. No single price index is appropriate in all cases. Three are used in this report (see box "Adjusting for Price Changes" for more information).

Farm Classification

In this report we classify farms as family farms or nonfamily farms. Family farms are those in which the principal operator and people related to the principal operator by blood, marriage, or adoption own more than 50 percent of the farm business, whether as a sole proprietorship, a partnership, or a family-controlled corporation. We further classify family farms as noncommercial farms (annual sales less than $10,000), small commercial farms (annual sales

ARMS versus Administrative 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, with indemnity payments coming from the Federal Crop Insurance Summary of Business Reports.

The two types of data have different strengths and weaknesses. Administrative data are both comprehensive and report actual Federal Government payouts; the ARMS data are based on information provided by respondents to a sample survey, so are not comprehensive and are only as accurate as the respondents' records or recollection. While the ARMS survey was designed to be representative of U.S. farms, it is not necessarily a representative sample of farms that participate in Government payment or insurance programs. But it has one big advantage over administrative data—ARMS data allow us to examine relationships that cannot be studied with administrative data alone, such as the distribution of payments by farm size and household income.

There are other important differences that need to 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 data for individual beneficiaries or other administrative units, such as insurance policies. Administrative data is 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 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.

Total Federal indemnity payments and farms receiving them
1997, 2003, and 2009 ARMS

Crop year	Farms receiving Federal indemnities (number of farms)	Total Federal indemnities ($ billions)	ARMS total/ RMA total
1997	76,715	1.2	0.62
2003	140,618	3.9	0.61
2009	134,757	5.2	0.81

GDP = Gross domestic product.
RMA = Risk Management Agency, USDA.
Note: indemnities are in 2009 dollars, deflated using the GDP chain-type price index

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1997, 2003, and 2009 Agricultural Resource Management Survey.

While ARMS' coverage of Government program payments and crop insurance indemnities varies by program and over time, in general the survey appears to capture 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. For 2006 to 2009, Park et al. (2010) find that ARMS estimates of total Government payments are on average about $3.3 billion lower than, or about 75 percent of, the corresponding estimates from calendar-year administrative data. Unlike administrative data, however, the ARMS data exclude farm program payments to nonoperator landlords. This accounts for about $2.3 billion per year (2006-2009). If we restrict attention to the share of payments received by farm operators, the ARMS captures about 90 percent of the payments in the sector accounts over this period.[1]

The ARMS coverage of Federal indemnity payments is not as complete as it is for Government program payments, but it has improved from about 62 percent of total Federal indemnity payments in 1997 to about 81 percent in 2009 (see table). Thus, we are confident that the relationships discussed in this report are accurate.

[1]See pages 15-16 in Park et al. (2010) for a detailed comparison of Government payments in the ARMS versus the farm sector accounts (derived from administrative data).

Adjusting for Price Changes

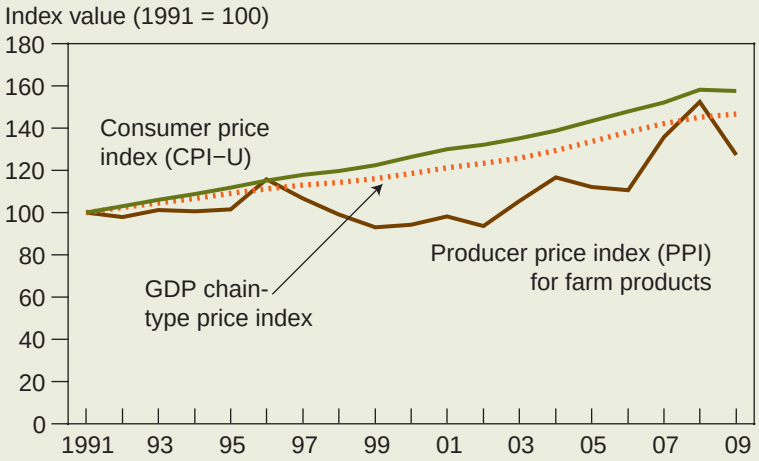
We analyze changes over various years between 1991 and 2009 in:

- The distribution of farms, production, and Government payments by sales class
- The level of Government payments
- Income levels of operator households that receive Government payments

Sales class, Government payments, and household income are all commonly measured in current dollars. Since we are focusing on changes in production—not changes in dollars—we adjust these dollar amounts for any price changes that may have occurred in the 1991-2009 period. This ensures that the reported changes reflect changes in production rather than prices.

To see the need for adjusting for price changes, consider a simple example. In 1991, the average corn yield in Iowa was 117 bushels per acre, and the season-average price was $2.30 per bushel. In 2009, the corresponding figures were 182 bushels per acre and $3.59 per bushel. Thus in 1991 the average corn acre in Iowa generated $269 of revenue (the product of 117 and $2.30), while in 2009 the average acre generated $653. Part of the increase in revenue per acre reflected greater corn production, but part reflected price increases (from $2.30 to $3.59). Using revenue as a measure of production would overstate the increase in corn production.

Value of three price indices, 1991-2009
The farm PPI shows no clear trend, unlike the two other indices



GDP = Gross domestic product.
Source: U.S. Department of Labor, Bureau of Labor Statistics for the CPI-U and PPI for farm products; U.S. Department of Commerce, Bureau of Economic Analysis for the GDP chain-type price index.

When we measure more aggregated quantities such sales of all farms products, the issue of price changes is a little more complex than in the Iowa corn example, because there may be many different products and therefore many different prices. In this case, we use a price index, which is a weighted average of prices for a given set of goods or services in a given time period. Different sets of goods and services require different price indices. We use three in this report:

- **Producer price index (PPI) for farm products.** To adjust farm sales for price changes, we use an index that captures commodity prices received by farmers. The farm PPI is used to express sales in constant dollars to ensure that a shift in farms to higher sales classes between two years reflects greater physical production, rather than an increase in commodity prices. Deflating farm sales by the PPI for farm products adjusts for farm price changes, and allows us to compare quantities of production over time.
- **Gross domestic product (GDP) chain-type price index.** In the case of Government payments, we need a broader price index than the farm PPI. Government payments are funded by taxes—or borrowing—from other economic entities, so the relevant price index should reflect the general price level for the entire economy. We use the GDP chain-type price index. This allows us to compare government payments over time as if we were comparing how much of the output of the entire economy they would buy in different years.
- **Consumer price index for all urban consumers (CPI-U).** When we look at changes in household income over time, we want to measure changes in purchasing power, i.e., changes in the household's ability to purchase a standard basket of goods. To do this, we deflate household income by the CPI-U. The CPI-U prices a market basket of goods and services that consumers typically buy and follows the change in the cost of the basket over time. Ideally, a CPI for rural areas or for farm households would be used in this report, but such an index does not exist.

Both the GDP chain-type index and the CPI-U increased steadily between 1991 and 2009 (see the figure). An exception was 2009 when the CPI-U declined slightly, a result of the recession ending in June 2009. Changes in the PPI for farm products were less consistent than those for the other indices, reflecting the volatility of farm commodity prices. Nevertheless, the farm PPI prior to 2006 fell within a relatively narrow range, from 93 to 117. Commodity price change became more marked when the index jumped from 111 in 2006 to 153 in 2008 and then back fell to 123 in 2009. Obviously, using the appropriate time series index is important, because the three indexes are substantially different in most years.

between $10,000 and $249,999), large farms (annual sales between $250,000 to $999,999), and very large farms (annual sales of $1 million or more). Nonfamily farms include any farm for which the operator and relatives do not own a majority of the business. For example, nonfamily farms include farms operated by publicly held corporations, farms equally owned by three unrelated business partners, as well as farms operated by a hired manager for a family of absentee owners.

Government Payments Programs for Farmers and Federal Crop Insurance

USDA runs several different types of payment programs for farmers. We classify these payment programs as follows:

- *Commodity direct or "fixed" payments* to farmers are based on their historic production of program crops. These include production flexibility contract (PFC) payments prior to the 2002 Farm Act. Direct payments are paid annually based on a producer's historical acreage (so-called "base acreage") and yields of program crops in earlier years.

- *Counter-cyclical payments (CCP)* provide benefits to producers with historical production of certain crops. Unlike direct payments, the counter-cyclical payment rate depends on market prices.

- *The Average Crop Revenue Election (ACRE)* program, authorized by the 2008 Farm Act, is an alternative to the counter-cyclical payments program for crop years 2009 to 2012. Under the ACRE program, payments are triggered when State revenue and farm-level revenue for a commodity fall below benchmark levels. ACRE program payments were first reported by farmers in 2010.

- *Marketing loan benefits* include loan deficiency payments (LDP), marketing loan gains, and, through the 2009 crop, commodity certificate gains. Unlike direct payments and counter-cyclical payments, marketing loan benefits directly depend on current production. Marketing loan benefits are only paid when market prices are low.

- *Conservation payments* include land-retirement programs and working-land programs. Land-retirement programs require that landowners not produce on land enrolled in the program. Working-land programs provide incentives for natural resource conservation on land still in production.

- *Emergency or disaster relief payments* were generally ad hoc Government responses to droughts, floods, or other natural disasters prior to the 2008 Farm Act. In 2008, the Supplemental Agricultural Disaster Assistance Program was created to replace these ad hoc disaster programs.

- All other Government payments to farms.

In addition to Government payments, USDA reduces risk for farmers by subsidizing crop insurance. Costs to the Federal Government from the crop insurance program fall under three major categories: Federal premium subsidies, administrative and operating (A&O) costs, and program underwriting losses (or gains).

Over the period covered by this report—1991 to 2009—farm programs have undergone a number of changes. While we attempt to describe the programs as they currently exist (see Appendix for additional program design information), it is important to recognize that not all of the 2008 Farm Act's provisions resulted in payments in 2009. Thus, while ACRE and the Supplemental Revenue Assistance Payments Programs were enacted in 2008, they are not reflected in the 2009 Government payments reported by ARMS respondents. On the other hand, some 2008 Farm Act provisions are reflected in the 2009 payments. For example, starting in 2009, most farms with fewer than 10 base acres (a measure used to calculate the size of direct and counter-cyclical program payments) were no longer eligible for such payments (Arriola et al., 2011).

Who Receives the Benefits of Government Payments?

The billions of dollars the Government spends on payments to farmers undoubtedly benefit farmers. However, one dollar of Government payments does not necessarily translate into a dollar of net benefit to farmers. Payments can affect farmers' expenses as well as revenues. Payments affect land rents, and most cropland is rented. Furthermore, different programs benefit farmers in different ways. Finally, the level of support also varies with a farm's mix of commodities. For example, farms that historically grew program crops are often eligible for direct payments, but farms that grow only fruits and vegetables are not eligible for direct payments.

The Land Market

To understand how payments affect land rents, we first need to understand the market for cropland since many Government payments are based on current or historic crop production. Crop farmers may own their land, they may rent some or all of it for cash, and they may rent some or all of it for a share of production (share-rent). Cash rents are determined at the beginning of the season. So under a cash lease agreement, the landlord does not assume any of the risk associated with uncertain harvests. Share-lease agreements are also set at the beginning of the season, but the payment to the landlord is determined after the uncertainty about production and prices is resolved. Thus, under a share lease, the landlord assumes some of the risk. Under share leases, landlords are also eligible for a share of Government payments.

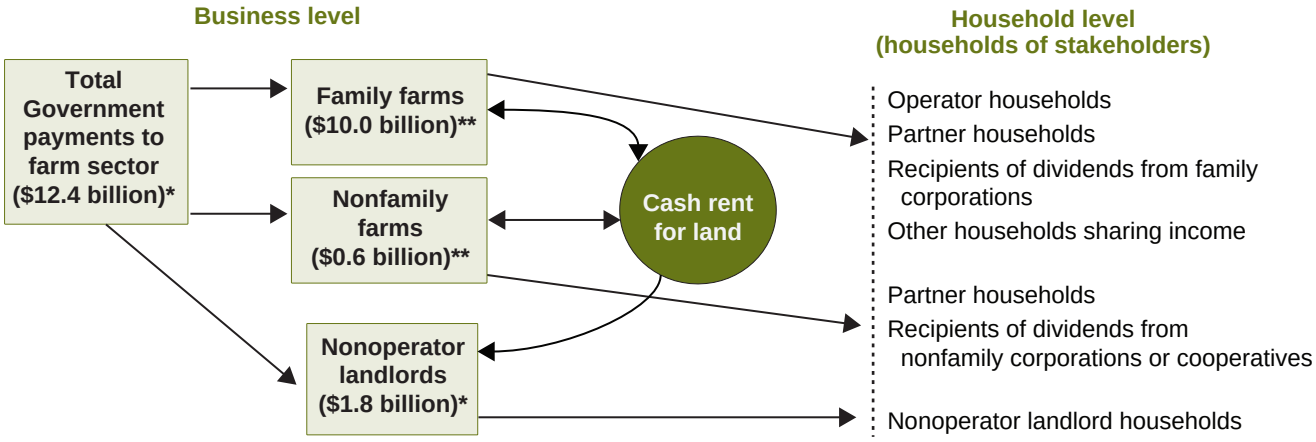
Payments increase the gross returns to land. The gross return to land includes both the returns the producer can make from producing and selling crops or livestock and the Government payments the producer can receive. Like any other asset, an increase in the gross returns to land drives up the price of that land. For example, suppose a landowner rents a plot of land to a farm operator. When Government payments increase, the landowner may realize that the operator can earn more from the land, and as a result, the landlord may charge higher rent. Alternatively, when Government payments increase, other farm operators, realizing they can earner higher gross returns, may offer higher rent for the plot of land, thus bidding up the rental rate.

Figure 1 is a simplified diagram of the flow of Government payments through the farm sector. In 2009, about $12.4 billion flowed to the farm sector. Of this total, $10 billion went directly to family farm businesses, $0.6 billion went to nonfamily farm businesses, and $1.8 billion went to nonoperator landlords. Of the $10 billion received by family farm businesses, some went to pay for increased cash rents to other family farm businesses, other nonfamily farm businesses, or nonoperator landlords, or to pay other expenses associated with production. The rest went to operator households, partners' households, recipients of dividends from family corporations, or other households associated with the farm. The flow of payments from nonfamily farms to households follows a similar path.

Recent research supports the hypothesis that some of the benefits of payments are mitigated by higher costs to farmers in the form of higher

Figure 1

The flow of Government payments through the farm sector, 2009



*From 2009 farm sector accounts.
**Sector estimate was distributed by ratios computed from ARMS.

Government payments do not all ultimately flow to operator households, dollar for dollar:

- Payments may be capitalized into the value of land, which raises rents.
- For some programs, receipt of payments requires production of commodities, which entails expenses. Payments may also be capitalized into prices paid for inputs.
- Some payments go to nonoperator landlords, nonfamily farms, and other stakeholders.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2009 Agricultural Resource Management Survey (ARMS) and U.S. and State Farm Income Data (the farm sector accounts), available at: http://www.ers.usda.gov/data/farmincome/finfidmu.htm/.

land prices and higher rental payments for land. Using data from the 1992 and 1997 Censuses of Agriculture, Roberts, Kirwan, and Hopkins (2003) found that between 34 and 41 cents of each Government-payment dollar went to increased land rents. In more recent research using the same data, Kirwan (2009) found that landlords capture roughly 25 percent of each additional dollar of Government payments to farmers in the form of higher cash rents. Although many farmers own their own land, 64 percent of cropland is operated by someone other than the owner.[1] Goodwin, Mishra, and Ortalo-Magné (2011) report that 57 percent of agricultural landlords are not farmers. Kirwan (2009) finds that 94 percent of rented farmland is owned by nonfarmers. Thus nonfarmer landlords are likely to capture a significant fraction of the benefits of Government payments to farmers.

Economic theory suggests that Government payments might also raise the costs of other agricultural inputs that are in short supply to the extent that payments increase demand for inputs to production. Therefore, some portion of Government payments may also flow to inputs providers. To summarize, empirical evidence and economic theory suggest that for most farmers, Government payments raise both revenues and expenses.

An additional dollar of payments can provide different benefits to producers of the same crop depending on whether they own, cash-rent, or share-rent. These benefits also depend on the type of program. For example, using ARMS data from 1998 to 2001, Goodwin, Mishra, and Ortalo-Magné (2011) found that an additional dollar (per year) of expected loan deficiency payments appeared to add $27 to the value of the land. This benefits eligible cropland owners (both farmer and nonfarmer) but not tenants. These researchers also found

[1]The data source for this statistic is the 1999 Agricultural Economics and Land Ownership Survey, the most recent comprehensive data available on rented cropland.

that an additional dollar per acre of direct payments (or production flexibility contract payments, as they were called prior to 2002) raised cash rents by 29 cents per acre, while an additional dollar of expected LDPs per acre raised cash rents by 83 cents per acre. In contrast, neither direct payments nor expected LDPs appear to influence share-rental rates, presumably because the landlords already receive their share of the payments as part of the share-lease.

Risk Mitigation

Different Government payment programs also protect farmers against different types of risk. Some Government programs—particularly those that vary with commodity prices, such as marketing loan programs, counter-cyclical payments, and ad hoc market loss assistance payments—reduce revenue risk for farmers. Marketing loan benefits accrue to farmers when prices are low. Thus they provide insurance against down-side price risk. The ACRE program provides some protection against a farmer's revenue risk. Agricultural disaster payments and ad hoc market loss assistance payments also directly insured against revenue risk, since these have historically been enacted by Congress when revenues for particular crops or areas are low.

Although counter-cyclical payments are not tied to current production, they also provide revenue risk protection, especially if the farmer chooses to plant the same crop as the crop upon which the counter-cyclical payments are based, since CCPs are larger when prices are lower (Westcott, Young, and Price 2002). The insurance effects of Government payments are supplemented by crop insurance subsidized by USDA's RMA. Different crop insurance policies protect against the risk of low yields or low revenues at either the farm level or the county level.

Variation by Farm Size and Specialization

Government payments also vary by farm type and sales classes. Tables 1 and 2 show the distribution of Government payments by farm type and sales class in 2005, the most recent year of large total payments, and 2009, the most recent year of complete ARMS data at the time this study was initiated. The four panels of the tables show the total number of farms, the percent of farms reporting payments, the average payment per farm reporting payments, and payments as a percentage of gross cash farm income (GCFI) among farms reporting payments. GCFI is the sum of the farm's cash and marketing contract revenues from the sale of livestock and crops, Government payments, and other farm-related income, including fees from production contracts. Examining payments' share of GCFI gives an idea of how much of a farm's gross income is coming from Government payments.

Farm types are defined by the type of farm commodity that represents the largest portion of the farm's gross cash farm income in a given year. If more than 50 percent of a farm's gross income comes from the sale of cotton, the farm is classified as a cotton farm ("cash grains and cotton"), even though it may produce other crops. If no commodity comprises more than 50 percent of a farm's gross income, then the farm is classified as a general crop farm (or a general livestock farm if the farm primarily produces livestock).

Table 1

Distribution of Government payments, 2005

Payments' share of gross cash income varies by farm type and size

Item	Farm type defined with value of production				
	Cash grains and cotton	General crops	High-value crops	Dairy and livestock	48-State total
Number of farms			*Numbers*		
All	306,616	449,414	140,168	1,198,679	2,094,876
Less than $10,000	43,905	330,499	54,117	696,547	1,125,067
$10,000-$249,999	183,601	95,845	57,740	397,365	734,551
$250,000-$999,999	61,470	9,229	11,638	56,342	138,678
$1,000,000 or more	7,374	1,572	6,738	20,067	35,751
Nonfamily (any size)	10,266	12,269	9,936	28,357	60,828
Farms receiving payments			*Percent of farms*		
All	92.6	56.3	14.2	28.6	42.9
Less than $10,000	72.2	48.1	*4.8	11.6	24.4
$10,000-$249,999	95.3	76.1	16.4	50.2	62.2
$250,000-$999,999	98.9	91.6	33.0	67.8	80.3
$1,000,000 or more	99.4	87.7	34.5	65.9	67.8
Nonfamily (any size)	86.7	91.9	16.5	36.5	52.9
Mean payment per reporting farm			*Inflation-adjusted dollars per farm*		
All	34,461	9,409	28,095	10,131	18,004
Less than $10,000	1,887	3,116	na	1,290	2,421
$10,000-$249,999	17,900	13,018	14,554	6,498	12,073
$250,000-$999,999	72,477	60,477	35,628	27,107	54,720
$1,000,000 or more	205,024	146,129	75,183	60,350	110,383
Nonfamily (any size)	76,029	19,865	*63,710	*22,622	38,533
Share of gross cash farm income, reporting farms			*Percent*		
All	16.0	18.9	4.9	5.6	11.0
Less than $10,000	*21.1	45.9	na	20.1	35.0
$10,000-$249,999	18.1	24.5	14.0	9.7	15.5
$250,000-$999,999	16.2	13.2	6.9	6.9	12.7
$1,000,000 or more	12.5	7.4	3.0	2.9	5.6
Nonfamily (any size)	15.2	21.5	*3.9	*4.0	8.8

All 48 contiguous States were included in the sample.
Coefficient of variation = (standard error/estimate)*100.
* = CV is greater than 25 and less than or equal to 50.
na = value is not available due to no observations, an undefined statistic, or reliability concerns.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2005 Agricultural Resource Management Survey, using all versions of the survey.

Table 2

Distribution of Government payments, 2009

For most farm types and sizes, payments comprised a smaller share of gross cash income than in 2005

Item	Farm type defined with value of production				
	Cash grains and cotton	General crops	High-value crops	Dairy and livestock	48-State total
Number of farms			*Numbers*		
All	330,394	537,193	146,126	1,178,140	2,191,853
Less than $10,000	38,849	426,750	53,486	762,703	1,281,788
$10,000-$249,999	174,559	81,590	65,386	317,735	639,270
$250,000-$999,999	90,036	9,134	13,606	53,236	166,012
$1,000,000 or more	13,971	2,538	6,303	21,124	43,937
Nonfamily (any size)	12,979	17,182	7,343	23,342	60,846
Farms receiving payments			*Percent of farms*		
All	85.5	50.7	10.5	21.2	37.4
Less than $10,000	45.5	45.9	*4.4	8.7	22.0
$10,000-$249,999	88.3	68.6	11.9	42.1	55.0
$250,000-$999,999	96.9	80.8	23.4	58.9	77.8
$1,000,000 or more	95.3	86.2	25.9	59.1	67.4
Nonfamily (any size)	77.7	63.7	*5.3	24.6	44.6
Mean payment per reporting farm			*Inflation-adjusted dollars per farm*		
All	15,962	7,316	13,872	10,736	11,459
Less than $10,000	1,196	2,980	na	1,268	2,458
$10,000-$249,999	7,235	14,566	*6,384	6,799	8,218
$250,000-$999,999	25,362	37,557	13,895	30,272	26,968
$1,000,000 or more	73,386	86,307	*58,659	44,472	61,347
Nonfamily (any size)	18,164	*11,671	*47,002	31,923	18,868
Share of gross cash farm income, reporting farms			*Percent*		
All	5.1	13.5	2.1	4.6	5.5
Less than $10,000	12.9	36.7	na	*10.9	27.3
$10,000-$249,999	6.9	24.3	*5.8	8.9	9.5
$250,000-$999,999	4.9	6.4	2.3	6.7	5.4
$1,000,000 or more	4.0	4.3	*1.7	2.1	3.0
Nonfamily (any size)	4.8	11.3	*1.3	2.6	3.9

All 48 contiguous States were included in the sample.
Coefficient of variation = (standard error/estimate)*100.
* = CV is greater than 25 and less than or equal to 50.
na = value is not available due to no observations, an undefined statistic, or reliability concerns.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2009 Agricultural Resource Management Survey, using all versions of the survey.

In 2005, about 43 percent of the 2.1 million farms in 48 States received Government payments. The number and percentage of farms receiving Government payments varied considerably across farm types and farm sales classes. In 2005, about 93 percent of the approximately 307,000 cash grains and cotton farms received payments. Cash grains and cotton include most of the major program crops: cotton, corn, soybeans, wheat, barley, sorghum, oats, and rice. Lower percentages of other types of farms receive payments. In 2005, only 14 percent of the approximately 140,000 high-value crops farms[2] and 29 percent of the 1.2 million dairy and livestock farms received Government payments. In most cases, these farms receive payments because they are also producing program crops. For most types of farms, the percentage of farms receiving payments increases with sales class. While only 72 percent of noncommercial cash grains and cotton farms received payments, about 99 percent of cash grains and cotton farms with sales over $250,000 received payments.

[2]High-value crops include fruits, vegetables, and nursery and greenhouse crops.

Average payments per farm also varied considerably by farm type and sales class. For every type of farm, in 2005, the average payment per farm rose significantly with farm sales class. Average payments varied the most among cash grains and cotton farms, ranging from $1,887 for noncommercial farms to about $205,000 for farms with sales of $1 million or more. In table 1, we have adjusted prices to 2009 dollars as described in the box "Adjusting for Price Changes." These are average payments for farms receiving payments, so farms that did not receive Government payments are excluded from the averages. Average payments for other types of farms tended to be smaller than those for cash grains or cotton. However, since nonoperator landlords capture some of the payments, operators of cash grains and cotton farms do not receive all the benefits of these higher payments.

The final panel of table 1 shows payments as a percentage of GCFI in 2005. Averaging across all sales classes, payments' share of GCFI ranged from about 5 percent for high-value crop farms to 19 percent for general crop farms. The latter category includes all crop farms that are not classified in one of the other categories of crop farms. With the exception of high-value crops, Government payments accounted for a larger percentage of GCFI for crop farms than they did for livestock and dairy farms. However, since some of these payments also result in higher production costs for crop farms, the operators of these farms do not receive all of the benefits of these payments. For most types of crop farms—cash grains and cotton, general crops, and high-value crops—payments' share of GCFI declines with farm sales class. For example, payments account for about 21 percent of the GCFI of noncommercial cash grains and cotton farms, but only 13 percent of the GCFI of cash grains and cotton farms with sales of $1 million or more.

The size of Government payments also varies across years, depending on yields and market prices. Table 2 shows the distribution of payments by farm type and sales class in 2009. In years when prices are low—such as 2005—a higher percentage of farms receive payments, and payments per farm and payments' share of GCFI are higher. Compared to 2005, a lower percentage of farms in all sales classes reported receiving payments in 2009. The biggest decrease occurred among noncommercial cash grains and cotton farms, only 46 percent of which reported receiving payments in 2009, down from 72 percent in 2005. In general, program participation in 2009 followed the

same patterns as in 2005: higher percentages of cash grains and cotton farms participated than did livestock and dairy farms and high-value crop farms. As in 2005, the percentage of farms receiving payments tended to increase with sales class in 2009.

For most farm types and sizes, average payments per farm were lower in 2009 than in 2005. At this level of aggregation, the average payment per farm increased with sales class for all types of farms. For example, cash grains and cotton farms with sales between $250,000 and $999,999 received about $25,000 of Government payments per farm in 2009, while cash grains and cotton farms with sales over $1 million received about $73,000 per farm.

Compared to 2005, payments as a share of GCFI in 2009 were lower for all types of farms. Payments' share of GCFI declined especially sharply for cash grains and cotton farms, from 16 percent in 2005 to 5 percent in 2009. Payments in 2009 accounted for a larger percentage of GCFI for general crop farms than they did for other types of farms. For all types of farms, payments as a share of GCFI were lower for larger farms in 2009, just as in 2005.

In summary, Government payments to farms vary by type of program, farm type, farm size, and year. Cash grain and cotton farms had the highest share of farms receiving payments. Larger farms of most types are more likely to receive payments and tend to receive larger payments, although these payments are a smaller percentage of these farms' gross income. When prices are low, payments per farm and payments' share of GCFI are higher, and a larger proportion of farms receive payments. However, a dollar of payments does not equal a dollar of net benefit to farms, because Government payments may result in greater expenses for farms, as well as greater revenue.

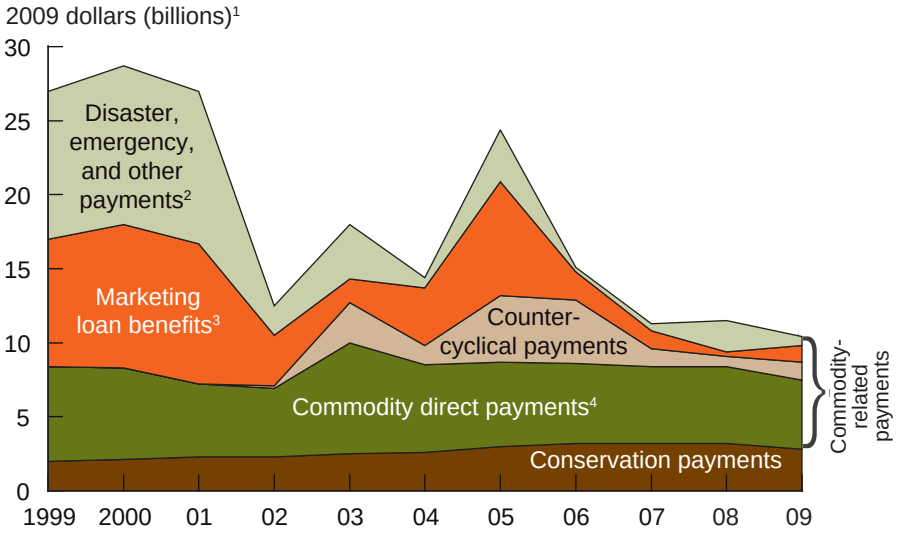
Changes in Government Payments and Crop Insurance Programs

Figure 2 shows the annual variation in Government payments from 1999 to 2009 for commodity direct payments; marketing loan benefits; counter-cyclical payments; conservation payments; disaster/emergency; and all other Government payments to farms. We chose the period 1999 to 2009 in order to focus on recent trends.

Spending in the conservation category tends to be stable, because the Conservation Reserve Program (CRP), created in the 1985 Farm Act, has historically accounted for the bulk of conservation payments. The CRP uses long-term contracts and while land has moved into and out of the program over time, the level of enrollment has remained fairly steady since the first years of the program. Since enrollment in land-retirement programs takes land out of production, increases in land-retirement enrollment acreage tend to decrease overall commodity-related payments and Federal indemnities. Working-land programs have expanded since 2002, and working-land payments are now almost as large as payments under the CRP.

Emergency or disaster relief payments fluctuate from year to year, since they were ad hoc Government responses to disasters such as droughts or floods over the period covered in this study. The "other payments" category includes programs such as milk income loss payments and temporary programs such as the peanut quota buyout payments and tobacco transition payments.

Figure 2
Government payments by program, 1999 to 2009
Conservation payments and direct payments are relatively stable



[1]Deflated with the gross domestic product (GDP) chain-type price index.
[2]Includes peanut quota buyout payments, milk income loss payments, and tobacco transition payments.
[3]Loan deficiency payments, marketing loan gains, and certificate exchange gains.
[4]Includes the similar production flexibility contract payments that preceded direct payments.
Source: USDA, Economic Research Service, U.S. and State Farm Income Data (the farm sector accounts).

For ease of exposition, we aggregate the payment programs into two broad categories: commodity-related payments and conservation payments. Commodity direct or fixed payments, payments depending on market prices, disaster and emergency payments, and the "other payments" categories are collectively called commodity-related payments.[3] We also break the second category, conservation payments, into two subcategories: land-retirement payments (including the CRP) and working-land payments, (including the Environmental Quality Incentives Program (EQIP) and the Conservation Security Program (CSP), which was replaced by the the Conservation Stewardship Program (CStP) in the 2008 Farm Act.

[3]Commodity-related payments also include the Average Crop Revenue Election (ACRE) program. ACRE is an optional revenue-based program introduced by the 2008 Farm Act as an alternative to counter-cyclical payments.

Federal Crop Insurance

Federal crop insurance premium subsidies and indemnity payments have increased substantially in the past 20 years (table 3).[4] The largest increase occurred between 1991 and 1997, when the number of policies, the value of premiums and crops, and the amount of land insured all roughly doubled. Government subsidies increased from $200 million in 1991 to $5.4 billion in 2009. The Agricultural Risk Protection Act (ARPA) of 2000 also introduced substantial changes to Federal crop insurance programs. ARPA increased the portion of the premium that is subsidized (the subsidy rate) for higher levels of coverage. This led to an increase in program participation at higher levels of coverage (Dismukes and Vandeveer, 2001). Later growth in crop insurance resulted from increased subsidies for more costly insurance policies and from the introduction of new insurance products.[5] Indemnities typically range between $1 billion and $5 billion annually. Indemnities show less of a trend than the other statistics, since these payments are more directly related to events like droughts and floods that occur sporadically. Most federally subsidized indemnity payments are not Government support per se, because the producers pay a portion of the insurance premium.

[4]Table 3 uses administrative data from the USDA's Risk Management Agency. For a comparison of these data and ARMS data, see box "ARMS versus Administrative Data."

[5]For more information, see "Crop Policies and Pilots" on the RMA website at: http://www.rma.usda.gov/policies/.

The 2008 Farm Act requires farms to have crop insurance in order to participate in a new program, the Supplemental Revenue Assistance Payments (SURE) Program (USDA, FSA, 2008). The SURE program was designed to replace ad hoc disaster programs that provided aid in response to natural

Table 3
Magnitude of Federal crop insurance, 1991, 1997, 2003, and 2009

Crop year	Policies with premiums	Total premiums	Subsidies	Value of crops insured	Indemnities received by farmers	Land insured
	Number		***2009 dollars (billion)[1]***			***Million acres***
1991	706,822	0.9	0.2	14.3	1.2	82.4
1997	1,319,762	2.1	1.1	30.3	1.2	182.2
2003	1,241,468	4.1	2.5	49.0	3.9	217.4
2009	1,171,901	8.9	5.4	79.6	5.2	264.8

Note: Data accurate as of July 4, 2011.
[1]The producer price index (PPI) for farm products was used to adjust for price changes in the value of crops insured. 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, 1989 through 1997, 1998 through 2007, and 2008 through 2011, available at: http://www.rma.usda.gov/data/sob.html/.

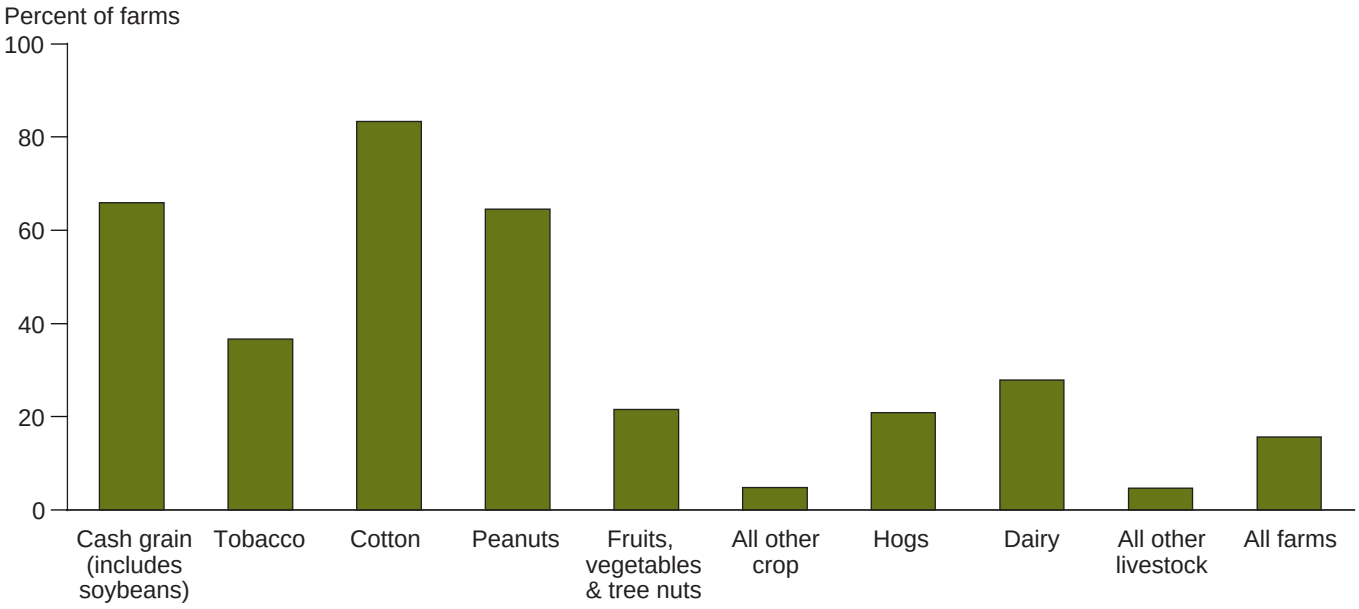
disasters. To be eligible for SURE, farms must have Federal crop insurance for all their crops or be covered by the Noninsured Crop Disaster Assistance Program.

Most farms specializing in cash grains, cotton, and peanuts reported farmland covered under a Federal crop insurance policy in the 2009 ARMS (fig. 3). Farms with other specializations participated in Federal crop insurance, but to a lesser degree. About a third of tobacco farms had insured land, as well as 20 to 30 percent of farms specializing in hogs, dairy, or fruits, vegetables, and tree nuts. Hog and dairy farms often grow crops to feed their livestock, and these crops are eligible for Federal crop insurance.

Figure 3

Farms reporting acres covered under a Federal crop insurance policy by specialization, 2009

Most cash grain, cotton, and peanut farms insure their crops



Note: A farm's specialization is the commodity that accounts for at least half of its value of production.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2009 Agricultural Resource Management Survey.

Agricultural Production Shifts to Larger Farms

Total commodity-related payments and indemnity payments to producers change from year to year because of annual market price fluctuations or weather conditions. Shifts in the distribution of production among farm sizes can also affect the *distribution* of payments, since receipt of these payments depends on current or past production. Agricultural production has in fact shifted to larger farms over the past 20 years, continuing an earlier trend. Figure 4 shows the distribution of agricultural production by sales class for selected years from 1991 to 2009.[6]

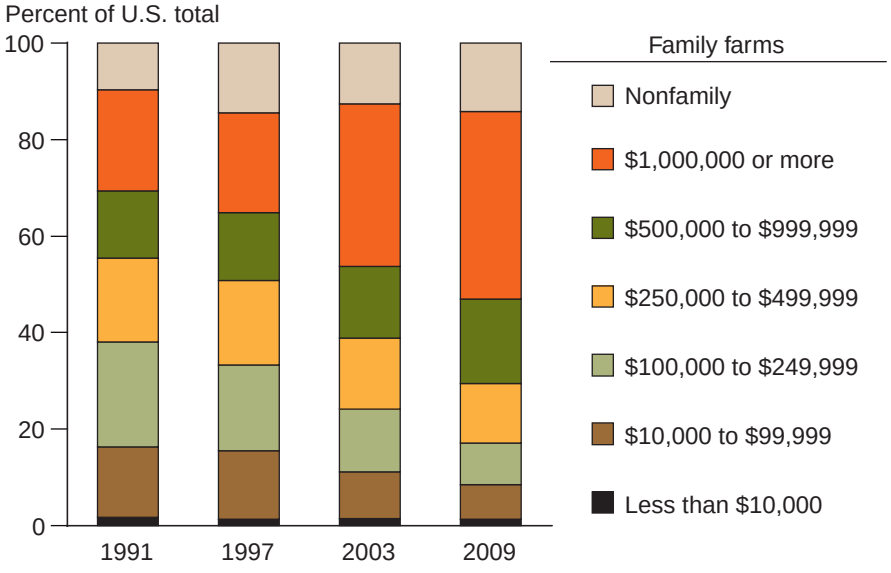
Shifts in Production

Between 1991 and 2009, production shifted to larger farms. In 1991, family farms with production of more than $1,000,000 (in 2009 dollars) accounted for 21 percent of total production. By 2009, this sales class accounted for 39 percent of production. Family farms with production of $500,000 to just under $1 million also increased their share of the total production over this period. In contrast, small commercial family farms—with annual production between $10,000 and $249,999—decreased their share of production from 36 percent in 1991 to 16 percent in 2009. Note that we have adjusted the values to 2009 dollars, so that to the extent possible, we track changes in production and not changes in prices.

Figure 4 could be misleading in terms of how changes in farm size affect the distribution of Government payments, because many of the largest farms produce livestock and fruits and vegetables, commodities which are not

[6]The value of production measures the value of commodities produced in a given year. This differs from annual commodity sales to the extent that some crop production may be placed in storage for sale in a following year, while some current crop sales may be made out of earlier production held in storage.

Figure 4
Value of production by sales class, 1991, 1997, 2003, and 2009
The share of farms with sales of a million dollars or more increased from 1991 to 2007



Note: Sales classes are expressed in 2009 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, and 2009 Agricultural Resource Management Survey.

supported by commodity programs. However, the production of specific crops covered by Government payments programs also shifted to larger farms over this period. Figure 5 shows shares of the total value of production of selected program crops[7] by sales class. Family farms with values of production more than $1 million increased their share of the production of program crops from 8 percent in 1991 to 27 percent in 2009. Similarly, family farms with annual values of production between $500,000 and $1 million increased their share of program crop production from 14 percent in 1991 to 27 percent in 2009. Over the same period, the shares of the total value of production of smaller family farms decreased.

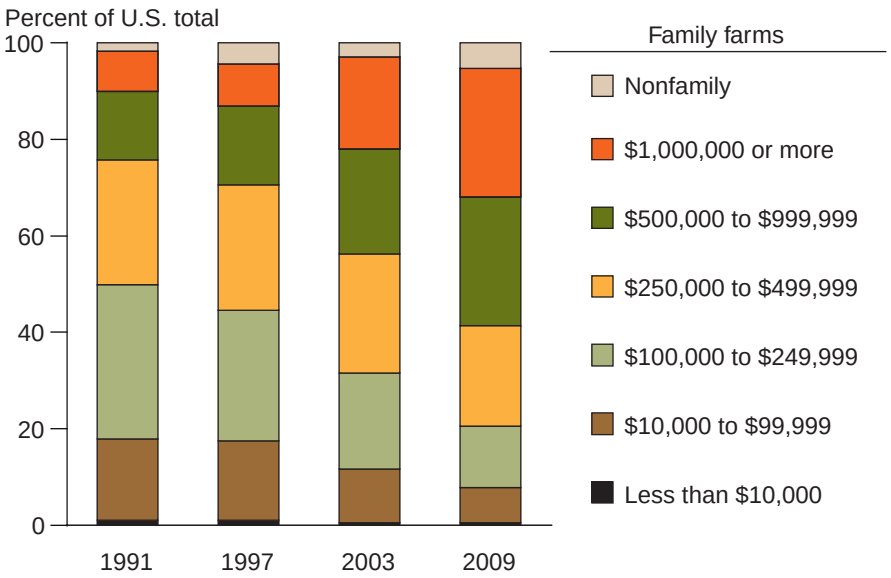
[7]The selected program crops are barley, corn, cotton, oats, peanuts, rice, sorghum, soybeans, and wheat.

Increasing Enterprise Size

Many farms produce more than one commodity. The value of production provides a way to aggregate different commodities in one measure. Since the value of production includes both prices and quantities, we have adjusted the values to account for inflation (see box "Adjusting for Price Changes"). For farms that produce multiple crops, we can also measure the number of acres harvested for each crop enterprise or the part of the farm that is devoted to production of a particular crop. This allows us to compare production of the same commodities in different years, and it avoids the problem of price changes inherent in the value of production.

Examining the percentage of total acres harvested by crop enterprise size class supports the conclusions in the previous two paragraphs: agricultural

Figure 5
Value of production of selected program crops[1] by sales class, 1991, 1997, 2003, and 2009
Production of program crops shifted to family farms with sales greater than $500,000



Note: Sales classes are expressed in 2009 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.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 1997, 2003, and 2009 Agricultural Resource Management Survey.

production has been shifting to larger farms. Table 4 shows the percentage of total acres harvested by crop enterprise size category for 1992 and 2007 for selected major program crops.[8] For example, the first two rows of the table show the percentages of total acres of corn for grain harvested on corn for grain enterprises of less than 100 acres, 100 to 499 acres, 500 to 999 acres, and corn for grain enterprises larger than 1,000 acres. For every crop except oats, a significant percentage of production shifted to larger enterprises between 1992 and 2007.

The final column of the table shows the mid-aggregate enterprise size based on acres harvested for each crop in 1992 and 2007. This tracks the changes in the distribution of acreage, by crop enterprise size, over time. In technical terms, the mid-aggregate enterprise size is the median enterprise size, weighted by acreage. Half of all acres harvested of a particular crop are on enterprises harvesting more acres of the crop than the mid-aggregate size, and half are on enterprises harvesting fewer acres. Once again, for all crops except oats, between 1992 and 2007 land shifted to significantly larger farms. For example, the mid-aggregate corn for grain enterprise doubled from 300 acres in 1992 to 600 acres in 2007. Even for oats—which had the smallest increase—mid-aggregate enterprise size increased by 52 percent.

[8]We chose these years because they are the closest Census of Agriculture years to 1991 and 2009, the beginning and end periods of figures 4 and 5. The Census of Agriculture is conducted every 5 years and provides comprehensive data on harvested acreage, by commodity.

Table 4
Percent of total acres harvested by crop enterprise size category, selected major program crops, 1992 and 2007

Commodity	Year	Crop enterprise size by acres harvested: Less than 100	100 to 499	500 to 999	1,000 or more	All enterprise sizes	Mid-aggregate enterprise size[1]
		Percent of U.S. total acres harvested					Acres
Corn for grain	1992	15.4	54.9	20.7	9.0	100.0	300
	2007	7.4	35.0	25.8	31.8	100.0	600
Soybeans	1992	15.6	54.8	19.0	10.6	100.0	300
	2007	8.7	41.8	26.3	23.1	100.0	490
Barley	1992	19.0	54.6	16.4	9.9	100.0	256
	2007	10.0	45.1	22.6	22.4	100.0	426
Oats	1992	70.5	26.6	2.1	0.8	100.0	50
	2007	56.3	36.7	5.6	1.5	100.0	76
Rice	1992	4.3	56.6	25.8	13.2	100.0	400
	2007	2.0	29.5	32.4	36.1	100.0	700
Sorghum for grain	1992	15.3	51.5	19.1	14.1	100.0	300
	2007	7.5	39.3	24.2	28.9	100.0	532
Wheat, all varieties	1992	10.0	34.9	26.1	29.1	100.0	562
	2007	5.9	25.2	21.3	47.5	100.0	910
Peanuts for nuts	1992	22.9	57.7	14.1	5.3	100.0	215
	2007	9.8	50.1	23.7	16.4	100.0	362
Cotton, all varieties	1992	4.9	34.8	30.3	29.9	100.0	605
	2007	1.8	18.8	24.9	54.5	100.0	1090

Note: An enterprise is the portion of the farm operation producing a particular commodity.
[1]Half of all harvested acres are on enterprises harvesting more acres of the crop than the mid-aggregate size.

Source: USDA, Economic Research Service, compiled from USDA, National Agricultural Statistics Service's Census of Agriculture data.

Reasons for the Shift in Production

The higher profitability of larger farms, evidenced by their higher return on equity (ROE), likely encourages farms to increase in size (see box "Return on Equity").

Between 1991 and 2009, the median rate of return on equity (ROE) of farms with gross farm sales between $100,000 and $250,000 ranged from -2.4 percent to -1.1 percent (fig. 6).[9] Over the same time period, the median ROE of farms with more than $1 million in sales ranged between 4.6 percent (in 2009) and 7.7 percent (in 1991).

Why are larger farms more profitable? For most program crops, changes in technology have tended to favor large-scale farming. For example, larger planting and harvesting equipment and more sophisticated measuring and monitoring technology may have allowed full-time farmers to manage larger operations (Gray and Boehlje, 2007). Larger and more sophisticated equipment has allowed some producers to reduce planting and harvesting time per acre by 50 percent over the past 10 years (Bechdol, Gray, and Gloy, 2010). In addition, recent research suggests that conservation tillage[10] and genetically modified (GM) seeds allow farmers to spend fewer hours per acre on crop production (Fernandez-Cornejo and McBride, 2002). This may also allow full-time farmers to manage larger operations. To the extent that a full-time operator's time is a fixed cost and per-acre costs do not increase with size, larger farms will tend to have larger profit margins.

Demographic change, specifically farm operator age, is also related to the shift toward larger farms. Table 5 shows the percentages of principal farm operators in each farm sales class that were over 65 years old in 1991, 1997, 2003, and 2009. A higher percentage of the operators of small commercial family farms tend to be over age 65. When the older operators of small

Return on Equity

A farm's return on equity (ROE) measures the farm's profitability as the ratio of net farm income, adjusted for unpaid labor (including management and operator labor), over the farm's net worth. We multiply this ratio by 100 to put the numbers in percentage terms. Net farm income is the difference between gross farm income and expenses. Expenses include cash operating expenses, depreciation, and in-kind benefits provided to employees. Unincorporated farms do not deduct any explicit expenses for unpaid operator labor, the unpaid labor of nonoperators, or for farm management in the farm income measures generated from the Agricultural Resource Management Survey (ARMS). For unincorporated farms, charges for these inputs are deducted from net farm income to reflect the opportunity cost of these inputs. The charges for unpaid operator labor and unpaid nonoperator labor are each calculated as the total hours worked by those individuals multiplied by the wage rate for farm labor. The charge for management is computed as 5 percent of the net value of production. In layman's terms, return on equity measures how much profit (or loss if negative) a farm generates per unit of financial investment (equity).

[9]We used the median, rather than the average, because the average is affected by extreme "outlier" observations. Since the ROE is a ratio, values of the denominator (net worth) close to zero can cause very large (positive or negative) ROE values. These outliers do not reflect the majority of farms, so we use the median instead of the average to reflect the center of the distribution of farms within each sales class.

[10]Conservation tillage practices reduce soil erosion by water or wind by leaving more crop residue on the fields between harvest and planting. These practices generally require less plowing (fewer passes over the field) than conventional tillage practices.

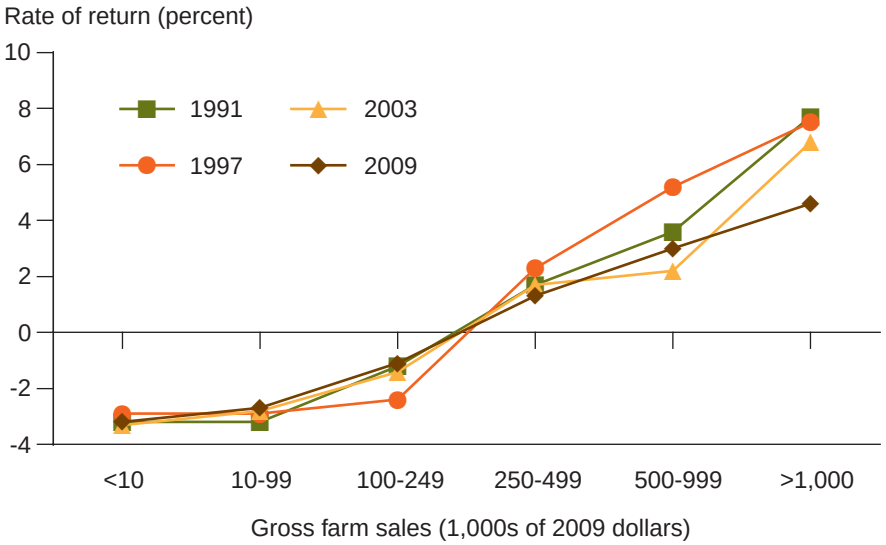
commercial farms retire, their farms often are not continued as separate businesses, due to the low profitability of operations of that size (see figure 6).[11] The land from these farms then either becomes part of another operation or is taken out of production. It is not clear from these simple descriptive statistics whether demographic change is contributing to the shift of production toward larger farms, or just another reflection of it.

[11]Also see Hoppe and Banker (2006), pages 7-9, and MacDonald, Hoppe, and Banker (2006).

Figure 6

Median rates of return on equity by farm sales class, 1991-2009

Larger farms have higher rates of return on equity



Note: Sales classes are expressed in 2009 dollars, using the producer price index (PPI) for farm products to adjust for price changes.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 1997, 2003, and 2009 Agricultural Resource Management Survey.

Table 5

Principal operators over age 65, by sales class, 1991, 1997, 2003, and 2009

Item	1991	1997	2003	2009
	Percent of principal operators			
Principal operator 65 years old or older	25.4	27.3	26.5	30.3
Less than $10,000	31.0	31.9	27.7	31.3
$10,000-$99,999	26.9	28.4	31.0	35.6
$100,000-$249,999	11.4	15.8	17.6	24.4
$250,000-$499,999	8.2	13.4	15.6	18.4
$500,000-$999,999	12.8	10.5	12.3	16.1
$1,000,000 or more	15.7	14.5	13.1	14.9
Nonfamily	14.0	16.0	22.9	24.3

Note: Sales classes are expressed in 2009 dollars, using the producer price index (PPI) for farm products to adjust for price changes.

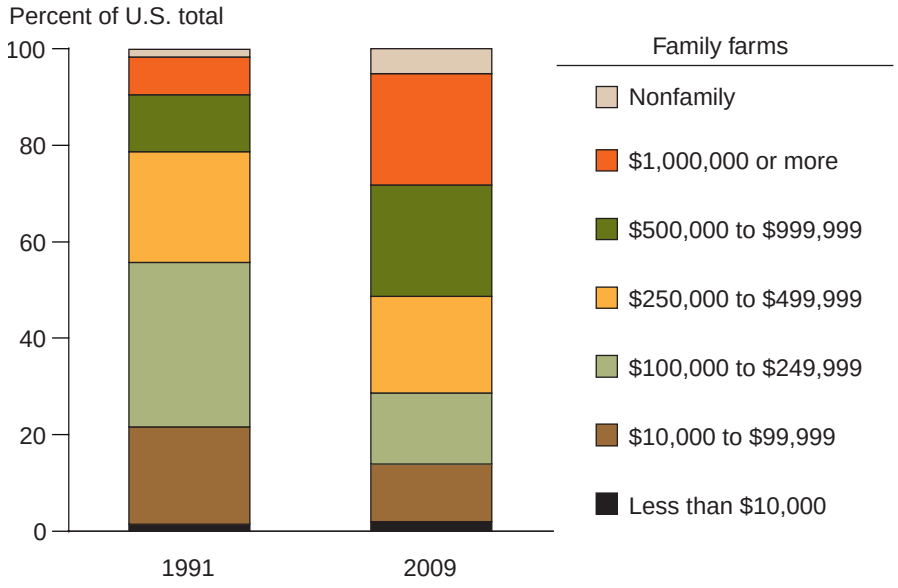
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 1997, 2003, and 2009 Agricultural Resource Management Survey.

Shifts in Program Payments and Federal Indemnity Payments

Commodity program payments are based on current or past production of program commodities. As production of these commodities shifts to larger farms, so do commodity-related program payments. Figure 7 shows the distribution of commodity-related Government payments by sales class for 1991 and 2009. These 2 years represent the earliest and latest years for which we have consistent data from the FCRS and ARMS. The shifts in commodity-related payments among sales classes are similar to the shifts in production in figure 5. By 2009, farms with gross sales of $1 million or more received 23 percent of all commodity-related payments, up from 8 percent in 1991. A similar shift occurred for farms with sales between $500,000 and $999,999. In contrast, the share of commodity-related payments received by farms in the $100,000 to $249,999 sales class shrank from 34 percent in 1991 to 15 percent in 2009.

The situation was different for land-retirement payments, which largely came from the CRP. Figure 8 shows the distribution of Government land-retirement payments by sales class for 1991 and 2009. Land-retirement programs target environmentally sensitive land, so the distribution of payments from these programs differs from those from commodity programs. Family farms with sales less than $10,000 (noncommercial farms) nearly doubled their share of land-retirement payments from 16 percent to 30 percent. From 1991 to 2009, the share of noncommercial farms participating in land-retirement

Figure 7
Commodity-related payments by farm sales class, 1991 and 2009
Payments shifted to family farms with sales greater than $500,000



Note: Sales classes are expressed in 2009 dollars, using the producer price index for farm products (PPIFP) to adjust for price changes.

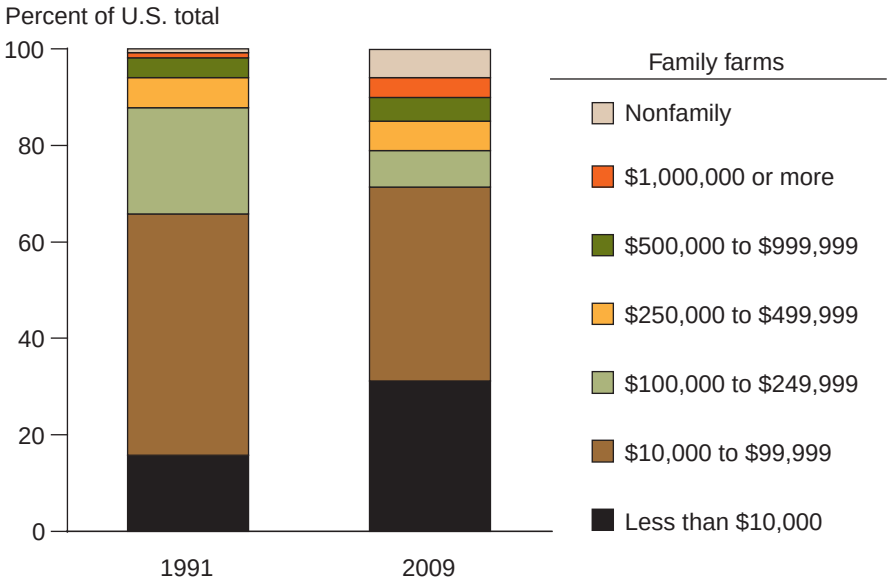
Sales classes are in the same order, top to bottom, in the legend as in the stacked bars.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 2009 Agricultural Resource Management Survey.

Figure 8

Land-retirement payments by farm sales class, 1991 and 2009

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



Note: Sales classes are expressed in 2009 dollars, using the producer price index for farm products (PPIFP) to adjust for price changes.

Sales classes are in the same order, top to bottom, in the legend as in the stacked bars.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 2009 Agricultural Resource Management Survey.

programs increased from about 9 percent to about 14 percent. Over the same period, among noncommercial farms participating in land-retirement programs, the average share of acreage enrolled—the ratio of the acres enrolled to total acres operated—increased from 36 percent to 46 percent for participating farms. Note that retiring a substantial share of a small farm's land can move a farm into the noncommercial class.[12] Some of the shift of payments to noncommercial farms reflects older farmers with small commercial farms scaling their operations down by enrolling in the CRP.

Working-lands programs accounted for a small portion of conservation payments until after 2002, when they began to expand. Unlike most Government payments programs, a portion of working-lands programs (a minimum of 60 percent of EQIP payments) are required to be allocated for livestock practices.[13] In addition, working-land programs, unlike commodity-related programs, reduce the cost of implementing conservation practices and so do not provide income-support to farm operators. Examining benefits from these programs in the early years is difficult when using a sample survey like the ARMS, because only a small percentage of farms participated in the programs. So we cannot give an accurate picture of the changes in working-land payments over the 1991 to 2009 period.

However, we can get an accurate snapshot from the 2009 ARMS data because a larger percentage of farms participated in working-land programs in that year than in earlier years. In 2009, most working-land payments went to large and very large farms, just as we saw with commodity-related payments (fig. 9). For example, although family farms with sales between

[12]For example, if a 160-acre farm produces 75 bushels of corn per acre (half the average U.S. yield) at $4 per bushels, the farm generates $48,000 of gross revenue. If the entire farm were placed in the CRP at the average U.S. CRP rental payment ($51 per acre in 2008), gross revenue falls to $8,160.

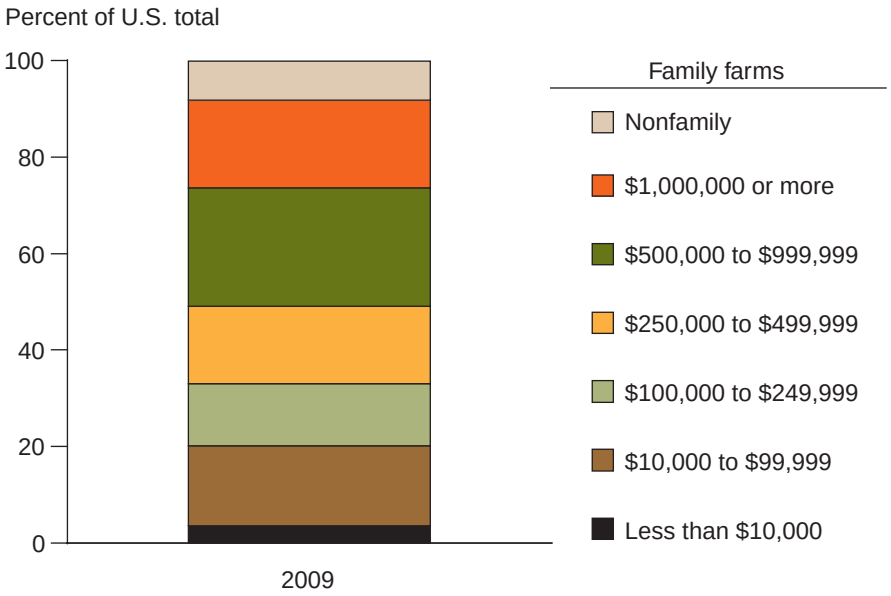
[13]Between 2004 and 2008, 65-68 percent of EQIP funds were allocated to livestock-related practices.

$500,000 and $999,999 accounted for only 3 percent of farms in 2009, as a group, they received almost 25 percent of working-land payments that year. Family farms with sales of $1 million or more accounted for 2 percent of farms, but received 18 percent of working-land payments.

On the other hand, when the distribution of payments is compared with the distribution of production—rather than the distribution of farms—all but the largest farms receive a larger share of working-land payments than their share of production. For example, farms with gross sales of $1 million or more produced 39 percent of the total value of production in 2009, but received only 18 percent of working-land payments (see figure 4). In contrast, farms in the $500,000 to $1 million sales class produced 18 percent of the value of production, but received 25 percent of working-land payments.

The distribution of working-land payments by sales class in 2009 was quite similar to that of commodity-related payments (see figures 7 and 9). Roughly one-third of payments from both types of programs went to family farms with sales less than $250,000, two-fifths went to family farms with sales between $250,000 and $999,000, and one-fifth went to family farms selling more than $1 million.

Figure 9
Working-land payments by farm sales class, 2009
Forty-three percent of payments go to family farms with sales over $500,000



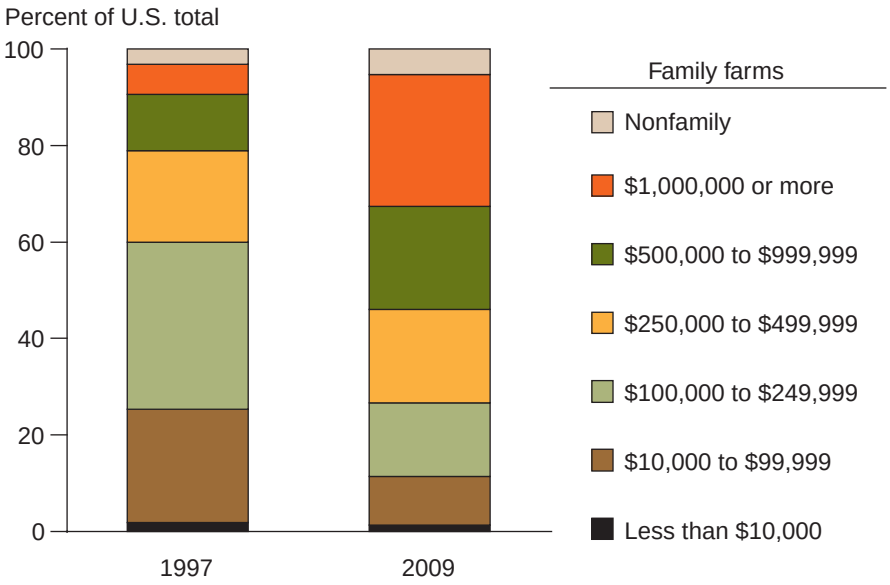
Note: Sales classes are expressed in 2009 dollars, using the producer price index for farm products (PPIFP) to adjust for price changes.

Sales classes are in the same order, top to bottom, in the legend as in the stacked bars.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2009 Agricultural Resource Management Survey.

As production has shifted to larger farms, Federal indemnity payments have shifted to larger farms (fig. 10), as was the case for commodity-related payments. In 1997, small commercial farms received about 58 percent of Federal crop insurance indemnity payments. By 2009, their share had shrunk to about 25 percent.[14] Consequently, family farms with sales over $500,000 increased their share of total Federal indemnity payments from about 18 percent in 1997 to about 49 percent in 2009.[15]

Figure 10
Federal indemnity payments by farm sales class, 1997 and 2009
Payments shifted to family farms with sales greater than $500,000



Note: Sales classes are expressed in 2009 dollars, using the producer price index for farm products (PPIFP) to adjust for price changes.

Sales classes are in the same order, top to bottom, in the legend as in the stacked bars.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1997 and 2009 Agricultural Resource Management Survey.

[14]We choose the years 1997 and 2009 because these are the earliest and latest years for which we have consistent data on Federal indemnity payments in the ARMS data.

[15]However, as noted above, unlike Government payments, Federal indemnity payments are not Government support per se. Premium subsidies would be a better measure of Government support provided by Federal crop insurance. However, the ARMS does not collect data about premium subsidies, and the ARMS is the only national survey that collects data on Federal crop insurance, farm size, and farm household income.

Payments Shift to Higher Income Households

Farm household income is not the same as farm sales. In the ARMS, farm sales are the sum of the farm's crop sales, livestock sales, and Government payments—plus the contractor's share of production and the landlord's share of production and Government payments, if the farm has any contractors or landlords. Sales represent gross revenue generated from commodities produced on the farm, regardless of who actually receives the revenue.

Operator household income in the ARMS is an entirely different concept. Rather than measuring gross revenues, operator household income measures the income available to the principal operator's household. It has three components: (1) net income from the farm business, (2) income from other farming activities, and (3) income from off-farm sources.

- **Farm business income.** The household's farm business income is calculated as its share of net cash income generated by the farm. Net cash income is gross cash farm income—the sum of sales of commodities, other miscellaneous farm-related income, and Government payments—less cash expenses.[16] The principal operator household does not necessarily receive all the business income generated by its farm. For example, business income may be shared with partners or relatives who hold an interest in the farm.

- **Income from other farming activities.** This component consists of net income from a farm business other than the one being surveyed in the ARMS, wages paid by the farm business to household members other than the operator, and net income from farmland rental.

- **Off-farm income.** Off-farm income can come from earned sources, such as wages, salaries, and self-employment income, or from unearned sources, such as interest, dividends, and transfer payments, such as Social Security.

Figure 11 diagrams the flow of income to operator households and other households. Note that not all operator households receive income from all sources, and for some farms net income from the farm business is shared with other households. For farms at the lower end of the size spectrum—sales less than $10,000, for example—sales are typically far less than household income, due to off-farm income received by the principal operator household. At the other end of the spectrum—where sales exceed $1 million, for example—sales are typically greater than operator household income. At that level, most household income comes from farming.

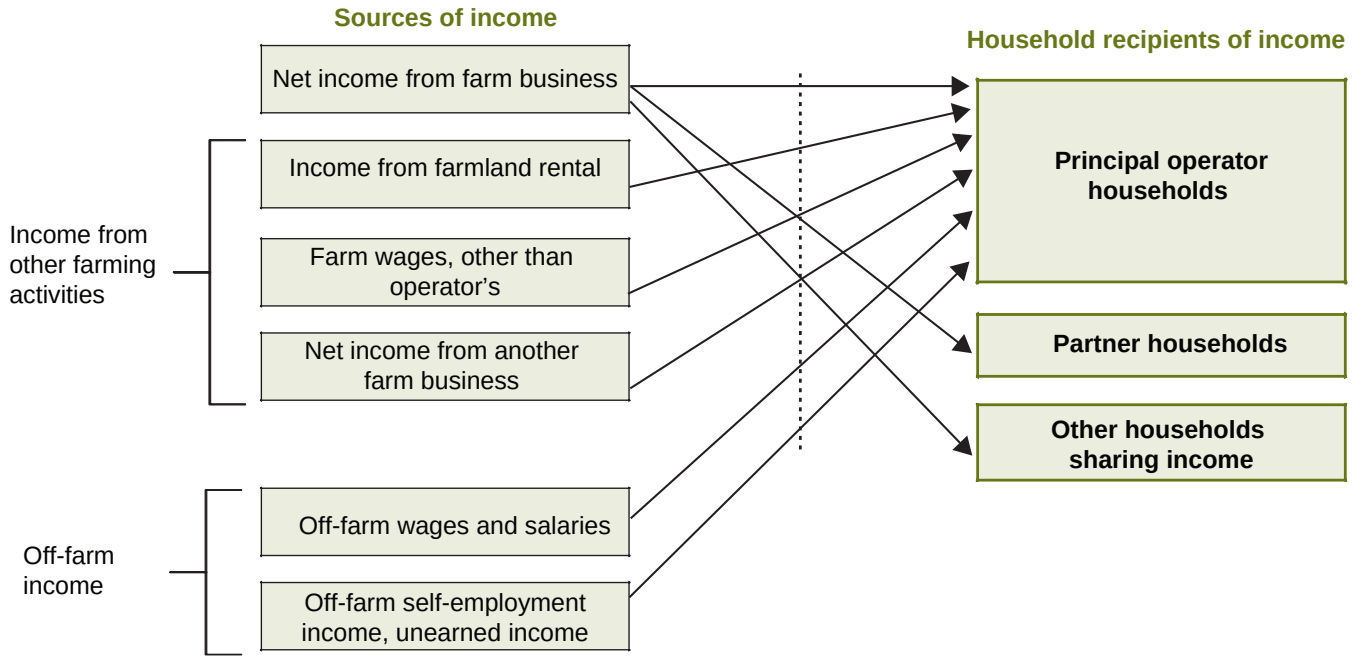
Household Income Varies by Sales Class

The overall shift of production to larger farms has led to a shift of payments to higher income households, since households operating large or very large farms tend to have higher income than households operating small commercial farms (fig. 12). For example, the median operator household income of family farms with sales between $10,000 and $99,999 in 2009 was about $51,000, slightly above the median income of all U.S. households, which was $49,777. In contrast, the median operator household income of farms with

[16]ARMS also deducts depreciation in calculating the household's farm business income. Depreciation is not a cash expense, but it is deducted to be consistent with accounting conventions used in the Current Population Survey (CPS). The CPS is the source of official income statistics for the United States.

Figure 11

The flow of income to family farm households



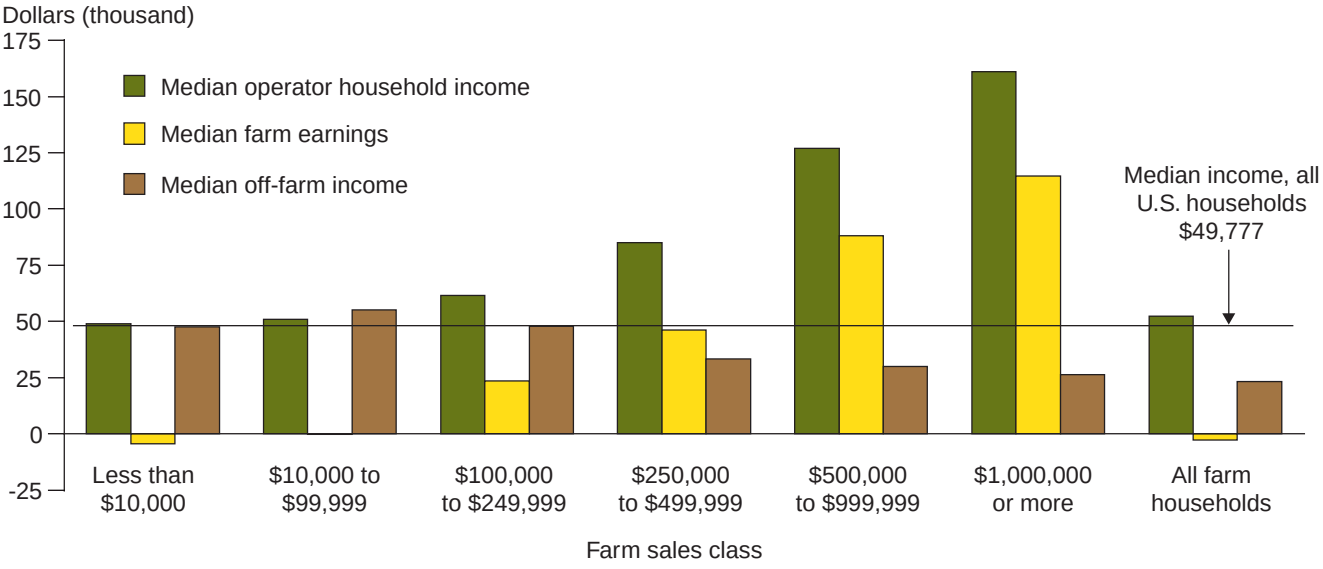
Note: Not all farm households receive income from all sources.

Source: USDA, Economic Research Service.

Figure 12

Median operator household income by source and sales class, 2009

Larger farms tend to have higher operator household income



Note: Half of the households earn less than the median income, while the other half earn more. Medians are often used to summarize household income because its skewed distribution. Household income is estimated only for family farms.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2009 Agricultural Resource Management Survey, Phase III, for farm households and U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey for all U.S. households.

sales between $500,000 and $999,999 in 2009 was about $127,000, and for farms with sales of $1 million or more, median operator household income was $161,000.

The figure also shows that operators of larger farms tend to have higher farm earnings and lower off-farm income than the operators of smaller farms. For example, the median off-farm income of operators of farms with sales between $10,000 and $100,000 in 2009 was $55,000. The median off-farm income of operators of farms with gross sales of $1 million or more was only $26,250. So the operators of large and very large farms tend to earn most of their income from the farm, whereas the operators of small farms—even small commercial farms—tend to earn most of their income off-farm.

Figure 12 also shows that the median farm earnings of noncommercial farms and the smallest commercial farms are negative. Farm households can have negative farm earnings or even negative household income for several reasons. Even large and commercially successful farms could have negative farm incomes because of natural disasters or because of poor business years. They could also have negative incomes because they have yet to sell all of their commodities at the time that the survey is conducted. Finally, some farms with substantial recent investments in structures or equipment can claim high depreciation expenses for tax purposes, and therefore have negative farm incomes. For households with limited off-farm incomes, net farm incomes can drive estimated household incomes.

Commodity-Related Payments

Since the operators of larger farms tend to have higher incomes, the shift of commodity-related payments to larger farms led to a shift of payments to higher income households. Table 6 shows the principal operator household income at selected percentiles of the commodity-related payments distribution for selected years between 1991 and 2009, as well as the median income for all U.S. households in those years. In 1991, half of commodity payments went to farms operated by households with incomes over $54,940 in constant 2009 dollars (50th percentile), a quarter of commodity payments went to farms operated by households with incomes greater than $115,000 (75th percentile), and 10 percent went to farms operated by households with incomes over $229,000 (90th percentile). According to the U.S. Census Bureau's Current Population Survey, in 1991 the median household income among all U.S. households (in 2009 dollars) was $47,453, reasonably close to the household income at the midpoint of the commodity payments distribution.

However, by 2009, the distribution of payments shifted upward. Half of commodity payments went to farms operated by households with incomes over $89,540, a quarter went to farms operated by households with incomes greater than $209,000 and 10 percent went to farms operated by households with incomes greater than or equal to $425,000. In 2009, the median household income among all U.S. households was $49,777, practically the same as in 1991. Because of the shift in commodity payments to higher income households, most commodity-related payments in recent years went to households with incomes that are significantly higher than the incomes of most U.S. households.

Table 6

Changes in the distribution of commodity payments

Operator household income levels at selected percentile levels

Percentiles of the distribution of commodity-related payments	Operator household income						Change, 1991 to 2009
	1991	1997	2003	2007	2008	2009	
	Constant 2009 dollars						*Percent*
25th percentile	18,237	16,269	29,353	34,396	32,365	24,773	35.8
50th percentile	54,940	64,837	87,210	112,712	116,249	89,540	63.0
75th percentile	115,028	143,263	177,862	281,877	280,737	209,195	81.9
90th percentile	229,040	291,603	384,102	573,962	584,398	425,000	85.6
Median Income, All U.S. households	47,453	49,464	50,507	51,976	50,124	49,777	4.9

Note: All household income estimates are expressed in 2009 dollars, using the consumer price index (CPI-U).

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 1997, 2003, 2007, 2008, and 2009 Agricultural Resource Management Survey; and U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey for all U.S. households.

Effects of Increases in Commodity Prices

While there were strong structural trends in U.S. agriculture between 1991 and 2009—for example, production is moving to larger farms—there were also sharp year-to-year fluctuations in commodity prices. Prices for program crops are determined in global markets, and thus a variety of domestic and international factors can affect those prices. For example, the weakening U.S. dollar between 2001 and 2008 caused U.S. commodities to be more competitive in international markets, thus increasing demand for those commodities. Weather in other parts of the world can also affect U.S. commodity prices. In 2006 and 2007, droughts, floods, high temperatures, and freezes adversely affected agricultural production in an unusually large number of countries around the world. In response to high commodity prices and a fear of shortages, in 2007, several large countries—including India and China—raised export taxes and restricted exports of agricultural commodities. The U.S. Energy Policy Act of 2005 mandated that 7.5 billion gallons of renewable fuels be used in gasoline by 2012. This was increased still further by the Energy Independence and Security Act of 2007 (EISA), which led to a rapid expansion of U.S. corn-based ethanol production, which increased the demand for corn.

All of these factors contributed to an increase in crop commodity prices in 2007 and 2008.[17] For example, the average price of U.S. corn for grain increased from $2.05 per bushel in June 2005 to a peak of $5.47 per bushel in June 2008. For livestock producers, the situation was more mixed, since increases in feed prices outpaced increases in the prices they received for their products. For example, the feed price ratio for hogs (defined as the bushels of corn equal in value to 100 pounds of live weight hog) fell from 25.3 in 2005 to 10 in 2008.[18]

Since we are interested in shifts in production, we control for price changes to the extent possible through price adjustments, as discussed in the box "Adjusting for Price Changes." However, farm earnings to the household are not adjusted for farm commodity price changes. As a result, an increase in

[17]For more information on factors contributing to recent increases in food commodity prices, see Trostle (2008).

[18]For monthly prices for corn, grain, and other commodities and annual feed price ratios, see NASS Quickstats at: http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats_1.0/index.asp/.

commodity prices can cause an increase in farm income. For example, ERS estimated aggregate net farm income was $70.9 billion in 2007 and $87.1 billion in 2008, but only $62.2 billion in 2009.[19] Table 6 shows the effects of high commodity prices in 2007 and 2008. Most farms receiving commodity-related payments had unusually high income in those years because of high commodity prices. Thus, in those years, commodity-related payments shifted even more strongly toward higher income households. For example, 10 percent of commodity-related payments in 2008 went to farms operated by households earning over $584,000, which was more than 10 times the median income among all U.S. households in that year.

[19]These estimates are from the Farm Sector Accounts for 2007-2008.

Conservation Payments

Land-retirement payments tend to go to households with lower incomes (table 7)—especially when compared with households receiving commodity-related payments. Although land-retirement payments have shifted toward higher income households, the shift has not been as large as that for commodity-related payments. However, even for land-retirement programs, a significant percentage of payments go to high-income households. In 2009, for example, 10 percent of land-retirement payments went to farms operated by households with incomes over $203,000.

Next we turn to working-lands programs. Until recently, working-lands programs were small compared with other payments programs. This makes it difficult to examine the distribution of working-lands payments in the early years of the programs using the ARMS survey. Currently, these payments tend to go to farms operated by higher income households (table 8). Half of working-land payments went to farms operated by households with $78,464 or more income, a quarter went to farms operated by households making at least $205,000 and 10 percent of these payments went to farms operated by households with income greater than or equal to $436,191.

Federal Crop Insurance Indemnities

As Federal indemnity payments shifted to larger farms, the indemnity payments also shifted to higher income households (fig. 13). The share of

Table 7
Changes in the distribution of land-retirement programs
Operator household income levels at selected percentile levels

Percentiles of the distribution of land-retirement payments	Operator household income						Change, 1991 to 2009
	1991	1997	2003	2007	2008	2009	
	Constant 2009 dollars						*Percent*
25th percentile	28,356	23,443	32,441	41,026	30,765	38,704	36.5
50th percentile	48,825	59,357	60,129	75,846	57,670	59,000	20.8
75th percentile	80,125	102,062	100,892	136,749	113,905	116,949	46.0
90th percentile	157,289	157,405	181,273	263,169	232,862	203,335	29.3

Note: All household income estimates are expressed in 2009 dollars, using the consumer price index (CPI-U).

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 1997, 2003, 2007, 2008, and 2009 Agricultural Resource Management Survey; and U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey for all U.S. households.

Federal indemnity payments received by households with incomes less than $50,000 shrank from about 47 percent in 1997 to about 29 percent in 2009. Over the same period, the share received by households with income greater than $500,000 increased from about 7 percent to about 13 percent, and the share received by households with income between $200,000 and $500,000 increased from 14 to 23 percent.

Table 8

Changes in the distribution of working-land programs

Operator household income levels at selected percentile levels

Percentiles of the distribution of working-land payments	Operator household income					
	1991	1997	2003	2007	2008	2009
				Constant 2009 dollars		
25th percentile	na	na	na	36,684	30,931	27,247
50th percentile	na	na	na	95,970	94,148	78,464
75th percentile	na	na	na	164,058	209,396	205,000
90th percentile	na	na	na	385,983	537,526	436,191

Note: All household income estimates are expressed in 2009 dollars, using the consumer price index (CPI-U).

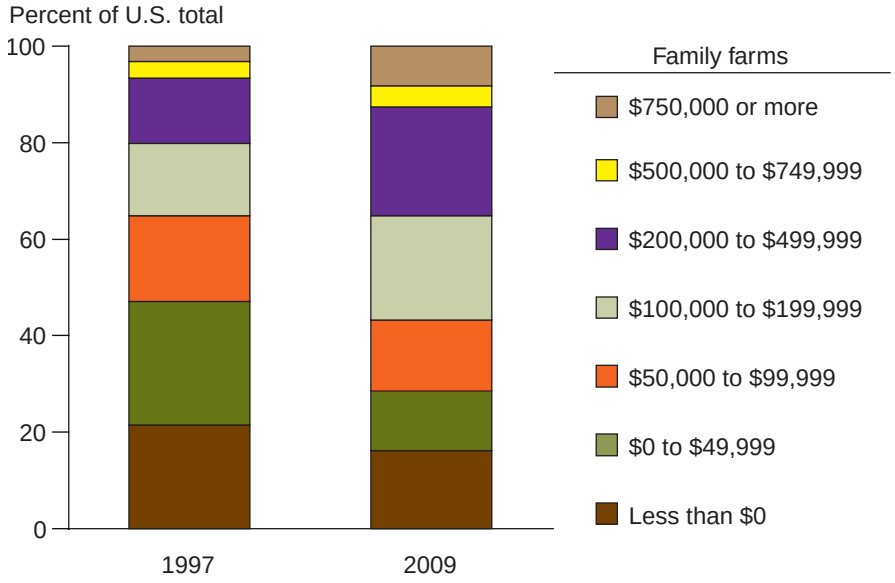
na = data not available. Total working-land payments were too small in 2003 and earlier years to estimate an accurate distribution from ARMS data.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1991 Farm Costs and Returns Survey and 1997, 2003, 2007, 2008, and 2009 Agricultural Resource Management Survey.

Figure 13

Federal indemnity payments by household income class, 1997 and 2009

Payments shifted to farm households with income greater than $100,000



Note: Household income classes are expressed in 2009 dollars, using the consumer price index (CPI-U) to adjust for price changes.

Income classes are in the same order, top to bottom, in the legend as in the stacked bars.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1997 and 2009 Agricultural Resource Management Survey.

Some Caveats

Structural change is shifting production to larger farms. This means Government payments and Federal indemnities are shifting to larger farms, since most Government payments are tied directly or indirectly to production. In addition, since operators of larger farms tend to have higher household income, payments and indemnities are shifting to higher income households. When examining the shift of Government payments toward higher income households, however, there are two caveats to keep in mind.

First, the ARMS data identifies Government payments accruing to the farm business, but it does not track payments to households. The ARMS tracks the incomes of principal operator households, but we do not know if the principal operator household receives all the Government payments accruing to the farm business. The payments may be shared with junior partners or stockholders, for example. While the ARMS data does not allow us to track payments to households, it does allow us to say what percent of farm households share income with other households (table 9). The percentage rises with farm sales class in each year. For example, in 2009 only 4.7 percent of operators of noncommercial farms shared income with other households, but in each higher income class a successively higher percentage of farm operator households shared income with other households. For example, 23 percent of operators of farms with sales between $500,000 and $1,000,000 and 33 percent of the operator households of farms with gross sales of $1,000,000 or more shared income with other households.

Second, although Government payments to farms generally involve a net transfer of wealth from taxpayers to the farm sector, they are not a transfer payment like Social Security, where the entire amount is available for household spending. Costs often must be incurred before a farm household receives most types of Government payments. For example, production expenses are incurred to produce commodities in order to receive LDPs. Payments increase the farm operator's revenue, but they may also increase the operator's expenses, especially cash-rents for land. Even direct payments, which do not require the operator to produce, increase the cash-rents of the land attached to the payments.

Table 9
Farm households sharing income, by sales class
Multiple households often share in net income from larger farms

Farm sales class	2007	2008	2009
		Percent	
All	10.4	6.2	7.8
Less than $10,000	6.7	3.0	4.7
$10,000 to $99,999	12.2	8.0	8.2
$100,000-$249,999	16.8	10.7	12.3
$250,000-$499,999	20.8	15.0	17.4
$500,000-$999,999	24.9	22.6	23.3
$1,000,000 or more	37.8	34.0	33.0

Note: The table shows percentages of principal operator households in each sales class sharing income with one or more other households. Sales classes are expressed in 2009 dollars, using the producer price index to adjust for price changes.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007, 2008, 2009 Agricultural Resource Management Survey, all versions.

Current and Proposed Income Eligibility Caps and Payment Limits for Receipt of Government Payments

The 2002 Farm Act included various provisions restricting higher income individuals' and legal entities' eligibility for payments. The 2008 Farm Act tightened some of these restrictions. For example, under the 2002 Act, to be eligible for payments, an individual's or legal entity's average adjusted gross income (AGI) for the 3 tax years prior to the applicable program year had to be less than $2.5 million, unless at least 75 percent of the average AGI was derived from farming, ranching, or forestry.[20] Under the 2008 Act, to receive direct or counter-cyclical payments, ACRE payments, marketing loan gains, loan deficiency payments, Milk Income Loss Contract (MILC) payments, or selected disaster assistance payments, a recipient's 3-year average AGI from nonfarm sources must be no more than $500,000. In addition, to receive direct payments, the applicable 3-year average AGI from farming must be no more than $750,000. To receive conservation payments, the recipient's average nonfarm AGI may not exceed $1,000,000, unless at least two-thirds of average total AGI is derived from farming, ranching, or forestry.

Previous research on the effects of income caps and payment limits has used three different data sources—the ARMS, administrative data from USDA's Farm Service Agency (FSA), and IRS tax return data. Among other things, FSA's administrative data tracks payments, land parcels in farms, and production outcomes necessary to administer farm programs. The FSA definition of a farm differs from the ARMS definition. Typically a single ARMS farm may consist of several FSA-defined farms in the FSA administrative data.[21,22] As a result, farm counts based on FSA administrative data are higher than farm counts based on ARMS or Census data. ARMS and FSA data also differ in other respects. Household incomes in the ARMS are self-reported and are not the same as AGI. However, in the ARMS, we can more easily tie elements of the farm business and operator's household to program payments than is possible with administrative data.

Previous research suggests that statutory income caps in place or proposed at the time the research was conducted affected few farmers and farmland owners and a small fraction of payments. Using ARMS data and tabulated data from the IRS, Durst (2007) examined the Bush Administration's 2007 farm bill proposal to reduce the AGI eligibility cap to $200,000 and eliminate the exception for those with 75 percent or more of their income from farming, ranching, or forestry. The proposed eligibility cap would have applied only to farm commodity payments. Durst found it unlikely that the lower AGI cap would have affected more than about 1 percent of farm sole proprietorships and about 2 percent of crop share landlords. Using FSA administrative data matched to IRS tax return data, a 2008 Government Accountability Office (GAO) report found that of the 1.8 million individuals receiving Government payments between 2003 and 2006, about 2,700 had a 3-year average AGI over the $2.5 million income cap and derived less than 75 percent of their income from farming, ranching, or forestry.[23] In summary, both the GAO report and Durst (2007) concluded that only a very small fraction of farm households or individuals is affected by the income caps. The ARMS data used in this report reinforce those conclusions.

[20]AGI is income that is used to determine the household's income tax liability. AGI is equal to the household's gross income (the sum of wages and salaries, interest income, dividends, capital gains, etc.) minus deductions such as contributions to retirement accounts, self-employment taxes, etc. AGI is calculated on Internal Revenue Service (IRS) tax forms.

[21]A farm business typically grows by buying or renting land that was previously operated by another farm business. The newly added land may have a different payment yield associated with it than the acquiring farm's original land. The acquiring farm has the legal right to keep the farms separate for payment purposes.

[22]In some cases, an FSA-defined farm may represent portions of more than one ARMS-defined farm and vice versa.

[23]The GAO report recommended tighter USDA controls to prevent payments to individuals who exceed income eligibility limits. In response USDA worked with IRS to develop an electronic information exchange process for the purposes of average AGI cap verification. USDA receives indications of whether or not the participant appears to exceed the average AGI caps, but does not receive any tax data. For further details see the FSA website at http://www.fsa.usda.gov/.

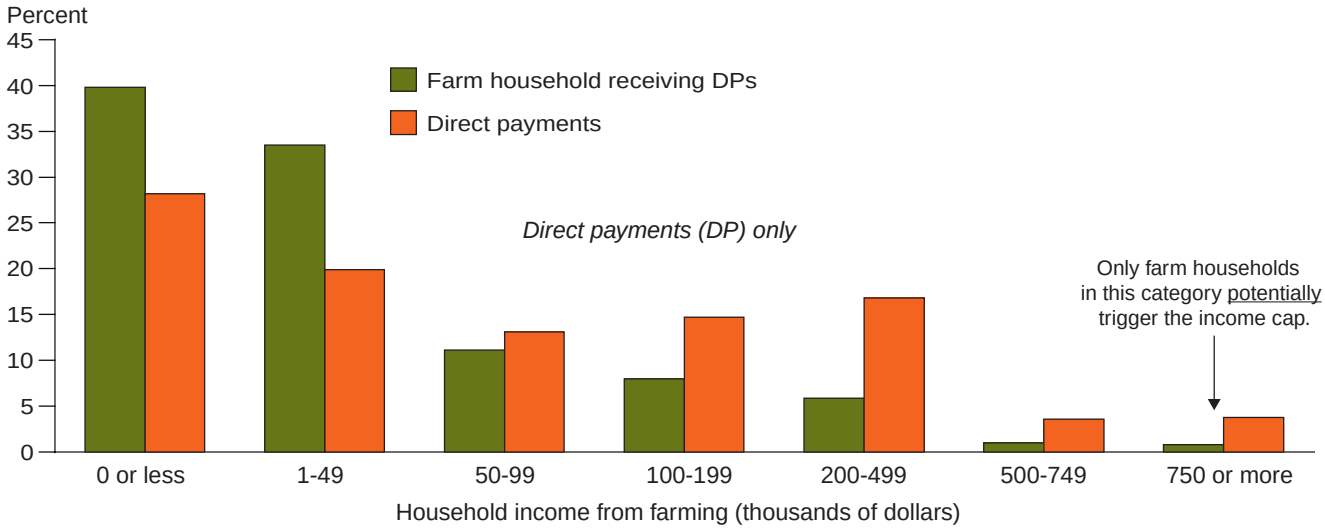
The caps in the 2008 Farm Act continue to affect very few farm households. For example, based on the income of principal operator households, only about 0.8 percent of farm households that received direct payments potentially had income above the cap, although their share of payments was somewhat higher, about 3.8 percent (fig. 14). Of course, some individuals may have been prevented from receiving payments because of the income eligibility criteria, and thus would not be counted in figure 14. However, previous research suggests that only a small percentage of farms were prevented from receiving payments. According to the 2009 ARMS, only 0.2 percent of all farm households, or about 5,200 households, had farm income greater than $750,000 in 2009. The other income caps appear to affect a similarly small fraction of farm households. Again based on principal operator households, only 0.3 percent of farm households receiving direct and counter-cyclical payments had off-farm income of $500,000 or more (fig. 15), and less than 1 percent of farm households receiving conservation payments had nonfarm income of at least $1 million.[24] Among all family farms—not just those receiving payments—in 2009, about 0.8 percent had off-farm income greater than $500,000, and about 0.4 percent had off-farm income greater than $1 million.

Although figures 14 and 15 show a few farms with incomes potentially above the caps, receipt of payments by these high-income households is permissible for two reasons. First, the average AGI caps apply to individuals and legal entities,[25] and these figures show self-reported income for households. Married couples may be able to divide farm income between spouses if both are actively engaged in farming. Each spouse can be counted as a separate recipient, so the effective farm income cap for a household consisting of a married couple is potentially twice the statutory cap. Second, farm income in the ARMS is not the same as AGI, and the income caps are based on AGI over the preceding 3-year period (2006-2008 tax years for 2009 payments).

[24]The statistics cited in this paragraph were computed from the 2009 ARMS Phase III using all versions of the survey.

[25]While the income caps and payment limits apply to individuals and legal entities, FSA requires legal entities receiving Government payments to apportion those payments to individual taxpayers. If legal entities pass Government payments to other legal entities, the second- and third-level entities also have to apportion payments to individuals.

Figure 14
Direct payments and principal farm operator households, by income received from farming, 2009

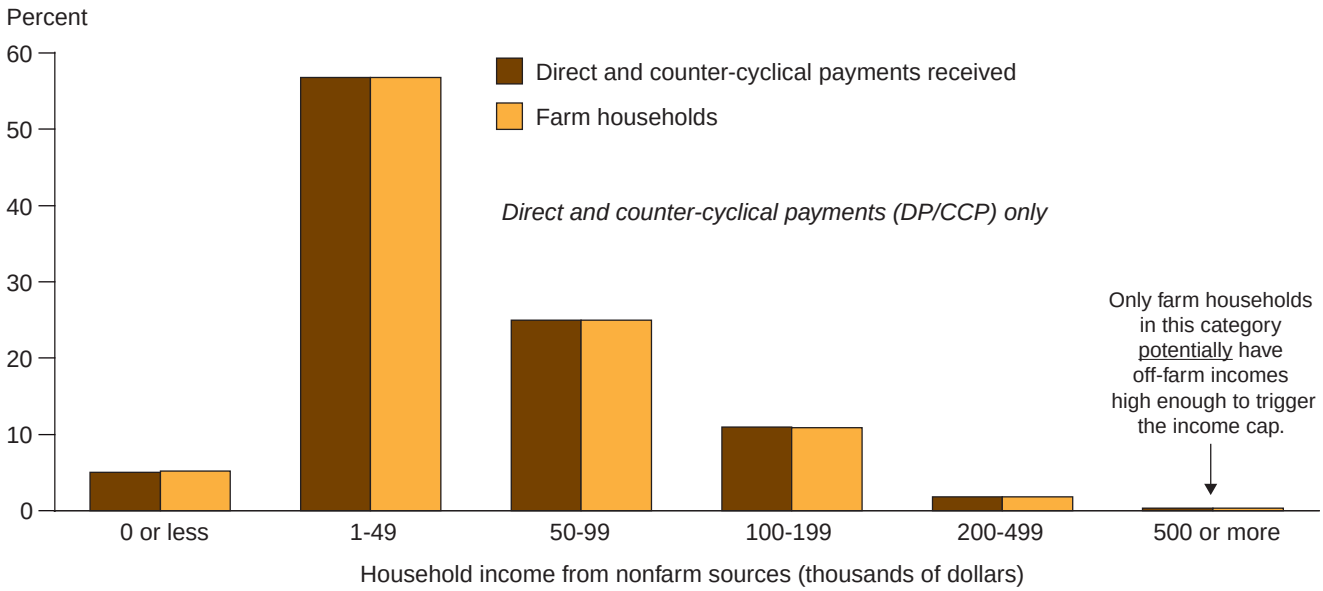


Note: Even households earning more than $750,000 from farming may be eligible for payments. The farming income eligibility cap applies to *individuals*, and this chart uses the farming income of *households*. Multiple individuals in a household may be actively involved in operating a farm and have incomes below the cap; they would be eligible to receive payments even if the household's total income from farming exceeded $750,000.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2009 Agricultural Resource Management Survey.

Figure 15

Commodity payments and principal farm operator households, by income received from nonfarm sources, 2009



Note: Even households earning more than $500,000 from nonfarm sources may be eligible for payments. The nonfarm income eligibility cap applies to *individuals*, and this chart uses the nonfarm income of *households*. Multiple individuals in a household may be actively involved in operating a farm and have incomes below the cap; they would be eligible to receive payments even if the household's total nonfarm income exceeded $500,000.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2009 Agricultural Resource Management Survey.

Since 2006-2008 was a period of generally increasing—and high—grain prices and thus high grain-farmer income, more operator households might have had unusually high incomes during this period relative to earlier periods. On the other hand, as noted above, ARMS data tracks payments to the farm, and the income of the principal operator's household. The ARMS data do not track junior partners or stockholders associated with the farm (but not part of the farm household). If these junior partners or stockholders are not principal operators of other surveyed farms, then the ARMS does not count how many of these individuals might be affected by the income caps.

If the shift in agricultural production toward larger farms, and thus higher income households, continues—which seems likely—it is possible that the current payment limits and income caps will become binding for a larger number of individuals and entities, and presumably farm households. However, given the separate caps for farm and nonfarm income, the ability to allocate ownership shares of the farm (and thus to effectively split payments) between family members and business associates, and the 3-year average AGI rule, a farm household's income would have to be high for several years before the income cap would affect eligibility. For example, a married couple could have a combined AGI of $2.5 million ($500,000 each from nonfarm sources and $750,000 each from farming) every year for 3 years and still potentially be eligible for most Government payments.

The Obama Administration has proposed lowering income caps. The Administration's budget for fiscal year 2012 proposed limiting direct payments to individuals with 3-year average AGI of no more than $500,000 from farming, down from the current limit of $750,000. For married couples, since

both spouses can potentially receive payments, the effective farm AGI cap for married couples could be $1 million. In addition, the budget proposed limiting direct payment program eligibility to individuals with average nonfarm AGI of no more than $250,000 (potentially up to $500,000 for married couples). In 2009, approximately 2 percent of family farms receiving direct payments—about 11,000 farms—had principal operator households with farm income over $500,000, accounting for roughly 7 percent of direct payments. In the same year, roughly 3,000 farms receiving direct payments had principal operator households with incomes over $1 million, accounting for about 3 percent of direct payments to family farms. Thus, based on 2009 ARMS data, neither of the proposed AGI caps would affect a large number of farms or appreciably alter the overall distribution of farm program payments.

Because of price increases and the shift of production toward larger farms operated by higher income households, it is likely that lowering the AGI eligibility cap today would affect a larger percentage of payments and farms than we estimate based on the 2009 ARMS data. While farms can often smooth income across years to reduce AGI during high-earning years, the recent string of high-income years enjoyed by most program-eligible crop producers reduces the impact of income averaging. Average AGI cannot be reduced by prepaying production expenses in the current tax year or delaying crop sales until the following tax year if income is consistently high in all 3 years. Farm operators can significantly reduce average AGI by purchasing farm equipment—the depreciation of farm equipment can be deducted from AGI over multiple years—but there is a limit to how much farm equipment can be profitably used.

Payment Limits

In addition to income eligibility caps, Congress has enacted payment limits. The 2008 Farm Act included a $40,000 limit on direct payments to individuals and entities, a $65,000 limit on CCPs, and other payment limits on ACRE, CRP, and disaster assistance programs such as SURE. Since spouses may have a separate limit, married couples could receive up to $80,000 of direct payments and $130,000 of CCPs (see the box on "Payment Limits Under the 2008 Farm Act"). Table 10 shows the number of farms, the percentage of payment-receiving farms, and the percentage of payments that might be affected by these and other payment limits. In 2009, direct and counter-cyclical payments to farms that, if accruing to the principal operator, exceeded these limits accounted for a significant fraction of payments, but only a small percentage of farms. To summarize, in 2009, among farms receiving direct payments:

- Only 3 percent (approximately 14,700 farms) received direct payments of more than $40,000; total direct payments to these farms accounted for about 28 percent of direct payments.
- About 1 percent (roughly 3,800 farms) received direct payments of more than $80,000; total direct payments to these farms accounted for approximately 12 percent of direct payments.

Payment Limits Under the 2008 Farm Act

By Terry Hickenbotham (Terry.Hickenbotham@wdc.usda.gov)

The 2008 Farm Act mandated that payments be "directly attributed" to individuals and legal entities such that the limits would be applied, starting with the 2009 program year, to the total direct and indirect payments for each individual and entity. Under direct attribution, if a payee is an entity, then the entity's payments are disaggregated among its members based on the members' ownership shares. If a first-level entity (an entity to which a proposed payment may be made) is partially or wholly owned by one or more entities, then the indirect payments for that second-level entity (those entities) are also disaggregated to their members. The attribution process continues to the fourth level, at which point all indirect payment beneficiaries must be individuals. If, at the fourth level, an entity has an interest in a third-level entity, then the first-level entity's payment is reduced by the attributed ownership share of the fourth-level entity. Payment limits apply to all individuals and entities regardless of the level at which they may appear, and directly attributed payments for a given program in a program year are summed across all payments to determine if reductions will be applied for each individual and entity.

In general, payment limits are applied to individuals and entities, not to farm households. Furthermore, payment limits are not applied on a calendar-year or fiscal-year basis unless one or the other is the applicable program year for a given program (e.g., the fiscal year is the applicable program year for the Conservation Reserve Program). Hence, payments received in a calendar year may represent payments for 2 or more program years. Finally, direct attribution is applied and payment limit checks are done before each payment is made.

Table 10
Farms and payments potentially affected by payment limits

Type of payment	Year analyzed	Limit applied to	Limit	Number of farms	Percent of farms*	Percent of payments**
Direct payments	2009	Individuals***	$30,000	25,836	6	39
		Married couples	$60,000	7,569	2	19
		Individuals	$40,000	14,695	3	28
		Married couples	$80,000	3,838	1	12
Counter-cyclical payments	2005	Individuals	$65,000	4,621	2	23
		Married couples	$130,000	1,099	<1	10
	2009	Individuals	$65,000	1,506	1	29
		Married couples	$130,000	517	<1	16
LDPs/Marketing loan gains	2005	Individuals	$150,000	1,278	<1	9
	2009	Individuals	$150,000	112	2	17

*Percent of farms is the percentage among farms that receive the specified type of payment.
**Percent of payments is the percentage of payments of the specified type.
***Individuals = counts and percentages for households with payments above the individual limit.
LDPs = Loan deficiency payments.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2005 and 2009 Agricultural Resource Management Survey, all versions.

Among farms receiving CCPs:

- Approximately 1 percent (roughly 1,500 farms) received CCPs over $65,000; total CCPs to these farms accounted for about 29 percent of CCPs.
- Less than 1 percent (about 500 farms) received CCPs over $130,000; total CCPs to these farms accounted for approximately 16 percent of CCPs.

These payments can legitimately exceed limits set by the 2008 Farm Act because the ARMS tracks payments to farm businesses and the payment limits apply to individuals and legal entities. Some of the payments could be going to junior partners in the farm business. Under the Act, payment limits for general partnerships are applied to each partner. As long as each partner is actively engaged in the farming operation, each partner has a separate payment limit. A person is considered actively engaged in farming if he or she makes a significant contribution of operating funds, equipment, land, labor, or active management to the farm. Moreover, recipients are allowed to receive an advance direct payment of 22 percent for the subsequent crop year. This means an individual could receive more than $40,000 in direct payments in a calendar year—up to $40,000 for the current crop year plus 22 percent of the next crop year's payment. Since the ARMS is based on a calendar year, such a situation would show up as more than $40,000 in the ARMS data.

Total counter-cyclical payments in 2009 were relatively low by historical standards—about $1.2 billion—because the payment rate is tied to commodity prices and commodity prices were high. In contrast, total CCPs in 2005, when commodity prices were low, were $4.5 billion in 2009 dollars (see figure 2). Payment limits for CCPs are more likely to bind when prices are low. Despite this fact, in 2005 farms receiving CCPs over $65,000 accounted for only about 23 percent of total CCPs, and farms receiving CCPs over $130,000 accounted for only about 10 percent of total CCPs. The farms receiving these payments accounted for, respectively, 2 percent and less than 1 percent of farms receiving CCPs in 2005 (table 10). The number of CCPs that could potentially be affected by the payment limit in a given year varies considerably by farm type. In 2005, of the 1,099 crop farms with CCPs high enough to be potentially affected by the limit, an estimated 408 were cotton farms, accounting for about 3 percent of all cotton farms (table 11).

Table 11
Crop farms with counter–cyclical payments over $130,000 in 2005, by farm type

	Farm type defined with value of production		
Item	Cotton	All other crops	48-State total
Number of farms	408	691	1,099
Percent of farms	2.7	0.1	0.1

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2005 Agricultural Resource Management Survey, all versions.

The 2008 Farm Act removed payment limits on marketing loan benefits for crop years 2009-2012. However, an earlier proposal in the Senate[26] called for limiting marketing loan benefits (loan deficiency payments plus marketing loan gains) to $150,000 per individual. In 2009, about 15 percent of the sum of LDPs and marketing loan gains received by family farms went to family farms receiving more than $150,000 in marketing loan benefits. Farms receiving benefits above that level accounted for less than 1 percent of family farms receiving LDPs or marketing loan gains. Since commodity prices were high, total marketing loan benefits in 2009 were small—only $1.1 billion. In 2005, total marketing loan benefits were $7.7 billion in 2009 dollars (see figure 2). However, even in that year of large marketing loan benefits, only 0.4 percent of family farms receiving payments had combined LDPs and marketing loan gains over $150,000, accounting for only 6 percent of those payments. The number of total LDPs and marketing loan gains over $150,000 also varies by farm type. In 2005, of the 1,278 crop farms that received LDPs or marketing loan gains over the proposed limit, 676 were corn farms and 125 were cotton farms (table 12). Although the number of corn and cotton farms receiving these large marketing loan benefits was high compared to other types of farms, only 0.7 and 0.8 percent of corn and cotton farms, respectively, received marketing loan benefits over $150,000 in 2005.

The Obama Administration's fiscal year 2012 budget proposed limiting individual direct payments to $30,000. In 2009, about 5 percent of family farms receiving direct payments received payments over $30,000. Total direct payments to these farms accounted for 37 percent of direct payments to family farms. Since these payment limits would apply to individuals (and legal entities), under the proposed limit, a married couple could receive payments of up to $60,000. In 2009, about 2 percent of family farms with direct payments received direct payments over $60,000. Total direct payments to these farms accounted for about 18 percent of direct payments to family farms. The percentage of farms that might be affected by direct payment limits also varies by commodity (table 13). For example, in 2009, only about 1 percent of wheat, corn, and soybean farms had direct payments over $60,000, while 25 percent of rice farms and 9 percent of cotton farms had direct payments over $60,000. Of the estimated 7,569 farms receiving more than $60,000 in direct payments, 1,155 were rice farms and 767 were cotton farms. Payments over the proposed limit also accounted for a higher proportion of farm income for cotton and rice farms than other farms. For these rice and cotton farms, direct payments were, respectively, 9 percent and 7 percent of GCFI, compared to only 4 percent of GCFI for the average of all other farms receiving more than $60,000 in direct payments. Large farms

[26]Senate Bill 385, from February 2005.

Table 12
Crop farms with marketing loan benefits over $150,000 in 2005, by farm

	Farm type defined with value of production			
Item	Cotton	Corn	All other crops	48-State total
Number of farms	125	676	478	1,278
Percent of farms	0.8	0.7	0.1	0.1

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2005 Agricultural Resource Management Survey, all versions.

Table 13
Farms with direct payments over $60,000 in 2009, by farm type

	Farm type defined with value of production							
Item	Wheat	Corn	Soybeans	Rice	Cotton	Peanuts	Other	48-State total
Number of farms	3,298	1,416	793	1,155	767	60	3,081	7,569
Percent of farms	0.9	1.0	1.0	25.1	9.4	3.7	0.2	0.3
Percent of GCFI	6.6	2.7	5.4	8.7	7.0	na	3.7	4.3

GCFI = Gross cash farm income.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2009 Agricultural Resource Management Survey, all versions

are more likely to receive larger payments and have more than one operator receiving income from the farm business. Therefore, these estimates probably overstate the potential effects of the proposed direct payment limits on farm households.

The effect of payment limits can be lessened in several ways. First, since each spouse can have a separate payment limit, married couples can share ownership so that the combined payment limit for the couple is effectively doubled. Program payments to farm operators can also be affected by changing their land rental agreements. Landlords who receive direct payments as part of a share-rent agreement may be able to switch to cash-rent agreements and increase the rental rate to make up for the lost Government payments. Conversely, operators who currently cash-rent may be able to switch to share-renting, thereby sharing some of the payments with the landlord. Operators can also alter payments accruing to the farm by changing the legal organization of the farm business. One way to do this is by forming a general partnership.

For general partnerships, under certain situations, the sum of the partners' individual payment limits increases when a partner is added. For example, when an adult family member is added to the partnership, that family member may be eligible to receive payments if he or she is actively engaged in the farming operation. The statutory definition of "actively engaged" includes any person that makes a significant contribution of active personal management. However, a 2004 GAO study found that USDA's regulations to ensure recipients are actively engaged in farming do not provide a measurable standard for what constitutes a significant contribution of active personal management (GAO, 2004).

Effects of Payment Limits in Practice

While there are a number of options for legitimately increasing the amount of program payments a farm is eligible to receive, adopting these changes in business organization could affect the distribution of risk-sharing in the farm sector. Partners in a farm business and landlords in a share-rental agreement share some of the risk inherent in agricultural production. For example, if a landlord agrees to share-rent instead of cash-renting, then the landlord faces some risk that the share-rent will be lower than expected in the event of low yields or crop prices. Economic theory suggests that people do not voluntarily accept additional risk without being compensated for it. For example,

landlords who accept additional risk by switching from cash-rent to share-rent may ask for higher share-rents.

Payment limits might also affect land prices. Since land values are affected by the economic returns to the land—including Government payments—an increase in the number of farms affected by payment limits would tend to reduce the value of that land. Nationally, only a small percentage of farms received direct payments of more than $60,000, so it is unlikely that a $30,000 direct payment limit would significantly affect national average land prices. However, roughly 25 percent of rice farms and 9 percent of cotton farms had direct payments over $60,000 in 2009. Therefore, other things equal, lower payment limits are more likely to exert downward pressure on land prices in States with many large cotton and rice farms, such as California and Arkansas.

Finally, reduced payment limits may not halt the shift of production toward larger farms. The current and proposed payment limits apply to legal entities and individuals, and larger farms are more likely to have multiple operators sharing income and payments from the farm business (see table 9). Payments' share of GCFI already declines with farm size (see tables 1 and 2), and larger farms are still more profitable than smaller farms. Therefore, it is likely that production will continue to shift toward larger farms even if lower payment limits are implemented.

Payment limits can also affect production. Direct and counter-cyclical payments are not based on a farm's current production. However, a farm's LDPs and marketing loan gains are directly affected by the farm's current production, and thus limits on these types of benefits might affect production even if they do not cause operators to alter the size of their operation. For example, suppose a marketing loan benefit limit was in effect, the limit was expected to bind for a cotton producer, and cotton production that year was not expected to be profitable without LDPs. In this case, the cotton producer might plant fewer acres. If many cotton producers expect to be affected by the payment limit, then total cotton production could decrease.

It is difficult to determine precisely how low hypothetical payment limits on marketing loan benefits would have to be to significantly affect production, because operators make production decisions in the face of uncertainty about yields, production costs, and market prices as well as payments tied to production. For example, when operators decide which crops to plant and how many acres of each crop, they do not know exactly what their yields will be (i.e., how many bushels or pounds per acre they will be able to harvest) or what commodity prices will be after harvest. If after-harvest commodity prices are unexpectedly low and a particular operation's yields are unexpectedly high, then that operation's marketing loan benefits could be higher than the operator expected them to be at planting time.

Despite this uncertainty, it is possible to simulate the effects of payment limits under various yield, production cost, and market price scenarios. Using data on yields and prices from 2004, Goodwin (2009) performed a computer simulation of the effects of the payment limits proposed in Senate Bill 385 (introduced in February 2005) on acreages of program crops in key commodity-producing States. Goodwin assumed that operators are

risk-averse—that is, they are willing to forgo some potential profits in order to avoid some potential loss. The simulation results varied by State, crop, average yield, market price, and farm-operator risk aversion. Goodwin found that payment limits were most likely to affect production for California and Arkansas rice and cotton farmers who tend to have larger farms. Cotton and rice farmers also tend to receive higher payments per acre than for other commodities, making it more likely that payment limits will bind (Monke 2005). For example, Goodwin found that marketing loan benefit limits would probably have the largest effect on the acreage of Arkansas cotton farms. In Arkansas, 65 percent of the cotton acreage is on farms for which hypothetical marketing loan benefit limits were likely to be binding when yields are high and prices are low. At planting time, if operators expect high cotton yields and low cotton prices, they may plant fewer acres of cotton. As a result, cotton production would decline. However, under most scenarios, the proposed payment limits on CCPs and LDPs were unlikely to have a significant effect on total acreages of soybeans, corn or wheat in key States producing those commodities. To the extent that production continues to shift to larger operations, potential limits on marketing loan benefits might become binding for a larger percentage of corn, wheat, and soybean farms, and thus have a larger effect on production of those commodities.

Conclusions

U.S. agricultural production has been shifting toward larger farms because they are more profitable, and this trend is likely to continue. Operators of larger farms tend to earn higher incomes. Consequently, Government payments, as currently structured, will probably continue to shift to higher income households. As these trends continue, current payment limits and income eligibility caps may affect a larger share of payments.

The Federal Government supports farmers through a variety of USDA programs. These include conservation programs, commodity-related programs, disaster payments, federally subsidized crop insurance, and other programs. Recent proposals to reduce payments to farmers have focused on commodity-related programs—which include direct and counter-cyclical payments programs and marketing loan benefits—and federally subsidized crop insurance. Although most of these payments go to high-income households, farm income can fluctuate from year to year because of fluctuations in commodity prices or yields. Furthermore, some of these payments are captured by nonoperator landlords in the form of higher rents.

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Appendix: Government Payments Programs for Farmers and Federal Crop Insurance

USDA runs several different types of payment programs for farmers. Here we classify and briefly describe the payment programs as well as the Federal crop insurance program.

Commodity Direct Payments

Direct payments are annual fixed payments to farmers using their farm's historic reported acreage—also called "base" acreage—and program payment yields for program crops (wheat, corn, barley, grain sorghum, oats, upland cotton, rice, soybeans, other oilseeds, and peanuts).[27] These include production flexibility contract (PFC) payments prior to the 2002 Farm Act. Note that soybeans, other oilseeds, and peanuts were not eligible for PFC payments. A farm's base acreage for the PFC-eligible program crops was generally based on reported acreage during the 1991-1995 period and for other program crops during the 1998-2001 period. Program yields were generally established using yields during the 1981-1985 period.

A farm's owner can designate base acreage in one of several ways, and the rules for determining a farm's base acreage have also changed over time.[28] Under the 2002 Farm Act, one of the simplest choices was to set the base acreage of a particular crop equal to average acreage planted to that crop from 1998 to 2001. Once the base acreage for a particular crop on a particular farm is determined, the farm's direct payment for that crop is the product of a percentage of the base acreage (83.3 percent for crop years 2009-2011 under the 2008 Farm Act), the farm's "payment yield" for that commodity, and the statutorily mandated direct payment rate for that commodity. A farm's payment yield for a commodity is also based on that farm's historical yield for that commodity. For example, in 2009 the direct payment rate for corn was 28 cents per bushel. Therefore a farm with 100 base acres of corn and a corn payment yield of 110 bushels per acre would receive a direct payment for corn of 0.833 times 100 times 110 times 28 cents, or $2,556.[29] This payment is independent of the price of corn in 2009 or whether or not the farm planted any corn in 2009. However, production on a given farm tends to be correlated over time, so farms that currently produce large quantities of a program commodity also tended to produce large quantities of that commodity in the past, and thus have high levels of direct payments.

The fact that direct payments are not tied to *current* production puts them in a special category under World Trade Organization (WTO) agreements. Program payments that are considered trade-distorting are subject to limits under the WTO.[30] However, direct payments are currently not considered to be trade-distorting. This means that, unlike most other major program payments, direct payments are not subject to WTO limits.

Counter-Cyclical Payments

Like direct payments, counter-cyclical payments (CCPs) are based on a farm's base acreage for a particular crop, the counter-cyclical payment yield, and the legislatively mandated payment rate formula (in this case, the CCP rate).

[27]The phrase "direct payments" also sometimes refers to any Government payment made directly to farmers. In this report, we use the phrase "Government payments" to refer to any Government payment made directly to farmers. We use the phrase "direct payments" to refer to fixed payments to farmers based on their historic production. In our definitions, "Government payments" include direct payments.

[28]See Young et al. (2005) for a detailed description of the options for updating base acres and program yields in the 2002 Farm Act.

[29]See USDA Farm Service Agency's Fact Sheet on Direct and Counter-Cyclical Payments for additional examples at: http://www.fsa.usda.gov/Internet/FSA_File/dcp2008.pdf/.

[30]Note that the WTO limits are distinct from payment limits defined by Congress.

Unlike direct payments, the counter-cyclical payment rate depends on market prices. The counter-cyclical payment rate for a commodity is the amount that its "effective price" falls below its target price. The effective price for a commodity is the direct payment rate plus the higher of (a) the national average market price received by producers during the marketing year or (b) the national loan rate for the commodity. The national loan rate for a commodity is the national average price USDA offers for a commodity under the marketing assistance loan programs. For example, suppose the 2009 national average market price for soybeans was $5.10 per bushel and the national loan rate was $5.00 per bushel. The direct payment rate for soybeans for that year was 44 cents per bushel, and the target price was $5.80. In this case, the effective price for soybeans is $5.10 + $0.44 = $5.54 per bushel, and the counter-cyclical payment rate is $5.80 - $5.54 = $0.26 per bushel.

A farm's counter-cyclical payment for a commodity is equal to the product of 85 percent of the farm's base acres for that commodity, the farm's counter-cyclical payment yield, and the given year's counter-cyclical payment rate for that commodity. For example, suppose a farm has 100 base acres of soybeans and a counter-cyclical payment yield of 30 bushels per acre. Using the counter-cyclical payment rate of 26 cents per bushel, the farm's counter-cyclical payment for soybeans would be 0.85 times 100 base acres times 30 bushels per acre times 26 cents per bushel, or $663. If the market price were lower, the CCP would be higher. Like direct payments, a farm's CCPs do not depend on the farm's current plantings. However, since a farm's production tends to be correlated over time, farms that currently produce large quantities of program commodities also tend to have large counter-cyclical payments in years when CCPs are paid. When commodity prices are high, as they have been in recent years, farms do not receive counter-cyclical payments.

The Average Crop Revenue Election (ACRE) Program

The 2008 Farm Act authorized the Average Crop Revenue Election (ACRE) program, an alternative to the counter-cyclical payments program for crop years 2009 to 2012. To receive ACRE payments, the commodity for which a payment may be made must be grown on the ACRE-enrolled farm. Payments are triggered when State revenue and farm-level revenue for a commodity fall below benchmark levels. Thus, while CCPs mitigate price risk, the ACRE program mitigates revenue risk. A producer who enrolls a farm in the ACRE program may also receive direct payments, but such payments are reduced by 20 percent compared to what would otherwise be paid for the farm if it had been enrolled in the Direct and Counter-Cyclical Payment Program. About 8 percent of FSA-defined farms with about 14 percent of eligible base acres elected to participate in ACRE in 2010.[31] ACRE payments for the 2009 crop, the first year of the program, were made in calendar year 2010, so the 2009 ARMS did not collect payment information on ACRE. Unlike direct and counter-cyclical payments, ACRE payments are made on the farm's acreage planted to program commodities, but ACRE payment acreage is limited to the farm's total base acreage.

[31]See the 2010 ACRE Preliminary Enrollment Report, available at: http://www.fsa.usda.gov/Internet/FSA_File/prelim_2010_dcp_acr_enroll.xls/.

Marketing Loan Benefits

USDA makes several forms of marketing loan benefits available to producers, including loan deficiency payments (LDP) and marketing loan gains. Marketing loans provide producers of certain commodities financing at the time of harvest so that they don't have to sell when prices are low. The commodity itself is pledged to the Commodity Credit Corporation (CCC) as collateral for the loan. When the CCC's proxy for the market price (the alternative loan repayment rate) drops below the loan rate (which is set by statute), producers are allowed to repay the loan at the alternative loan repayment rate. The difference between the alternative loan repayment rate and the loan rate is the marketing loan gain rate. Therefore, the more the loan rate exceeds the alternative loan repayment rate, the greater benefit the producer receives. Producers who are eligible for marketing loan gains can opt to take the gains directly as a payment. These are known as loan deficiency payments (LDPs).

A third form of marketing assistance benefit involves the use of commodity certificates which the CCC was mandated to offer through the 2009 crop. Producers used to be able to take out a CCC marketing loan and at the same time or later purchase commodity certificates to settle the loan at the alternative loan repayment rate. If the alternative loan repayment rate was below the applicable marketing loan rate, the difference was the commodity certificate exchange gain (CEG). CEGs were not subject to the payment limit.

Unlike direct payments and counter-cyclical payments, marketing loan benefits directly depend on current production. Farms that produce large quantities of a program commodity may receive large marketing loan benefits (assuming the marketing loan rate is above the alternative loan repayment rate). For example, for 2008, the loan rate for upland cotton was 52 cents per pound. Suppose an Arkansas farm produced 100,000 pounds of upland cotton that year, and the alternative loan repayment rate was 48 cents per pound. In this case, if the producer elects to receive an LDP, the payment would be 100,000 x $0.04, or $4,000. If the market price is above the loan rate, as it has been for most commodities in recent years, then farms do not receive any marketing loan benefits.

To summarize, direct payments and CCPs are based on a farm's recent historical plantings or base acreage and historical program payment yields. For ACRE payments and marketing loan benefits, payments depend on current production. Because of the relationships between payments and production, shifts in production to larger farms will also shift the distribution of payments to larger farms.

Conservation Payments

Conservation programs include land-retirement programs and working-land programs. Land-retirement programs require that the landowners not produce on the land enrolled in the program. The main land-retirement program is the Conservation Reserve Program (CRP), which gives farm owners or operators an annual per-acre rental payment in exchange for taking highly erodible and environmentally sensitive cropland and marginal pasture out of production for 10 to 15 years. The Conservation Reserve Enhancement Program

(CREP) supplements the CRP by providing additional economic incentives for farmers to retire land from production in areas that address specific State and nationally significant water quality, soil erosion, and wildlife habitat concerns. Landowners who participate in the Wetlands Reserve Program (WRP) can receive payments for implementing a wetlands restoration and protection plan. The goals of the WRP include providing habitat for wetland-dependent wildlife, protection or improvement of water quality, and attenuation of water flows to reduce flooding.

In contrast to land-retirement programs, working-land programs provide incentives for natural resource conservation on land still in production. Working-land programs include the Conservation Security Program (CSP) and the Environmental Quality Incentives Program (EQIP). The 2008 Farm Act replaced the CSP with the Conservation Stewardship Program (CStP). The CSP and the CStP pay farmers for maintaining or adopting structural or land management practices that address natural resource concerns such as air, water, and soil quality. EQIP provides technical assistance and also pays farmers for part of the costs of implementing a wide range of conservation practices. Unlike the CSP and CStP, EQIP includes incentives for livestock producers.

Although EQIP payments do not directly depend on production, larger operations tend to have higher total costs of implementing many conservation practices. For example, larger hog operations produce larger quantities of manure, and the total cost of implementing manure management practices is higher than for smaller operations, especially if additional land has to be rented for applying the manure or if the manure has to be removed from the farm. Therefore, EQIP payments for implementing manure management practices tend to be higher for large hog farms than for small hog farms.

Disaster and Emergency Payments

Prior to the 2008 Farm Act, emergency or disaster relief payments were generally ad hoc Government responses to droughts, floods, or other natural disasters. For example, the Omnibus Appropriations Act of 1999 provided $3.1 billion in “market loss” payments to grain, cotton, and dairy farmers in response to low prices for these commodities; $1.3 billion in farm disaster payments for 1998 crop losses; and $575 million in disaster payments for multi-year crop losses. Although emergency or disaster relief payments fluctuate significantly from year to year, they have been a recurring feature of Government support for decades (Chite, 2010). Since larger farms tend to suffer larger losses when natural disasters occur, larger farms tend to receive higher levels of disaster payments.

The 2008 Farm Act introduced a standing emergency disaster program—the Supplemental Agricultural Disaster Assistance program—for losses that occur through September 30, 2011. This included the Supplemental Revenue Program (SURE) for crops, a livestock indemnity program, and a livestock forage disaster program, among others. To be eligible for the SURE program, farms are required to have a crop insurance or non-insured crop disaster assistance program (NAP) policy.

Other Government Payments

The Government also makes payments to farmers under programs that do not fit neatly into any of the above categories. For example, the Milk Income Loss Contract (MILC) program makes monthly payments to milk producers when a benchmark price for fluid milk falls below a certain level. MILC payments to a single operation are limited to a maximum of 2.985 million pounds of milk produced per fiscal year. The MILC program is designed to be counter-cyclical in prices, like CCP payments, but because MILC payments are capped at certain levels of production, they are directed to smaller and mid-size farms. Other programs are temporary. For example, the peanut quota buyout paid owners of peanut marketing quota in one lump-sum payment or in payments over several years from 2002 to 2006.[32] The Tobacco Transition Payment Program helps tobacco quota holders and producers transition to the free market with annual transitional payments which began in 2005 and continue through 2014. These payments are funded through assessments of approximately $10 billion on domestic tobacco product manufacturers and importers.

[32]Prior to 2002, domestic producers of peanuts for domestic "food use" had to own marketing quota in order to sell the peanuts.

Federal Crop Insurance

In addition to Government payments, the USDA reduces risk for farmers by subsidizing crop insurance. USDA's Risk Management Agency (RMA) provides insurance to farmers through the Federal Crop Insurance Corporation (FCIC), which the agency operates and manages. RMA is responsible for developing insurance products and works with 17 private-sector insurance companies to sell and service the policies.

Costs to the Federal Government from the crop insurance program include: Federal premium subsidies, administrative and operating (A&O) costs, and program underwriting losses (or gains). RMA establishes premium rates and shares risk with the private companies in an agreement known as the Standard Reinsurance Agreement (SRA) (USDA, RMA, 2010). A producer purchasing an insurance policy from a private company pays a portion of the premium, which increases as the level of coverage rises. RMA subsidizes the rest of the premium, with the subsidy rate varying from 38 to 67 percent. These premium subsidies totaled $4.7 billion in 2010. Under the current SRA, which was completed in 2010, RMA reimburses the insurance companies for A&O costs, up to a limit of $1.3 billion per year (adjusted for inflation). The SRA also determines how risk is shared between RMA and the insurance companies. Under the SRA, the RMA assumes the liability for some of the insurance policies, and the private insurance companies retain the liability for others. The Government's underwriting loss (or gain if negative) is the difference between total indemnity payments and total premiums, plus or minus the private insurance companies' gains or losses. In 2009, the RMA's underwriting losses were $108 million, and in 2010, its gains were $2.5 billion (Shields, 2010).[33]

[33]See Shields (2010) for more information on Federal crop insurance.

Various insurance policies are available. Policies can insure against unexpectedly low yields for a particular crop, low revenue from a crop, low revenue for an entire farm, or unexpectedly low yields or revenues for an entire county. Policies are available for over 100 crops, although availability varies by county. There are also insurance policies available for livestock.

In recent years, Federal crop insurance has become increasingly important. In 2009, farms received a total of $5.1 billion of indemnity payments—the payments to farmers for crop losses—from Federal crop insurance. Farmers can also purchase insurance that is not subsidized by the Federal Government. However, this insurance is limited to hail, wind, and fire. Broader insurance, known as multi-peril crop insurance (MPCI) is subsidized by the Federal Government. In this report, we focus on federally subsidized crop insurance.

List of Acronyms

A&O: Administrative and Operating
AGI: Adjusted Gross Income
ACRE: Average Crop Revenue Election program
ARMS: Agricultural Resource Management Survey
ARPA: Agricultural Risk Protection Act of 2000

CCC: Commodity Credit Corporation—a Government-owned and -operated entity created to stabilize, support, and protect farm income and prices
CCP: Counter-Cyclical Payments
CEG: Commodity certificate Exchange Gain
CPI-U: Consumer Price Index for all Urban consumers
CPS: Current Population Survey
CRP: Conservation Reserve Program
CREP: Conservation Reserve Enhancement Program
CSP: Conservation Security Program
CStP: Conservation Stewardship Program
CV: Coefficient of Variation

DP: Direct Payments

EISA: Energy Independence and Security Act of 2007
EQIP: Environmental Quality Incentives Program
ERS: Economic Research Service

FCIC: Federal Crop Insurance Corporation
FCRS: Farm Costs and Returns Survey
FSA: Farm Service Agency

GAO: Government Accountability Office
GCFI: Gross Cash Farm Income
GDP: Gross Domestic Product

IRS: Internal Revenue Service

LDP: Loan Deficiency Payment

MILC: Milk Income Loss Contract program

NAP: Noninsured Crop Disaster Assistance Program
NASS: National Agricultural Statistics Service

PFC: Production Flexibility Contract
PPI: Producer Price Index
PPIFP: Producer Price Index for Farm Products

RMA: Risk Management Agency
ROE: Return on Equity

SURE: Supplemental Revenue Assistance Payments program

WRP: Wetlands Reserve Program

WTO: World Trade Organization