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Small Farms in the United States

Persistence Under Pressure

Robert A. Hoppe, James M. MacDonald, and Penni Korb

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Small Farms in the United States
Persistence Under Pressure

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Abstract

Ninety-one percent of U.S. farms are classified as small—gross cash farm income (GCFI) of less than $250,000. About 60 percent of these small farms are very small, generating GCFI of less than $10,000. These very small noncommercial farms, in some respects, exist independently of the farm economy because their operators rely heavily on off-farm income. The remaining small farms—small commercial farms—account for most small-farm production. Overall farm production, however, continues to shift to larger operations, while the number of small commercial farms and their share of sales maintain a long-term decline. The shift to larger farms will continue to be gradual, because some small commercial farms are profitable and others are willing to accept losses.

Keywords: Family farms, farm businesses, farm financial performance, farm-operator household income, farm operators, farm structure, noncommercial farms, small farms, small commercial farms

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Summary

Small farms—defined here as those with gross cash farm income (GCFI) less than $250,000 (see box at right)—range from retirement and residential farms with little or no output to commercially oriented farms with operators employed full-time in agriculture. At the lower end of the small-farm size spectrum, farm households rely heavily on earnings from off-farm work or on retirement income. At the upper end of the spectrum, farm households earn more from farming. A few commodities—beef cattle, hay, poultry, and grain/soybeans—account for most small-farm production.

What Is the Issue?

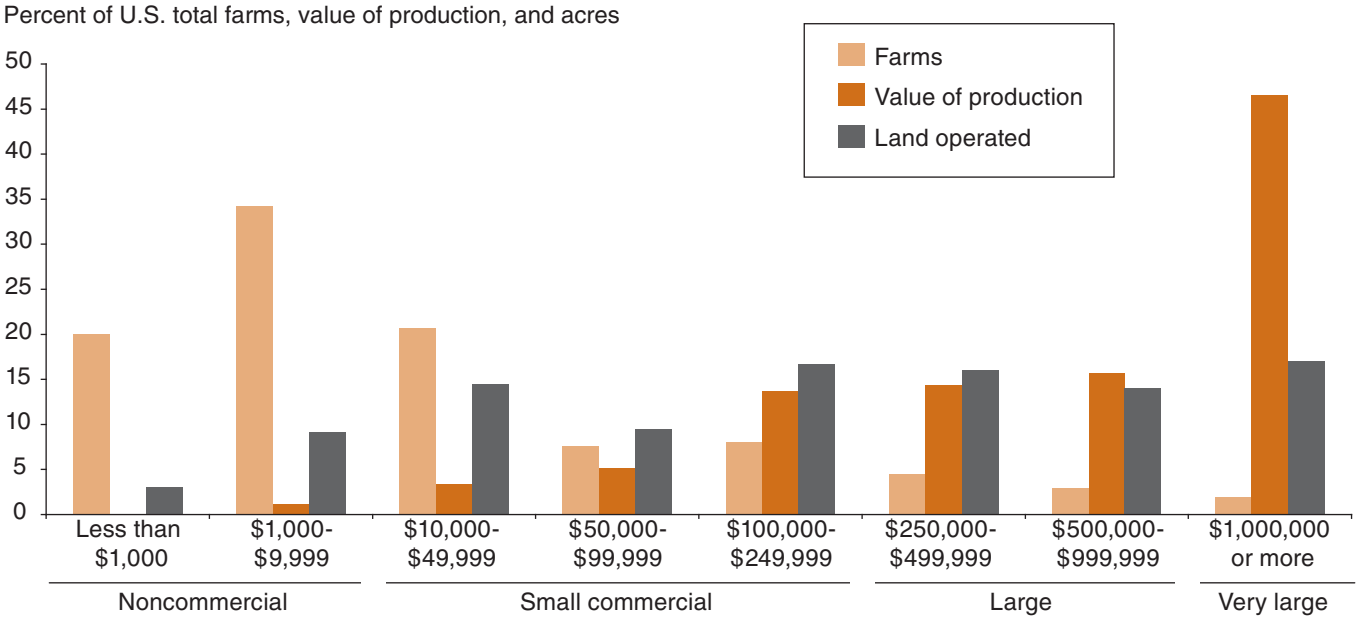
Small farms account for 91 percent of all farms and 23 percent of agricultural production. There are large differences among small farms, however, because USDA statistics are based on a very broad farm definition. Most small-farm production occurs on small commercial farms with GCFI of at least $10,000. Most places counted as small farms, however, are much smaller than that—60 percent of small farms have GCFI of less than $10,000, and 22 percent have less than $1,000. While there are good reasons to maintain a broad farm definition, statistics based only on that definition obscure the performance of small commercial farms. This report examines the differences between small and large farms and—among small farms—distinguishes between noncommercial farms (GCFI of less than $10,000) and small commercial farms (GCFI of $10,000-$249,999).

Calculating Gross Cash Farm Income (GCFI)

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. GCFI focuses on the farm business, excluding returns to share landlords and contractors. It includes all farm-related revenue, not just crop and livestock sales, and is based on annual sales, not the value of annual production.

Distribution of farms, value of production, and land operated, by GCFI class, 2007

Most small farms produce little, while very large farms account for nearly half of production



GCFI=Gross cash farm income.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

What Did the Study Find?

U.S. farm production continues to shift to larger operations, while the number of small commercial farms and their share of farm sales continue a long-term decline. Larger farms have competitive advantages over smaller farms in most commodities, reflecting economies of size in farming. Nevertheless, about 800,000 of the 2.2 million U.S. farms in 2007 were small commercial farm operations. Their total production—$65 billion in 2007—was greater than the total agricultural production from all farms in the Corn Belt States.

Product mix. Small commercial farms have a product mix distinctly different from that of larger farms: small commercial farms focus on commodities that do not necessarily require a full-time commitment of labor—poultry, beef (generally cow/calf or stocker enterprises), hay, and grain/soybeans. High-value crops (vegetables, fruits and tree nuts, and nursery and greenhouse products) and dairy play a minor role in farm production on small commercial farms, but make up 44 percent of production on very large farms (GCFI of at least $1 million).

Farm finances. Average small-farm financial performance lags well behind that of large farms, suggesting that production will continue to shift to larger operations. Financial performance among small farms varies, however, and many are quite profitable. Other small farms, particularly very small ones, will remain in business in spite of financial losses because their operators have other sources of income and operate the farm for reasons other than profit.

Household income and wealth. Small-farm households depend heavily on off-farm income, and the nonfarm economy is important to them. Because of their off-farm income, median household income for small-farm households is comparable with the median income for all U.S. households. Farm households, regardless of the size of their farms, tend to have a high net worth, with their farms accounting for most of that value. Ninety-four percent of farm households in 2007 had a net worth equal to or greater than the median for all U.S. households.

Longrun changes. The number of very large farms grew rapidly between 1982 and 2007, according to the census of agriculture, while the number of small commercial farms declined. The share of sales by very large farms also grew substantially, from 27 to 59 percent. The 2007 census reported more noncommercial farms than prior censuses, and they now account for well over half of all farms. The increase in noncommercial farms, however, coincides with greater efforts by the USDA to count all small farms in the census.

The future? Because larger farms realize higher-than-average financial returns and because many operators of small commercial farms are over 65 years old—especially those with GCFI of less than $100,000—competitive forces will likely continue to reduce the number of small commercial farms and shift production to larger farms. The number of noncommercial farms is less likely to fall. In some respects, noncommercial farms exist indepen-

dently of the farm economy, so competition from larger farms is less likely to reduce their numbers.

How Was the Study Conducted?

Most of the data in this report are from the 2007 Agricultural Resource Management Survey (ARMS). The ARMS is a detailed, annual survey of farm businesses and associated households conducted jointly by the U.S. Department of Agriculture's Economic Research Service (ERS) and National Agricultural Statistics Service (NASS). The report also uses data from the 1982, 1987, 1992, 1997, and 2007 Censuses of Agriculture to follow the shift in sales to very large farms.

Introduction

Small farms are diverse, ranging from retirement and residential farms with little or no output to commercially oriented farms with sales approaching a quarter of a million dollars. According to the 2007 Census of Agriculture, nearly 2 million farms—91 percent of all U.S. farms—are small, based on the National Commission on Small Farms' definition of "small" as a farm with less than $250,000 in sales (USDA, National Commission on Small Farms, 1998, p. 28).

This farm diversity is due, in part, to the way farms are defined. A farm is defined by the USDA as a place that produces or could produce $1,000 of sales, including income from Government payments. A property with less than $1,000 in sales could still be classified as a farm if it had enough acreage of various crops or head of livestock to generate $1,000 of sales. These places are called "point farms," and their numbers have grown sharply.[1] In the 2007 census, point farms accounted for 31 percent of all farms, up from 11 percent in the 1982 census.

While the number of point farms increased, the number of small commercial farms continued to decline as production shifted to larger farms. This report documents the structural shifts in U.S. agriculture, focusing primarily on the role played by small farms with:

- An analysis of the distinctive mix of small-farm products to show how and why small farms differ from large farms.
- An assessment of small-farm finances, as well as the demographics and finances of the households that operate them.
- Documentation of the linkages between different size farms and the Government support they receive.

[1] Named for the process by which USDA statisticians assign points to places in accordance with their crop acreage and livestock holdings, where the points reflect the potential value of sales. For a place with no sales, 1,000 points qualify it as a farm. See "What Is the Definition of a Farm?" on the NASS Web site at: http://www.agcensus.usda.gov/Help/FAQs/2002_Census/index.asp#1.

Data Sources

Our analysis relied on two data sources: the 2007 Agricultural Resource Management Survey (ARMS) and the census of agriculture. ARMS is an annual sample survey conducted jointly by the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) and the Economic Research Service (ERS). The ARMS sample, which includes 20,000-24,000 farms in each year's data, covers all types of farms and is designed to accurately represent farms and production in the continental United States. The census includes all farms and is carried out every 5 years.[2]

ARMS collects detailed data about farm business finances and the farm operator's household, tying them to information about farm production and resources. The census forgoes the detailed financial and demographic data collected in ARMS, focusing instead on more detailed information about the physical production of crop and livestock commodities. The census is also useful in following long-term trends, since it dates back to 1840, while ARMS has been in use only since 1996.

[2] ARMS data are collected in coordination with the census in census years (such as 2007), and ARMS questions are integrated into the census questionnaires of farms selected for the ARMS sample.

Measuring Farm Size

For our purposes, farm size is measured according to sales, which is a better measure of economic activity than acreage operated. Farmland can be of varying quality, can be farmed at various levels of intensity, and can produce a variety of commodities. As a result, production levels per acre vary widely across farms. Sales measure production in dollars, rather than the level of one input (land).

Measuring Sales

There are several ways to measure farm sales, and the measures vary along three dimensions:

- **Whose revenue to include.** We can focus on the revenue of the farm business or the revenue accruing jointly to a combination of the farm business and to two stakeholders: share landlords and production contractors.[3] Share landlords rent land to farmers and receive a share of farm production as rent. Contractors hire farmers to grow livestock (and, less often, crops) for a fee; the contractor receives the commodity at the end of the production stage and handles its sale. All three entities—the farm business, share landlords, and contractors—receive a share of the revenue generated by the production and sale of the farm's commodities.
- **The sources of revenue to include.** We can focus only on revenue received from crop and livestock commodities or we can also include Government payments and "other farm income" from custom work, machine hire, livestock grazing, timber sales, outdoor recreation, and contract production fees.
- **Whether to stress annual sales or annual production.** We can focus on annual sales or on the value of annual production. The two differ to the extent that commodities produced in 1 year can be sold in another, and the difference can be measured by changes in commodity inventories.

Various sales measures, including the one we chose to use, are examined below.

Gross Cash Farm Income

For the purposes of this report, we focus on the economics of farm businesses and rely primarily on gross cash farm income (GCFI)—the total revenue received by the farm business in a year.[4] 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. In some analyses, we expand GCFI to gross farm income (GFI), which adds three noncash items to GCFI: the change in inventories,[5] the value of farm commodities consumed on the farm, and the imputed rental value of the farmhouse.

[3]Farms typically enter into two types of contracts. A *production contract* is a legal agreement between a farm operator and another person or firm (contractor) to produce a specific type, quantity, and quality of agricultural commodity for the contractor, who owns the commodity being produced and pays the farm a fee for producing the commodity. Under a *marketing contract*, the contractor buys a known quantity and quality of a commodity from a farm for a negotiated price. The farm owns the commodity while it is being produced and receives a price that reflects the value of the commodity.

[4]GCFI focuses on the farm business, excluding returns to share landlords and contractors. It includes all farm-related revenue, not just crop and livestock sales, and is based on annual sales, not the value of annual production.

[5]Inventory change in ARMS includes changes in accounts receivable and changes in the values of crop, livestock, feed, and fertilizer inventories.

Gross Farm Sales

GCFI differs from gross farm sales, which focuses on the revenues from all commodities produced on the farm. It includes the value of commodity production that accrues to share landlords and to production contractors, as well as Government payments received by the farm business and its landlords, but excludes other farm-related income generated by the farm business.

GCFI Versus Gross Farm Sales

For farms with no production contracts or landlords, gross farm sales and GCFI will generally be the same: the sum of crop sales, livestock sales, and Government payments received by the farm. GCFI may exceed gross sales if the farm business has no production contracts, but engages in other activities that generate other farm-related income.

GCFI may be much less than gross farm sales for farms with production contracts. Commodities removed under production contacts are excluded from GCFI, but are included in gross farm sales. GCFI does include the fees received by farmers from contractors for the services they provide—labor, housing, and management—but these fees are usually a small share of the value of commodities removed. In these cases, GCFI is a more accurate indicator of the amount of economic activity carried out by the farm business. For farms with production contracts, the amount of economic activity carried out by the contractor can be extensive, including the provision of feed, young animals, and veterinary services in the case of livestock.

Market Value of Agricultural Products Sold

Gross farm sales is closely related to a measure used in the census of agriculture: the market value of agricultural products sold. These census data are useful because they have been collected for many years and allow for long-term comparisons. The market value of agricultural products sold is similar to gross farm sales, except it excludes Government payments received by the farm operation—and landlords—and thus captures less of the economic activity of the farm than gross farm sales.

Value of Production

Finally, the value of production—a measure used in ARMS databases—is similar to the market value of sales, except it measures the value of commodities produced in a given year without the effects of inventory change. It is calculated by multiplying the quantity of each commodity—including the farm, landlord, and contractor shares—by the price of the commodity.[6] The value of production is most useful when examining the production distribution of individual commodities across different types of farms, including various types of small and large farms.

Does the Choice of a Measure Matter?

Most farms are small, based on a $250,000 cutoff, regardless of whether we use GCFI or gross farm sales—two measures that best capture the economic activity of the farm business. Ninety percent of farms are small based on

[6]For some commodities, quantity produced is not available from ARMS, so cash sales is used as a proxy for price multiplied by the quantity. These cases generally involve perishable commodities where sales from inventory is less of an issue. Note also that the value of production excludes the value of crops grown to feed livestock on the same farm to avoid double counting.

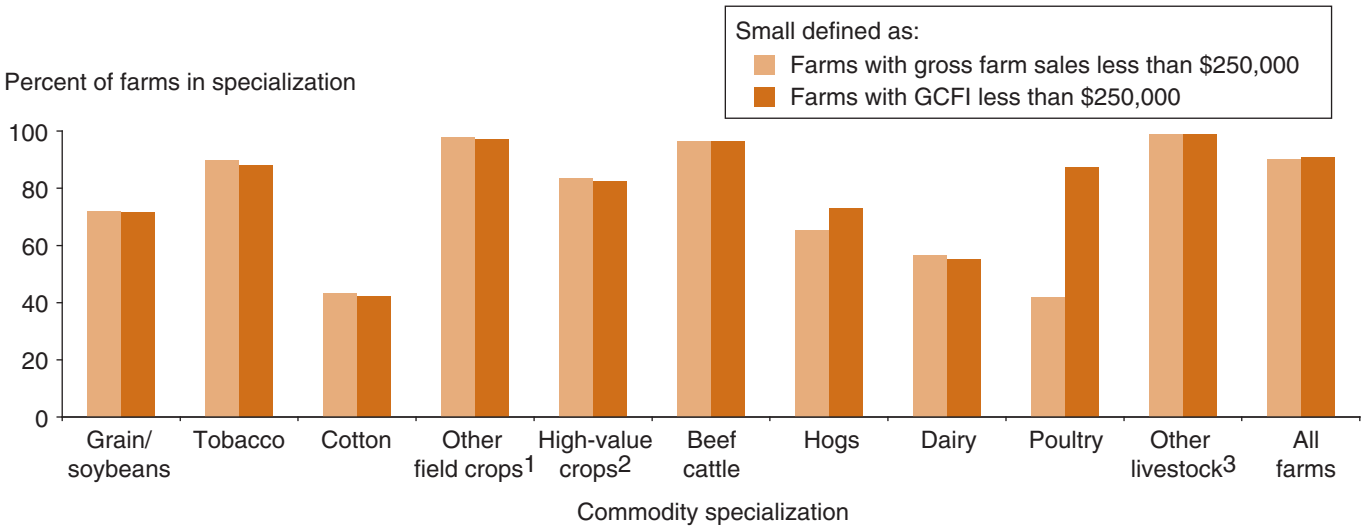
gross farm sales, while 91 percent are small based on GCFI (fig. 1). Using GCFI makes a difference, however, in the case of poultry farms: 87 percent are classified as small with GCFI, double the share classified as small using gross farm sales.

Most poultry farms are small businesses that feed a large number of birds owned by contractors. For example, contract broiler producers—who are provided with feed and chicks by integrators—receive contract fees that may amount to only 16 percent of the value of the poultry removed (MacDonald and Korb, 2006, p. 18). Those poultry farms in particular will frequently be defined as large farms using gross farm sales, but as small farms using GCFI.

Sorting Farms by Size Class

Farm sales vary widely from farm to farm, and many relevant features of farm performance vary with sales. We must therefore classify farms by size to accurately summarize performance. For this report, farms are divided into eight size classes based on GCFI (see box, "Classifying Farms by Gross Cash Farm Income") and four aggregates of those classes—noncommercial farms (sales less than $10,000), small commercial farms (GCFI of $10,000-$249,999), large farms (GCFI of $250,000-$999,999), and very large farms (GCFI of $1 million or more). We chose GCFI because it is the most complete measure of the revenues received by the farm business. GCFI includes farm business income from all sources—sales of commodities, Government payments, and other farm-related income—while excluding income received by landlords and production contractors.

Figure 1
Farms classified as small under two definitions, by commodity specialization, 2007
Using GCFI doubles the number of small poultry farms



GCFI=Gross cash farm income.

[1]Hay, peanuts, sugar beets, sugarcane, corn for silage, sorghum for silage, canola, etc.

[2]Vegetables, fruits and tree nuts, and nursery and greenhouse products.

[3]Sheep, lambs, wool, goats, goats' milk, mohair, horses, ponies, mules, donkeys, bees, honey, aquaculture, mink, rabbits, other fur-bearing animals, bison, deer, elk, llamas, etc.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Classifying Farms by Gross Cash Farm Income

Farms can be divided into more homogeneous groups based on gross cash farm income (GCFI). We classify farms (by group and then class) as:

- **Noncommercial farms**—GCFI of less than $10,000
  - Less than $1,000
  - $1,000-$9,999
- **Small commercial farms**—GCFI of $10,000-$249,999
  - $10,000-$49,999
  - $50,000-$99,999
  - $100,000-$249,999
- **Large farms**—GCFI of $250,000-$999,999
  - $250,000-$499,999
  - $500,000-$999,999
- **Very large farms**—GCFI of $1 million or more

Regardless of the level of GCFI, most farms are family farms (defined by ERS as farms where the majority of the business is owned by the operator and individuals related to the operator). Ninety-eight percent of all farms in the United States are classified as family farms, as are 84 percent of very large farms. Nonfamily farms consist largely of partnerships, cooperatives, farms with hired managers, and small corporations with unrelated owners.

Small Farms' Share of Farms, Production, and Farmland

Farm size distribution is highly skewed (fig 2). Most places defined as farms are quite small, while most production is carried out on large and very large farms. Specifically, 54 percent of all farms are noncommercial (GCFI of less than $10,000), but they account for just 1 percent of the total value of production. At the other end of the size spectrum, 40,800 very large farms (GCFI of over $1 million) account for only 2 percent of farms, but 47 percent of production. Large farms (GCFI of $250,000-$999,999) account for 7 percent of farms and 30 percent of the value of production.

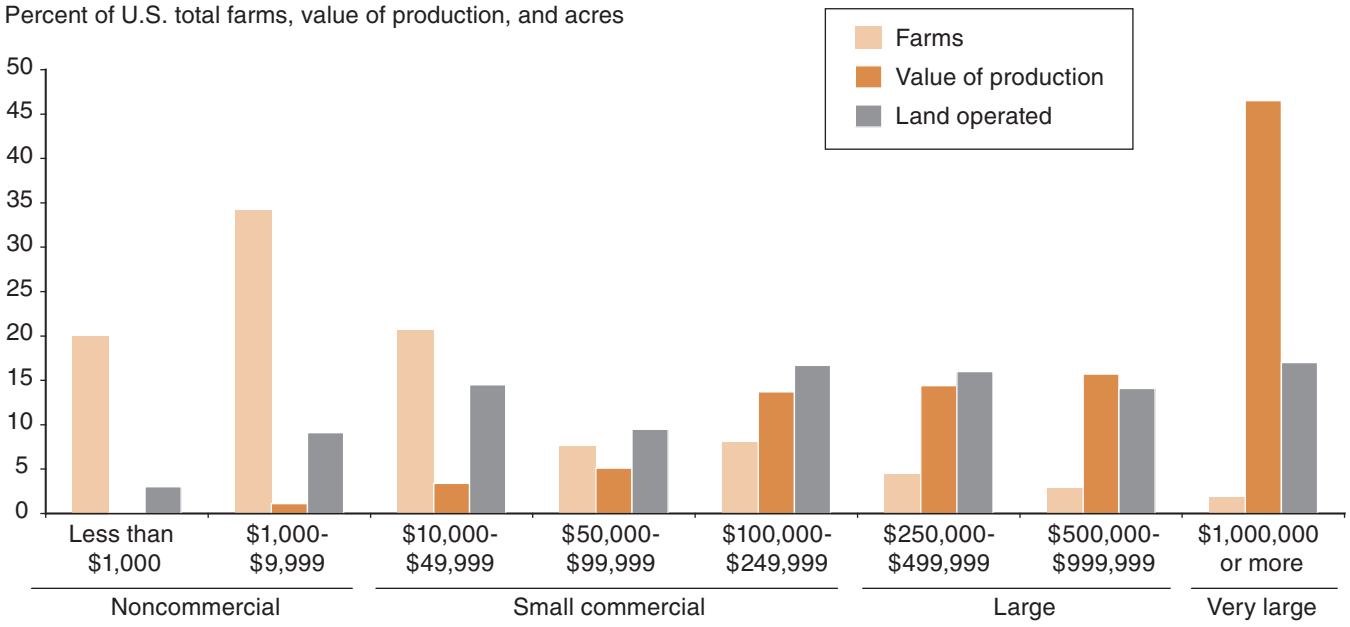
Small farms with substantive agricultural production must be evaluated separately from those with very little production. We define small commercial farms as those with a threshold level of sales—GCFI of at least $10,000. While substantially outnumbered by the 1.2 million noncommercial farms in the United States in 2007, there were still 800,000 small commercial farms (36 percent of all farms). They held 41 percent of farmland, accounted for 22 percent of production, and provided virtually all of the 23-percent share of total small-farm production.[7]

The number of small commercial farms has shrunk over time, as has their share of U.S. farm production (Hoppe and Banker, 2006, pp. 7-9). Their total production remains quite large, coming in at $65 billion for 2007, or 16 percent more than total agricultural production in the Corn Belt.[8] Small commercial farms produced nearly twice as much as California, which ranked first in agricultural production.

[7]If gross farm sales were used to measure farm size, then small commercial farms' share of production falls to 16 percent due largely to reclassification of poultry production. Small commercial farms account for 3 percent of poultry production if gross farm sales is used to measure size, compared with 55 percent if GCFI is used.

[8]Agricultural production in the Corn Belt States of Iowa, Illinois, Indiana, Missouri, and Ohio totaled $56 billion.

Figure 2
Distribution of farms, value of production, and land operated, by GCFI class, 2007
Most farms produce little, while very large farms account for nearly half of production



GCFI=Gross cash farm income.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Noncommercial farms and small commercial farms account for 53 percent of the land in farms. Because of the large amount of land they control (in aggregate), small farms play an important role in conservation efforts, accounting for 82 percent of the land enrolled in land-retirement programs—the Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), Farmable Wetlands Program (FWP), and Conservation Reserve Enhancement Program (CREP). Small farms' participation in land-retirement and other conservation programs is discussed in more detail in a later section.

Small and Large Farms Focus on Different Products

In every farm size class, three commodities account for at least two-thirds of class production (table 1), but the three commodities vary across classes. Beef, grain/soybeans, and hay account for at least 80 percent of production among noncommercial farms and for 77 percent of production among those small commercial farms with GCFI of $10,000-$49,999.

Among noncommercial farms and small commercial farms with GCFI of less than $50,000, cow/calf or stocker enterprises account for most beef production, and hay is grown to complement the beef operation. Beef enterprises often are less labor intensive than other enterprises, which may be attractive to part-time operators (Cash, 2002, p. 21). In contrast, dairy and high-value

Table 1
Largest commodities, by GCFI class, 2007

GCFI class	Commodity[1] and share of value of production			
	Percent (in parentheses)			
Noncommercial farms:				
Less than $1,000	Hay	Grain/soybeans	Beef	Other livestock
	(40.8)	(38.7)	(13.1)	(4.9)
$1,000-$9,999	Beef	Hay	Grain/soybeans	Other livestock
	(47.9)	(22.1)	(11.3)	(9.8)
Small commercial farms:				
$10,000-$49,999	Beef	Grain/soybeans	Hay	High-value crops
	(42.1)	(22.5)	(12.0)	(8.1)
$50,000-$99,999	Grain/soybeans	Poultry	Beef	High-value crops
	(26.1)	(24.3)	(21.7)	(8.3)
$100,000-$249,999	Poultry	Grain/soybeans	Beef	Dairy
	(32.3)	(28.7)	(15.3)	(6.8)
Large farms:				
$250,000-$499,999	Grain/soybeans	Poultry	Beef	Dairy
	(40.5)	(14.5)	(12.5)	(9.8)
$500,000-$999,999	Grain/soybeans	Beef	High-value crops	Dairy
	(43.3)	(13.3)	(11.1)	(9.2)
Very large farms:				
$1 million or more	High-value crops	Beef	Dairy	Grain/soybeans
	(25.5)	(24.1)	(18.5)	(13.9)

GCFI=Gross cash farm income.

Notes: Eleven commodity groups were used for this analysis: Grain/soybeans, hay, cotton, tobacco, high-value crops, other crops, beef, hogs, dairy, poultry, and other livestock. High-value crops include vegetables, fruits and tree nuts, and nursery and greenhouse products. Grain/soybeans include barley, corn, oats, rice, grain sorghum, soybeans, and wheat. Other livestock includes sheep, lambs, wool, goats, goats' milk, mohair, horses, ponies, mules, donkeys, bees, honey, aquaculture, mink, rabbits, other fur-bearing animals, bison, deer, elk, llamas, etc.

[1]In order of largest to smallest, by the share of value of production in the class.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

crops (vegetables, fruits and tree nuts, and nursery and greenhouse products) require more substantial commitments of capital and full-time labor. Those commodities account for 44 percent of production on very large farms, but for a much smaller share of small-farm production.

For the two remaining classes of small commercial farms (GCFI of $50,000-$99,999 and $100,000-$249,999), beef cattle remain important, as do grain/soybeans, but poultry plays an important role. Poultry, primarily broilers, is the most important commodity for the larger farm class, accounting for nearly a third of production, and it accounts for nearly a quarter of production for the smaller class. Each of those commodities—cattle, grain/soybeans, and broilers—can be produced commercially, using current technologies, by farmers who combine off-farm employment with limited hours spent on the farm.

Sixty-two percent of the smallest farms—those with GCFI of less than $1,000—specialize in "other livestock," which includes grazing animals other than cattle (horses, sheep, and goats). Only five horses or ponies are necessary to qualify a property as a farm (USDA, NASS, 2008, pp. 6-30). These farms produce little, however, and account for only 5 percent of farm production in that class. They do, however, spend 69 percent of the cash expenses incurred by the smallest farms.

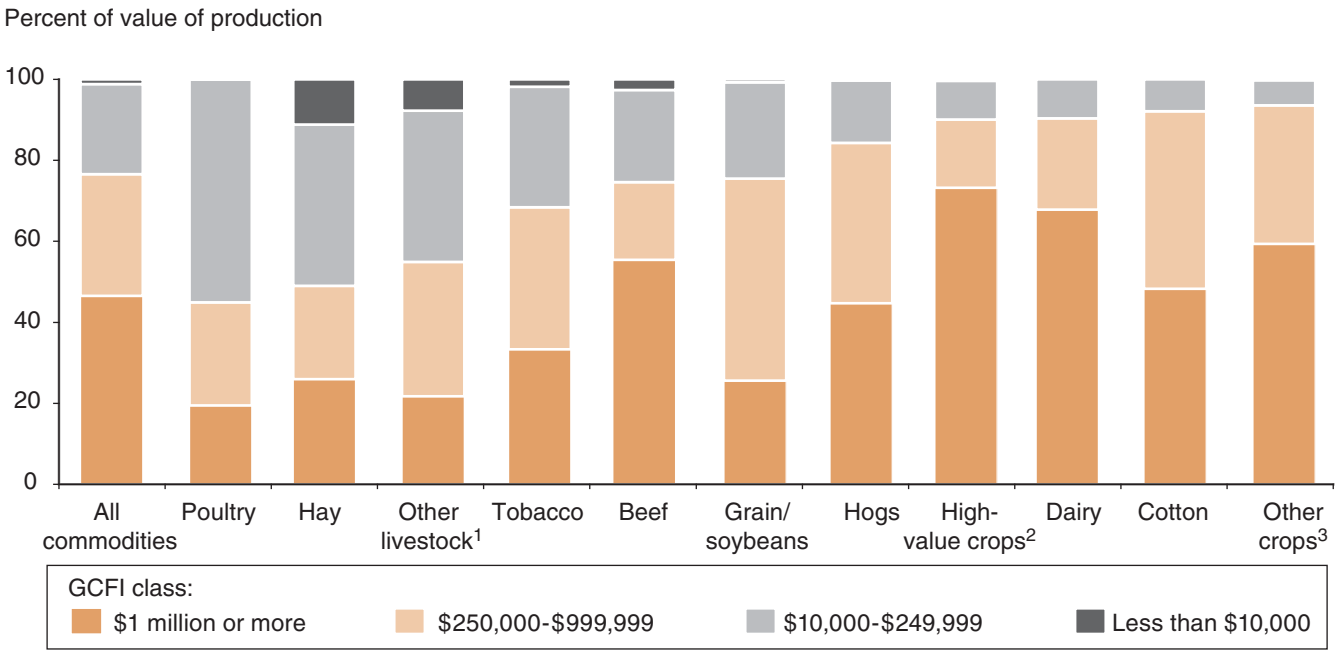
Small Farms Are a Major Source of Some Commodities

The variations in product mix shown in table 1 suggest that small farms should be primary providers of some commodities. Since small-farm production is concentrated in beef, grain/soybeans, poultry, and hay, it is likely that they would be major providers of those commodities and minor providers of fruits, vegetables, and dairy products.

Small farms account for 55 percent of poultry production, 51 percent of hay, 45 percent of other livestock (largely grazing animals other than cattle), and 32 percent of tobacco (fig. 3), which is a relatively small crop with a long history of production on small farms. In addition, small farms' share of beef and grain/soybeans is similar to their 23-percent share of all production.

By contrast, large and very large farms dominate the production of dairy, hogs, cotton, and high-value crops. In fact, very large farms produce about three-fourths of high-value crops. High-value crops can generate large sales per acre, but require substantially more labor than cattle, more commonly produced by small farms.

Figure 3
Value of production for selected commodities, by GCFI class, 2007
Small commercial farms produce substantial shares of some commodities



GCFI=Gross cash farm income.

[1]Sheep, lambs, wool, goats, goats' milk, mohair, horses, ponies, mules, donkeys, bees, honey, aquaculture, mink, rabbits, other fur-bearing animals, bison, deer, elk, llamas, etc.

[2]Vegetables, fruits and tree nuts, and nursery and greenhouse products.

[3]Peanuts, sugar beets, sugarcane, corn for silage, sorghum for silage, canola, etc.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Farms and Farm Operators

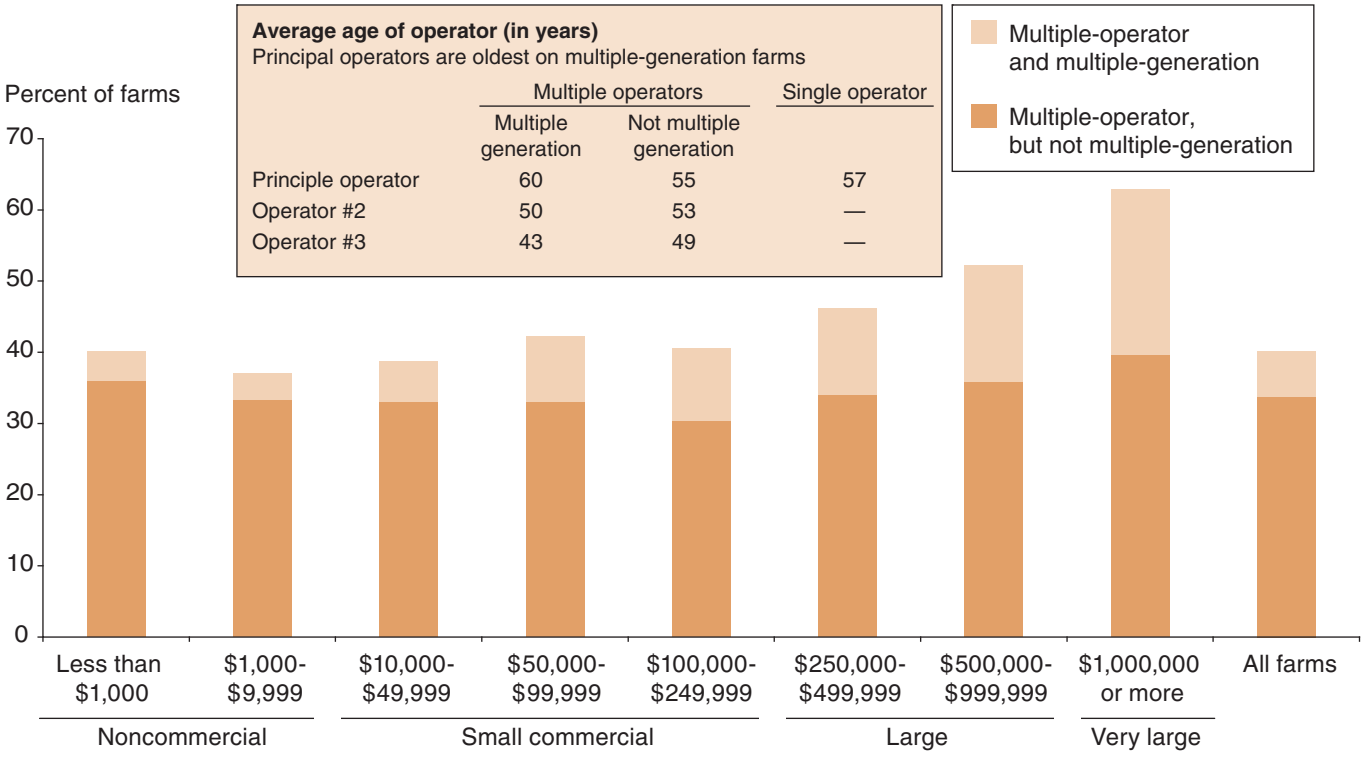
Every farm has at least one operator who makes day-to-day decisions about the farm business, and some farms, particularly larger ones, have more than one. Until 2002—when the "one farm, one operator" assumption was dropped—the census of agriculture and ARMS collected data for only a single operator. Since then, all operators are counted and the questionnaires ask for detailed information on up to three operators. Both the census and ARMS designate one principal operator—the one most responsible for running the farm—and designate the others as secondary operators. The count of principal operators also includes sole operators on single-operator farms.

Secondary Operators and Their Farms

About 880,500 farms (40 percent of the U.S. total) have more than one operator (fig. 4). This pattern extends to small farms. For example, nearly 39 percent of farms with GCFI of $10,000-$49,999 report multiple operators.

How do small farms that fail to provide income support for a single person still report multiple operators? The census and ARMS questionnaires both

Figure 4
Multiple-operator and multiple-generation farms, by GCFI class, 2007
Multiple-generation operations are most common among very large farms



GCFI=Gross cash farm income.

Notes: Multiple-operator farms have more than one operator. Multiple-generation farms are multiple-operator farms with a difference of at least 20 years between the ages of the youngest and oldest operators.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

ask for the number of operators, and many small farms choose to report more than one operator, which simply means that two or more people share in the day-to-day decisions for a small farming operation. Most are married couples and rely on off-farm employment for much of their household income, farming more for supplemental income, enjoyment, or other nonfinancial reasons.

The share of farms with multiple operators increases with farm size (once GCFI exceeds $100,000), reflecting a greater need for labor and management. Sixty-three percent of very large farms have multiple operators. Secondary operators are typically family members, as farms are generally family businesses. Spouses make up about three-fourths of secondary operators on noncommercial farms and two-thirds of secondary operators on small commercial farms. Larger farms tend to have fewer spouses listed as secondary operators, and only 20 percent of secondary operators on very large farms are spouses.

About 16 percent of multiple-operator farms are also multiple-generation farms, which we define as farms that report an age difference of at least 20 years between the youngest and oldest operators. Multiple-generation farms are more common among larger farms, and their share peaks at 23 percent of very large farms. Shifts in farm size are often closely tied to life-cycle changes in the farm family—farm businesses expand when a younger generation can provide more management capacity and shrink when an operator transitions toward retirement with no generational replacement.

Principal Farm Operators

One of the most striking characteristics of U.S. agriculture is the advanced age of principal farm operators compared with other self-employed workers. Twenty-eight percent of principal operators report their age as 65 years or older (table 2). In contrast, the Bureau of Labor Statistics estimates that, in 2007, only 8 percent of self-employed workers in nonagricultural industries were that old (U.S. Department of Labor, 2008, p. 224). Three small-farm classes (GCFI of $1,000-$99,999) report especially large shares, with 29 to 37 percent of their operators age 65 years or older. Only 5 percent of all principal farm operators are under age 35.

We should not be surprised that many farm operators are age 65 or older when we recall that farms are defined as places with at least $1,000 in actual or potential sales. The farm is the home for most farmers; farmers can phase out of farming and into retirement over a decade or more and even retain land or livestock capable of producing $1,000 in sales after retirement. Sixteen to 25 percent of operators on farms with GCFI of less than $100,000 report that they are retired, at least twice the percentage reported by operators of larger farms.

Gender and Minority Status

Principal farm operators are largely White and male. Minorities account for 5 percent of all principal farm operators, but account for a larger share of noncommercial farms (6 percent) than larger farms (2-4 percent). Minority operators are heavily concentrated on farms with GCFI of less than $10,000.

Table 2

Demographic characteristics of principal operators, by GCFI class, 2007

Item	Less than $1,000	$1,000-$9,999	$10,000-$49,999	$50,000-$99,999	$100,000-$249,999	$250,000 or more	All farms
				Number			
Total principal operators	439,499	751,473	455,510	167,572	178,177	204,560	2,196,791
				Years			
Average age of principal operator	56	57	59	58	54	53	57
				Percent of operators in class			
Age of principal operator:							
Younger than 35 years	4.9	5.0	4.4	5.2	6.2	6.0	5.1
35 to 44 years	12.6	12.4	9.4	11.4	15.7	15.5	12.3
45 to 54 years	26.6	22.3	21.4	22.2	28.0	32.5	24.4
55 to 64 years	33.0	31.7	28.1	29.4	29.3	29.9	30.7
65 years or older	22.9	28.6	36.7	31.7	20.7	16.2	27.6
Principal operator is retired	25.1	22.8	19.3	15.7	6.2	4.4	18.9
Race or ethnic origin of principal operator:							
White, non-Hispanic	94.1	93.9	96.5	97.1	98.1	97.8	95.4
Minority[1]	5.9	6.1	3.5	2.9	1.9	2.2	4.6
Gender:							
Male	83.7	86.8	89.4	93.3	93.7	98.0	88.8
Female	16.3	13.2	10.6	6.7	6.3	2.0	11.2

GCFI=Gross cash farm income.

[1]Includes American Indians or Alaska Natives, Asians, Blacks or African Americans, Hispanics or Latinos, and Native Hawaiians and other Pacific Islanders. Also includes operators who reported more than one racial or ethnic group. Small sample size for individual minority groups prevents separate estimates for each group.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Seventy-two percent of minority operators are on noncommercial farms, compared with 53 percent of White operators.

Women operators are more common than minority operators, but still make up only 11 percent of all operators. Their share of farms is highest for farms with GCFI of less than $50,000, ranging from 11 to 16 percent, depending on the GCFI class. By the time GCFI passes $250,000, virtually all operators (98 percent) are male. Similar to minorities, 70 percent of women operators are on noncommercial farms, compared with 52 percent of male operators.

Nevertheless, growth in the number of women operators between the 2002 and 2007 Censuses of Agriculture was widespread across all farm sizes. Female farm operators increased 30 percent for noncommercial farms, 25 percent for small commercial farms, 18 percent for large farms, and 95 percent for very large farms. By 2007, nearly 2,000 very large farms were operated by women.[9]

[9]The size classes are defined here in terms of the market value of agricultural products sold, a measure used in the census of agriculture.

Occupation

Farm operators often combine farming with off-farm work. The ARMS asks farm operators to list their major occupation—where they spend the majority of their work time—from a list of three choices: farm work, off-farm work, and not in the paid workforce. Most operators of noncommercial farms report a nonfarm job as their major occupation, and a substantial fraction of operators reports that they are not in the paid workforce (table 3). Once GCFI exceeds $10,000, however, the share of small-farm operators reporting off-farm work as their major occupation falls off and the share reporting farming as their occupation increases. By the time GCFI reaches $100,000, most (81 percent) operators report farming as their major occupation.

Education

Historically, farm operators have reported lower levels of educational achievement—measured by high school completion rate—than the U.S. population in general. This high school educational gap had largely closed by the late 1980s (Bellamy, 1992, p. 37). More current data show similar shares of high school graduates for farm operators and all U.S. heads of household, 90 and 87 percent, respectively (fig. 5). High school graduation, however, is the highest educational attainment for a larger share of farm operators than for all U.S. householders.

Table 3
Occupation and education of principal operators, by GCFI class, 2007

Item	Less than $1,000	$1,000-$9,999	$10,000-$49,999	$50,000-$99,999	$100,000-$249,999	$250,000 or more	All farms
				Number			
Total principal operators	439,499	751,473	455,510	167,572	178,177	204,560	2,196,791
				Percent of operators in class			
Major occupation of principal operator:[1]							
Farm or ranch work	20.3	24.7	42.6	67.9	80.7	91.6	41.6
Work other than farming	59.9	58.5	46.0	26.9	17.0	7.2	45.7
Not in the paid workforce	19.8	16.8	11.4	5.2	2.4	1.2	12.7
Education of principal operator:[2]							
Some high school or less	13.4	9.2	8.0	11.5	10.2	5.4	9.7
Completed high school	39.6	42.6	42.3	43.8	41.1	39.7	41.6
Some college	26.9	24.9	22.9	21.8	24.0	28.8	24.9
Completed college	20.1	23.4	26.8	22.9	24.7	26.0	23.8

GCFI=Gross cash farm income.

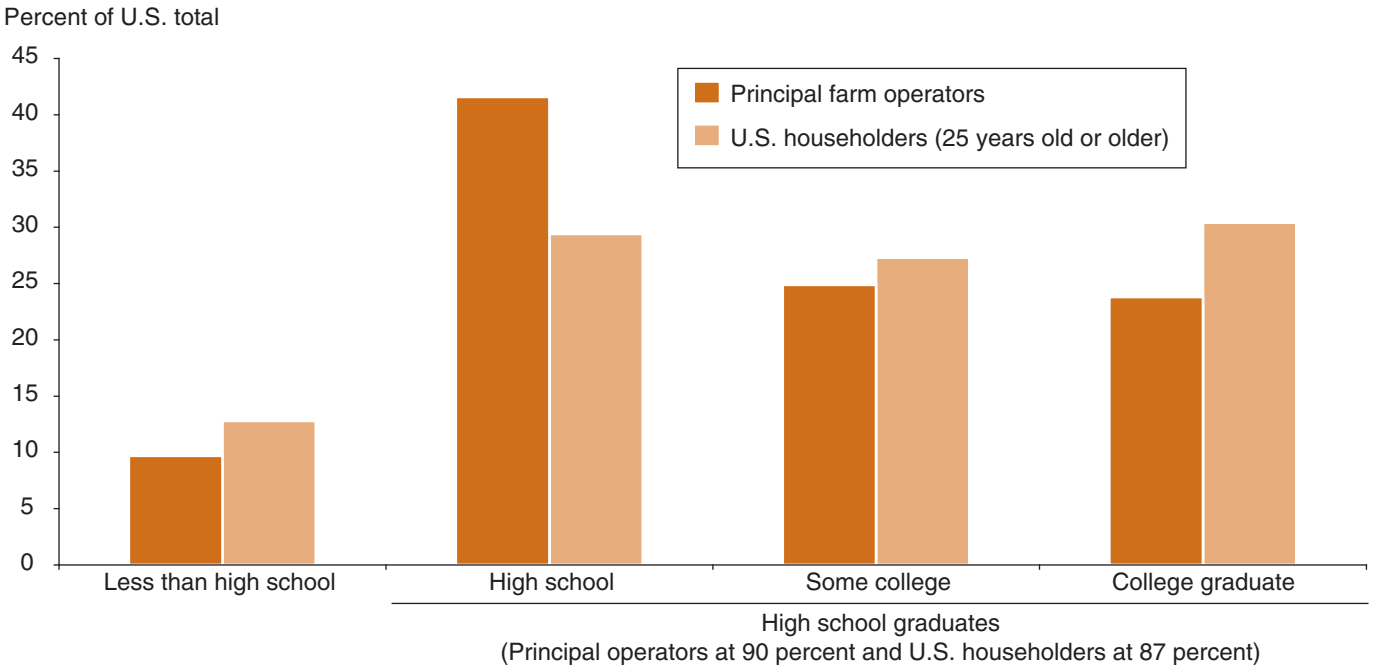
[1]Occupation at which the operator spent the majority of his or her work time.

[2]Vocational school is not counted, unless the credits can be transferred to a college or university. An associate degree is classified as "some college."

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Similar shares of principal operators completed college—between 20 and 27 percent—regardless of farm size (see table 3). A higher education can be advantageous to farmers when running their farm or competing for off-farm work. Nevertheless, the share graduating from college for each income class is less than the 30-percent share for all U.S. householders.

Figure 5
Educational attainment of principal farm operators and all U.S. householders, 2007
High school is the highest educational attainment for a larger share of farm operators



Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III for farm operators, conducted by the National Agricultural Statistics Service and the Economic Research Service. U.S. Census Bureau, Current Population Survey for all U.S. householders.

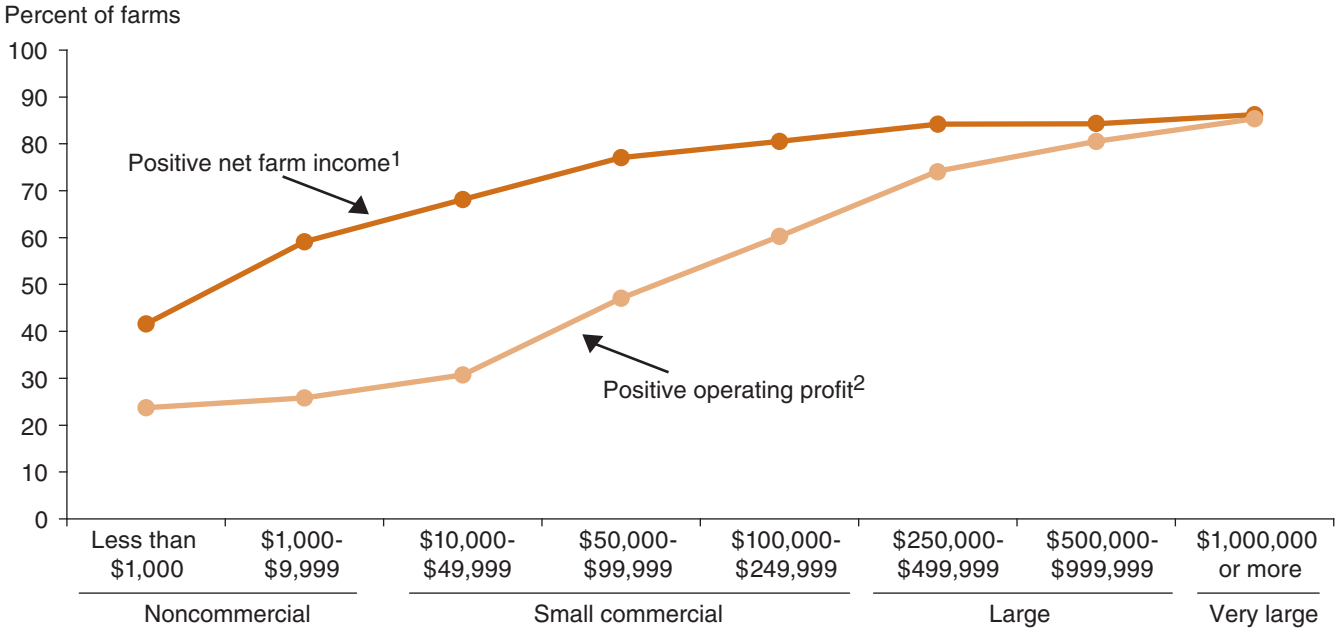
Financial Performance Improves With Farm Size

Profitability is directly related to farm size and is frequently measured by net farm income (fig. 6). Net farm income is the difference between gross farm income (GFI)—defined earlier—and expenses. Expenses include cash operating expenses plus depreciation and inkind benefits provided to employees.

Among the very smallest farms (GCFI of less than $1,000), fewer than half generate positive net farm income, and households operating these farms rely heavily on off-farm income. Nearly 60 percent of farms with GCFI between $1,000 and $9,999 have a positive net farm income, a percentage that increases gradually with farm size to 84 and 86 percent, respectively, for large and very large farms.

The expenses included in net farm income do not include an important implicit cost—the unpaid labor and management provided to the farm business by principal operators, secondary operators, spouses, and other household members (see box, "Unpaid Labor and Management"). Farms with positive net farm income still might not provide returns that adequately compensate operators for the time they devoted to the farm. Other financial measures do account for those expenses.

Figure 6
Net farm income and operating profit, by GCFI class, 2007
Charges for unpaid operators' labor and management pull operating profits down, especially on small farms



GCFI=Gross cash farm income.

[1]Net farm income = Gross cash receipts + home consumption + imputed value of farm dwelling + net inventory change – cash expenses – noncash benefits for paid labor – depreciation.

[2]Operating profit = Net farm income + interest paid – charge for operator and unpaid labor – charge for management.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Unpaid Labor and Management

In farm business income statements generated from the Agricultural Resource Management Survey (ARMS), unincorporated farms do not deduct an explicit expense for unpaid labor and/or management provided by the principal operator, the operator's spouse, other operators, and other household members. This exclusion follows the recommendation of the Farm Financial Standards Council (2008, pp. II-20 to II-22). Net farm income is the return to operator and unpaid labor, management, and equity. Household members, including the operators, typically are not paid a wage, but withdraw funds as needed. Withdrawals should be recorded in the statement of owner equity.

When calculating some financial measures—including operating profits—a charge for unpaid labor and management is deducted from net farm income to reflect the opportunity costs of those resources. This charge has three parts:

- A charge for operator labor in ARMS that is calculated as total hours worked by the operator multiplied by the wage rate for farm labor.
- A charge for unpaid labor provided by persons other than the operator that is calculated as their unpaid hours multiplied by the wage rate for farm labor.
- A charge for management that is calculated as 5 percent of the net value of production.

The charge for unpaid labor and management applies only to unincorporated farms because corporations can pay explicit salaries to farm operators, and the salaries are reflected in cash operating expenses.

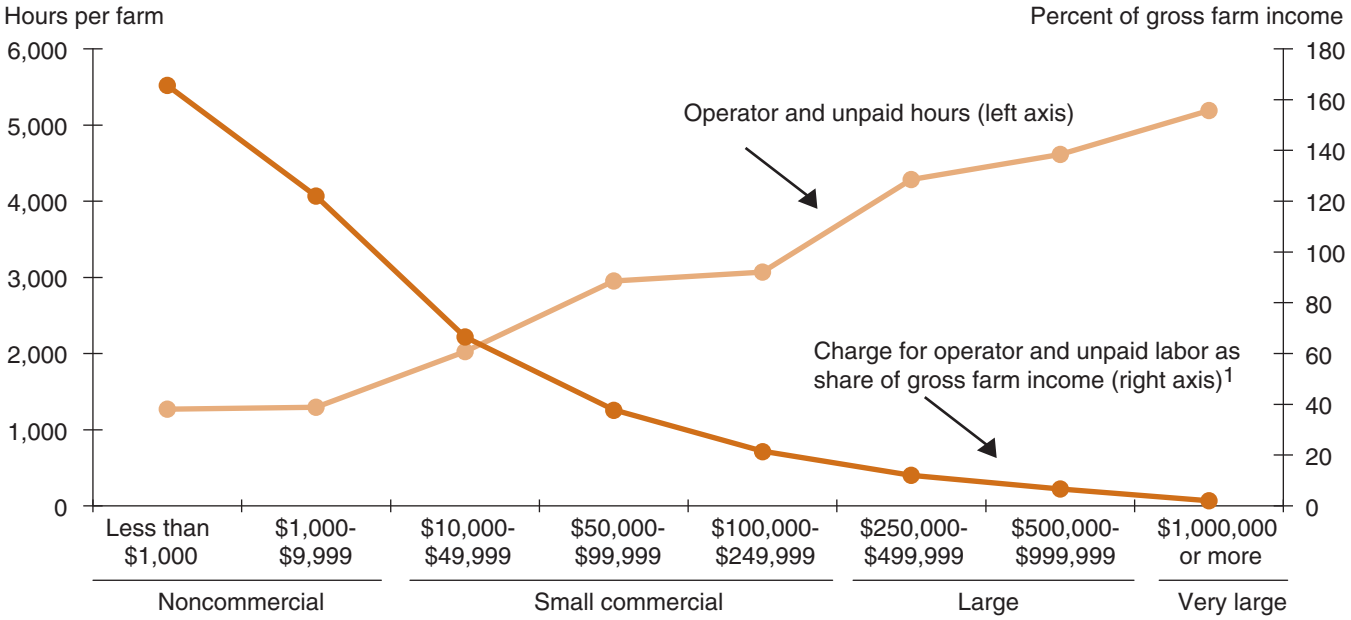
Operating Profits Are Low for Small Farms…

Operating profit is designed to account for the implicit costs of unpaid labor and management. It is defined as net farm income, plus interest payments, minus an estimated charge for unpaid labor and management. Operating profit measures the funds available to finance the farm business's capital, after accounting for the labor and management contributed by operators and their families.

Many small farms, especially those with GCFI between $1,000 and $49,999, appear profitable using the net farm income measure because no value is placed on unpaid labor. The share of farms returning positive operating profits, however, increases sharply with farm size once GCFI exceeds $10,000, and a majority of small commercial farms with GCFI of at least $100,000 have a positive operating profit.

Management costs are small, averaging no more than 5 percent of GFI, regardless of farm size, so that charge has little impact on the share of profitable farms. The impact of the labor charge, however, is much larger and strongly associated with farm size (fig. 7). The labor charge ranges from

Figure 7
Operator and unpaid labor, by GCFI class, 2007
Unpaid hours per farm increase with farm size, but the charge percentage declines



GCFI=Gross cash farm income.

Note: This figure includes only unincorporated farms, since the adjustments for operator and unpaid labor apply only to those farms.

[1]Charge for operator and unpaid labor = (hours worked by the principal operator + unpaid hours worked by others) x the wage rate for farm labor.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

more than 100 percent of GFI for noncommercial farms down to 2 percent for very large farms.

At the lower end of the farm size spectrum, the labor charge as a percentage of GFI is high because GFI is very low and the number of hours is high—nearly 1,300—relative to the output produced. On average, operators of small commercial farms report providing 2,000-3,000 hours of annual unpaid labor to the farm.[10] Farms that combine small-farm revenues with 2,000-3,000 hours of annual labor are unlikely to generate operating profits. Hours of labor increase with farm size, but GFI increases even more, reducing the charge for unpaid labor as a percentage of GFI.

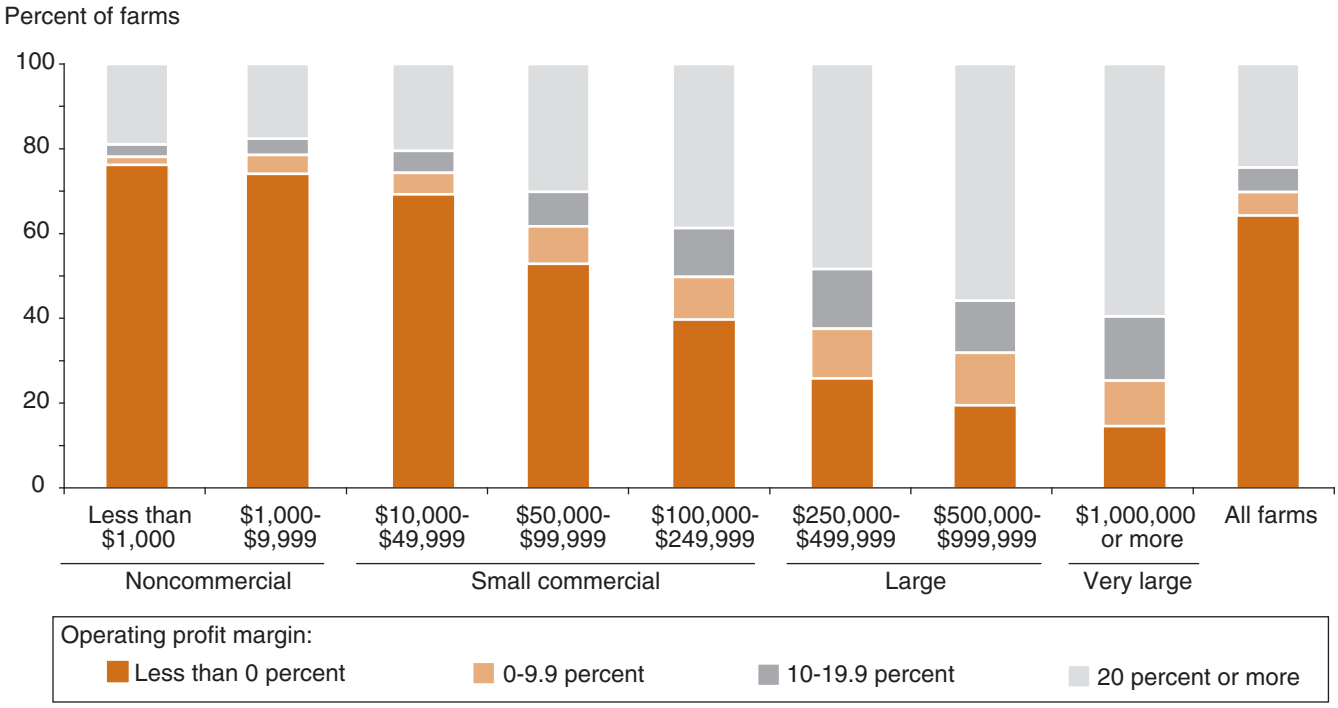
The valuation of unpaid labor used in the ARMS data is conservative since it is based on the wage rate for farm labor rather than what farm people might earn working off the farm. The average U.S. wage rate for farm labor in 2007 was $10.21 an hour (USDA, NASS, 2007, p. 15). In the same year, principal farm operators who earned wages and salaries at off-farm jobs earned a median wage of $21.63 an hour, according to ARMS data.

…But Many Small Farms Are Profitable

Financial performance varies among small farms, and many small farms are profitable (fig. 8). Eighteen to 19 percent of noncommercial farms and 21-39 percent of small commercial farms had operating profit margins of at least 20

[10]Figure 7 includes all unpaid hours, whether provided by operators, spouses, children, or others, but most of the hours are provided by principal operators.

Figure 8
Distribution of farms, by GCFI and operating profit margin, 2007
The share of farms with profit margins of at least 20 percent increases with farm size



GCFI=Gross cash farm income.

Note: Operating profit margin = 100 percent x (net farm income + interest paid – charge for operator and unpaid labor – charge for management) ÷ gross farm income.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

percent—where margins are calculated as operating profits divided by GFI. In contrast, 48-56 percent of large farms and 60 percent of very large farms had margins of at least 20 percent.[11]

Unprofitable small farms do not necessarily go out of business. Small-farm households may accept losses—or place a low value on their labor—to meet goals that go beyond operating a profitable farm. Some of these goals may include receiving long-term capital gains, sheltering off-farm income from taxation, living a rural lifestyle, and having the opportunity to pass the farm on to heirs. These unprofitable farms are likely to continue, as long as the operator's household has enough off-farm income to meet living expenses and farm losses are not unduly large.

Nevertheless, the disparity in average financial performance across farms in different size classes has important implications for farm structure. The number of small commercial farms is shrinking, as is their share of agricultural production, while the number of larger farms is growing. Given that the average financial performance of larger farms continues to exceed that of small operations, production should continue to shift to larger farms. Because some small farms remain profitable or are willing to accept losses, the shift of production to larger farms will continue to be gradual, and substantial numbers of small commercial farms will remain in business.

[11]Because of the large number of small farms, most profitable farms are small, even though most small farms are not profitable. About 215,200 noncommercial farms and 212,500 small commercial farms had profit margins of 20 percent or more, compared with 83,900 large farms and 24,300 very large farms.

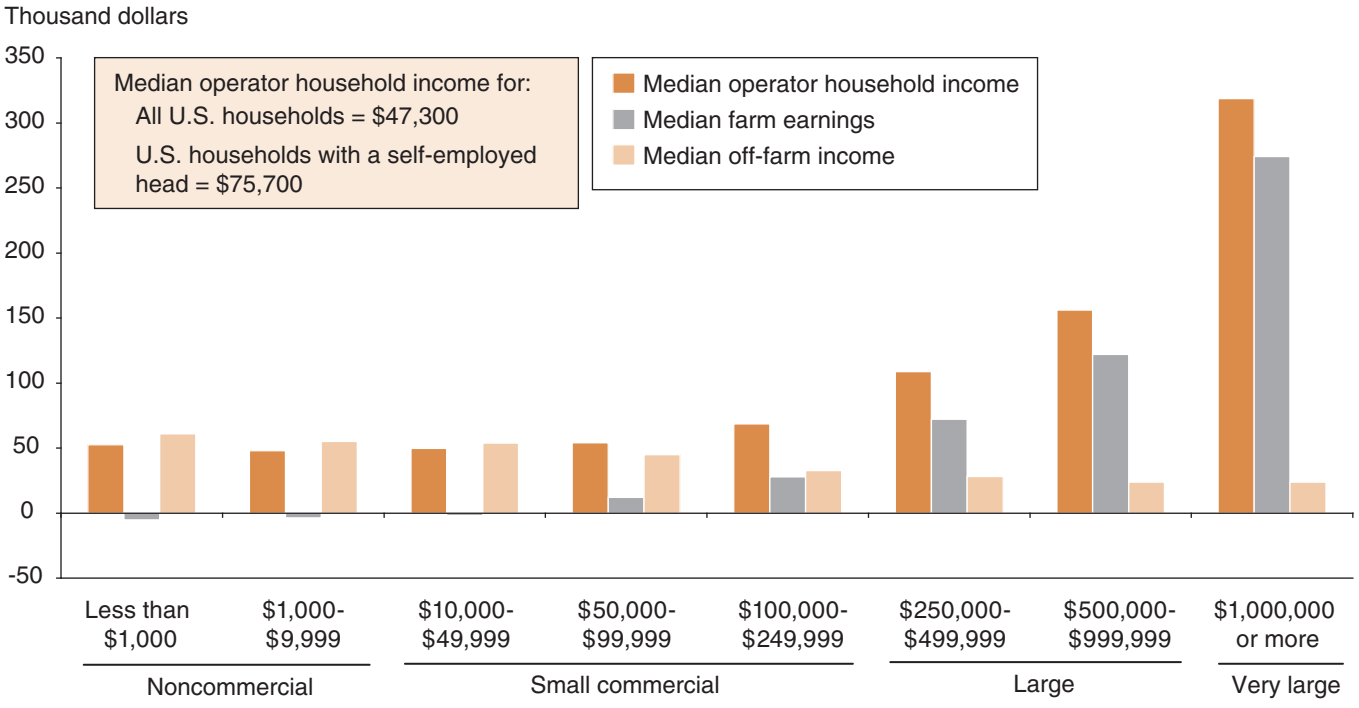
Off-Farm Income Supports Small-Farm Households

While operators of larger farms tend to earn higher household incomes, operators of small farms do not, in general, earn low incomes. On average, small-farm household income corresponds closely to income for other U.S. households. Small-farm operators rely heavily on income from off-farm sources. In calculating household income, we combine income from off-farm sources, such as wages and salaries, earnings from operating another business, or pension payments, with the net income accruing to the household from the farm business (i.e., net of expenses and farm business income flowing to partners and other stakeholders). ARMS collects these data for principal operator households on family farms.

On farms with GCFI of less than $100,000, operator households have a median income near the $47,300 median for all U.S. households (fig. 9). Overall, about 56 percent of farm households earn at least the median income for all U.S. households. Households operating farms at the upper end of the small commercial scale (GCFI of $100,000-$250,000) had a higher median income in 2007 ($68,600), which is closer to the median for U.S. households with a self-employed head ($75,700) than to that for all U.S. households.[12]

[12]Farm household income estimates from ARMS are generally compared with the income of all U.S. households from the Current Population Survey (CPS). This report, however, uses the Survey of Consumer Finances (SCF) to make comparisons because the SCF oversamples wealthy households that hold a large share of unincorporated businesses (Bucks et al., 2009, p. A54). This allows more meaningful comparisons between farm households from ARMS with all U.S. households with a self-employed head. In addition, the SCF collects data on wealth, unlike the CPS. Farm household wealth will be compared with the wealth of all U.S. households in another section.

Figure 9
Median operator household income, by source and GCFI class, 2007
Median income from farming becomes positive when GCFI reaches $50,000



GCFI=Gross cash farm income.

Notes: Median household income falls at the midpoint of the distribution of income for households in a group. Half of the households have income above the median, while the other half have income below that level. Household income is estimated only for family farms.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III for farm households, conducted by the National Agricultural Statistics Service and the Economic Research Service. Federal Reserve Board, 2007 Survey of Consumer Finances for all U.S. households and U.S. households with a self-employed head (Bucks et al., 2009).

Farm and Off-Farm Sources of Income

Farming, on average, does not make a positive contribution to household income until GCFI reaches $50,000. Even for small commercial farms in the $100,000-$249,999 class, off-farm income contributes about as much to total household income as farm earnings. On most noncommercial and small commercial farms (74 percent and 59 percent, respectively), the operator and/or spouse work off the farm. For older operators, income from Social Security, pensions, and investments may also be an important source of income.

The more small-farm households rely on off-farm income, the more they are affected by the nonfarm economy. As a result, macroeconomic and monetary policies affecting the nonfarm economy are important to small-farm households. The U.S. tax code provision that allows farmers to write off farm losses against other income is important to farmers with off-farm income (Durst, 2009, pp. 4-6). In addition, the status of retirement programs is important to retired operators and to older operators approaching retirement.

Wealth of Farm Households

Wealth—or net worth—also contributes to farm households' well-being. Compared with all U.S. households, farm households have a high net worth, regardless of farm size. Much of their wealth comes from the ownership of land, and even a small farm operator can own land worth several hundred thousand dollars. ARMS calculates net worth as the difference between the value of the assets owned by the principal operator's household and the liabilities that it owes.

Household wealth is also strongly associated with farm size (fig. 10). Median net worth for households owning very large farms ($2.5 million) is six or seven times larger than that for operators of noncommercial farms. Nevertheless, median household net worth in every farm income class is higher than that for U.S. households in general. In fact, 94 percent of farm households' net worth is equal to or greater than that for all U.S. households.

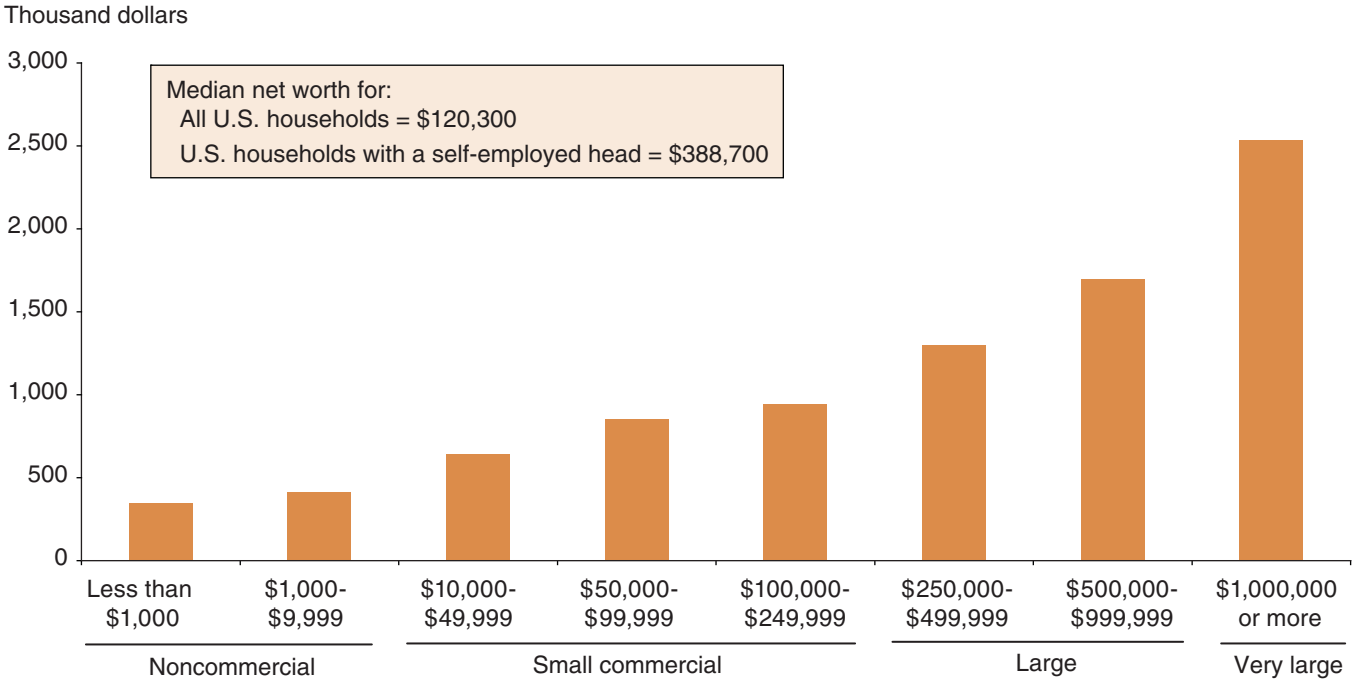
Farm households also have a high net worth compared with U.S. households with a self-employed head (median net worth of $388,700 in 2007). Median net worth among farm households with GCFI less than $1,000 was about 11 percent lower, but net worth in all other farm size classes exceeded it. Overall, 64 percent of farm households' net worth was at least equal to the median for self-employed households.

The farm accounts for most of the wealth of farm households, regardless of farm size. Overall, about three quarters of operator household net worth is based on the farm. Most of this net worth is illiquid and not available for household spending, since it is largely based on assets necessary for farming. Real estate, including the operator's dwelling, accounts for 79 percent of family farms' assets.

Figure 10

Median operator household net worth, by GCFI class, 2007

Regardless of farm size, median farm household net worth exceeds that of all U.S. households



GCFI = Gross cash farm income.

Notes: Median household net worth falls at the midpoint of the distribution of net worth for households in a group. Half of the households have net worth above the median, while the other half have net worth below that level. Household net worth is estimated only for family farms.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, for farm households, conducted by the National Agricultural Statistics Service and the Economic Research Service. Federal Reserve Board, 2007 Survey of Consumer Finances for all U.S. households and U.S. households with a self-employed head (Bucks et al., 2009).

Small Farms and Farm Policy

The Federal Government provides support to farmers in many ways, typically through programs administered by the USDA. USDA agencies perform and support research and extension efforts, develop new products, purchase commodities, and provide services to farmers. For example:

- The Agricultural Marketing Service operates information programs designed to make commodity markets operate more effectively.
- The Farm Service Agency provides farm real estate and operating loans through certain designated programs.
- The Risk Management Agency provides support for premiums in crop insurance programs.
- Several USDA agencies combine to purchase some agricultural commodities for food distribution programs or may increase purchases of surplus commodities.

These programs affect farm income indirectly by providing services to farmers or by affecting the prices at which they sell products. The USDA also provides direct financial support payments to farmers through two broad groups of "farm programs:" commodity-related programs and conservation programs (see box, "Farm Program Payments"). In general, support from commodity-related programs follows the production of certain commodities. While small farms receive such payments, most go to large farms because they generate more production of the relevant commodities. Small farms receive a larger share of conservation program payments.

Commodity-related payments depend on past or present production of specific commodities. Most such payments relate to field crops—largely feed and food grains, cotton, and oilseeds—and are tied to yield histories and the amount of cropland enrolled in programs. Fruit and vegetable commodities and most livestock commodities have generally not provided a basis for payments under commodity programs.[13]

Conservation payments are made through two types of programs: land-retirement and working-land programs. Land-retirement programs take environmentally sensitive farmland out of production for long periods—at least 10 years—while working-land programs provide financial and technical aid to farmers who use conservation practices on land still in production.

Almost 40 percent of U.S. farms received some type of farm program payment in 2007 (table 4). Most noncommercial farms do not receive payments, but the likelihood of receiving payments rises sharply with farm size. The distribution of commodity payments differs from that of conservation payments, so they are discussed separately.

Commodity-Related Payments

Because commodity payments are tied to land and to the production of specific commodities, they go primarily to large commercial producers of those commodities. As a result, few of the smallest farms receive commodity

[13]There is also a dairy program in which payments are tied to production (up to a limit) and market prices for dairy products. For more on farm program design, see the ERS Farm and Commodity Policy Briefing Room at www.ers.usda.gov/Briefing/FarmPolicy/.

Farm Program Payments

The 2007 Agricultural Resource Management Survey (ARMS) collected information about the following farm program payments:

Commodity-related payments: Direct payments, countercyclical payments, loan deficiency payments, marketing loan gains, net value of commodity certificates, milk income loss contact payments, agricultural disaster payments, and other miscellaneous State, Federal, and local payments. Participation in these programs generally requires present or past production of specific commodities. **Goals:** Establish price and farm income support, stabilize production, and provide a financial safety net for farmers.

Conservation payments:

- **Payments from land-retirement programs:** Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), Farmable Wetlands Reserve Program (FWP), and Conservation Reserve Enhancement Program (CREP). **Goal:** Remove environmentally sensitive farmland from production for long periods of time—at least 10 years or permanently, in some cases.
- **Payments from working-land programs:** Environmental Quality Incentives Program (EQIP) and Conservation Security Program (CSP). **Goal:** Provide technical and financial assistance to farmers who install or maintain conservation practices on land in production to protect and preserve natural resources.

payments, because they often specialize in beef and other livestock—commodities that do not receive support—and because they produce only limited quantities of commodities that do receive support. The same pattern holds for small commercial farms with GCFI of less than $50,000. They produce some grain/soybeans, but beef, hay, and high-value crops account for most production in that class (see table 1). As a result, only a third of farms in that class receive commodity-related payments, and most payments received by those farms are conservation payments (table 4).

Grain/soybeans are more important products for small commercial farms with GCFI between $50,000 and $249,999 (see table 1). Most receive commodity-related payments, and the total payments received exceed conservation payments for those farms (table 4). ARMS allows us to estimate the value of production for commodities covered by these programs and to estimate the share of such production held by farms in each size class. Small commercial farms accounted for 23 percent of program commodity production in 2007, and they received 29 percent of all commodity payments.[14]

The share participating in commodity-related programs is even higher, however, for farms with GCFI of at least $250,000. These farms also

[14]Note that small commercial farms receive a share of payments that exceeds their share of program commodity production. Some commodity program payments are tied to land historically enrolled in programs and not to current production.

Table 4

Government payments, by GCFI class, 2007

Item	Less than $10,000[1]	$10,000-$49,999	$50,000-$99,999	$100,000-$249,999	$250,000 or more	All farms
			Number			
Total farms	1,190,972	455,510	167,572	178,177	204,560	2,196,791
			Percent of farms in class			
Farm received payments[2]	21.3	46.5	60.5	67.6	78.1	38.5
Conservation	12.2	20.4	22.0	19.6	28.2	16.7
Commodity-related	11.2	33.8	52.9	64.5	76.1	29.4
			Percent of U.S. total			
Share of payments:						
Total payments	5.5	11.3	9.8	14.4	59.0	100.0
Conservation	16.6	30.5	14.1	11.4	27.4	100.0
Land-retirement	20.7	34.7	15.7	11.8	17.0	100.0
Working-land	1.3	15.1	8.3	9.6	65.7	100.0
Commodity-related	1.7	4.8	8.3	15.4	69.9	100.0
Share of:						
Retired acres enrolled by farms	20.5	32.6	16.6	12.4	17.9	100.0
Program crop production[3]	0.7	2.9	5.1	14.8	76.6	100.0
			Percent of payments in class			
Composition of payments:						
Conservation	77.0	68.7	36.9	20.2	11.9	25.5
Land-retirement	75.7	61.5	32.3	16.6	5.8	20.1
Working-land	1.3	7.3	4.6	3.6	6.1	5.5
Commodity-related	23.0	31.3	63.1	79.8	88.1	74.5
			Percent of land operated			
Land enrolled in land-retirement programs on participating farms	47.8	49.9	30.2	14.6	6.1	18.4

GCFI=Gross cash farm income.

Note: For definitions of conservation and commodity-related payments, see box, "Farm Program Payments."

[1]Farms with GCFI less than $1,000 and farms with GCFI between $1,000 and $9,999 were combined due to sample size considerations.

[2]Because some farms receive both conservation and commodity-related payments, farms receiving conservation payments plus farms receiving commodity-related payments are greater than farms receiving any payments.

[3]Crops include barley, canola, corn, cotton, oats, peanuts, rice, sorghum, soybeans, and wheat.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

receive 70 percent of commodity-related payments, roughly proportional to their 77-percent share of program crop production. Grain/soybeans and dairy account for over half of all production on farms with GCFI between $250,000 and $999,999 (see table 1), and those operations are the primary targets of commodity-related programs.

The very largest farms (GCFI of $1 million or more) receive only 26 percent of commodity-related payments (not shown in table 4), which is considerably less than their 47-percent share of the value of total U.S agricultural production. Those farms account for a relatively small share of grain/soybean production (see fig. 3). Instead, they specialize in fed cattle, high-value crops, and dairy. The first two commodities receive no program support, while dairy support is generally limited to a fraction of the production on those farms in years of low prices.

Conservation Payments

Large farms are somewhat more likely to receive conservation payments than small farms (see table 4). Nevertheless, 73 percent of all conservation payments go to small farms, largely because they receive 83 percent of land-retirement payments. Land-retirement programs also constitute the majority of Government payments until GCFI passes $50,000. The remaining conservation program payments—for working-land programs—go primarily to farms with sales of at least $250,000.

Small farms receive most land-retirement payments because of the sheer number of small farms, because small farms hold a large share of all farmland, and because small farms tend to enroll larger shares of their land in retirement programs when they do participate in these programs. Since land enrolled in land-retirement programs requires little labor or capital investment and provides a guaranteed income stream, farmers with full-time off-farm jobs may find the programs financially attractive, particularly if their farms are not profitable. Given their age, many older or retired farmers have more land available to put into conservation uses. Operators of large and very large farms enroll a smaller share of their land in land-retirement programs because the opportunity cost of removing their land from production is high, except on the most environmentally sensitive land.

Shifts to Very Small and Very Large Farms

While most farms are small, large farms produce most agricultural output. Small commercial farms used to account for a much larger share of farm production, but U.S. farm structure has changed over the last 25 years in response to financial returns that favor large operations. We used census data to evaluate longrun trends in farm structure and compare changes in the size distribution of farms between 1982 and 2007 (table 5).

To measure farm size in the census data, we must use size classes based on the market value of agricultural products sold or total sales made by the operation, plus the value of production received by landlords and production contractors.[15] These size classes were used earlier in the report, but they are defined here in terms of the market values of agricultural products sold, rather than GCFI.

Agricultural prices were 43 percent higher, on average, in 2007 than they were in 1982, according to the Producer Price Index for Farm Products (PPIFP). We want to compare farm size distribution on a consistent basis, exclusive of the effects of price changes on sales. To make that comparison, we adjust the 1982 market value of agricultural products sold—denoted simply as sales in this section—to 2007 prices using the PPIFP.

[15]GCFI cannot be constructed from census data, because the census does not separate the landlord's share of sales from the sales of the farm. In addition, the census did not collect information about receipts of Government payments or reasonably complete information about receipts of farm-related income until 1987. Thus, we could not construct an approximation of GCFI for 1982, even if we ignored the issue regarding the landlord share of sales.

Table 5
Number of farms, by constant-dollar sales class,[1] 1982 and 2007

Sales class[1] (2007 constant dollars)	1982		2007		Change, 1982-2007
	Farms	Distribution	Farms	Distribution	
	Number	*Percent*	*Number*	*Percent*	
Total farms	2,240,976	100.0	2,204,793	100.0	-1.6
Noncommercial	954,349	42.6	1,319,161	59.8	38.2
Point farms[2]	254,097	11.3	688,834	31.2	171.1
$1,000-$9,999	700,252	31.2	630,327	28.6	-10.0
Small commercial	1,137,892	50.8	675,973	30.7	-40.6
$10,000-$49,999	601,840	26.9	403,017	18.3	-33.0
$50,000-$99,999	253,243	11.3	125,456	5.7	-50.5
$100,000-$249,999	282,809	12.6	147,500	6.7	-47.8
Large	132,544	5.9	154,150	7.0	41.0
$250,000-$499,999	97,894	4.4	93,373	4.2	-4.6
$500,000-$999,999	34,650	1.5	60,777	2.8	75.4
Very large:					
$1,000,000 or more	16,191	0.7	55,509	2.5	242.8

Notes: Sales classes are defined in 2007 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes. Point farms are identified using current dollars—with no adjustment for price changes—because the minimal level of sales in the farm definition is not adjusted for price changes.

[1]Sales class is based on the market value of agricultural products sold.

[2]Point farms have sales of less than $1,000 (current dollars) but are still considered farms because they would be expected to normally sell at least $1,000 of agricultural products.

Source: Economic Research Service calculations based on U.S. Census Bureau, 1982 Census of Agriculture and USDA, National Agricultural Statistics Service, 2007 Census of Agriculture.

Shifts in the Distribution of Farms

During the 25-year period between 1982 and 2007, the total number of U.S. farms fell by 1.6 percent, from 2.241 million to 2.205 million (see table 5). That modest decline masks striking changes in the distribution of farms by size class, with large increases in farm numbers at the extremes and declines in between.

Specifically, the number of farms with at least $1 million in sales more than tripled, while the number with $500,000-$999,999 in sales rose by 75 percent. (Sales are stated in 2007 dollars, so the changes are not affected by 1982-2007 price increases.) The number of point farms (less than $1,000 in sales) nearly tripled. This increase reflects, in part, greater efforts by NASS to count all of the smallest farms, which can be difficult to track (USDA, NASS, 2009, p. 31). In total, those three classes added 500,000 farms between 1982 and 2007, more than matching the loss of 462,000 small commercial farms (a decline of 41 percent) over the period.[16]

Shifts in the Distribution of Sales

Changes in the distribution of farm sales mirrored the dramatic shifts in farm numbers (fig. 11). Small commercial farms accounted for 14 percent of farm sales in 2007, down from 41 percent in 1982. Production clearly shifted to the largest farms—those with at least $1 million in sales—whose share of agricultural production rose to 59 percent by 2007 from 24 percent in 1982. Despite the increase in numbers, noncommercial farms handled a smaller share of production in 2007 than they did in 1982.[17]

The shift in sales and production to very large farms reflects, in part, technological advancements in the production of fed cattle, hogs, poultry, and milk. Livestock production moved from the outside to climate-controlled buildings, making production less dependent on the weather. Other advances in disease control, handling, transport, and nutrition increased the number of production cycles per year. These technological advancements helped standardize production, making it easier for farms to operate on a large scale (Allen and Lueck, 1998, p. 370).

Substantial shifts to larger farms also occurred in crops (Hoppe et al., 2007, table 11, p. 33). Technological factors—including larger and faster equipment, information technologies, and more routinized pest control through genetically modified seeds—expanded the acreage that farm operators could control.

In field crops, however, farm size increased most in areas where commodity payments per acre were highest, with payments per acre varying across local areas in accordance with the mix of commodities grown, with historic yields, and with soil quality. While this growth in farm size could reflect technological changes that differentially affected areas with high yields and higher payments, it also suggests that the pattern of payments could accelerate changes in farm size (Key and Roberts, 2007).

The share of production held by small commercial farms fell by 3 percentage points between 2002 and 2007, after falling by 5-6 percentage points in each

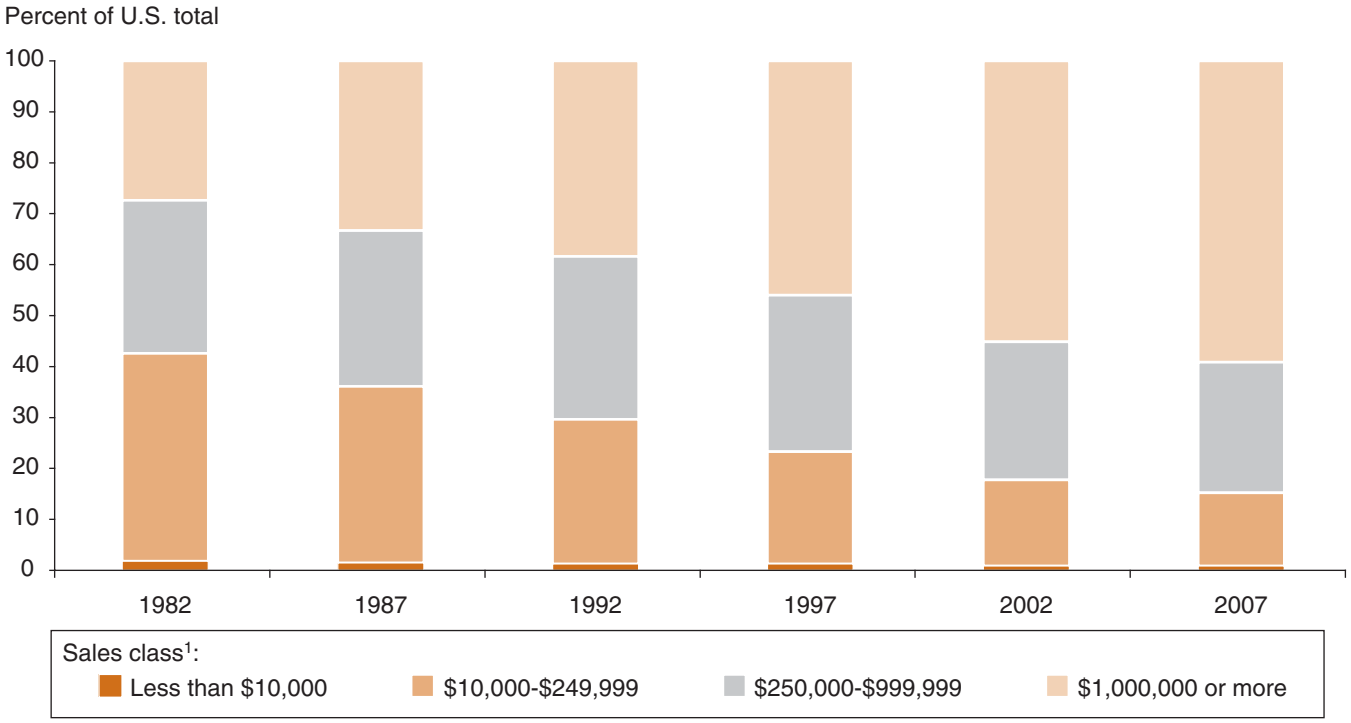
[16]Another factor that increased the count of point farms was an adjustment for undercoverage instituted in the census of agriculture, beginning with the 2002 census. This adjustment has the largest impact on farms near the $1,000 cutoff in the farm definition (Allen, 2004; USDA, NASS, 2004). Adjusting the 1982 count of point farms for undercoverage—using published adjustment factors (U.S. Department of Commerce, 1985)—reduces the 1982-2007 growth in point farms from 171 percent (see table 5) to 94 percent.

[17]Note that the 2007 estimates differ from those reported in figure 2, where small commercial farms accounted for 22 percent of production and very large farms accounted for 47 percent. The difference reflects our reliance on GCFI as a sales measure in figure 2, whereas we are forced to use the market value of agricultural products sold as the sales measure in the long-term analysis found in figure 11. The market value includes the value of production accruing to contractors, which can be substantial in poultry and hog production. Several thousand poultry and hog farms, and their production, would be assigned to the very large class using market value and to smaller sales classes using GCFI.

Figure 11

Market value of agricultural products sold, by constant-dollar sales class,[1] 1982-2007

Very large farms' share increased from 27 percent in 1982 to 59 percent in 2007



Note: Sales classes are expressed in constant 2007 dollars, using the Producer Price Index for Farm Products (PPIFP) to adjust for price changes.

[1]Sales class is based on the market value of agricultural products sold.

Source: Economic Research Service calculations based on U.S. Census Bureau, 1982, 1987, and 1992 Censuses of Agriculture and USDA, National Agricultural Statistics Service, 1997, 2002, and 2007 Censuses of Agriculture.

of the 4 previous intercensal periods. Those small farms now focus on beef production in cow-calf operations, poultry production in contract growing operations, and small-scale production of hay and grain/soybeans (see table 1). Each of these production operations can be carried out without a full-time commitment of farm labor. Absent technological changes that alter how production can be carried out, small commercial farms will likely maintain a significant presence in these areas.

Summary and Discussion

This report reviewed recent data on small-farm finances and how small farms and their operators participate in agricultural production, commodity and conservation programs, and the nonfarm economy, revealing key findings:

- Most farms are small, and noncommercial farms account for more than half of all U.S. farms. Although small commercial farms make substantial contributions to the production of some commodities, noncommercial farms produce very little in the aggregate, while large and very large farms account for most production.
- Small farms account for half of all farmland. Due to the large amount of land they control, small farms are important to conservation efforts. Small farms account for 82 percent of the land enrolled in land-retirement programs and receive 83 percent of land-retirement payments.
- Small commercial farms have a distinct product mix, focusing on commodities that do not require a full-time commitment of labor: poultry, beef (cow/calf or stocker enterprises), hay, and grain/soybeans. High-value crops and dairy require substantial commitments of labor. Small commercial farms produce few of these commodities, while high-value crops and dairy production account for 44 percent of production on very large farms.
- Small-farm households depend heavily on off-farm income. Because of their off-farm income, median household income for each small-farm sales class is comparable with the median for all U.S. households.
- Large and very large farms tend to be more profitable than small farms, and the difference in average returns is an important factor behind structural changes in agriculture. Financial performance varies among small farms, however, and many small farms are profitable and will remain viable economic entities. Other farm households—especially those operating noncommercial farms—farm for reasons other than profit and will remain in business as long as their farm losses are not unduly large.
- Small commercial farms have faced declining shares of farm numbers and production for decades and those trends will likely continue. Larger farms have competitive advantages over smaller farms in most commodities, reflecting economies of size in farming (Hoppe et al., 2008; MacDonald et al., 2007; Key and McBride, 2007). The advanced age of farm operators with sales of $10,000-$99,999 suggests more small commercial farms will exit the industry.
- The number of noncommercial farms is less likely to decrease. These farms have consistently produced a very small share of farm output (1 or 2 percent) since 1982, and households operating them depend heavily on off-farm income. In some respects, these noncommercial farms and their households exist independently of the farm economy, so a decline in their numbers due to competition with larger farms is not as likely. The number of point farms increased substantially between the 2002 and 2007 Censuses of Agriculture, reflecting much greater efforts by NASS to count all small farms in the census. Another increase of this magnitude in the future is unlikely.

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