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Agricultural Income and Finance Situation and Outlook: 2021 Edition

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Okkar Mandalay, Dipak Subedi, Jessica E. Todd, and
Christine Whitt





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Agricultural Income and Finance Situation and Outlook: 2021 Edition

Robert Dubman, Nigel Key, Jonathan Law, Carrie Litkowski, Okkar Mandalay, Dipak Subedi, Jessica E. Todd, and Christine Whitt

Abstract

The U.S. agricultural economy experienced pronounced volatility over the 2009–19 decade, including strong periods of expansion in the first part of the decade followed by several years of contraction. Although many financial indicators of well-being—including farm sector and household income—were at or near their long-term average in 2019, shifts in the distribution of Government payments from farm programs occurred. In addition, bankruptcy rates were elevated in some key agricultural States. This report describes major trends in the agricultural economy over the most recent decade for which survey data are available (2009–19) and explores drivers underlying the trends. The analysis is based on USDA’s Farm Income and Wealth Statistics data product, data collected from farm operators and farm households through the Agricultural Resource Management Survey (ARMS), and data from U.S. Bankruptcy Courts. The charts and analyses provide a historical perspective to evaluate current economic conditions.

Keywords: farm financial performance, farm income, family farms, farm households, government payments, Agricultural Resource Management Survey, ARMS, bankruptcy rates, Market Facilitation Program, ERS Farm Resource Regions, U.S. Department of Agriculture, USDA, Economic Research Service, ERS

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What Is the Issue?

The U.S. farm economy experienced a wide range of financial conditions through 2009–2019, including a rise of real net cash farm income in 2012–14 to levels not seen since the mid-1970s, followed by a decline and leveling off of sector income. The U.S. Department of Agriculture (USDA) farm income estimates for 2020 and forecasts for 2021, released September 2, 2021, showed sector net cash income well below its 2012 peak but above its average since 1970 after adjusting for inflation (see appendix A). The Agricultural Income and Finance Situation and Outlook reports—which have been produced intermittently since 1984—compile analysis by the Economic Research Service’s (ERS) Farm Income Team and other researchers on pressing agricultural finance issues facing the sector’s farming operations as well as farm households. For the most recent financial forecast for the farm sector and farm households, see the farm sector income and wealth topic page on the ERS website. This edition

assesses major recent financial trends over the last decade using the most recent survey data through 2019, thereby complementing the short-term, frequently updated farm financial forecasts. It presents research on three major farm income and finance topics: (1) trends and drivers behind the major income and expense components of net cash farm income; (2) the changing distribution in direct Government payments from farm programs under three different Federal farm bills; and (3) trends in Chapter 12 bankruptcy filings at the State and national levels.

What Did the Study Find?

In aggregate and real terms, net cash farm income for all farm operations from 2009 through 2019 endured a series of multi-year swings not seen since the 1970s. In particular:

- the swings were driven largely by fluctuations in cash receipts for animals and animal products, with smaller contributions from crop cash receipts;
- incomes mostly varied with commodity prices rather than from variation in production levels, highlighting the importance of domestic and foreign demand for agricultural commodities;
- except for labor, cash expenses for the sector fluctuated closely with cash receipts—signifying stakeholders who supply inputs to production agriculture also experienced volatility, while payments to labor remained relatively stable despite increases in wage rates;



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- landowners saw net rents fluctuate with net cash farm income throughout the period, while land values initially rose then held steady; and
- Government payments averaged \$12.8 billion per year from 2009 to 2018, deviating no more than \$2.1 billion from the average in any year. However, 2019 Government payments were \$22.7 billion, largely due to payments from the Market Facilitation Program (MFP) that provided assistance to farmers impacted by trade disruptions.

While most of the period experienced stable direct Government payments at the sector level until 2019, the composition of payments shifted from primarily fixed (regardless of market outcomes) to counter-cyclical payments beginning in 2015. As programs changed, the composition of recipients changed as well to include greater participation among nonfamily farms and less participation among all sizes of family farms. In particular:

- the share of all farms receiving Government payments declined from 35 to 29 percent between 2010 to 2018. The share receiving commodity program payments declined from 21 percent in 2010 to 9 percent of all farms in 2018;
- an uptick in payment receipts occurred in 2019, corresponding to an increase in the scope of coverage of the MFP relative to 2018. MFP payments were distributed to 7 percent of farms in 2018 and 13 percent in 2019;
- Government payments accounted for between 2 and 5 percent of the total income among farm households. Simulating their removal—but not accounting for any adjustments in production decisions—found that Government payments increased the share of farm households that earned positive farm income by at most 3 to 5 percent; and
- because most farm households did not receive payments and farm income is generally a small share of total household income, Government payments affected total household income very little—between 1 to 5 percent—except for those households at the very bottom of the distribution of total household income.

Chapter 12—or family farm—bankruptcies started rising in 2014, and by 2019 were at their highest levels in almost a decade. Bankruptcy rates in 2019 were still below rates during the late 1980s, 2003, and 2010. However, national bankruptcy rates can mask substantial variation in economic conditions at the local level. To examine trends by State, we compared the number of bankruptcies to the number of farms eligible for Chapter 12 protection and found:

- for the 15 main agricultural States, the aggregate bankruptcy rate in 2019 was 6.7 per 10,000 farms eligible for Chapter 12 bankruptcy protection, compared with 3.4 per 10,000 farms, when considering all farms in the United States;
- among the 15 main agricultural States, only California and Florida had lower bankruptcy rates in 2019 than their respective averages over the previous 10 years; and
- 5 of the 7 largest agricultural States—Iowa, Minnesota, Nebraska, Illinois, and Kansas—had higher bankruptcy rates in 2019 than any year since at least 2005.

How Was the Study Conducted?

The USDA, Economic Research Service's Farm Income and Wealth Statistics data product published on December 2, 2020, was used to explore drivers and trends in the sector's net cash farm income since 2009. This product is compiled from a broad range of survey and administrative data. Underlying data are updated three times a year. The study of the structure, receipt, and distribution of Government payments was conducted using data from the 2010–19 Agricultural Resources and Management Survey (ARMS). ARMS is USDA's primary source of information on the production practices, resource use, and economic well-being of America's farms and ranches. In addition, we obtained program payment totals from the Farm Income and Wealth Statistics data product. Finally, this report used U.S. Bankruptcy Courts' Chapter 12 bankruptcy filings data—in conjunction with ARMS—to study farm bankruptcies.

Chapter 1: 2009–19 Trends in Farm Income

Carrie Litkowski, Robert Dubman, and Okkar Mandalay

Introduction

Over 2009–19, inflation-adjusted U.S. farm sector income increased to levels not seen since the early 1970s, followed by a significant multi-year decline.¹ Generally, income shifts affect the ability of farmers to provide for household living expenses, maintain or expand their farm operations, and meet debt repayment obligations.² Net cash farm income (NCFI) is a primary measure of farm sector income and represents annual income from cash receipts, cash farm-related income, and Government farm program payments minus cash expenses paid during the year.³

NCFI, across 2009 to 2019, was highly volatile, mainly among commercial farms, creating challenges for farm operators and farm households (see box, “The Role and Use of ARMS Data in Measuring Farm Sector Income”). These challenges could influence decision-making in addition to affecting agricultural production and household well-being. NCFI can be characterized in two periods: 1) NCFI growth starting in 2010 to its 2012–13 peak; and 2) the general decline after 2013 through 2019 to more average income levels. This study examined different sources of income received by the sector and their cash expenses to reveal factors contributing to the first period’s growth and the second period’s decline. Specifically, it used USDA Economic Research Service’s Farm Income and Wealth Statistics data product—published on December 2, 2020—to examine trends in NCFI, cash receipts, production expenses, and other sources of farm and farm-related income.

¹The farm sector consists of operations primarily engaged in growing crops, raising animals, aquaculture, and other animal production. It is represented by North American Industry Classification System (NAICS) subsector 111 for crop production and 112 for animal production and aquaculture.

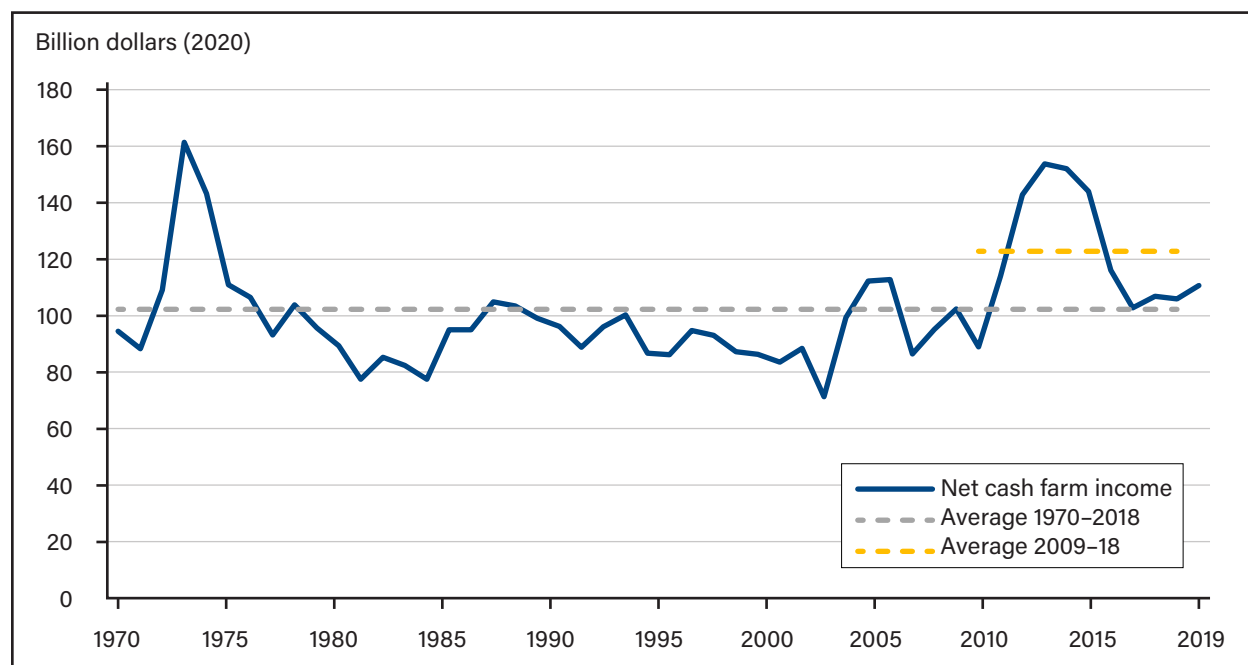
²USDA defines a farm as any place that produced and sold—or normally would have produced and sold—at least \$1,000 of agricultural products during a given year.

³The other primary measure of farm sector income is net farm income. In addition to cash income and expenses, it accounts for noncash items including changes in inventories, economic depreciation, and gross imputed rental income of operator dwellings.

Net Cash Farm Income Peaked in 2012

Beginning in 2010, inflation-adjusted NCFI began to rise, reaching near-record highs in 2012 and 2013 (figure 1.1).⁴ From 2009 to 2012, NCFI increased by \$64.8 billion—or 73 percent—to \$153.8 billion, its highest level since the 1970s. This large, multi-year dollar increase in NCFI was similar to the increase in the early 1970s when NCFI reached its all-time high in 1973 at \$161.3 billion. In 2013, income remained high, declining 1 percent from 2012.

Figure 1.1
Inflation-adjusted net cash farm income in 2019 fell below 2009–18 average



Note: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, Economic Research Service, 2020 = 100.

Source: USDA, Economic Research Service, Farm Sector Income and Wealth Statistics Data as of December 2, 2020.

After 2013, NCFI declined by \$49.3 billion—or 32 percent—through 2016 to \$102.8 billion. This was the largest multi-year decline since 1974–1977 in terms of dollars and percentages. However, in 2016, NCFI was at \$102.8 billion, which remained slightly above its historical average across 1970 to 2018 at \$102.2 billion. Since 2016, NCFI increased each year through 2019 except for a 1 percent decline in 2018. At \$110.7 billion in 2019, NCFI was 10 percent below its 10-year average.

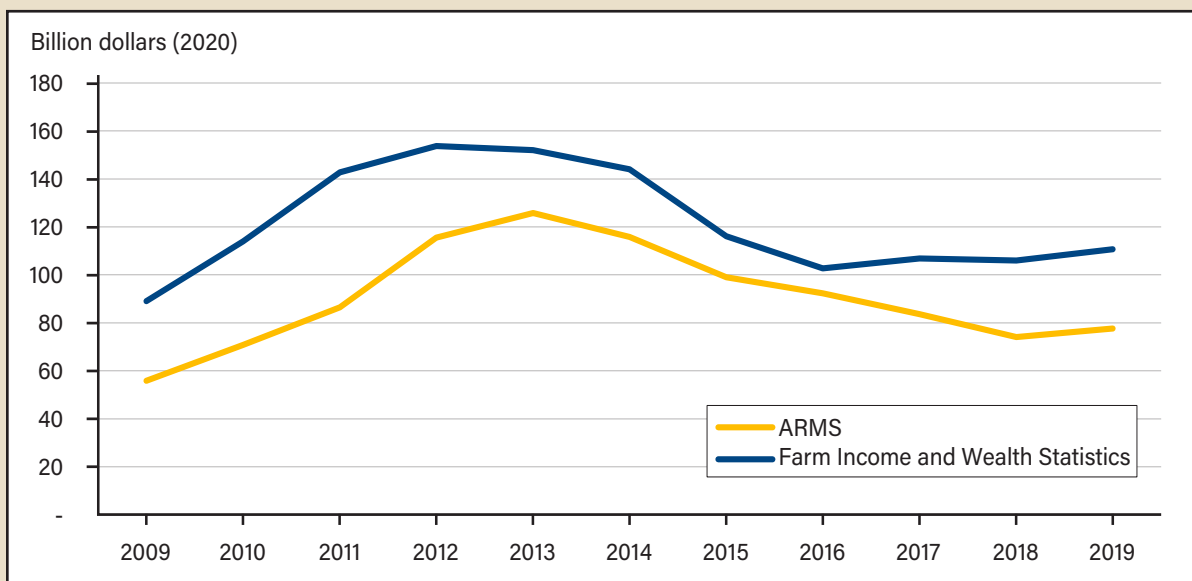
⁴All monetary values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, Economic Research Service.

The Role and Use of ARMS Data in Measuring Farm Sector Income

The USDA Economic Research Service's (ERS) Farm Income and Wealth Statistics data product is compiled using data from a broad range of surveys and administrative sources. One extensively used survey is the USDA's Agricultural Resource Management Survey (ARMS). This annual survey of farmers and ranchers is designed to provide estimates for all farms in the 48 contiguous States plus State-level data for the 15 major cash receipts States. Among the net cash farm income (NCFI) components, ARMS data are the primary source used to estimate cash production expenses and cash farm-related income—excluding forest products sold. ARMS data contribute to cash receipts estimates. However, other survey-based data from the USDA's National Agricultural Statistics Service (NASS) can provide more comprehensive information and is the primary data for those estimates. Direct Government payments are estimated using administrative data (see Chapter 2 of this report for more information).

It is possible to derive an alternate measure of NCFI using only ARMS data, as the survey allows researchers to compile information on cash receipts, farm expenses, and direct Government payments. Although the ARMS-based NCFI measure has been consistently below NCFI as measured in the Farm Income and Wealth Statistics, the two measures have shown similar trends from 2009–19.

NCFI from ARMS and Farm Income and Wealth Statistics data products have followed similar trends across 2009–19

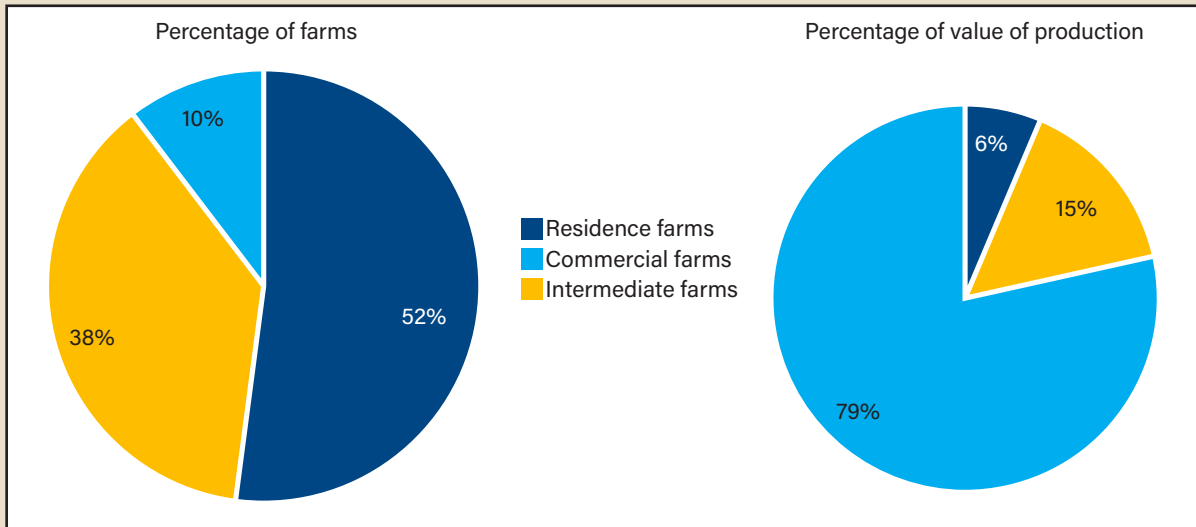


Note: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, ERS, 2020 = 100.

Source: USDA, Economic Research Service, Farm Sector Income and Wealth Statistics Data as of December 2, 2020; and 2009–19 Agricultural Resource Management Survey data as of December 18, 2020.

Using ARMS data, we can examine NCFI by type of farm. Before expenses, residence farms have gross cash farm income of less than \$350,000, and the farm operator is retired or has a primary occupation that is not farming. Intermediate farms have gross cash farm income of less than \$350,000, but the operator's primary occupation is farming. Commercial farms have gross cash farm income of \$350,000 or more or are nonfamily farms. Although residence farms accounted for 52 percent of all farms in 2019, commercial farms accounted for 79 percent of the farm sector's crop and animal/animal products production.

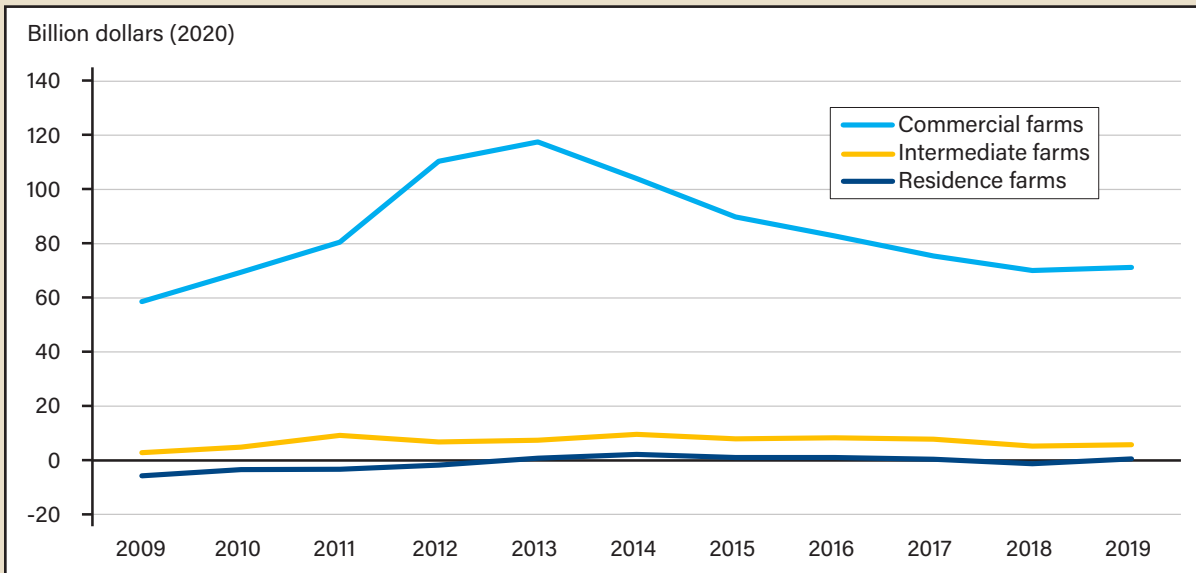
Distribution of farms and value of production by farm type, 2019



Source: USDA, Economic Research Service using 2019 Agricultural Resource Management Survey data (December 18, 2020).

NCFI trends across 2009–19 have varied significantly by farm type. NCFI for residence and intermediate farms remained low and relatively stable. Commercial farms had a greater range of fluctuation in NCFI and drove the trends for the farm sector.

Trends in NCFI across 2009–19 varied by farm type



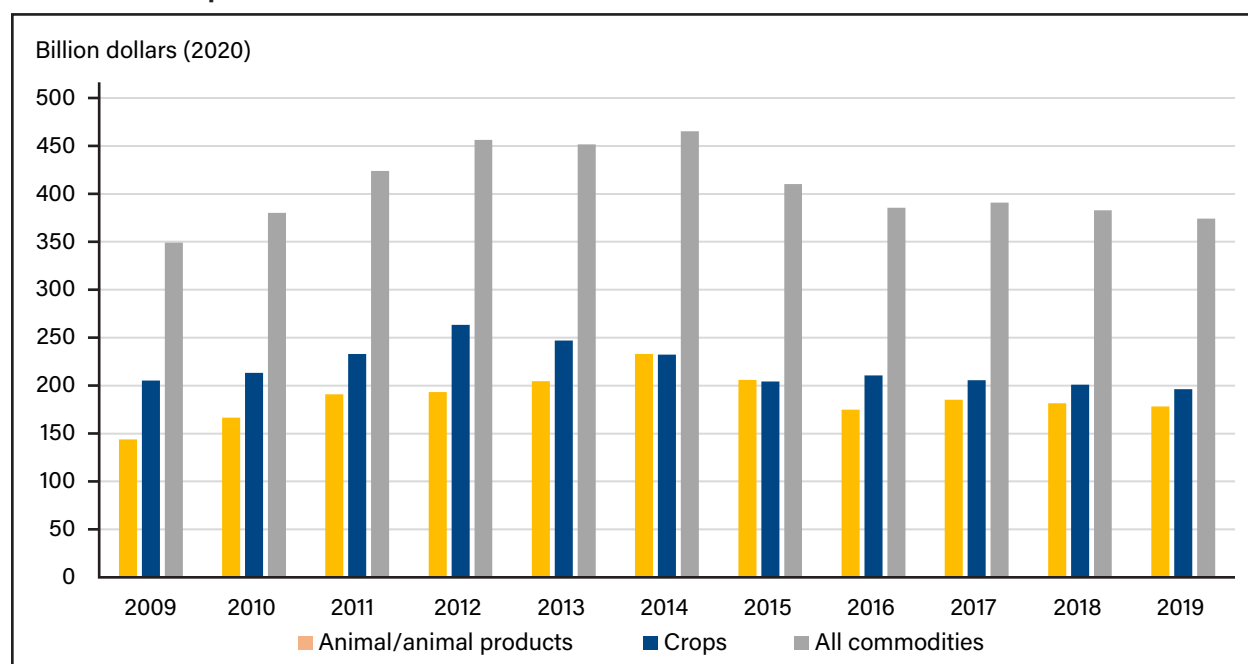
Note: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, ERS, 2020 = 100.

Source: USDA, Economic Research Service using 2019 Agricultural Resource Management Survey data (December 18, 2020).

Cash Receipts Fluctuated During 2009–19

Cash receipts represent the sector’s cash income from the sale of agricultural commodities, accounting for roughly 90 percent of the farm sector’s gross cash income. Farm-related cash income and direct Government payments from farm programs are the other components of gross cash income. Cash receipts increased from \$349.0 billion in 2009 to \$374.3 billion in 2019. From 2009 to 2014, cash receipts increased by \$116.1 billion—33 percent—and peaked at \$465.1 billion (figure 1.2). The \$107.3 billion increase from 2009 to 2012 was the largest consecutive increase in cash receipts since 1972–73. The increase was not evenly balanced across commodities. Correspondingly, 77 percent of the cash receipts increase from 2009 to 2014 was due to higher receipts for animal/animal products, and the remaining 23 percent was due to increased crop receipts. Higher commodity prices largely drove increases in receipts up to 2014, reflecting greater domestic and foreign demand for agricultural commodities. In aggregate terms, prices farmers received rose each year from 2010 to 2014 (figure 1.3).

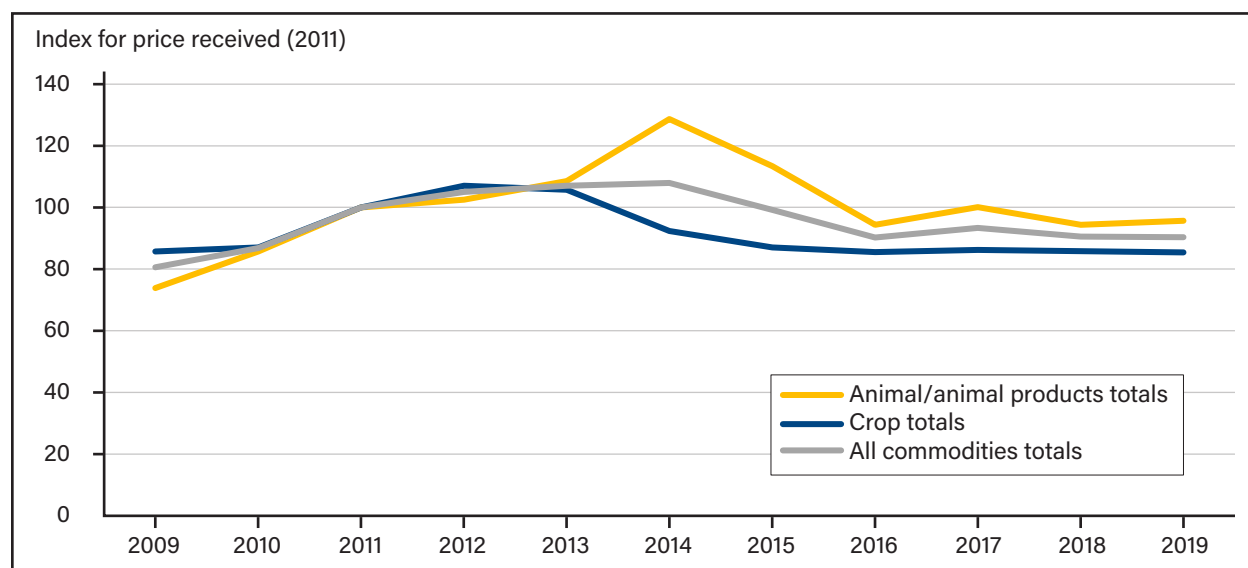
Figure 1.2
Total cash receipts increased to 2014 and then declined



Note: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product index rebased to 2020 by USDA, Economic Research Service, 2020 = 100.

Source: USDA, Economic Research Service, Farm Sector Income and Wealth Statistics Data as of December 2, 2020.

Figure 1.3

Prices received by farmers for all commodities, in aggregate, and peaked in 2014

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service as of March 4, 2021.

Following the 5-year increase, total cash receipts declined \$79.6 billion (17 percent) from 2014 to 2016. After remaining relatively stable in 2017, cash receipts fell 2 percent in both 2018 and 2019. Cash receipts for 2019 were 9 percent below their average from 2009 to 2018. In 2019, corn receipts declined to 15 percent, and cow-calf receipts declined to 6 percent below their 10-year averages. Increased plantings, combined with relatively good weather since 2014, led to record U.S. farm production and added to large stocks on hand for many major crop commodities.⁵ Major factors influencing prices included multiple consecutive years of high-production levels and large inventories. Additionally, the demand for U.S. agricultural products was tempered by trade disputes with China and other trading partners. Crop prices, as well as animal/animal product prices, shrank. From 2014 to 2019, animal/animal product receipts fell \$54.7 billion compared with a \$36.1 billion decline in crop receipts.

Crop Receipts Peaked in 2012

From 2009 to 2012, crop cash receipts increased \$58.0 billion (28 percent), peaking in 2012 with gains in corn and soybean receipts, which accounted for 68 percent of the increase. Large increases in corn and soybean cash receipts were largely due to higher prices. Corn prices and corn receipts both peaked in 2012. A drought in the Midwest and Great Plains in 2012 significantly reduced corn and soybean yields, putting upward pressure on prices. Corn yield per acre fell 16 percent, and sorghum yield per acre fell 8 percent in 2012 (USDA, NASS, 2020c). Soybeans yields—which are more resistant to drought conditions—fell 5 percent (Rippey, 2015). Despite lower yields, the combined value of corn and soybean production increased in 2012.

Other factors also contributed to rising cash receipts through 2012. Implementation of the 2009 Renewable Fuel Standard (RFS) with corn as the primary feedstock for ethanol production contributed to greater demand for corn and supported higher prices. U.S. agricultural exports increased with global trade expanding greatly due—in part—to strong income growth in developing countries and a depreciating U.S. dollar. For example, U.S. soybean exports rose 51 percent from 2009 to 2012, with China accounting for most of the increase (USDA, FAS, 2021).

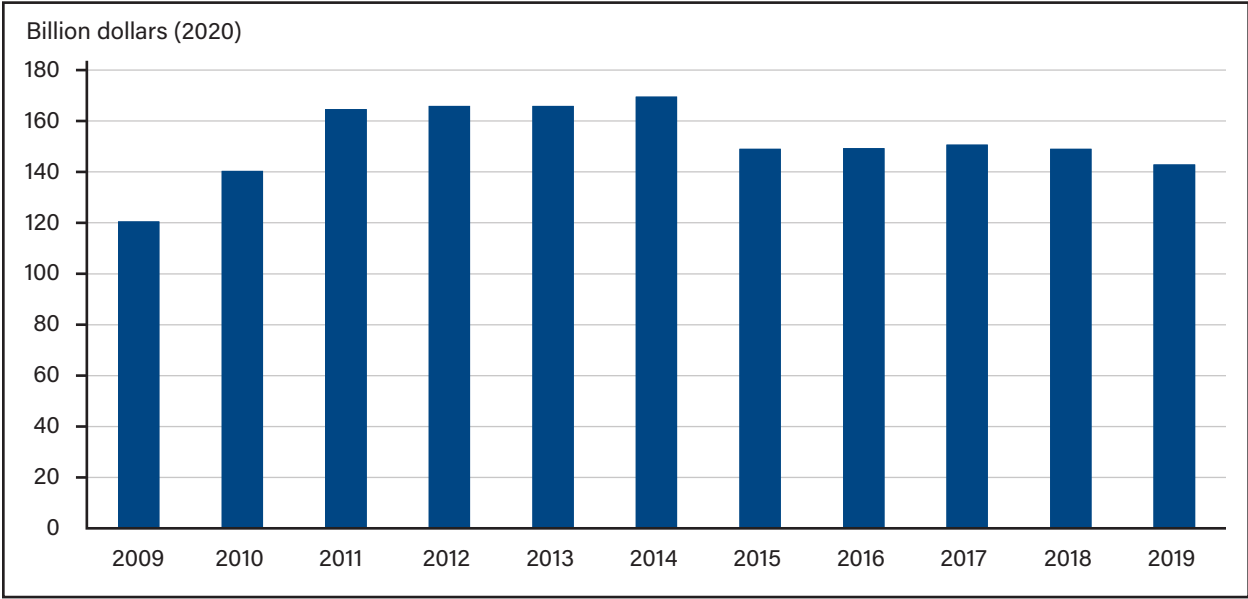
⁵Crop commodities for which production quantities peaked after 2014 include corn, cotton, rice, soybeans, and wheat.

From 2012 to 2019, crop cash receipts fell each year—except in 2016—as crop commodity prices generally declined. From 2012 to 2019, crop cash receipts decreased \$67.2 billion (26 percent), and in 2019, crop cash receipts were at their lowest since 2007 (values adjusted for inflation).

Animal/animal Product Receipts Peaked in 2014

Animal/animal product receipts peaked in 2014, lagging the 2012 peak for crops. From 2009 to 2014, animal/animal product receipts increased by \$89.2 billion (62 percent). Total animal/animal product receipts exceeded total crop cash receipts in 2014–15, which had not occurred since 2005. Receipt gains were typical, as meat animals, milk, and poultry/egg receipts all increased. More than three-quarters of the domestic cattle inventory were in drought areas at the height of the 2012 dry spell, as were more than two-thirds of U.S. hay acreage (Prager et al., 2017). Livestock commodity prices rose to reflect scarcity and higher feed costs. Export demand also contributed to higher prices for animal/animal products through 2014. For example, U.S. exports of livestock and meat increased 75 percent from 2009 to 2014 (USDA, FAS, 2021). From 2015 to 2019, animal/animal product receipts fell in every year except for 2017, as large inventories weighed on the market, lowering prices. Additionally, U.S. exports of agricultural products declined in 2015 and then remained relatively stable from 2016 to 2018 (figure 1.4). Even with declining receipts, the 2014–19 average for animal/animal products receipts of \$193.2 billion was still 7 percent above the 2009–13 average of \$179.8 billion.

Figure 1.4
U.S. exports of agricultural products, 2009-19



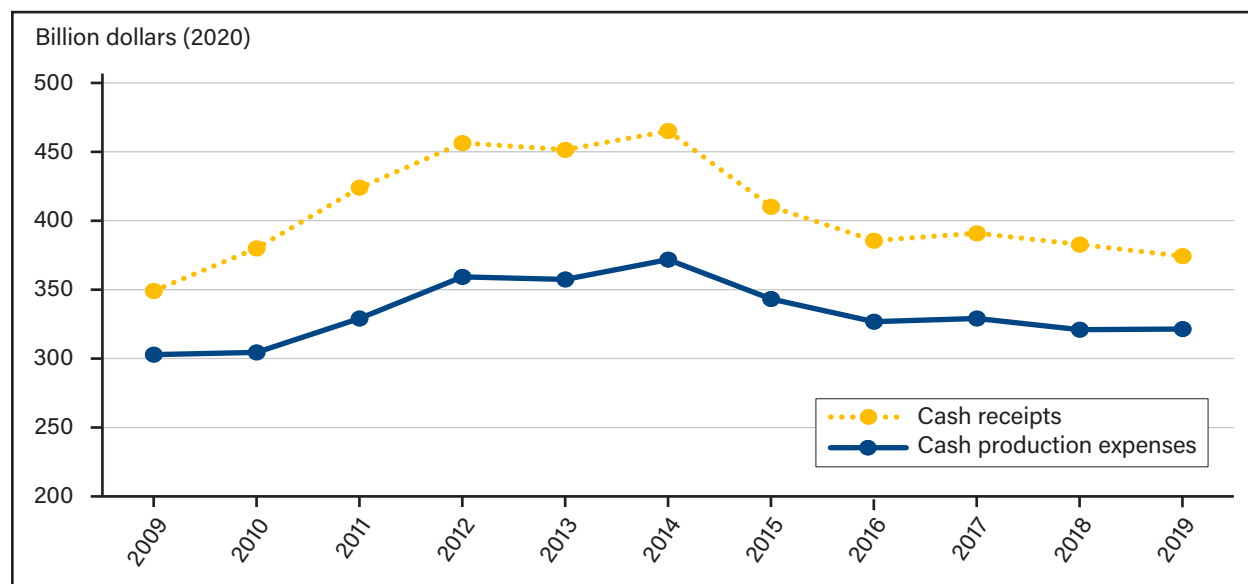
Note: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, Economic Research Service, 2020 = 100.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census data compiled by USDA, Foreign Agricultural Service, Global Agricultural Trade System as of March 5, 2021.

Cash Production Expenses Peaked in 2014

Farm production expenses—or the costs of inputs used to produce farm commodities and farm-related income—are a principal component of farm income statements. From 2009 to 2019, shifts in cash production expenses for the farm sector followed trends in total cash receipts. This trend is not surprising because farmers make spending decisions based on expected revenue (figure 1.5). In 2014, cash production expenses reached their highest level at \$371.9 billion, coinciding with the peak in cash receipts. From 2009 to 2014, cash expenses increased by \$69.1 billion (23 percent). After 2014, expenses declined each year except for 2017 and 2019 when they increased by less than 1 percent. By 2019, cash expenses decreased 14 percent compared with 2014 levels. The decline in expenses began in 2015 in response to declining revenues. In 2019, cash production expenses were 4 percent below their 2009–18 average.

Figure 1.5
Cash receipts and production expenses trend together



Note: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, Economic Research Service, 2020 = 100.

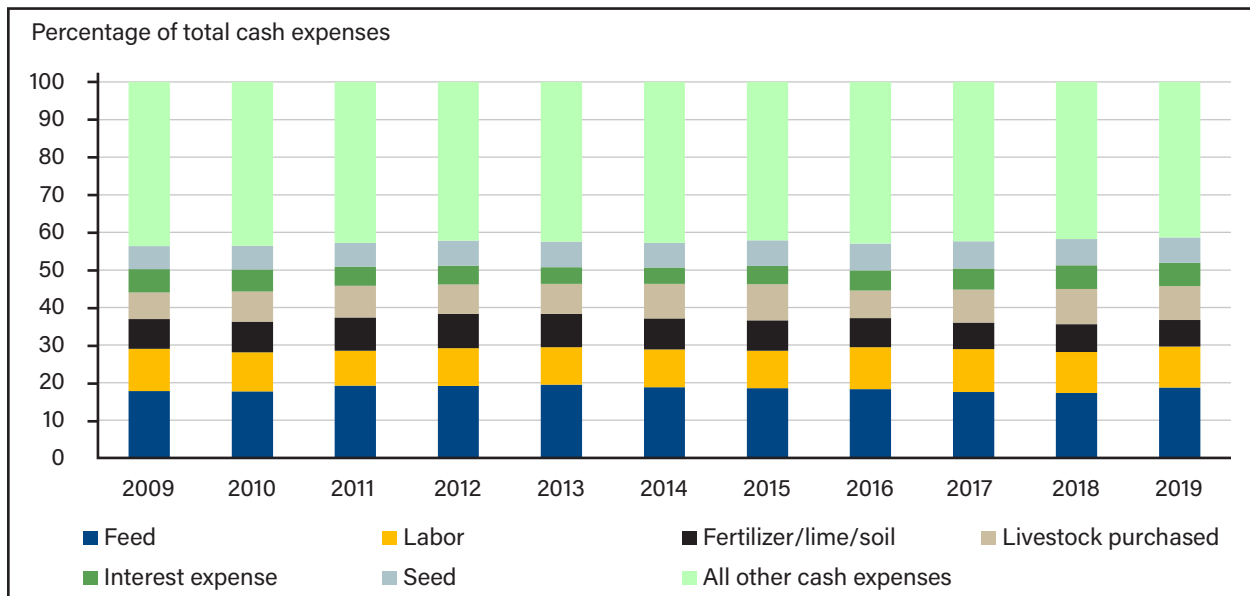
Source: USDA, Economic Research Service, Farm Sector Income and Wealth Statistics Data as of December 2, 2020.

From 2009 to 2019, cash production expenses—as a share of cash receipts—averaged 82 percent. Across 2000–09, cash production expenses averaged 84 percent of cash receipts. Relative to cash receipts, cash expenses did not change significantly across 2000–19. However, cash production expenses fluctuate year-to-year due to a variety of factors.

Volatility in energy prices caused fuel and oil expenses to fluctuate from a high of \$19.4 billion in 2014 to a low of \$13.1 billion in 2016. Interest expenses were influenced by the profile of the farm as well as broader credit conditions outside the agricultural sector. Interest expenses—excluding interest expenses on operator dwellings—ranged between \$15.7 billion in 2013 and \$20.0 billion in 2018. Despite the volatility in annual cash expenses, the composition of expense items remained stable from 2009 through 2019 (figure 1.6).

Figure 1.6

Largest expense items as a share of total cash expenses relatively stable across 2009-19



Note: All other cash expenses includes property taxes/fees, electricity, fuel/oil, pesticides, insurance premiums, and other intermediate expenses that individually account for a smaller share of total cash expenses.

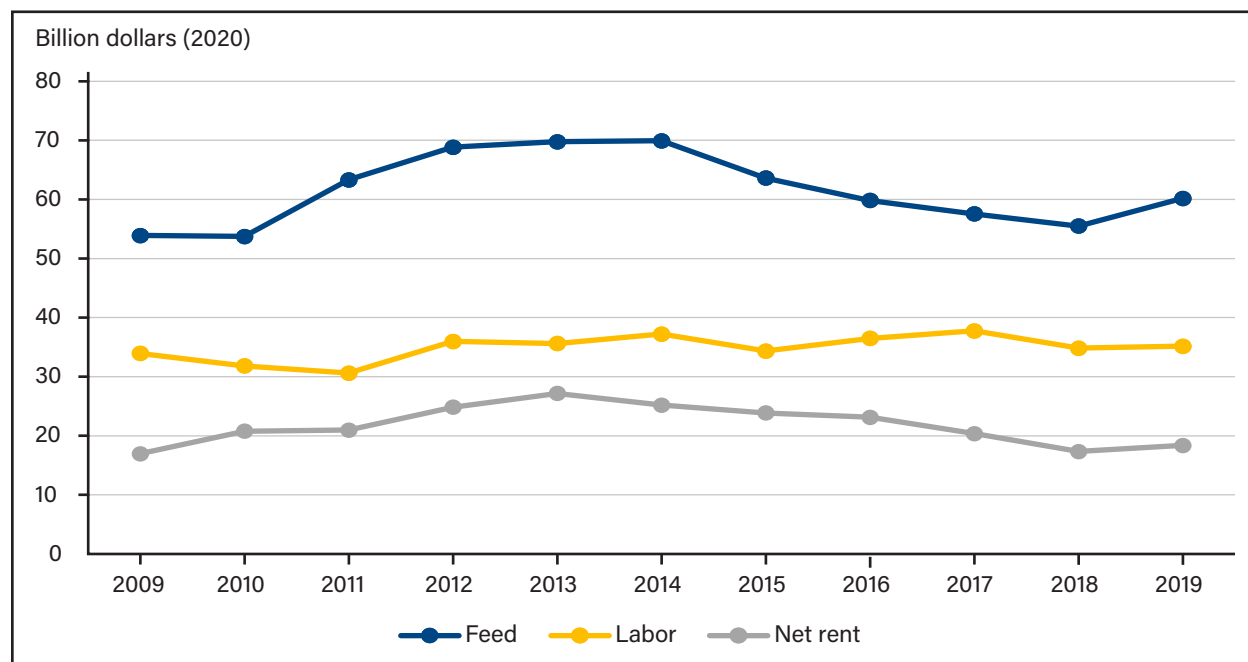
Source: USDA, Economic Research Service, Farm Sector Income and Wealth Statistics Data as of December 2, 2020.

Every year from 2009 through 2019, feed was the highest expense item, accounting for between 17 and 20 percent of total cash production expenses, followed by labor costs at about 10 percent of total cash expenses. Fertilizer/lime/soil treatment and livestock/poultry purchases each totaled about 8 percent. The roughly 40 percent of remaining cash production expenses included seed, pesticides, fuel, electricity, repairs, and marketing expenses. For a detailed accounting of other expenses, please see USDA, ERS Farm Income and Wealth Statistics tables (USDA, ERS, 2020a).

Feed Drove the Production Expenditure Cycle

As the largest expense item, changes in spending on feed accounted for 23 percent of the increase in total cash expenses from 2009 to 2014 and 19 percent of the decline in cash expenses since 2014. From 2009 to 2014, feed expenses rose by \$16.0 billion (30 percent) and declined by \$9.8 billion (14 percent) after 2014 (figure 1.7). Rising feed expenses through the first part of the period reflected growing demand for corn for ethanol production as RFS-mandated ethanol volumes increased. Additionally, the 2012 U.S. drought decreased feed grains production and raised feed costs. As a major exporter of grains, U.S. exports rose to meet the global demand in 2014, allowing the continuation of price increases that started with the 2012 drought. However, as crop commodity prices receded, purchased feed expenses fell after 2014. In 2019, feed expenses stood at \$60.2 billion, or 2 percent below their 2009–18 average of \$61.6 billion.

Figure 1.7
Feed, labor, and net rent varied differently over 2009–19



Note: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, Economic Research Service, 2020 = 100.

Source: USDA, Economic Research Service, Farm Sector Income and Wealth Statistics Data as of December 2, 2020.

Labor Costs Stable Over the Last Decade Despite Rising Wage Rates

Cash labor expenses are about 10 percent of total cash production expenses. Labor expenses include hired and contract labor. Contract labor is often employed by a third party to harvest fruits, nuts, and vegetables. These farms generally have much higher labor costs—36 percent of the average annual cash expenses from 2009 to 2019—when compared with other types of farms, which have an average labor cost of 10 percent, according to USDA’s Agricultural Resource Management Survey (ARMS).

From 2009 to 2019, farm sector labor expenses increased by 4 percent while hourly farm sector wage rates increased by 16 percent (USDA, NASS, 2020d).⁶ Along with reports of labor shortages from farmers and a decline in the supply for farmworkers from Mexico, labor expenses have indicated a tightening of the farm

⁶Annual dollar per hour wage rate reported by USDA, NASS adjusted for inflation using the U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, ERS, 2020 = 100.

labor market in the U.S. (Zahniser et al., 2018). The average annual number of hired workers decreased 9 percent from 2009 to 2019 (USDA, NASS, 2020d). Stricter enforcement of immigration laws during this period may have also contributed to the reduction in hired farmworkers because roughly half of these workers lack legal immigration status (USDA, ERS, 2020b). Decreased hired labor also suggests that farms utilized fewer labor hours, possibly substituting machinery or other inputs in response to higher wage rates. The decrease in farm workers may also be due to the tightening labor market resulting from sustained growth in the broader U.S. economy, which grew at an average of 3.3 percent from 2009 to 2019 (USDC, BEA, 2020).

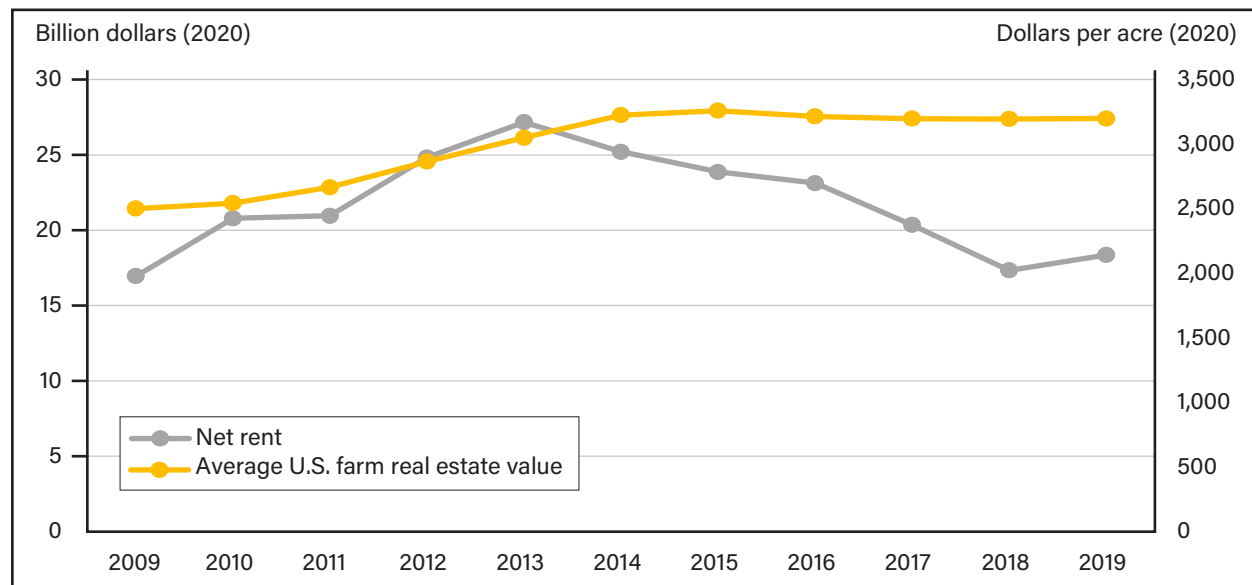
Net Rent to Landlords Also Trends With Cash Receipts

Net rent to landlords is another expense that has closely followed trends in cash receipts. Net rent is the net cost incurred by farming operations for leasing farmland and buildings, and it is calculated as gross rent paid by an operation to a landlord, minus expenses the landlord incurred. From 2009 to 2014, net rent increased 49 percent and then decreased 27 percent from 2014 to 2019 (figure 1.7). The two main types of leasing arrangements are cash rent and share rent. Cash rent is usually a fixed dollar, annual rental agreement that does not vary with production. Share rent is usually a fixed proportion of production on the leased land, and the landlord may also pay a share of the production costs.⁷

Additionally, the increase in net rent from 2009 to 2013 corresponded with increases in land values (figure 1.8). The average value per acre of all land and buildings on U.S. farms—also referred to as the farm real estate value—increased from \$2,490 in 2009 to \$3,036 in 2013, a 22 percent increase when adjusted for inflation (USDA, NASS, 2020b). After increasing 5 percent in 2014, farm real estate values remained relatively stable, averaging \$3,185 per acre in 2019. But from 2014 to 2018, net rent declined following lower cash receipts.

Figure 1.8

Farm real estate values are correlated with the increase in net rent paid, but not the decrease



Note: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2020 by USDA, Economic Research Service, 2020 = 100.

Source: Net rent from USDA, Economic Research Service Farm Income and Wealth Statistics as of December 2, 2020; and USDA, National Agricultural Statistics Service farm real estate value.

⁷Net rent to landlords is calculated as the cash or share rent paid to the landlord less any production expenses paid by the landlord. Net rent is then subtracted from gross cash farm income in the calculation of net cash income.

Stability in farmland values despite declining net rent might be because rental rates can reflect the short-term earning potential of the farmland. However, land values are based upon expected future returns from the land, thus are less affected by lower cash receipts in a given year. Relatively low interest rates also helped support farmland values by reducing the costs of borrowing and making it an attractive investment option to farmers and investors.

Trends in Government Payments and Farm-Related Income

From 2009 to 2019, Government payments and farm-related income contributed little to shifts in farm sector income except in 2019. Direct Government payments from farm programs averaged \$12.8 billion across 2009 through 2018, with little deviation despite changes in agricultural policy. Although the Agricultural Act of 2014—also known as the 2014 Farm Bill—repealed fixed direct payments and created new programs that provide benefits based on price or revenue targets for some crops, total direct Government payments remained relatively stable. From 2009 to 2018, payments ranged from a low of \$10.7 billion in 2014 to a high of \$14.7 billion in 2010. However, Government payments were \$22.7 billion in 2019. This increase was largely because of payments to help farmers in response to trade disruptions made through the 2019 Market Facilitation Program (MFP).

Cash farm-related income—which is non-commodity income from using farm sector assets and/or production inputs—averaged \$34.9 billion from 2009 to 2019. Insurance indemnities—or payments to producers for covered losses—are a component of farm-related income. Payments from Federal commodity insurance programs peaked in 2013 at \$16.3 billion following record payouts from the widespread 2012 drought. These payments may have reduced the need for ad hoc or supplemental disaster assistance that occurred in previous droughts. The 2014 Farm Bill provided new and continuing insurance products to protect farmers against losses. However, indemnity payments remained below their 2009–18 average until 2019 when widespread flooding across the U.S. contributed to a 62 percent increase in Federal commodity insurance indemnities relative to 2018. This increase partially offset the 2019 decline in cash receipts.

Conclusion

Net farm income is the difference between cash receipts (i.e., revenues) and expenses, and the levels of these are driven by various factors. Across 2009–19, farm income was highly volatile with large multiyear swings only surpassed by swings in the 1970s. Some volatility was exacerbated by drought conditions in 2012. Changes in foreign and domestic demand for U.S. agricultural commodities also contributed to income declines since 2012. The gains in NCFI in 2010 to 2012—when inflation adjusted—were not entirely wiped out by declines in 2013 to 2016. The increase in NCFI in 2019, mostly due to an increase in Government payments, put income above its 2009 level. Generally, trends in cash receipts—rather than changes in Government payments—drove most of the income trends. NCFI peaked in 2012 as cash receipts rose. Crop cash receipts peaked in 2012 while animal/animal product receipts peaked and surpassed crop receipts in 2014. Trends in cash production expenses tended to follow changes in cash receipts, with some influence from global energy markets.

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Chapter 2: Government Payments 2010–19: Changes in Programs and Importance to Farm Household Income

Jessica E. Todd and Dipak Subedi

Introduction

Although some Government programs aim to reallocate land use or protect resources, many programs help reduce price and yield risk that result in shocks to farm production beyond farmers' control and affect income received by farms and farm operator households. This chapter offers an overview of Government direct payment farm programs (Commodity or Title I, Conservation or Title II, and Miscellaneous or Title XII in the most recent Farm Bill) since 2010. This includes a description of how the types of programs offered and amounts received have changed over time as the structure of agriculture, international markets, and policy goals and objectives have also changed. Other titles of the Farm Bill that provide support to agricultural producers are not included in this analysis, such as trade (Title III), credit (Title V), research, extension and other services (Titles VII and IX), and crop insurance (Title XI).

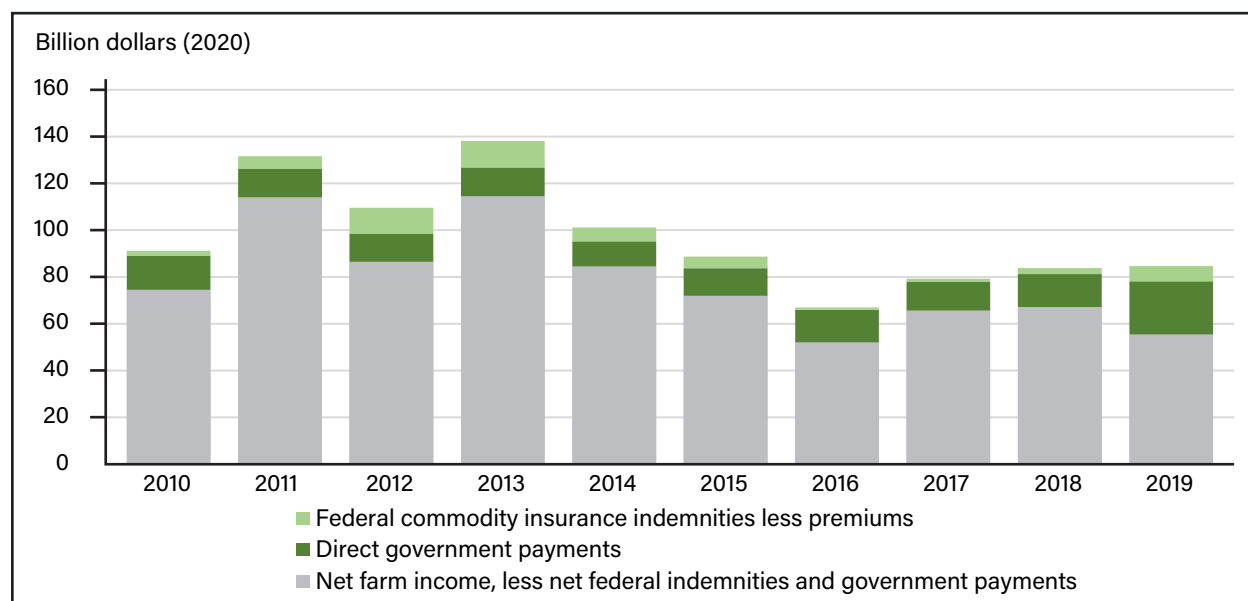
Because not all agricultural commodities or land types are covered by Title I, II, and XII farm programs, not all farmers are eligible to receive these payments. The payment amount individual farm program participants receive depends upon the types of programs available, whether a farmer meets participation guidelines and chooses to participate, and economic outcomes such as production, price, or income levels in any year. Between 2010 and 2018, total Government payments were as high as \$14.7 billion in 2010 to as little as \$10.8 billion in 2014 while total sector-level net farm income (NFI) ranged from a low of \$67 billion in 2016 to a high of \$131.6 billion in 2011 (Figure 2.1).⁸ In 2019, payments reached \$22.4 billion (in 2020 dollars) while total net farm income was \$85 billion. The ad hoc Market Facilitation Program (MFP) was implemented by USDA in 2018, and a second version was implemented in 2019. Both programs—developed to assist farmers in response to trade disruptions—constituted a large portion of Government payments in both years. Net indemnities from crop insurance, another component of farm income risk mitigation, generally made up a smaller share of NFI than Government payments this past decade. Not captured in these tabulations are subsidies for insurance premiums, about 60 percent of total premiums (see box, “Federal Crop Insurance”).

Administrative farm program data provide accurate information about total payments but do not allow one to explore the distribution of Government payments across different types of farms or farm households. In addition, administrative data do not contain information about farms and producers that do not receive payments. The Agricultural Resource Management Survey (ARMS) is unique in that it collects detailed farm-level characteristics as well as information about the primary producer's household, allowing comparison across farm and farm household types. Using farm-level data from ARMS, this chapter explores the distribution of payments to farms in different typology classifications, commodity specializations, and farm resource regions between 2010 and 2019. This analysis explores the changing distribution of payments and contribution to the primary producer's total household income as the types of programs offered responded to periodic changes in farm policy and the farm economy. We also explore how the distribution of MFP payments differs from all other programs.

⁸Net farm income (NFI) is different from net cash farm income (NCFI) referenced in other chapters of this report. NFI accounts for depreciation, inventory changes, and other nonmoney income and expenses, where NCFI does not.

Figure 2.1

Direct Government payments, net Federal insurance indemnities, and net farm income (NFI) less direct payments and net Federal insurance indemnities, 2010-19



Source: USDA, Economic Research Service Farm Income and Wealth Statistics as of December 2, 2020.

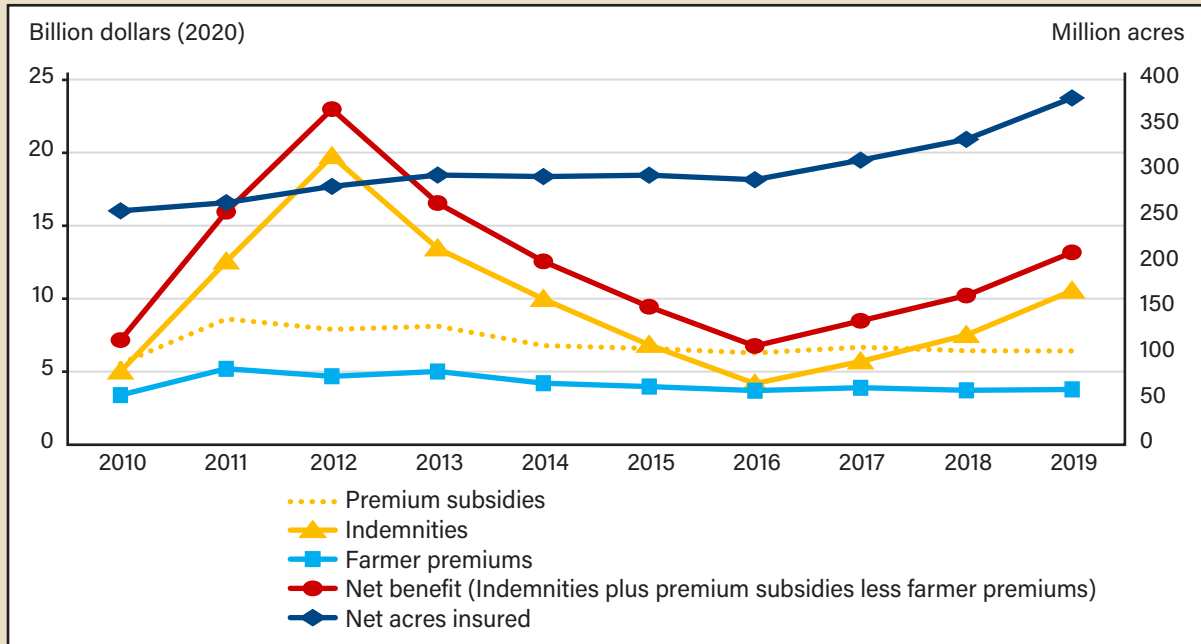
Federal Crop and Livestock Insurance

The Federal Crop Insurance Program (FCIP) is a permanently authorized program modified by provisions under Titles XI and XII of the Farm Bill. FCIP provides a variety of insurance products to U.S. producers, covering losses of yield, crop revenue, livestock price and margin, whole farm revenue, and other types of losses. The Federal Crop Insurance Corporation (FCIC) oversees the program, which is administered by the USDA Risk Management Agency (RMA). Private-sector insurance companies sell and service the policies. The FCIC approves and supports insurance products, including approving their premium rating bases. RMA administers the delivery of the policies by private insurers, including the collection of premiums and distribution of indemnities. RMA and private entities develop new crop insurance policy offerings on an ongoing basis, subject to FCIC approval.

The FCIP is permanently authorized under the Agricultural Adjustment Act of 1938 (7 U.S.C. § 1281) as amended by the Federal Crop Insurance Act of 1980 (7 U.S.C. § 1505). Each successive Farm Bill can modify specific provisions, such as authorizing legislation to update product offerings, directing action to develop new products, and making changes in how FCIP is administered. The 2014 Farm Bill mandated two new Title XI insurance products—the Supplemental Coverage Option (SCO) and the Stacked Income Protection Plan (STAX).

Over the past 10 years, the number of insured acres increased. While premiums declined slightly during times of lower commodity prices, premium subsidies—which vary across types of insurance policies—consistently averaged 62 to 63 percent. Indemnities varied, peaking in 2012 at nearly \$20 billion (in 2020 dollars). Although acres covered increased, the share of all farms—as measured by who reports paying premiums in ARMS—declined steadily from 20 percent in 2010 to about 14 percent in 2019. Consistent with that reported for 2015 by McFadden and Hoppe (2017), participation is greatest among large-scale producers and lowest among small farms, with declines in participation observed across family farms of all sizes and nonfamily farms.

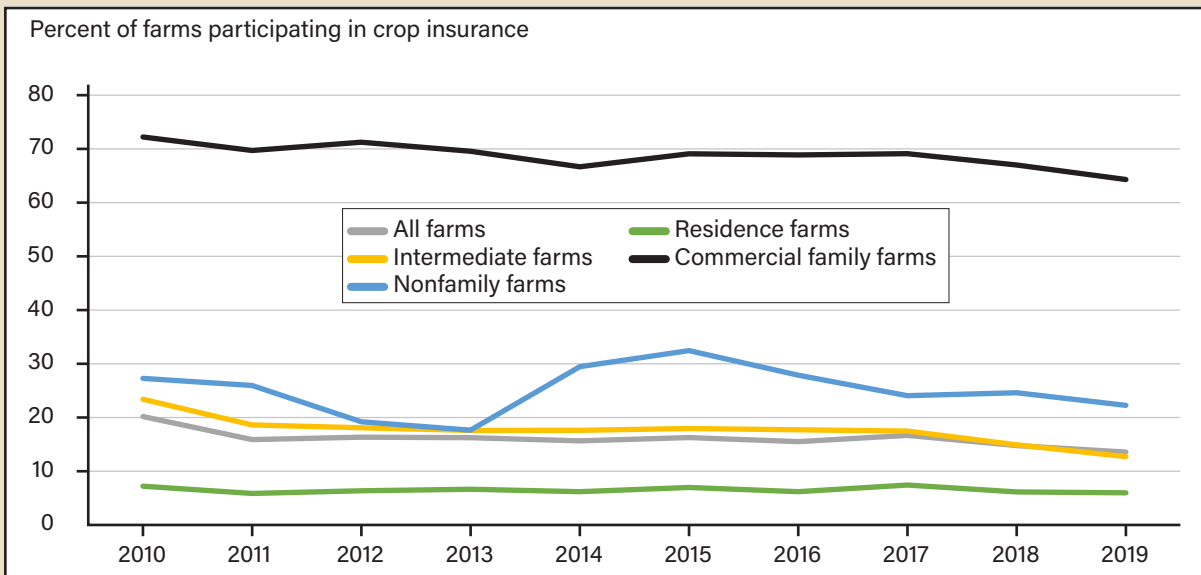
Acres covered by Federal Crop Insurance increased over the decade, while total premiums declined slightly, 2010-19



Notes: Premiums, subsidies, and indemnity payments are expressed in 2020 dollars using the gross domestic product (GDP) chain-type price index to adjust for price changes. Total premiums are the sum of farmer premiums and premium subsidies.

Source: USDA, Economic Research Service using data from USDA, Risk Management Agency, Federal Crop Insurance Corporation, Summary of Business Reports and Data, 2007-16 and 2017-20 (crop years to date).

The share of all farms that participate in Federal Crop and Livestock Insurance declined from 20 percent to 14 percent between 2010-19



Notes: Participants in Federal Crop and Livestock Insurance are defined as farms paying premiums. Residence farms are family farms with less than \$350,000 gross cash farm income (GCFI), and the principal producer reports having a main occupation other than farming; intermediate farms are family farms with less than \$350,000 GCFI, and the principal producer reports farming as their main occupation; commercial family farms have GCFI >= \$350,000. Nonfamily farms are those where the principal producer and their extended family do not own more than 50 percent of the farm's assets.

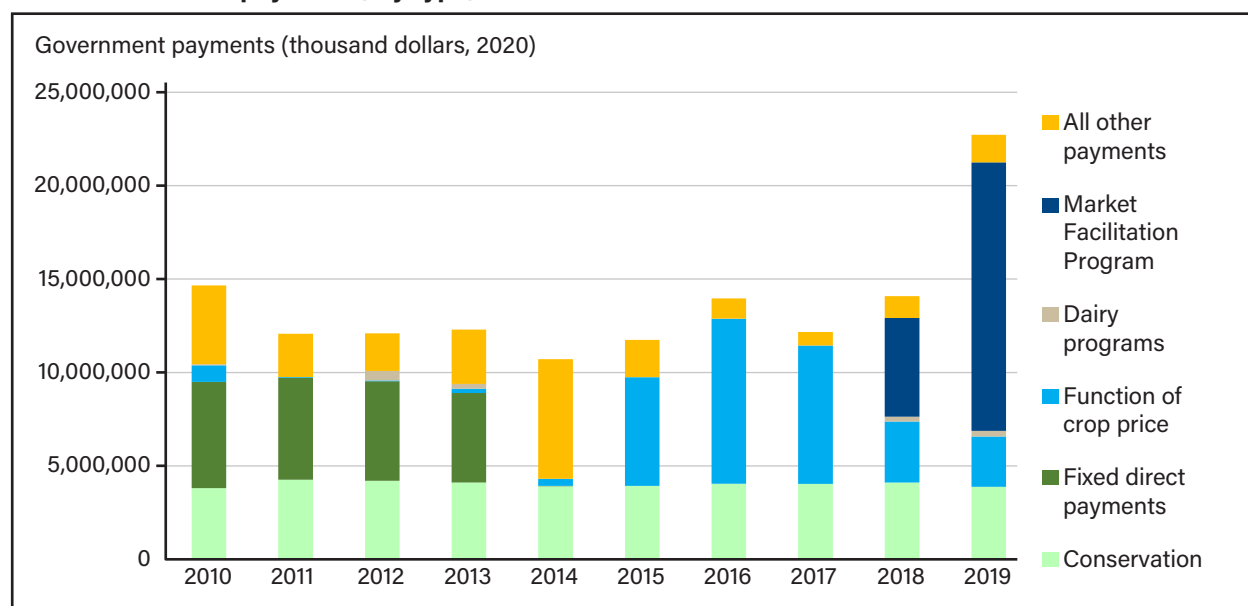
Source: USDA, Economic Research Service estimates using pooled 2010-14 and 2015-19 Agricultural Resource Management Survey data.

Government Payments by Program Type 2010–19

Many Government payment programs are available to producers. From 2010 to 2017, we aggregated these into three broad program groups: conservation programs, commodity programs, and all other programs. For 2018 and 2019, MFP is defined as a fourth category. As shown below, the primary crop commodity programs (based on historical base acres) transitioned from fixed payments early in the period to payments linked to crop prices or revenue. The two types are shown separately when summarizing the composition of Government payments each year using administrative data, but they are grouped as “commodity programs” when analyzed using ARMS data. The programs included in the “other programs” category varied by year (see box, “Categorization of Government Programs” for a list of programs in each group). With some exceptions, these aggregate groupings followed the organization used in McFadden and Hoppe (2017) that explored changes in the structure of Government payment programs between 1991 and 2015.⁹

Figure 2.2 shows that while conservation payments remained fairly constant over the past decade, a transition from fixed commodity payments to programs in which payment amounts are a function of prices started in 2015. In 2018 and 2019, a large share of payments was delivered through MFP, in which payments were a function of production (2018) and planted acres (2019). The amount of payments from other types of programs also decreased. In 2014, fixed commodity payments were phased out, and the new 2014 Farm Bill programs had yet to distribute payments.

Figure 2.2
Total Government payments, by type, 2010–19

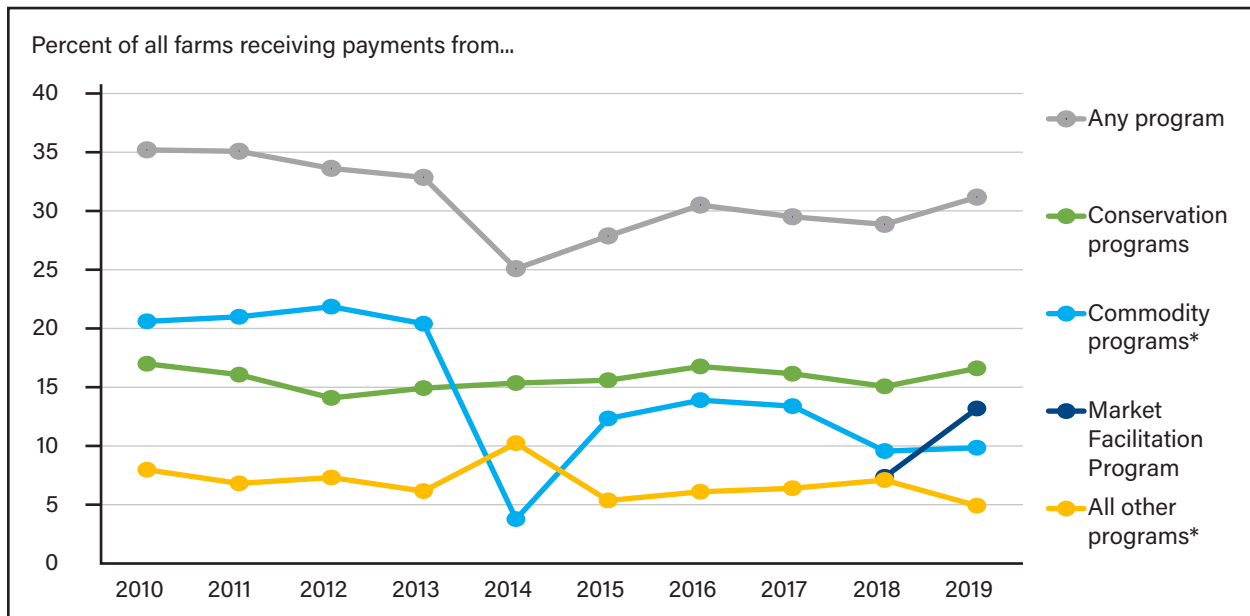


Source: USDA, Economic Research Service Farm Income and Wealth Statistics as of December 2, 2020.

⁹Two differences with our groupings compared with McFadden and Hoppe (2017) are that we put marketing loan payments with all other commodity payment programs, while they kept these payments as a separate category. In addition, we include dairy program payments with all other programs linked to commodity prices or revenues between 2015 and 2019. Data limitations prevent grouping dairy programs with other commodity programs in the ARMS data for earlier years.

In 2010, 35 percent of farms received some form of direct Government program payments (figure 2.3). The share of farms receiving payments under at least one program fell gradually each year through 2018, with 2014 and 2015 notably much lower at 25 and 28 percent, respectively. In 2018, 29 percent of farms received any direct payments, but in 2019, 31 percent reported receiving a payment from at least one program. The increase in the share of farms receiving payments in 2019 corresponded to an increase in the percent of farms receiving MFP payments, from 7 percent in 2018 to 13 percent in 2019.

Figure 2.3
Percent of farms receiving any direct Government payment, and percent by type of program, 2010-19



* Treatment of dairy programs vary. Milk Income Loss Coverage payments are included with all other payments and Margin Protection Program for Dairy and Dairy Margin Coverage are included in Commodity program payments.

Source: USDA, Economic Research Service estimates using 2010-19 Agricultural Resource Management Survey data.

Categorization of Government Programs

We define four groups for Federal Government Title I and II farm programs: conservation programs, programs tied to commodity prices or revenues (commodity programs), other programs, and—beginning in 2018—the Market Facilitation Program (MFP).

Conservation Programs

Conservation (Title II) programs include land-retirement programs, which aim to take environmentally sensitive land out of agricultural production, and working-land programs, which aim to increase the use of conservation practices on land used in production. The types of programs changed over the years and include the following:

- Conservation Reserve Program (CRP, since 1985);
- Conservation Reserve Enhancement Program (CREP, since 1996);
- Wetlands Reserve Program (WRP, from 1990 to 2014);
- Grassland Reserve Program (GRP, from 2002 to 2014);
- Farmland Protection Program (FPP, from 1996 to 2014)
- Agricultural Conservation Easement Program (ACEP, since 2014)—a consolidation of the WRP, GRP, and FPP;
- Emergency Forestry Conservation Reserve Program (EMCRP, from 2006 to 2014);
- Environmental Quality Incentives Program (EQIP, since 1996);
- Conservation Security Program (CSP, from 2002 to 2008);
- Conservation Stewardship Program (CSP, since 2008), which replaced the Conservation Security Program;
- Agricultural Management Assistance Program (AMAP, since 2000);
- Regional Conservation Partnership Program (RCPP, since 2014)—which consolidated the Agricultural Water Enhancement Program (AWEP, from 2002 to 2014, previously named Ground and Surface Water Conservation Program until 2008, some payments continued beyond 2014); Chesapeake Bay Watershed Program (CBWP, from 2008 to 2014); Cooperative Conservation Partnership Initiative (CCPI, from 2008 to 2014); and Great Lakes Basin Program (GLBP, since 2010);
- Wildlife Habitat Incentives Program (WHIP and WHIP+; since 1996)—folded into EQIP in 2014;
- Healthy Forest Reserve Program (HFRP, since 2002);
- Waterbank Program (since 2019)—this is different from the original Waterbank program (since 1971) that was folded into CRP in 1986; and
- Watershed Rehabilitation Program (WRP, since 1944).

Commodity Programs

Commodity programs include all Title I programs that target payment-eligible “base” acres¹ or support producers of specific commodities where supports are triggered by prices or revenues below a specific or formulaic reference point. Commodity programs include:

- Fixed payments (PFC/AMTA, from 1996 to 2001);
- Direct Counter-cyclical Payment (DCP, from 2002 to 2014);
- Counter-cyclical—Payments linked to crop prices:
 - Average Crop Revenue Election (ACRE; from 2009 to 2014);
 - Marketing Loan Assistance Program (LDPs and MLGs; since 1996, but as early as 1985/90 for some crops);
 - Price Loss Coverage (PLC, since 2014);
 - Agriculture Risk Coverage (ARC, since 2014);
 - Margin Protection Program for Dairy (from 2014 to 2018);
 - Milk Income Loss Contract (MILC, from 2002 to 2014);² and
 - Dairy Margin Coverage (since 2018).

Other Programs

Other programs include Title I programs targeted to livestock, dairy, and other producers (prior to 2015),³ and provide transition or disaster assistance or other short-term programs, which include:

- Disaster assistance programs (since 2008):
 - Livestock Forage Disaster Program (LFP);
 - Livestock Indemnity Program (LIP);
 - Emergency Assistance for Livestock, Honey Bees, and Farm-raised Fish (ELAP);
 - Tree Assistance Program (TAP);
- Ad hoc programs—various (excludes the Market Facilitation Program, which is described below);

¹Base acres are historical acreage entitlements enrolled with the USDA Farm Service Agency for purposes of participation in specified programs. Base acre entitlements derive from historical plantings of designated covered commodities—wheat, corn, grain sorghum, barley, oats, upland cotton, seed cotton, soybeans, other oilseeds (which include canola, flaxseed, mustard seed, rapeseed, safflower, sunflower seed, crambe, and sesame seed), long and medium grain rice, peanuts, small and large chickpeas, dry peas, and lentils—and do not require current production of the historically planted crops. The initial designation of historical base, including acres and payment yields on those acres, occurred under the 1996 Farm Bill and has been adjusted occasionally under succeeding Farm Bills. Soybeans, other oilseeds, and peanuts were added in 2002. Pulses (i.e., chickpeas, dry peas, and lentils) were added in 2008, and seed cotton was added in 2018.

²Due to how MILC program payments are reported in ARMS (lumped in with all other payments), MILC payments are not included in the commodity program payment aggregate from ARMS data.

³Although dairy program payments are linked to prices and revenues, ARMS did not collect the payments from these programs separately from the other programs included in this group between 2012 and 2014. As such, we are unable to separate them in these years.

- Cotton Transition Assistance Payments (CTAP, from 2015 to 17);
- Tobacco transition (from 2004 to 14);
- Milk Income Loss Contract (MILC, from 2002 to 2014);⁴ and
- Noninsured Assistance Program (NAP, since 2014).

Market Facilitation Program

The Market Facilitation Program (MFP) was authorized by President Trump and USDA Secretary Purdue (USDA, OCE, 2018) in 2018 in response to retaliatory trade actions by China and other major trade partners. It was designed to provide support to producers to adjust to trade disruptions. Although MFP was designed and implemented as an ad hoc program, we separated it from all other programs due to its size relative to other ad hoc and disaster assistance program payments. Although most 2018 benefits went to a subset of traditional program crop producers (including corn, soybeans, wheat, and sorghum), producers of hogs, shelled almonds, and fresh sweet cherries also received payments. The 2019 MFP version included more of other commodities, and payments were larger in aggregate (see USDA's damage analyses [USDA OCE, 2018; USDA OCE 2019] and Congressional Research Service, 2019, for a comparison of the two programs).

⁴This is a program linked to commodity prices and revenues but cannot be separated from all other program payments in ARMS, so this program is included in the total of all other program payments in this analysis.

Distribution of Payments Across Farm Types, Specializations, and Resource Regions

U.S. farms differ along many dimensions, including the scale of production, what they produce, and the characteristics of the operators. There are also differences in how payments are distributed among U.S. farms. This section explores these differences across ERS' farm typology, farm commodity specializations, and ERS Farm Resource Regions. The 10-year period between 2010 and 2019 is broken into two 5-year periods (2010–14 and 2015–19) for this part of the analysis, given that 2015 was the first year that payments from the new 2014 Farm Bill Title I programs were distributed.

Distribution of Payments Across ERS Farm Typology

ERS defines “family farms” as those in which the principal producer and their extended family own more than half of the farm’s assets. About 98 percent of all farms are classified as family farms. Family farms are further differentiated into three groups based on the principal producer and the farm’s level of production.¹⁰ Residence farms are defined as those with gross cash farm income (GCFI) less than \$350,000, and the principal producer’s main occupation is something other than farming. Intermediate farms also have GCFI below \$350,000, but the principal operator reports farming as their primary occupation. The remaining family farms with GCFI above \$350,000 are classified as commercial farms. Thus, our resulting definition consists of four categories: nonfamily, residence, intermediate, and commercial farms. During 2015–19, 55.3 percent of all farms were residence farms, producing 6.4 percent of the value of production; 34.4 percent were intermediate farms, accounting for 16.2 percent of production; 8.5 percent were commercial farms, accounting for 65.4 percent of production; and 1.8 percent were nonfamily farms, accounting for 11 percent of production (figure 2.4).

Among family farms, residence farms were the least likely to receive payments, whereas commercial family farms were most likely (figure 2.4), reflecting differences in scale of production and also the types of commodities produced. A smaller share of all family farm types received payments in 2015–19 compared with 2010–14, but the opposite is true among nonfamily farms. Correspondingly, nonfamily farms received a greater share of all payments in 2015–19 compared with 2010–14, and despite the decline in the share of commercial family farms getting payments, nonfamily farms saw an increase in the share of total payments received.

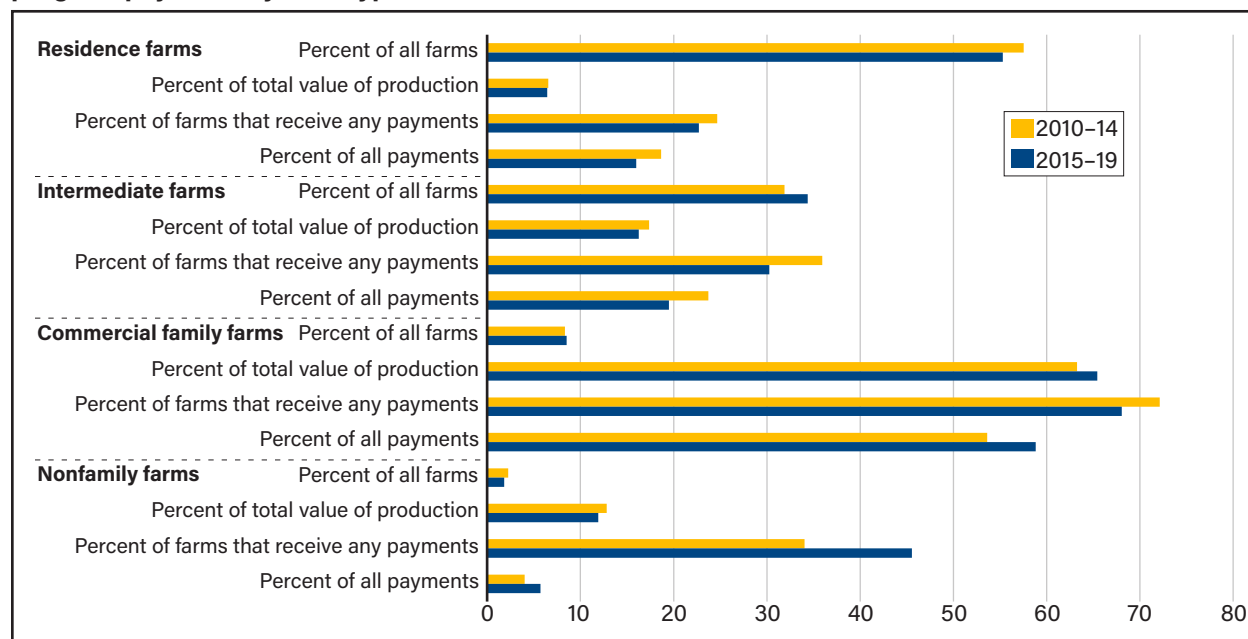
Relative to the share of total production, residence farms received nearly 3 times as much in payments (i.e., 6 percent of production versus 16 percent of all payments). Intermediate farms received nearly an equivalent share of all payments (i.e., 16 percent of production and 20 percent of all payments). This gap between production and payment shares among intermediate farms lessened between 2010–14 and 2015–19. In contrast, commercial family farms and nonfamily farms receive smaller shares of all payments than their shares of the value of production.

Exploring the distribution of payments by type of direct payment program reveals commercial family farms received the majority of all commodity payments, and their share has increased slightly over time (figure 2.5). Combined, residence, and intermediate farms received more than half of all conservation payments, the majority of which were from the Conservation Reserve Program for land retirement (Whitt et al., 2021), although the share received declined between 2010–14 and 2015–19. MFP payment distribution in 2018–19 was similar to the distribution of commodity program payments during 2015–19.

¹⁰This is a modified version of ERS’s collapsed farm typology (Hoppe and MacDonald, 2013), where nonfamily farms are separated rather than being grouped with larger family farms.

Figure 2.4

Distribution of farms, production, and Government payments, and percent of farms receiving any program payment, by farm type, 2010-19

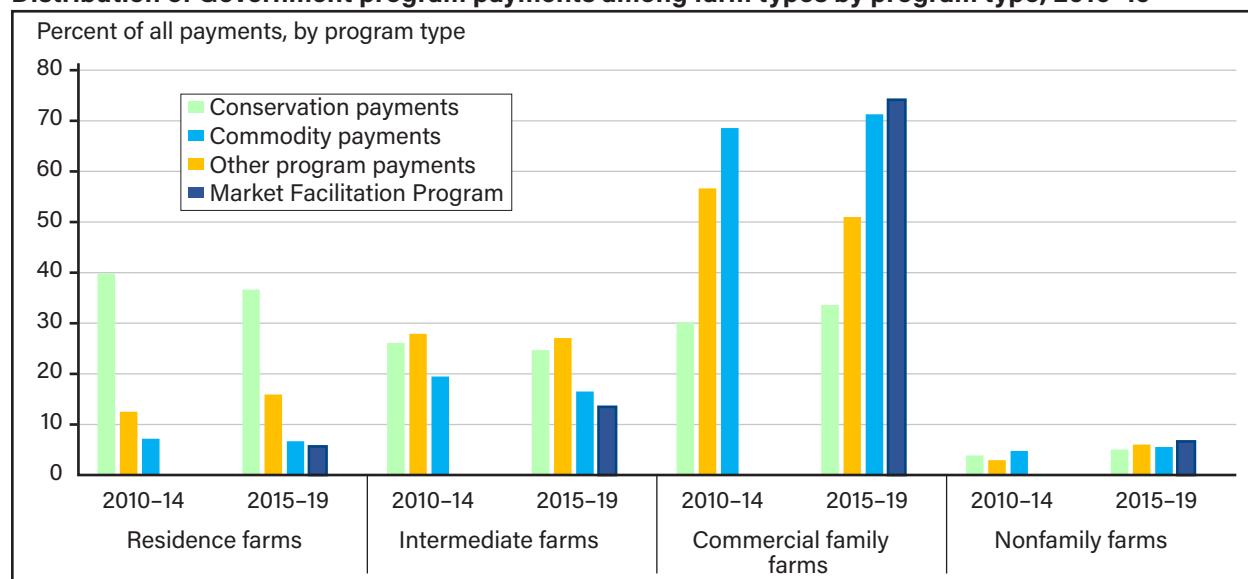


Note: Residence farms are family farms with less than \$350,000 gross cash farm income (GCFI), and the principal producer reports having a main occupation other than farming; intermediate farms are family farms with less than \$350,000 GCFI, and the principal producer reports farming as their main occupation; commercial family farms have GCFI >= \$350,000; and nonfamily farms are those where the principal producer and their extended family do not own more than 50 percent of the farm's assets.

Source: USDA, Economic Research Service estimates using pooled 2010-14 and 2015-19 Agricultural Resource Management Survey data.

Figure 2.5

Distribution of Government program payments among farm types by program type, 2010-19



Notes: Residence farms are family farms with less than \$350,000 gross cash farm income (GCFI), and the principal producer reports having a main occupation other than farming; intermediate farms are family farms with less than \$350,000 GCFI, and the principal producer reports farming as their main occupation; commercial family farms have GCFI >= \$350,000. Nonfamily farms are those where the principal producer and their extended family do not own more than 50 percent of the farm's assets.

Source: USDA, Economic Research Service using pooled 2010-14 and pooled 2015-19 Agricultural Resource Management Survey data.

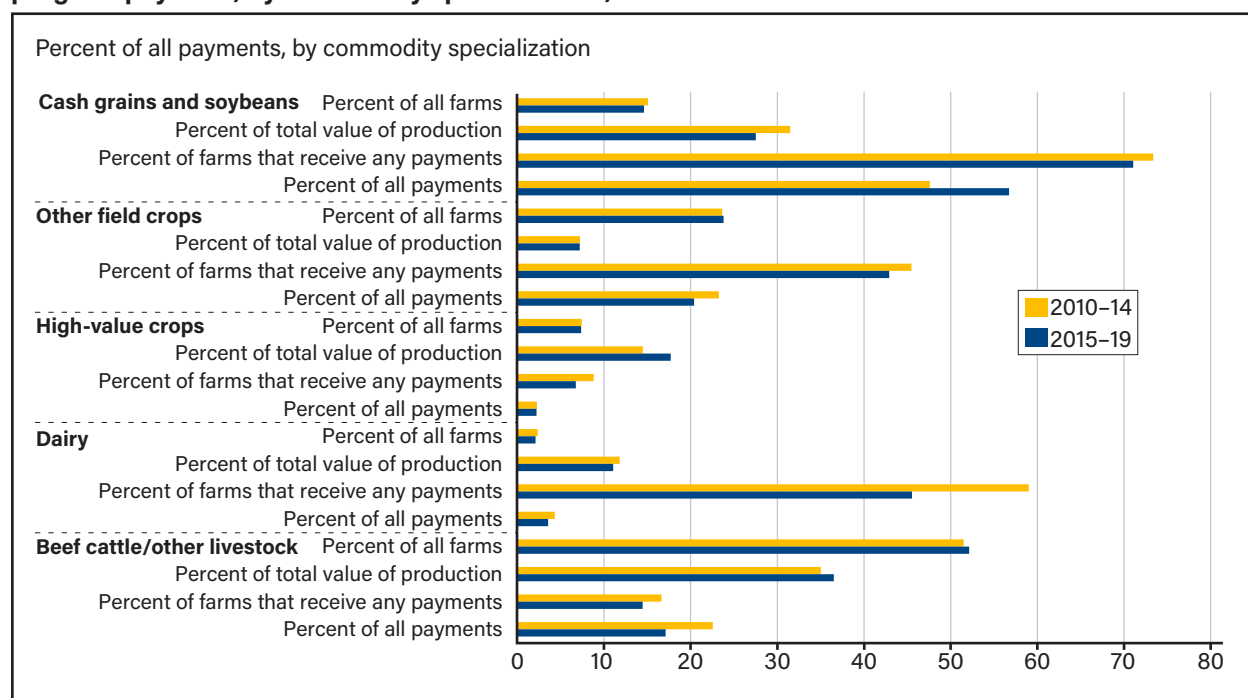
Distribution of Payments Across Commodity Specializations

Another way to compare receipt of payments is based on the commodity that makes up most of the value of production of the farm or the farm's specialization. We group farms into five categorical commodity specializations: cash grains and soybeans; other field crops; high-value crops; dairy; and beef cattle and other livestock (see box, "Commodity Specialization Groups"). Farms specializing in either cash grains, soybeans, or other field crops—commodities consistently eligible for programs—made up 38 percent of all farms and 35 percent of the value of production. These farms were the most likely to receive Government payments in 2015–19. Notably, 71 percent of cash grain and soybean farms received Government payments, while 43 percent of farms specializing in other field crops received Government payments in 2015–19 (figure 2.6). In contrast, farms specializing in high-value crops contributed 18 percent of the total value of production and received 2 percent of all payments, reflecting the fact that not many programs included in this analysis are targeted to high-value crops. All five specialization groups saw a decline in the share of farms that received payments between 2010–14 and 2015–19. Cash grain and soybean farms showed a decline in the overall share of value of production across the time periods but an increase in the share of payments.

Farms specializing in field crops—other than cash grains and soybeans—received the largest share of conservation payments at 42 percent in 2015–19, although this was down from 45 percent in 2010–14 (figure 2.7). Cash grain and soybean farms received the largest share of commodity program payments (71 percent) in both periods. This is consistent with the fact that these programs are targeted largely to producers who operate base acres for these crops. MFP payments were distributed to the same categories of farms that received commodity program payments, but farms specializing in cash grains and soybeans received an even larger share (78 percent), while all other farms received a smaller share compared with their share of commodity payments during 2015–19.

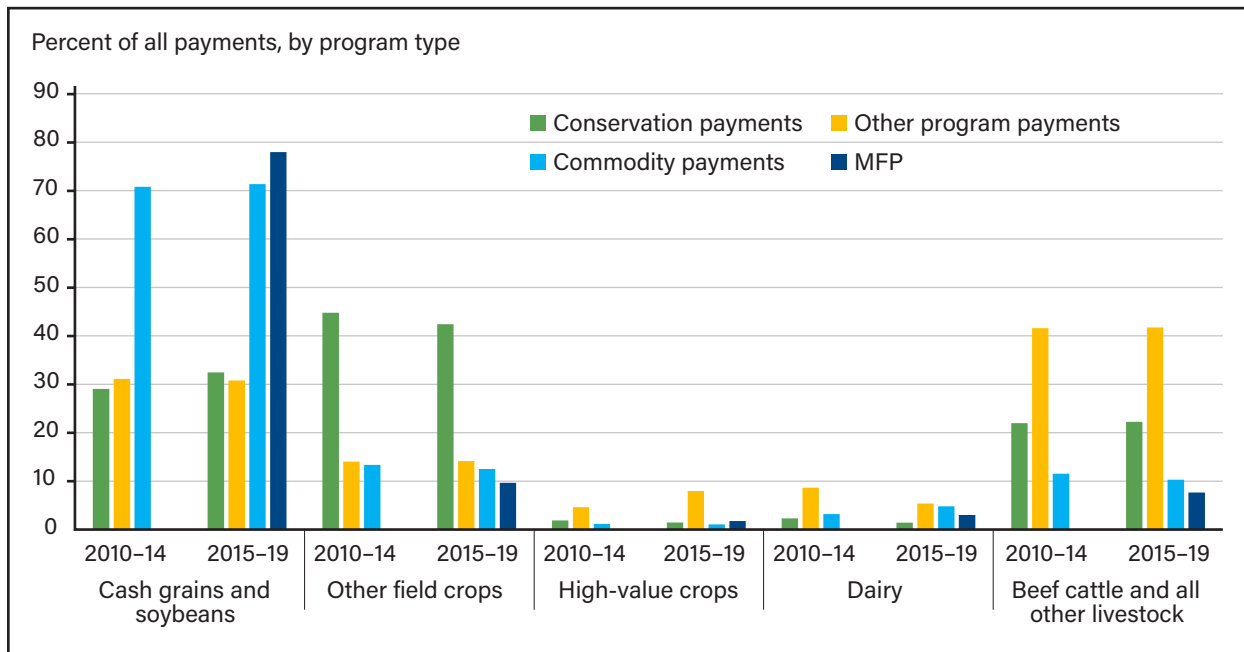
Figure 2.6

Distribution of farms, production, and Government payments, and percent of farms receiving any program payment, by commodity specialization, 2010–19



Note: Specializations are defined in box, "Commodity Specialization Groups." High-value crops includes fruit, tree nuts, vegetables, greenhouse, and nursery crops.

Figure 2.7
**Distribution of Government program payments across commodity specializations,
 by program type, 2010-19**



Notes: MFP = Market Facilitation Program. Specializations are defined in box, "Commodity Specialization Groups." High-value crops includes fruit, tree nuts, vegetables, greenhouse, and nursery crops.

Source: USDA, Economic Research Service using pooled 2010-14 and pooled 2015-19 Agricultural Resource Management Survey data.

Commodity Specialization Groups

A farm's specialization is based on the commodity or group of commodities that comprise at least 50 percent of the farm's total value of agricultural production. With the Agricultural Resource Management Survey data, it is possible to classify farms into 15 specializations, as well as 3 categories where no commodity is dominant (see table). For this analysis, we aggregated the 18 specializations into 5 groups.

Farm specializations and aggregation groups for analysis

Farm specialization	Aggregation group
Corn	Cash grains and soybeans
Grain sorghum	
Soybeans	
Wheat	
Other/mixed cash grains	
Rice	Other field crops
Tobacco	
Cotton	
Peanuts	
Other/mixed field crops	High-value crops
Fruit and tree nuts	
Vegetables	
Nursery and greenhouse	Dairy
Dairy	
Beef cattle	Beef cattle and other livestock
Hogs	
Poultry	
Other/mixed livestock	

Source: USDA, Economic Research Service.

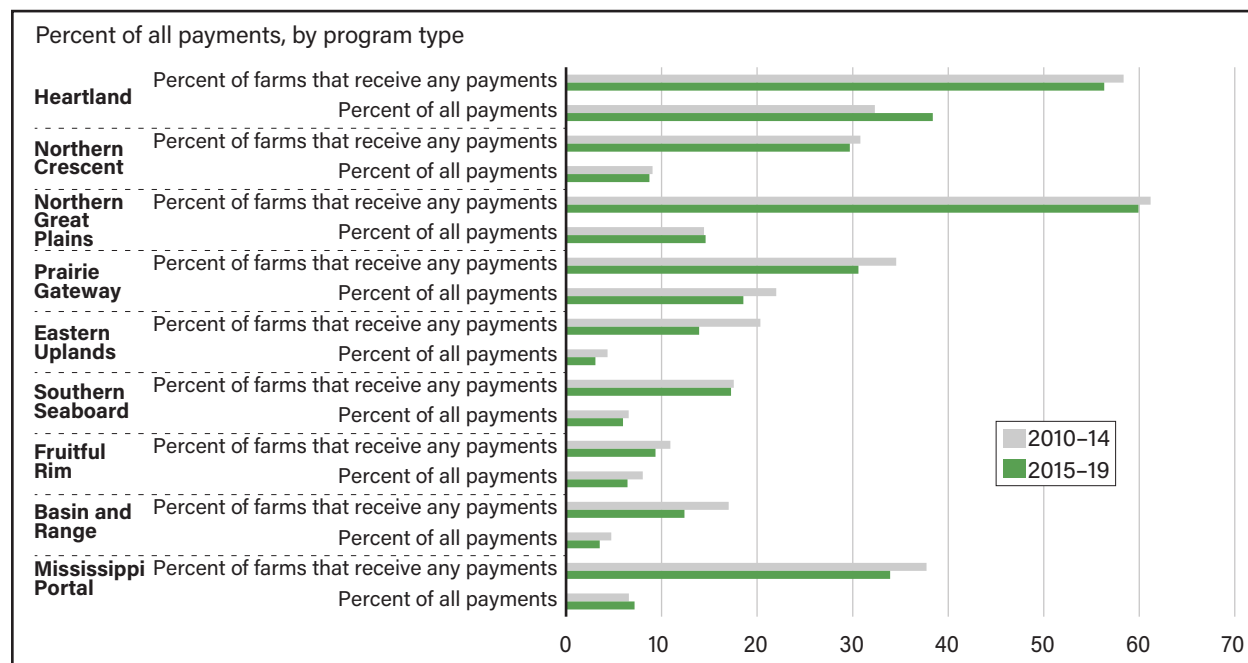
Distribution of Payments Across ERS Farm Resource Regions

Farms were also grouped by ERS Farm Resource Regions (see box, “ERS Farm Resource Regions”). Changes in receipt of Government payments across Farm Resource Regions reflected changes across specializations to some extent as specializations tend to be geographically concentrated. Farms in the Northern Great Plains were the most likely to receive any type of payment, followed by those in the Heartland region, which is consistent with the regions’ greater share of production of cash grains and soybeans, and other field crops (figure 2.8). Consistent with decreased participation in direct payment programs overall, each region experienced a decline in the share of farms receiving payments between 2010–14 and 2015–19. Although farms in the Heartland region received a greater share of payments—consistent with the increased share among cash grain and soybean farms—the rest of the regions saw a decline or no change in the share of payments received.

Farms in the Heartland region received the greatest share of conservation and commodity program payments in 2015–19 (33 and 38 percent, respectively), and these shares reflect an increase relative to 2010–14 (figure 2.9). Farms in the Heartland also received the greatest share of MFP payments (49 percent), corresponding to their greater share of production of crops targeted by the program.

Figure 2.8

Distribution of Government payments, and percent of farms receiving any program payment, by ERS Farm Resource Region, 2010-19

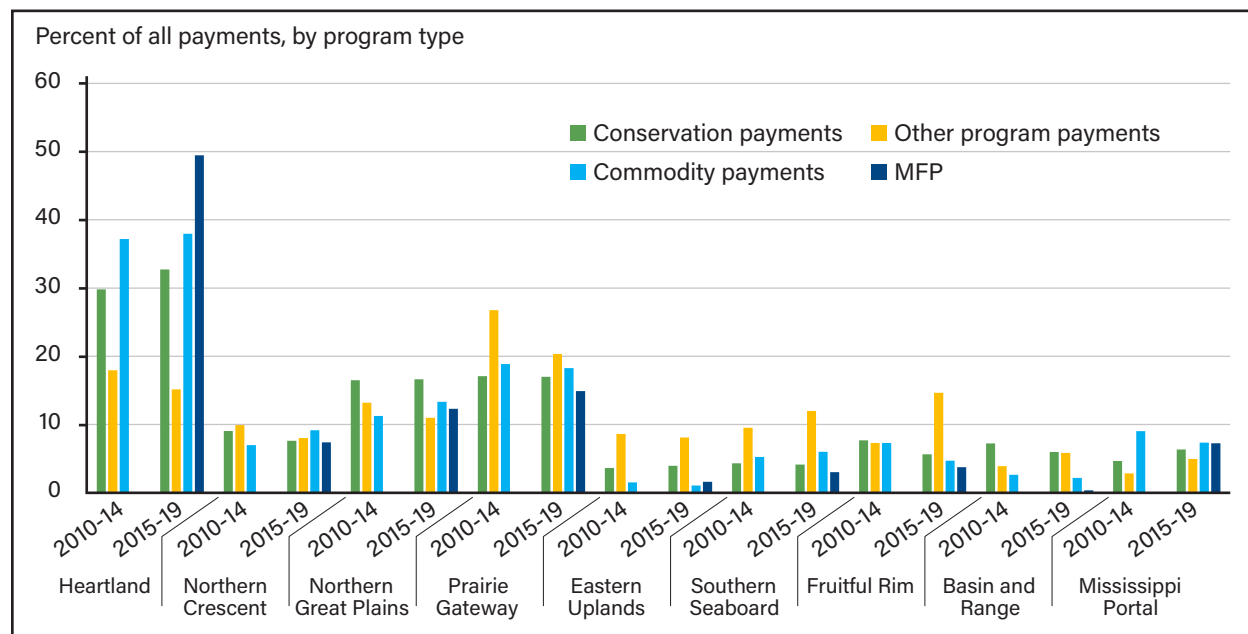


Note: Farm Resource Regions defined in box, "USDA, ERS Farm Resource Regions."

Source: USDA, Economic Research Service using pooled 2010-14 and pooled 2015-19 Agricultural Resource Management Survey data.

Figure 2.9

Distribution of Government program payments among ERS Farm Resource Regions by program type, 2010-19



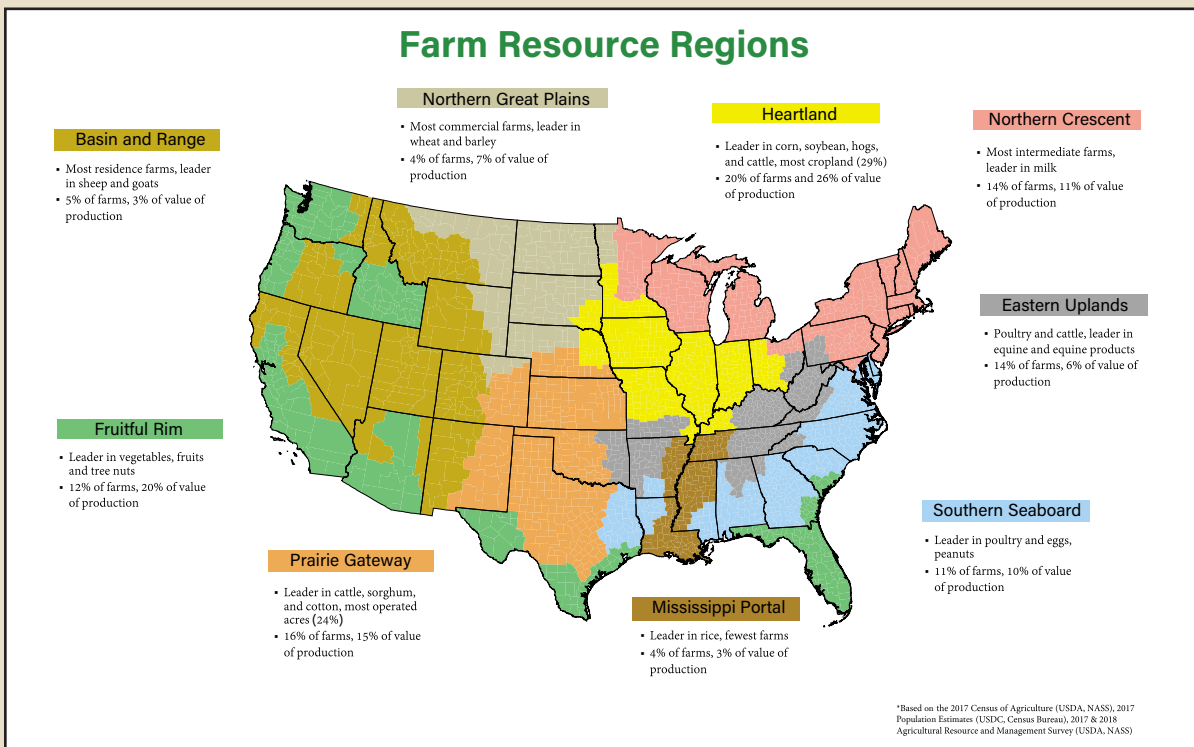
Notes: Farm Resource Regions defined in box, "USDA, ERS Farm Resource Regions." MFP = Market Facilitation Program.

Source: USDA, Economic Research Service using pooled 2010-14 and pooled 2015-19 Agricultural Resource Management Survey data.

USDA, ERS Farm Resource Regions

The ERS Farm Resource Regions were first defined in 2000 based on county-level farm, land, and soil characteristics from the 1970s to early 1990s (USDA, ERS, 2000). These Farm Resource Regions improved upon USDA's Farm Production Regions by illustrating that boundaries of Farm Resource Regions are not limited to State boundaries. This map provides characteristics of each region using data from the 2017 Census of Agriculture and the 2017–18 Agricultural Resource Management Survey (ARMS). The Northern Great Plains, Heartland, and Prairie Gateway regions lead production in various cash grains and, combined, contribute more than half of the value of production in the United States. The Northern Crescent leads in dairy production and has the most intermediate farms. The Eastern Uplands specializes in livestock production (e.g., poultry and cattle) across a relatively large number of small-production farms. The Basin and Range region also specializes in livestock (e.g., sheep and goats) and has the greatest number of residence farms. The Fruitful Rim specializes in vegetables, fruits, and tree nuts, and its contribution to production is greater than the share of all farms located in the region. The Southern Seaboard leads production in poultry, eggs, and peanuts, whereas the Mississippi Portal leads production in rice.

USDA, ERS Farm Resource Regions, 2017 characteristics



Source: USDA, Economic Research Service.

The table reports the percent of all farms and the value of production between 2010–14 and 2015–19 in each of these regions. Changes over the two periods were relatively small. The change in the share of all farms was largest in the Basin and Range Region, increasing from 4.9 to 5.6 percent between 2010–14 and 2015–19, respectively. The regions that saw a decline in their share of the total value of production in 2015–19 compared with 2010–14 were the Heartland, Eastern Uplands, Southern Seaboard, and Mississippi Portal regions.

Percent of farms and value of production by ERS Farm Resource Region, 2010–19

		2010-14	2015-19
Heartland	percent of all farms	20.3	20.4
	percent of total value of production	28.0	26.5
Northern Crescent	percent of all farms	14.3	13.7
	percent of total value of production	11.3	11.4
Northern Great Plains	percent of all farms	4.5	4.3
	percent of total value of production	6.8	7.2
Prairie Gateway	percent of all farms	14.2	14.4
	percent of total value of production	13.1	14.7
Eastern Uplands	percent of all farms	14.7	14.9
	percent of total value of production	5.2	5.0
Southern Seaboard	percent of all farms	11.5	11.5
	percent of total value of production	9.1	8.8
Fruitful Rim	percent of all farms	12.0	11.8
	percent of total value of production	20.0	20.1
Basin and Range	percent of all farms	4.9	5.6
	percent of total value of production	2.8	3.2
Mississippi Portal	percent of all farms	3.7	3.3
	percent of total value of production	3.6	3.1

Source: USDA, Economic Research Service estimates using pooled 2010–14 and 2015–19 Agricultural Resource Management Survey data.

Underreporting of Program Payment Receipt

One limitation of Government payment information in the Agricultural Resource Management Survey (ARMS) is that not all payments are reported by respondents. Underreporting of program participation is a common feature of survey data, but the level of underreporting can vary across program types and even over time. We estimated underreporting of Government payments in ARMS between 2010 and 2019 by comparing the total reported (i.e., the weighted sum of each farm's report) to the administrative totals in ERS's Farm Income and Wealth Statistics (FIWS) data product. The administrative totals reported in the FIWS data aim to provide calendar-year administrative totals, which is consistent with the reference period for amounts reported in ARMS.

McFadden and Hoppe (2017) estimated that between 1996 and 2015, ARMS captured about 76 percent of the Government payments administrative totals. We found a similar rate of reporting, with underreporting (relative to administrative data) more common than overreporting (see table). On average, payments made to operators capture between 73 percent (in 2016) and 81 percent (in 2012) of all Government payments. Some underreporting of Government payments is also likely because the ARMS survey frame excludes non-operator landlords. Including estimated payments to landlords (only collected during 2010–12 within this study period) increased the rate of capture by about 5 to 6 percentage points, indicating that some payments remained unreported. Additionally, although the survey aimed to capture all payments received by the operation, the respondent may not know (or report) payments received by all of the operators involved in the operation.

The rate of underreporting varied over time and across types of programs. For example, underreporting of commodity programs was much lower than conservation and other programs during 2010–13, ranging from 6 to 14 percent, as compared with 21 to 34 percent for conservation programs and 18 to 51 percent for other programs (see table “Percent of Government payments captured by ARMS, by year and average over period, 2010–19”). However, during 2015–18, underreporting of commodity programs ranged from 17 to 38 percent, while conservation payments ranged from 16 to 29 percent. In 2014, commodity program payments were overreported. Administrative data indicated there were very few commodity program payments that year as the 2014 Farm Bill payments had not yet begun, and programs from earlier bills were phased out. Even though efforts were taken to align administrative data to calendar year reporting in ARMS, some inconsistencies in the timing of reporting of payments may still exist. This—paired with the relatively small amount of commodity payments in 2014—may, in part, explain the overreporting observed.

Other program payments were overreported between 2016 and 2019. This may be due to respondent error and because ARMS asked respondents to report other Federal program payments, as well as State or local program payments together. Thus, the total of these other programs could exceed the Federal amount. In 2019, commodity payments were also slightly overreported. In contrast, MFP payments were reported at a lower rate than all other programs—at 64 and 59 percent in 2018 and 2019, respectively. Respondents may have included MFP payments when reporting other program payments, rather than alone as the survey requested.

Over the whole 2010–19 period, 24 percent of all Government payments were not reported. This includes 25 percent of conservation payments, 19 percent of commodity payments, 21 percent of all other program payments, and 40 percent of Market Facilitation Program (MFP) payments not reported by ARMS respondents.

Percent of Government payments captured by ARMS, by year and average over period, 2010-19

	Percent of administrative total payments captured by payments to operators collected in ARMS					Percent of administrative total payments captured by payments to operators + payments to landlords
	Total payments to operators	Conservation program payments	Commodity program payments	Other program payments	MFP payments	
2010	74.3	78.6	88.5	48.6		79.2
2011	76.9	69.7	85.6	69.6		82.5
2012	80.9	68.6	90.0	81.7		85.9
2013	75.5	65.7	93.7	59.2		
2014	79.8	81.9	176.2	72.5		
2015	79.4	74.3	83.0	78.9		
2016	72.9	83.8	61.9	121.8		
2017	75.0	77.7	64.1	171.7		
2018	76.1	71.3	80.3	132.6	64.4	
2019	71.3	80.7	103.2	105.2	58.6	
2010-19	75.6	75.2	80.9	78.5	60.2	

Notes: ARMS = Agricultural Resource Management Survey. Dairy program payments were included with "other programs" for 2010-14 and with commodity programs for 2015-19. Starting in 2013, payments made to landlords were no longer collected. Values less than 100 indicate totals estimated from ARMS data are less than administrative totals, and values greater than 100 indicate ARMS estimates are higher than administrative totals. MFP = Market Facilitation Program.

Source: USDA, Economic Research Service Farm Income and Wealth Statistics as of December 2, 2020; and USDA, Economic Research Service estimates using 2010-19 ARMS data.

Government Payments in Relation to Total Farm Household Income

Most farm households earn very little cash income from farming. In fact, most farm households do not “break even” or earn positive income from farming. Between 2010 and 2019, the share of farm households with positive farm income ranged from a low of 37 percent in 2011 to as high as 51 percent in 2019 (figure 2.10). Overall, Government payments make up a small share (between 2 and 5 percent between 2010 and 2019) of the total income among farm households (table 2.1). However, Government payments contributed between 7 and 12 percent of total household income during 2010–18, and they contributed nearly 16 percent to total household income in 2019, for those that received payments.

Table 2.1

Government payments received by farm households relative to total cash income of farm households, 2010–19

	All farm households	Farm households receiving Government payments
	<i>Percent of total household income from Government payments</i>	
2010	4.1	9.9
2011	3.6	8.2
2012	3.0	6.9
2013	2.7	6.5
2014	2.4	8.6
2015	2.9	9.3
2016	3.3	9.9
2017	3.1	8.6
2018	3.7	11.5
2019	5.2	15.7

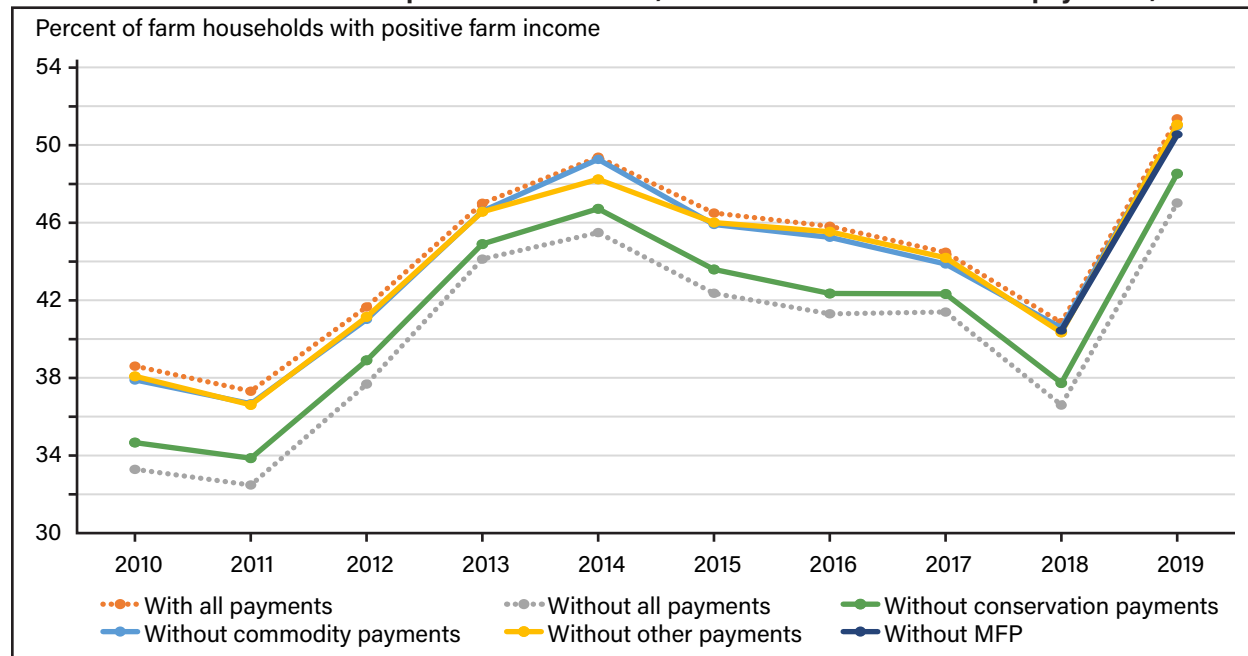
Note: Percent calculated as the weighted sum of all Government payments received by farm households divided by weighted sum of total household income times 100.

Source: USDA, Economic Research Service using 2010-19 Agricultural Resource Management Survey data.

We further explored the contribution of Government payments by estimating how farm income and total household income might change in the absence of payments between 2010 and 2019. Government payments received by the farm business were subtracted from the household's farm income in proportion to their share of the farm's income. This approach does not account for how farm production decisions, risk management decisions, or land rental costs (Kirwan and Roberts, 2016) might change in the absence of Government programs. As such, the estimated changes in household income in the absence of Government payments are likely an upper bound.¹¹ At most, the share of farm households with positive farm income could decline by as much as 3 to 5 percentage points when all Government payments are excluded, depending on the year (figure 10). Subtracting only conservation payments, more of which are received by farms near the break-even point, could reduce the share of households with positive income by 2 to 4 percentage points. Removing only commodity payments, which are more likely to be received by farms at the top and bottom of the distribution of farm income, reduces the share by less than 1 percent each year. Removing MFP payments reduces the share of households with positive farm income by 0.4 percentage point in 2018 and by 0.8 percentage point in 2019.

Figure 2.10

Percent of farm households with positive farm income, with and without Government payments, 2010-19



Notes: Government payments distributed to the farm business are subtracted from the farm income to the household, in proportion to the share of the farm business's income the household received. No adjustment is made when the household receives a dividend from a C-corporation, which is between 1.1 and 1.6 percent of households, depending on the year. MFP = Market Facilitation Program.

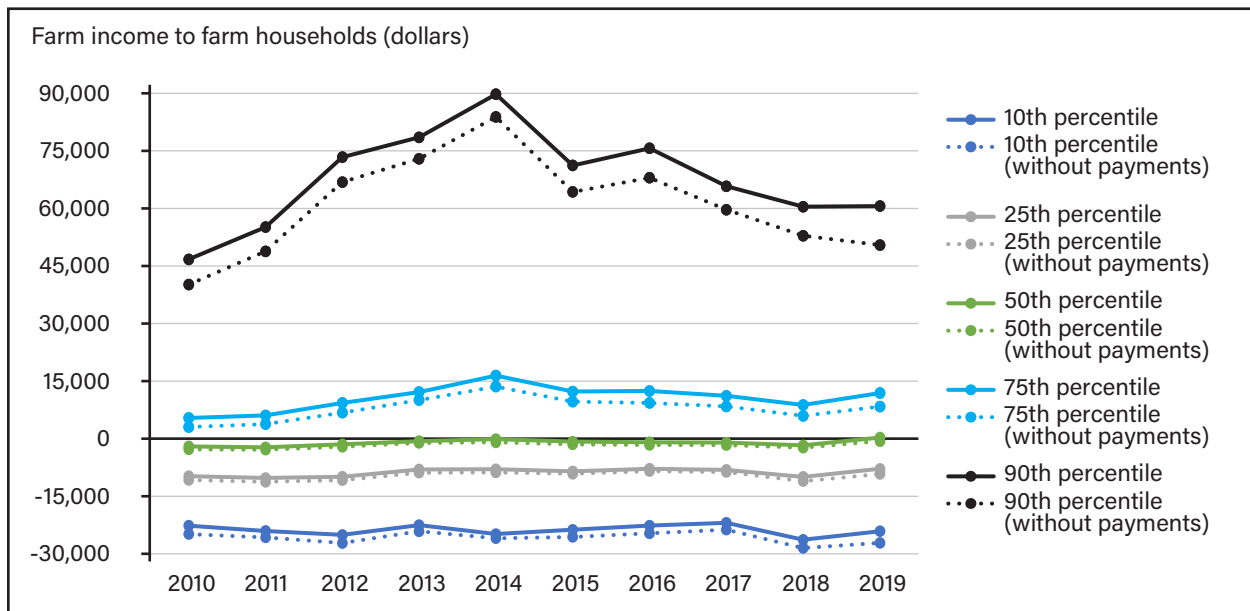
Source: USDA, Economic Research Service using 2010-19 Agricultural Resource Management Survey data.

¹¹Since the ARMS survey does not collect information about how a C-corporation determines how much to pay out in salary or dividends to the operator, we do not know how this income would be adjusted if Government payments changed. As such, we do not make any adjustment to the farm household's farm income when the farm is organized as a C-corporation, and the farm household receives a dividend or salary from the business.

We also explored how household farm income might change at various points in the distribution of household farm income. Specifically, we estimated the 10th, 25th, 50th (the median), 75th, and 90th percentiles before and after Government payments were excluded (figure 2.11). Although shifts in income levels were greatest at the upper end of the distribution, they were largest in percentage terms at the median and 75th percentiles. Excluding Government payments reduced estimated household income from farming at the 10th, 25th, and 90th percentiles by 4 to 17 percent, while the reduction at the 75th percentile is between 17 and 44 percent. The reduction at the median was ranged from 27 to 95 percent between 2010 and 2018, in part due to the small level of farm income at the median. In 2019, the median farm income was estimated to be negative without Government payments (as in 2010–18 with payments) but positive with payments.

Figure 2.11

Income from farming for farm households at the 10th, 25th, 50th, 75th, and 90th percentiles, with and without Government payments, 2010–19



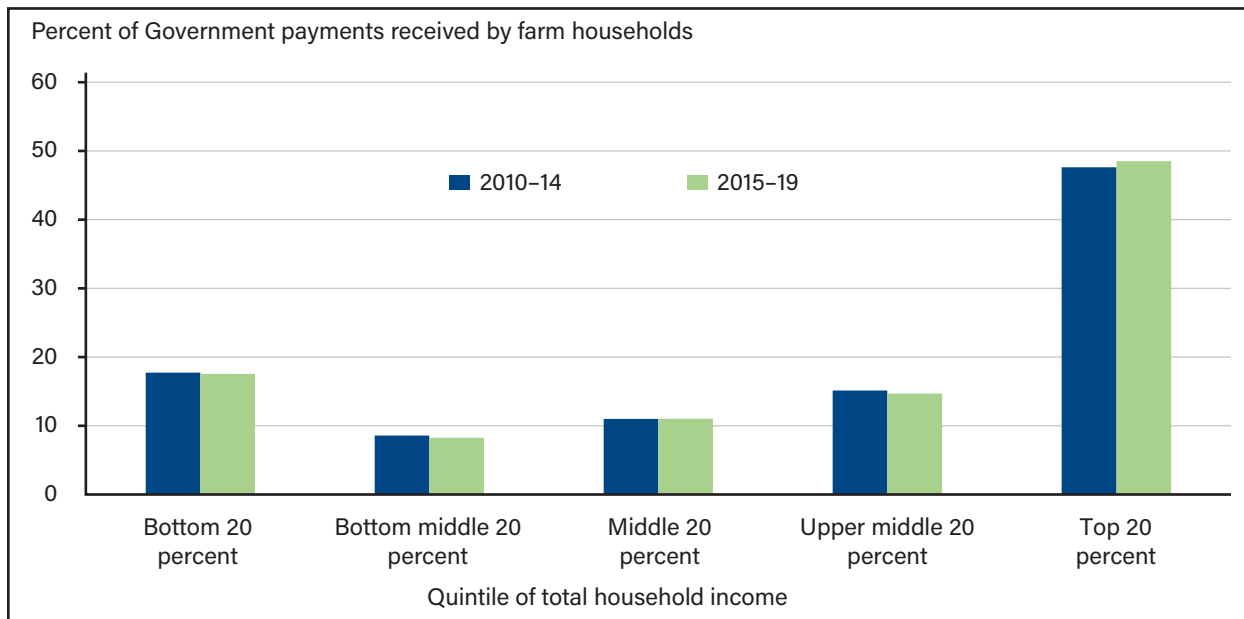
Notes: Government payments distributed to the farm business are subtracted from the farm income to the household, in proportion to the share of the farm business' income the household received. No adjustment is made when the household receives a dividend from a C-corporation, which is between 1.1 and 1.6 percent of households, depending on the year.

Source: USDA, Economic Research Service using 2010–19 Agricultural Resource Management Survey data.

Off-farm income makes up the majority of total income for most farm households. As such, it also makes sense to explore how Government payments were distributed across the distribution of total household income. Farm households in the top 20 percent of total household income received nearly half (48 percent) of all Government payments in 2015–19 (figure 2.12). Households in the bottom 20 percent received 18 percent of all payments, whereas the remainder of payments went to the middle three quintiles (9, 11, and 15 percent, respectively). Only minor changes in these shares occurred between 2010–14 and 2015–19, with the top quintile of households receiving a slightly larger share of payments and households in the second-lowest quintile receiving less.

Figure 2.12

Percent of all Government payments received, by quintiles of total household income, farm households, 2010–19

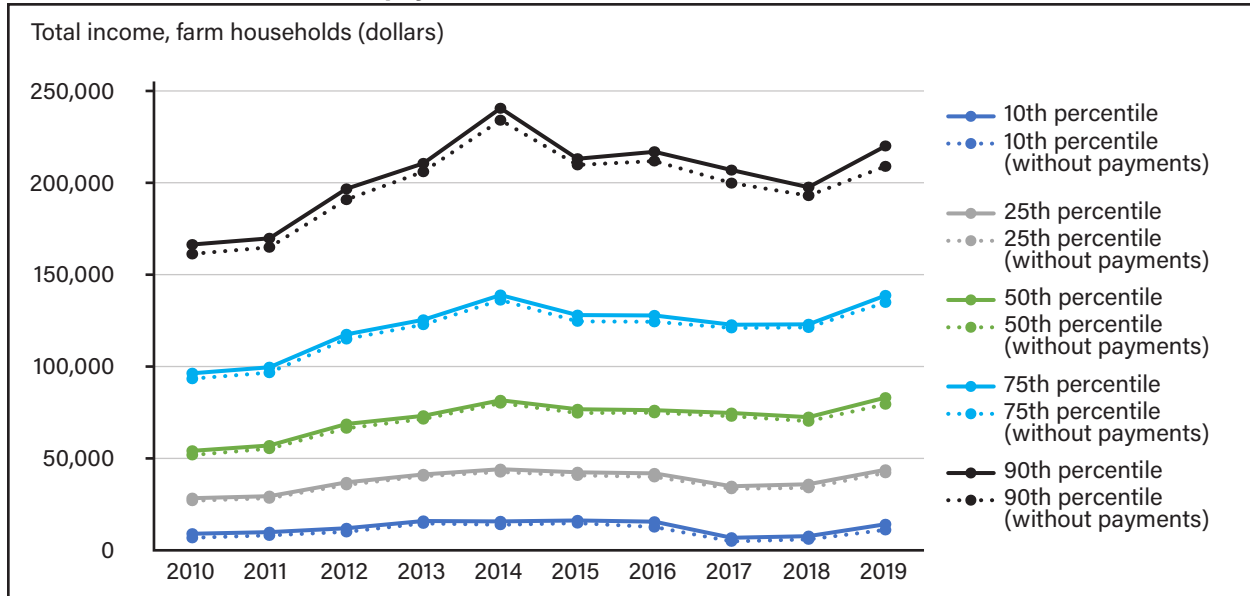


Source: USDA, Economic Research Service using pooled 2010–14 and 2015–19 Agricultural Resource Management Survey data.

Similar to the analysis of farm income, we compared total household income, including and excluding Government payments at the 10th, 25th, 50th, 75th, and 90th percentiles (figure 2.13). Despite the large share of payments received at the upper end of the distribution of total household income, subtracting Government payments from the household's farm income shifted the distribution of total household income very little. Although the changes in income levels were greater at the upper end of the distribution, the percentage changes were greatest at the 10th percentile. Excluding Government payments reduced the estimate of total household income at the 10th percentile between 9 and 29 percent from 2010 to 2019, whereas shifts at the other points in the distribution ranged between 1 and 5 percent.

Figure 2.13

Total household income among farm households at the 10th, 25th, 50th, 75th, and 90th percentiles, with and without Government payments, 2010-19



Notes: Government payments distributed to the farm business are subtracted from the farm income to the household, in proportion to the share of the farm business' income the household received. No adjustment is made when the household receives a dividend from a C-corporation, which is between 1.1 and 1.6 percent of households, depending on the year.

Source: USDA, Economic Research Service using 2010-19 Agricultural Resource Management Survey data.

Conclusion

The amount and composition of direct Government payments to agricultural producers vary over time, reflecting changes in the types of programs offered and changes in the farm economy that trigger safety net payments. Between 2010 and 2018, total payments ranged from as much as \$14.7 billion in 2010 to as little as \$10.8 billion in 2014, while 2019's total payments reached \$22.4 billion (in 2020 dollars). During the 10-year period examined, assistance for program commodities transitioned from payments that were primarily fixed to counter-cyclical payments; 2014 marked the transition between these two program structures for commodities with less than \$400,000 paid to program commodities. In 2018, MFP began to offset trade disruptions, and soybean producers received most of the initial payments. USDA modified the program during the year to include more commodities, and again in 2019 regarding commodities and payment rates.

Payment distribution was broader at the beginning of the decade. The share of farms receiving payments declined from 35 to 29 percent between 2010 and 2018, rising slightly in 2019 to 31 percent of farms under the 2019 MFP program. The share of farms receiving conservation payments held relatively constant between 14 and 17 percent between 2010 and 2019, whereas the share receiving commodity program payments fell from 21 to 10 percent. MFP payments went to 7 percent of farms in 2018 and 13 percent in 2019. Although program participation was low overall, farms that were responsible for most agricultural production had high participation. Less than 10 percent of farms are family farms with GCFI greater than \$350,000; these farms produced over 60 percent of agricultural production and received over 50 percent of all direct payments. As their contribution to total production increased between 2010–14 and 2015–19, so did their share of total Government payments. About 90 percent of all farms are small-scale family farms (including residence and intermediate farms, those with less than \$350,000 in GCFI). These farms received more than 60 percent of all conservation payments and 23 percent of all commodity program payments, but the shares of each type of payment received by small farms declined between 2010–14 and 2015–19. The distribution of MFP payments across farm types was very similar to the distribution of commodity program payments in 2015–19. Farms specializing in cash grains, soybeans, and other field crops received nearly all commodity program payments (84 percent) and the majority of conservation payments (75 percent). Cash grain and soybean farms received 78 percent of MFP payments in 2018 and 2019, more than their share of commodity program payments (71 percent) in 2015–19.

We also explored the contribution of Government payments to farm households' income. Overall, Government payments accounted for between 2 and 4 percent of total farm household income between 2010 and 2018 and 5 percent in 2019. Among households that received payments, the payments accounted for 7 to 12 percent of total household income between 2010 and 2018 and nearly 16 percent in 2019. Excluding all Government payments from farm income reduced the share of households with positive farm income by 3 to 5 percentage points, depending on the year. This calculation was sensitive to the exclusion of conservation payments because operations clustered near the break-even point receive these. Commodity program payments were more likely to go to operations in the extremes of the distribution; excluding these payments shifted the share less than 1 percentage point.

Total Government payments reached \$45.7 billion in 2020, largely due to the Coronavirus Food Assistance Programs (CFAP1 and CFAP2) authorized in 2020. An analysis of the distribution of these payments across specializations, production regions, and farm households can occur once the 2020 ARMS data are released in late 2021.

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Chapter 3: What Do Chapter 12 Bankruptcy Rates Tell Us About the Farm Economy?

Nigel Key, Jonathan Law, and Christine Whitt

Introduction

Following near-record levels from 2011 to 2014, U.S. farm sector income fell by about a third to near long-run average levels in 2016. The downturn in the agricultural economy created economic challenges for many farm businesses. Lower farm income makes it more difficult for farmers to meet their loan obligations and pay for production expenses, and family living expenses. For heavily indebted farmers, a less robust real estate market can make it more difficult to obtain credit or restructure existing loans.

Farmers have several options for coping with financial stress. Farmers who cannot meet their loan payments because of low farm income or an unexpected off-farm job loss might draw down their working capital, postpone capital investments, reduce input expenditures, or seek off-farm employment. Filing for bankruptcy is one of the last steps farmers would typically take to deal with extreme financial stress before selling farm assets. For farmers who qualify, filing for bankruptcy under Chapter 12 provides a relatively quick and predictable way to reorganize debts and avoid asset liquidation or foreclosure.

Chapter 12 bankruptcy rates provide one indicator of farm financial stress. As measured by the United States Courts quarterly bankruptcy report, the number of farms that had filed under Chapter 12 increased by 46 percent from 2014 to 2019, although the rate remains relatively low by historical levels. How do current bankruptcy rates compare with past levels during periods of financial stress? What do the rates tell us about the overall health of the agricultural economy? This analysis used data from the United States Courts on Chapter 12 bankruptcy filings to provide historical context for the recent bankruptcy rates and to illustrate the role of farm and nonfarm economic forces in determining farm bankruptcies. Because relatively few farms actually meet the requirements for Chapter 12 protection, the authors reported State bankruptcy rates as the share of eligible farms filing for bankruptcy rather than as the share of all farms. This measure allows for a more accurate comparison of bankruptcy rates across States and over time. The analysis aims to help readers judge the severity of the farm sector downturn.

Chapter 12 Farm Bankruptcies

The Family Farmer Bankruptcy Act of 1986 established Chapter 12 of the U.S. bankruptcy code as an emergency response to the 1980s farm crisis. Congress extended Chapter 12 several times before modifying it and making it permanent by passing the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005. Chapter 12 was designed to be more appropriate for farmers than other types of bankruptcy, such as Chapter 11, which is better suited to large corporations, or Chapter 13, which is designed for wage earners who typically have smaller debts.¹²

Chapter 12 allows financially distressed farmers to restructure debt and remain in operation. Under Chapter 12, debtors propose a repayment plan to the court to make installments to creditors over 3–5 years. Farmers can submit plans that reduce the amount owed, extend their payment period, and lower their existing loan interest rates to current market levels. Chapter 12 also permits farmers to “cramdown,” or reduce the value of their secured debt to the current fair market value of the land or other assets purchased with the loan. The flexibility granted to farmers under Chapter 12 provisions makes it their preferred method for filing.

¹²Commercial fishing operations can also file under Chapter 12. This report focuses on Chapter 12 as it applies to family farmers.

Chapter 12 Eligibility

To qualify for Chapter 12, family farmers—individuals or a married couple—must meet several eligibility requirements. These include:

- the debtors must be engaged in a farming operation by contributing labor or management hours;
- total debts must not exceed \$10 million (as of 2019);
- at least half of the total debts—not including debt for the farmer’s home—must be related to the farming operation; and
- more than half of the gross income for the preceding tax year—or for each of the second and third prior tax years—must have come from farming.

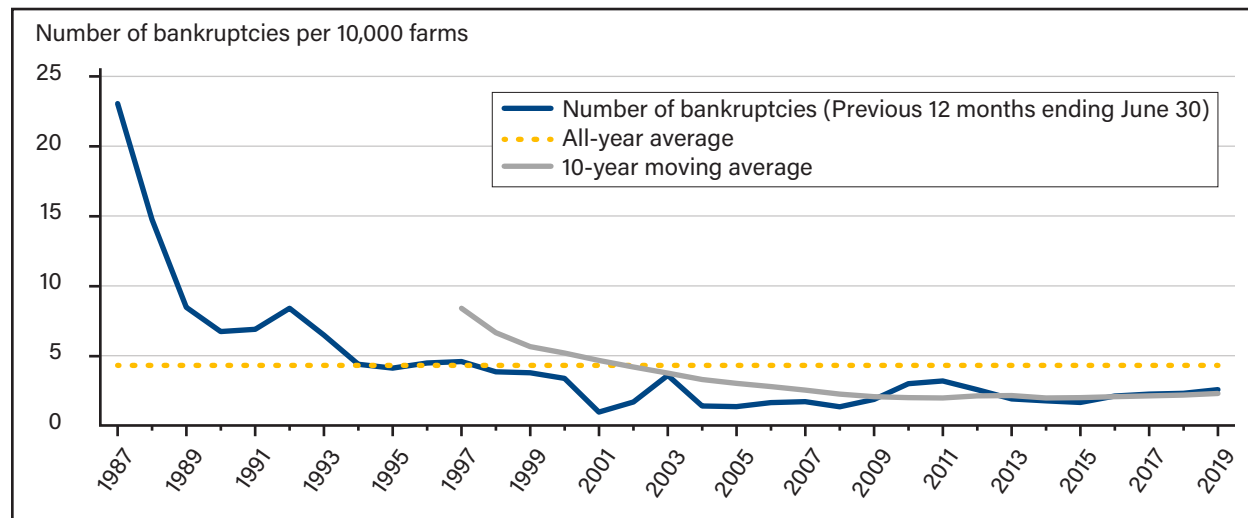
The requirement that more than half of gross income be derived from farming substantially limits the number of farms that qualify for Chapter 12 protection because a large share of farms have significant amounts of off-farm income. Since relatively few farms are eligible for Chapter 12 protection, the bankruptcy rate calculated as a share of eligible farms was considerably higher than the rate calculated as the share of all farms.

Trends in Chapter 12 Bankruptcy Filings as Traditionally Measured

Comparing current bankruptcy rates with past levels helps put the current downturn in the agricultural economy in perspective. Unfortunately, national data on farm bankruptcy rates are not available between 1979 and 1986—a period of great financial stress for farmers when bankruptcies were likely high (Stam and Dixon, 2004). Chapter 12 bankruptcy rates are available annually since 1987 and quarterly since 2001.¹³ Figure 3.1 displays the bankruptcy rate expressed as a share of all farms, as traditionally measured.

Figure 3.1

Trends in the number of Chapter 12 bankruptcies per 10,000 farms, 1987–2019



Note: To match the historical data, bankruptcy rates in this figure are for the 12-month period preceding June 30 of the calendar year.

Source: USDA, Economic Research Service (ERS) calculations using data from 1987 data from Stam et al., 1991; USDA, ERS using 1988–2019 data from United States Courts.

In the 1970s, farmers increased their borrowing to purchase land, equipment, and other inputs to take advantage of high commodity prices and rapidly increased farm real estate values. High levels of debt and rising interest rates caused the farm sector's interest expenses to reach record levels by 1980. In the decade that followed, commodity and farmland prices fell, and many heavily indebted farmers defaulted on loans and went out of business. High loan default rates contributed to a large number of agricultural bank failures in the 1980s (FDIC, 1997).

The 1987 Chapter 12 bankruptcy rate reflected the difficult economic conditions farmers faced at the time. The rate of 23 per 10,000 farms was the highest annual farm bankruptcy rate ever recorded—exceeding the previous high reached in 1925 (Stam and Dixon, 2004). It should be noted, however, the 1987 rate may have included farmers who waited for Chapter 12 to take effect in order to take advantage of the legislation's favorable provisions.

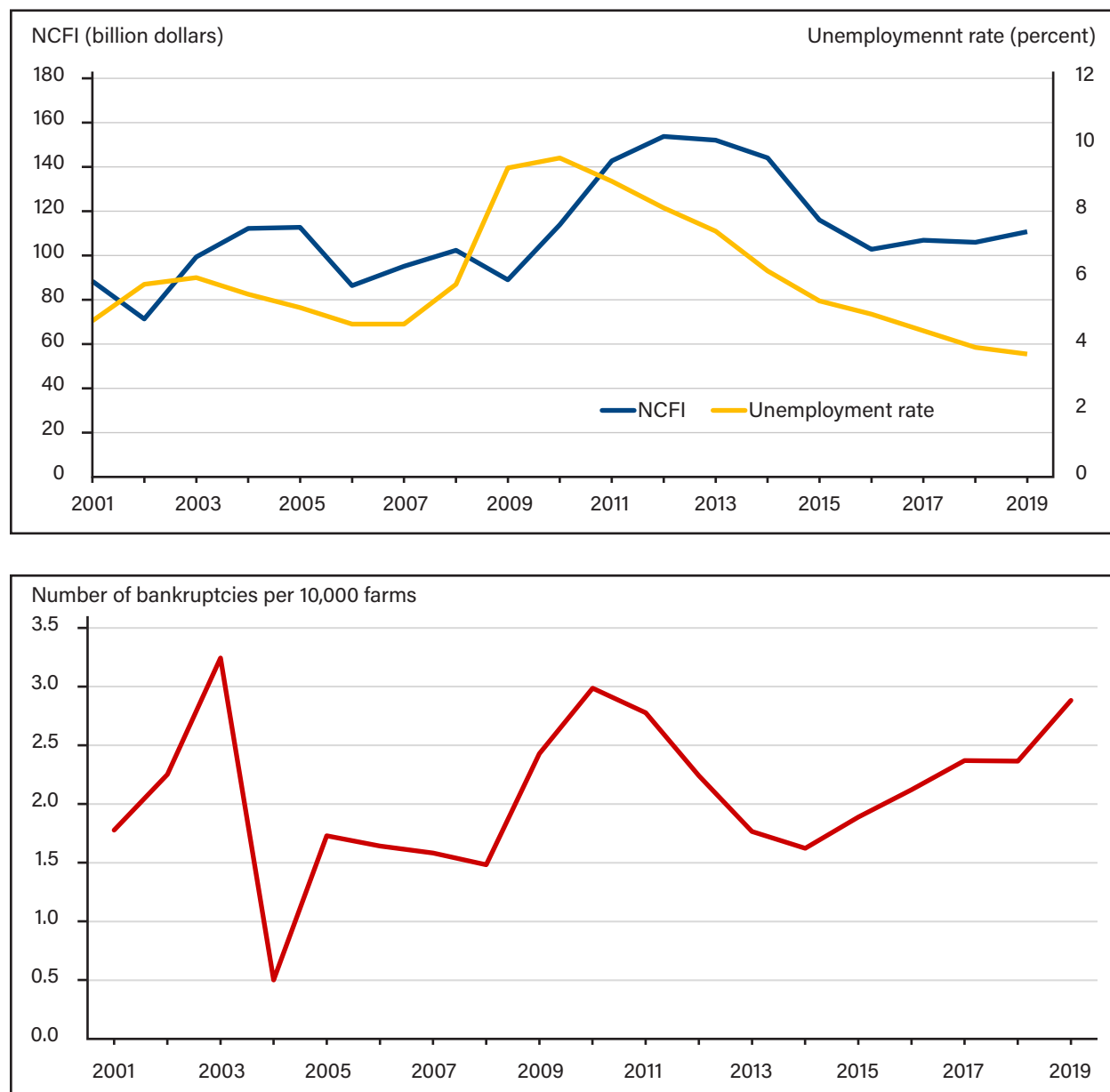
In the wake of the farm crisis, farm bankruptcy rates declined rapidly after 1987 and fell to less than 5 per 10,000 by 1994. The rate has not exceeded that level since. The decline in bankruptcy rates reflected the generally improving economic conditions in the agricultural sector: Farm income and land values rose, and debt levels declined relative to asset values. Other factors that may have contributed to the decline in bankruptcy rates following the 1980s farm crisis include new Government programs that helped stabilize farm income, farm loan mediation programs, Federal legislation that enhanced the rights of farm borrowers, and expanded Federal crop yield and revenue insurance programs (Stam and Dixon, 2004).

¹³To match the historical data, bankruptcy rates in figure 3.1 are for the 12-month period preceding June 30. Bankruptcy rates in all other figures are for the calendar year.

Factors Influencing Farm Bankruptcy Rates

Although the Chapter 12 bankruptcy rate has been relatively stable since the mid-1990s, a closer examination of trends over that last two decades illustrates the role of farm and nonfarm economic forces in determining farm bankruptcies. Since 2001, the annual bankruptcy rate fluctuated between 0.5 and 3.3 per 10,000 farms.¹⁴ The rate briefly peaked in 2003, hit a second high in 2010, declined until 2014, and then began to rise again in recent years (figure 3.2). The 2019 rate is just below the 2010 level.

Figure 3.2
Unemployment rate, net cash farm income (NCFI), and Chapter 12 bankruptcy rate



Source: USDA, Economic Research Service (ERS) using data from Farm Sector Income and Wealth Data as of December 2, 2020; U.S. Department of Labor, Bureau of Labor Statistics, Current Population Survey; and United States Courts 2001–2019 bankruptcy data.

¹⁴The analysis in this section begins in 2001 because it is the year quarterly Chapter 12 bankruptcy data became available.

Several studies attempted to better understand which factors drive changes in the bankruptcy rate. Using national farm bankruptcy data from 1910 to 1978, Shepard and Collins (1982) found non-agricultural bankruptcy rates, real net farm income, and the farm debt-to-asset ratio have all influenced farm bankruptcy rates. Using State-level panel data on Chapter 12 filings from 1987 to 2000, Dixon et al. (2004) found the unemployment rate and several measures of farm financial health explained State bankruptcy rates—including the debt-to-asset ratio, debt-servicing ratio, and net farm income. Using a similar approach with more recent data, Dinterman et al. (2018) found that nonfarm macroeconomic factors—interest rates and unemployment rates—were strong predictors of farm bankruptcies. The prices of agricultural land were also consistent predictors among the agricultural factors they examined.

Past empirical studies demonstrated both farm and nonfarm factors influence the rate of farm bankruptcies. Figure 3.2 shows trends in the national unemployment rate, farm sector net cash income, and the Chapter 12 bankruptcy rate. The unemployment rate is a broad measure of the health of the nonfarm economy that should reflect the off-farm employment opportunities of farm households. Net cash farm income (NCFI) is defined as annual income from cash receipts, cash farm-related income, and Government farm program payments minus cash expenses paid during the year. It is a measure of the profitability of farming and, hence, the ability of farmers to invest in new machinery, remain in production, expand their operations, and provide for family living expenses. Bankruptcies appear to be a lagging indicator of financial stress. The number of bankruptcies generally increases 1 to 3 years after a downturn in the agricultural or non-agricultural economies. The 2003 spike in the bankruptcy rate followed the recession of 2001 and a period of relatively low farm income in 2001 and 2002 (inflation-adjusted NCFI was at its lowest point in the past two decades in 2001).

The second period of relatively high bankruptcies occurred around 2010 in the wake of the Great Recession, which lasted from December 2007 to June 2009. As shown in figure 3.2, the growth in bankruptcies closely followed the rise in the unemployment rate, which may reflect the strong role of the non-agricultural economy in farm household finances.

Not long after the recession officially ended, the agricultural economy entered a boom period: NCFI attained near-record levels from 2011 to 2014, and farmland prices appreciated rapidly. The coincidence of high farm income and high farm bankruptcy rates around 2011 may be explained by the fact that the bankruptcy rate usually reflects economic conditions in prior years. The increases in farm income and land prices arrived too late to prevent bankruptcy for some operations coping with the consequences of the Great Recession. However, bankruptcy rates eventually fell after the boom in the agricultural economy.

Since bottoming out in 2014, the bankruptcy rate has trended up in recent years. This rise appears to be driven mainly by the downturn in the farm economy, as the nonfarm economy experienced steady growth from 2013 through the end of 2019, with declining unemployment and low interest rates.¹⁵ In addition, nonfarm business bankruptcies (Chapters 7, 11, and 13) fell during this period (Dinterman and Katchova, 2020). In contrast, NCFI fell 32 percent from 2013 to 2016 and remained substantially below its peak levels through 2019—though 2019 levels are near their long-run (i.e., 50-year) averages (Key et al., 2019). Following the decline in farm income, land price appreciation slowed considerably after 2014, and inflation-adjusted real estate values even fell in some regions.

Despite low interest rates, a less robust land market—combined with rising farm debt—may have contributed to the growth in bankruptcies. Farmers continued to accumulate debt since 2012, which increased their vulnerability to economic shocks. By 2019, farm sector debt was near its historical peak in the late 1970s and early 1980s after adjusting for inflation (Key et al., 2019). Since 2012, as debts increased while the market for land weakened, the debt-to-asset ratio (i.e., a measure of financial solvency indicating a business's ability to cover its financial liabilities through the sale of assets) trended upward, and in 2019 it was above its 10-year average.

¹⁵The increase in bankruptcies in 2019 may be partly attributed to the passage of Public Law 116 – 51, The Family Farmer Relief Act of 2019, which increased the debt ceiling for Chapter 12 eligibility from \$4.153 million to \$10 million.

Examining Bankruptcies at the State Level

The national bankruptcy rate is a useful indicator of the overall health of the agricultural economy, but it can mask variation in economic conditions at the State level. Farmers in different regions produce different commodities and confront different production conditions, including different weather and pest pressures. Off-farm employment opportunities and land prices also vary across States and are influenced by local factors. An examination of State bankruptcy rates can shed light on how conditions vary across the Nation and can provide a richer understanding of factors driving farm bankruptcies.

To compare Chapter 12 bankruptcy rates across States, we used the rate relative to the number of farms that could qualify for bankruptcy (see box, “Estimating State Bankruptcy Rates as a Share of Eligible Producers”). Larger-scale farms are more likely to qualify for Chapter 12 bankruptcy because eligibility requires that gross farm income must be greater than 50 percent of household income. Hence, the standard bankruptcy rate measure—expressed as a share of all farms—tends to indicate higher bankruptcy rates in States with relatively more large farms, even when economic conditions across States are similar. The bankruptcy rate as a share of eligible farms is less influenced by the size distribution of farms than would the bankruptcy rate as a share of all farms, and hence, should more accurately reflect economic conditions at the State level.

Estimating State Bankruptcy Rates as a Share of Eligible Producers

The bankruptcy rate for each State is estimated as a share of farms that qualify for Chapter 12 bankruptcy. Three criteria determine the number of farms that meet the eligibility standard: 1) total debts must not exceed a statutory limit that varies over time; 2) at least half of the total debts—not including debt for the farmer’s home—must be related to the farming operation; and 3) more than half of the gross income for the preceding tax year—or for each of the second and third prior tax years—must have come from farming.

The authors used data from the annual Agricultural Resource Management Survey (ARMS) to estimate the number of eligible farms using these eligibility criteria. ARMS is the U.S. Department of Agriculture's (USDA) primary source of information on the production practices, resource use, and economic well-being of farmers and ranchers in the U.S. The analysis was limited to examining the 15 main agricultural States for which ARMS provides statistically reliable estimates. The analysis was also limited to years after 2005 when the debt limit was consistently adjusted for inflation. Prior to 2005, the statutory debt limit for Chapter 12 bankruptcy protection was raised in an ad hoc fashion. Following the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005, the debt limit was adjusted for inflation every 3 years. The debt limit was \$3,237,000 in 2005 and rose to \$4,411,400 in April 2019. In November 2019, the Family Farmer Relief Act raised the debt ceiling to \$10 million.

For each farm surveyed, ARMS collected information about farm and nonfarm debt and income, which was used to estimate the number of eligible farms in a State. However, ARMS did not collect information about farm household income for the 2 prior tax years. For this reason, the third eligibility criterion is modified such that a farm is deemed eligible for Chapter 12 if farm income exceeds half of the total household income in either the current or previous tax years.

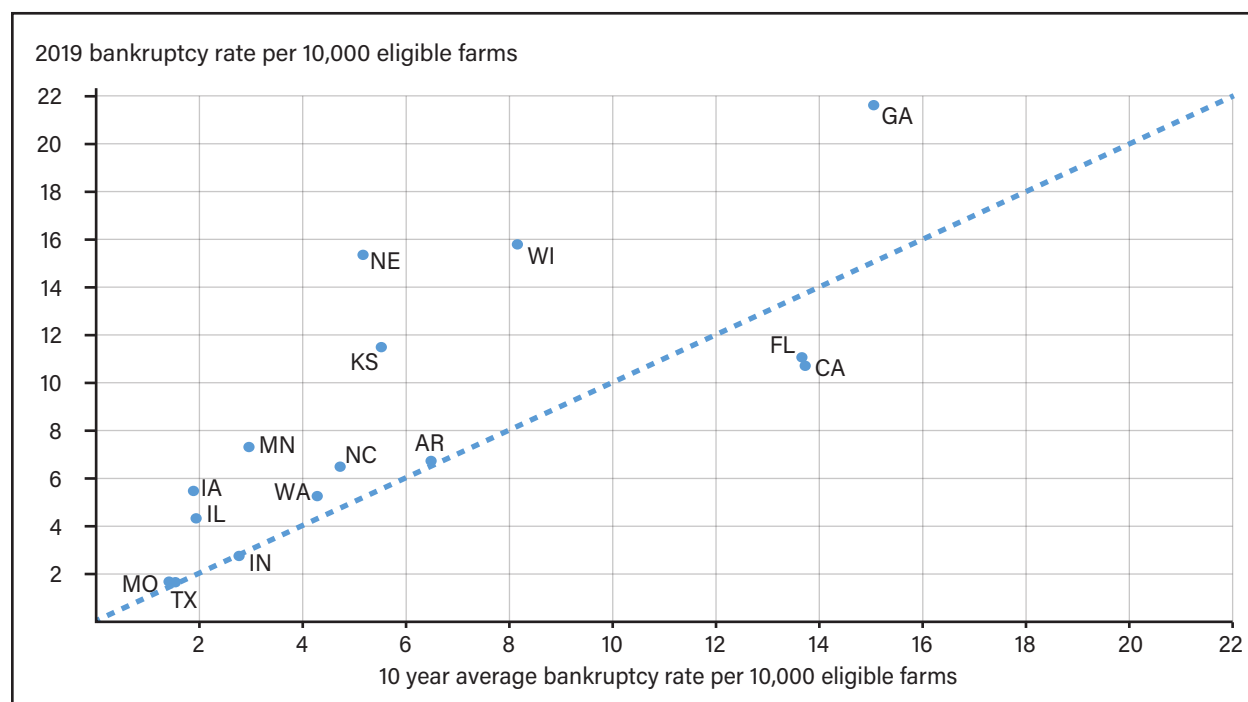
Because ARMS samples different farms each year, the estimated number of eligible farms varies from year to year because of random sampling error. To reduce this variation, estimated each State’s eligible number of farms is estimated using 3 consecutive years of data.

Because only a fraction of farmers can qualify for Chapter 12 bankruptcy protection, State bankruptcy rates—when expressed as a share of eligible producers—ranged from 54 percent to 161 percent higher than the rates expressed as a share of all producers. The aggregate bankruptcy rate in 2019 for the 15 main agricultural States is 6.7 per 10,000 farms eligible for Chapter 12 bankruptcy protection, compared with 3.4 per 10,000 farms for all farms.

Figure 3.3 shows the relationship between the 2019 bankruptcy rate and the average bankruptcy rate since 2010 for each of the main agricultural States. Points above the 45-degree dashed line indicate a State’s 2019 bankruptcy rate is above its 10-year average, whereas points below the line indicate the 2019 rate is below the average.

Figure 3.3

Bankruptcies in 2019 versus 10-year average bankruptcies per 10,000 farms eligible for Chapter 12



Notes: The 10-year bankruptcy average spans from 2010 to 2019. Data include the 15 top agricultural States: Arkansas (AR), California (CA), Florida (FL), Georgia (GA), Illinois (IL), Indiana (IN), Iowa (IA), Kansas (KS), Minnesota (MN), Missouri (MO), Nebraska (NE), North Carolina (NC), Texas (TX), Washington (WA), and Wisconsin (WI).

Source: USDA, Economic Research Service (ERS) calculations using data from USDA, ERS, Farm Sector Income and Wealth Data as of December 2, 2020; and United States Courts 2010–2019 bankruptcy data.

Out of the 15 States examined, only California and Florida had bankruptcy rates in 2019 that were below their respective 10-year averages. In both Florida and California, agriculture is characterized by a diverse commodity mix. Farm receipts in Florida are derived mainly from fruits and vegetables, and these high-value commodities did not experience as sharp a decline in prices as many row crops and livestock products experienced in recent years (USDA, NASS, 2020a). Since 2014, Florida’s inflation-adjusted NCFI increased by 0.4 percent (USDA, ERS, 2020a). Fruits and vegetables also comprised a substantial share of California’s farm receipts. Improving nonfarm economic conditions may have also contributed to relatively low bankruptcy rates in California in recent years.

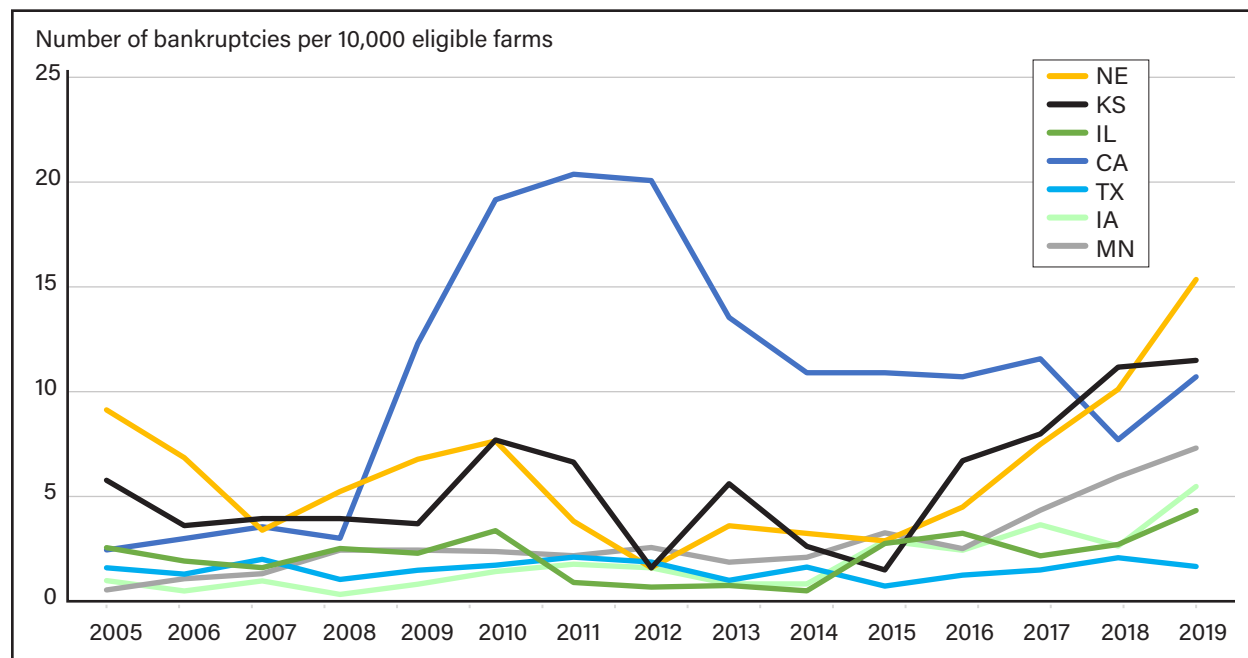
For 13 of the 15 main agricultural States, the 2019 bankruptcy rates were higher than their 10-year averages. Georgia and Wisconsin had the highest 2019 bankruptcy rates among these States. In Georgia, low broiler prices and weaker farmland prices may have contributed to the high 2019 bankruptcy rate of 21.6 per 10,000

eligible farms. Broilers are the most important commodity in Georgia, generating 50 percent of the State's farm cash receipts (USDA, NASS, 2020a). Prices for broiler chickens declined 30 percent from 2014 to 2019 after they peaked during the commodity price boom around 2014. Also, agricultural land values in Georgia fell 27 percent from 2009 to 2019 in real terms (USDA, NASS, 2020b). Lower land prices limit farmers' ability to secure debt from lenders and refinance their debts.

In 2019, Wisconsin had the second-highest bankruptcy rate at 15.8 per 10,000 eligible farms. The rate showed a long-term upward trend in recent years, increasing from 1.9 per 10,000 farms in 2005. This may have been driven by consolidation in the dairy industry, as dairy farming accounts for more of Wisconsin's agricultural output than any other commodity—nearly 46 percent of cash receipts in 2018. The average size of dairy herds in the United States increased from 140 head in 2005 to 273 head in 2019, while the number of licensed dairy herds fell from 64,540 to 34,187 (47 percent decline) (USDA, NASS, 2020c). The number of Wisconsin dairy herds fell from 15,100 to 7,720 (49 percent decline) in the same period, and the State lost 780 dairy herds (9 percent decline) between 2018 and 2019—the most of any State. Significant returns to scale in dairy production was likely one of the main drivers of consolidation (MacDonald et al., 2016). Smaller dairy farms—which are more concentrated in traditional dairy States like Wisconsin—have, on average, failed to achieve positive net returns in most years of the last decade (USDA, ERS, 2020c).

An evaluation of characteristics of the top seven States in terms of cash receipts can shed more light on the potential drivers of farm bankruptcies (figure 3.4). In 2018, the top 7 agricultural States were California, Iowa, Texas, Minnesota, Nebraska, Illinois, and Kansas.

Figure 3.4
Bankruptcy rates per 10,000 eligible farms for top 7 agricultural States



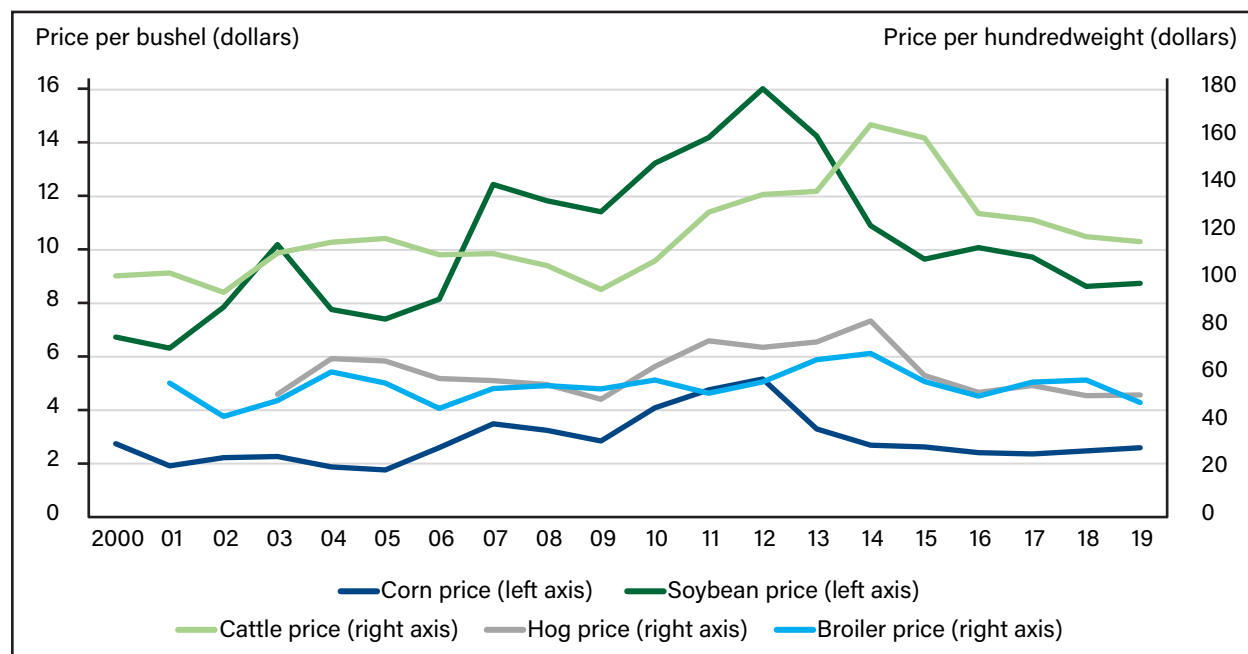
Note: Data include the seven top agricultural States: California (CA), Illinois (IL), Iowa (IA), Kansas (KS), Minnesota (MN), Nebraska (NE), Texas (TX).

Source: USDA, Economic Research Service (ERS) calculations using data from USDA, ERS, Farm Sector Income and Wealth Data as of December 2, 2020; and United States Courts 2005–2019 bankruptcy data.

In States where production is dominated by a few commodities, trends in the bankruptcy rates often reflect changes in commodity prices. For example, in Nebraska and Kansas, cattle accounts for about half of the total value of agricultural production. Cattle prices fell steadily in real terms since 2014, remaining below 2011 levels since 2016 (figure 3.5). Correspondingly, bankruptcy rates in these States increased more than fivefold since 2015.

In Minnesota, Iowa, and Illinois, production is concentrated in corn, soybean, and hog production, which together accounted for about 60 percent, 75 percent, and 89 percent of their respective cash receipts in 2018. Between 2016 and 2019, prices for each of these commodities stagnated at their lowest levels since at least 2009 (figure 3.5). In all three States, these lower prices corresponded to increasing bankruptcy rates over the last 4 years.

Figure 3.5
Prices for selected commodities 2000-19 (in year 2019 dollars)



Source: USDA, National Agricultural Statistics Service, 2000-2019 Agricultural Prices report.

California’s bankruptcy trend differed somewhat from the other big agricultural States. California’s farm bankruptcy rate was generally high over the last 15 years, but it increased dramatically in 2009 and remained very high until 2012. Unlike the other States, California did not see an increase in the bankruptcy rate in more recent years. Compared with the other big agricultural States, California’s agricultural production is diverse, and the State’s bankruptcy rate does not appear to be driven by the price of one or a few commodities. Instead, the bankruptcy rate in California appears to have been influenced to a significant degree by wider macroeconomic conditions.

Past research on farm bankruptcies suggested macroeconomic conditions influence farm asset values, off-farm employment opportunities, and farm bankruptcy rates. A closer look at land prices and unemployment rates can illustrate how these indicators of macroeconomic conditions correlated with farm bankruptcy rates in California. California saw a bigger increase in unemployment after the Great Recession than did many other States. The unemployment rate in California rose to 12.2 percent in 2010, significantly higher than the peak U.S. rate of 9.6 percent. As a result, a larger share of California farm households may have lost off-farm income during this period compared with other States.

The effects of the Great Recession are also reflected in real estate prices. Agricultural land values in California increased 6.8 percent in nominal terms between 2008–12, which was less than half the rate of the United States as a whole (16.1 percent). Over the same period—which included the recession—residential house prices (as measured by the Federal Housing Finance Agency’s House Price Index) in the State fell 39.8 percent from their 2006 peak, more than double the 17.7 percent decline seen for the United States as a whole. Many farm operators own residential properties, and thus were directly exposed to that market’s decline. Many agricultural operations are located near urban areas and may have seen larger decreases in their asset values than the change in the average agricultural land prices would suggest. This would be more likely in States like California where metropolitan areas are widespread (Zhang and Nickerson, 2015). Since 2012, California’s relatively robust growth in employment and real estate values may have contributed to the drop in State’s farm bankruptcy rate. Residential real estate values in California appreciated 74.5 percent since 2012, compared with 43.5 percent for the entire U.S.

Conclusion

Data from the U.S. Courts show that Chapter 12 farm bankruptcies in 2019 were at their highest levels since 2010. Although nonfarm factors can be important determinants of farm bankruptcies, the recent rise in bankruptcies appears to have been driven mainly by a downturn in the farm economy. Aggregate farm income fell 32 percent from 2013 to 2016 and remained at or below historical average levels through 2019. A less robust market for farmland combined with rising farm debt made producers more vulnerable to economic shocks. Although bankruptcies are at their highest level in nearly a decade, they are still relatively low by historical levels. The 2019 national bankruptcy rate of 2.9 per 10,000 farms is just below levels reached in 2010 and 2003 and well below peak levels reached in the late 1980s.

To examine trends in State bankruptcy rates, the authors developed a measure that compares the number of Chapter 12 bankruptcies with the estimated number of farms eligible for Chapter 12 protection. Of the 15 major agricultural States, only California and Florida had bankruptcy rates in 2019 that were below their 10-year averages. In most of the top agricultural States, the farm bankruptcy rates increased substantially since 2014. Among the largest seven States, Iowa, Minnesota, Nebraska, Illinois, and Kansas had higher bankruptcy rates in 2019 than any year since at least 2005—the first year of the State-level analysis. This demonstrates that financial conditions in agriculture vary substantially across the country. As of 2019, the national bankruptcy rate was still relatively modest, though bankruptcy rates in some key agricultural States were at a 15-year high.

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Appendix A: Farm sector income statement and balance sheet forecasts for 2021

The USDA, Economic Research Service (ERS) releases Farm Income and Wealth Statistics three times a year: usually in February, late August/early September, and late November/early December. The analysis in this report used data published on December 2, 2020. The tables below provide current data as of this report's publication, including a 2021 calendar year forecast for the farm income statement and balance sheet, as published on September 2, 2021. The September revisions to the 2009–19 estimates found in chapter 1 of this report were minimal in nominal dollars and do not alter the findings, although the inflation-adjusted values are scaled relative to chapter 1 because the base year for the deflator used to convert to real values was updated from 2020 to 2021.

Tables and files with the most recent income and wealth estimates and forecasts, along with a discussion of the most recent forecast, can be found on the ERS website. Search the ERS website with terms: data products, farm income and wealth, farm economy, farm sector, farm income, farm finances.

Table A1

U.S. farm sector cash income statement, 2016-21F

	2016	2017	2018	2019	2020	2021F	2009-19 Average	2019-20	2020-21F Percent change
	Billion dollars (2021)								
Gross cash income	444.9	451.7	442.1	445.0	453.3	486.4	471.1	1.9	7.3
All commodity receipts	399.4	405.0	396.4	385.0	370.3	421.5	420.7	-3.8	13.8
Crop receipts	218.1	213.1	208.1	201.0	199.2	230.1	226.9	-0.9	15.5
Animals and products receipts	181.3	191.9	188.3	184.0	171.1	191.5	193.8	-7.0	11.9
Cash farm-related income	31.1	34.1	31.1	36.4	35.6	36.8	36.1	-2.3	3.5
Forest products sold	0.8	0.8	0.7	0.6	0.6	0.6	0.7	-1.2	2.2
Machine hire and customwork	4.0	5.1	4.1	4.3	4.0	4.1	4.7	-7.5	2.6
Other farm income	26.3	28.2	26.2	31.5	31.0	32.1	30.7	-1.6	3.7
Direct government payments	14.5	12.6	14.6	23.5	47.4	28.0	14.2	101.2	-40.8
Cash expenses 1/	338.5	341.0	332.5	332.9	338.3	351.6	345.3	1.6	3.9
Interest 1/	18.1	19.1	20.7	20.7	19.1	19.7	18.5	-7.9	3.0
Nonreal estate	7.3	7.6	8.3	8.0	6.8	6.0	7.7	-14.8	-11.7
Real estate 1/	10.8	11.5	12.4	12.7	12.3	13.6	10.8	-3.6	11.1
Labor expenses	37.8	39.1	36.1	36.4	37.9	39.0	36.1	4.2	2.8
Property taxes and fees 1/	13.3	13.9	13.6	13.9	14.6	15.1	13.6	4.4	3.8
Farm origin	110.9	114.2	112.0	114.5	112.9	119.5	115.9	-1.4	5.9
Feed purchased	62.0	59.6	57.5	62.3	58.9	63.1	63.7	-5.5	7.0
Livestock and poultry	24.6	30.0	31.1	29.9	30.1	33.1	29.0	0.6	10.1
Seed	24.3	24.6	23.4	22.3	23.9	23.3	23.1	7.2	-2.2
Manufactured inputs	63.0	61.6	61.8	59.6	61.1	63.1	66.7	2.5	3.3
Electricity	6.2	6.3	6.5	6.0	6.2	6.3	6.2	2.6	1.1
Fertilizer and lime	26.2	24.1	24.8	23.4	25.3	25.4	27.9	8.2	0.2
Fuel and oil	13.5	14.0	14.1	13.8	12.4	15.2	16.6	-10.2	22.6
Pesticides	17.0	17.2	16.5	16.3	17.1	16.3	16.0	5.2	-5.1
Other intermediate expenses 1/	71.4	72.0	70.3	68.7	72.6	74.9	72.0	5.7	3.2
Net rent to landlords 2/	24.0	21.1	18.0	19.0	20.2	20.3	22.5	6.0	0.7
Net cash income	106.5	110.7	109.5	112.1	115.0	134.7	125.8	2.5	17.2

Notes: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2021 by USDA, Economic Research Service, 2021 = 100. F = forecast.

1/ Excluding expenses associated with operator dwellings.

2/ Excluding landlord capital consumption.

Source: USDA, Economic Research Service Farm Income and Wealth Statistics data as of September 2, 2021.

Table A2

U.S. farm sector balance sheet, 2016–21F

	2016	2017	2018	2019	2020	2021F	2019–20	2020–21F
	Billion dollars (2021)						Percent change	
Farm sector assets	3,247.2	3,286.5	3,232.1	3,225.5	3,291.6	3,253.6	2.1	-1.2
Investments and other financial assets	87.0	88.7	77.5	91.8	95.4	100.6	4.0	5.4
Investment in cooperatives	8.1	9.0	7.7	6.5	5.3	8.5	-18.6	59.0
Financial assets and net accounts receivable	78.9	79.7	69.8	85.2	90.1	92.1	5.7	2.2
Inventories	200.1	196.4	184.7	170.6	168.9	171.7	-1.0	1.7
Crops	62.0	62.1	63.8	52.0	52.4	47.2	0.8	-9.9
Animals and animal products	121.4	117.1	103.7	104.0	101.9	110.0	-2.0	8.0
Breeding animals	84.1	79.9	63.7	66.2	68.3	72.7	3.3	6.3
Non-breeding animals	37.4	37.2	40.1	37.8	33.6	37.4	-11.2	11.4
Purchased inputs	16.6	17.3	17.2	14.6	14.5	14.4	-0.5	-1.0
Cash invested in growing crops	4.2	4.8	5.3	4.2	3.7	NA	-12.2	NA
Prepaid production expenses	9.8	9.7	9.4	8.1	8.5	NA	4.9	NA
Prepaid insurance	2.6	2.7	2.5	2.4	2.4	NA	1.7	NA
Real estate	2,675.5	2,703.7	2,680.5	2,670.4	2,738.2	2,692.5	2.5	-1.7
Machinery and vehicles	284.6	297.7	289.4	292.6	289.1	288.9	-1.2	-0.1
Farm sector debt	416.9	426.9	429.3	440.2	461.3	443.9	4.8	-3.8
Real estate	251.8	258.3	262.3	281.0	302.5	296.1	7.6	-2.1
Commercial banks	94.1	96.6	99.1	102.7	100.4	NA	-2.2	NA
Farm Credit System	115.6	117.2	120.7	131.3	145.6	NA	10.9	NA
Farm Service Agency	6.6	6.6	7.1	8.4	9.6	NA	14.9	NA
Farmer Mac	6.1	6.8	7.0	8.0	9.0	NA	12.1	NA
Individuals and others	13.9	13.8	10.6	11.1	16.9	NA	52.9	NA
Storage facility loans	0.8	0.8	0.9	0.9	1.0	NA	10.3	NA
Life insurance companies	14.7	16.4	16.9	18.7	19.9	NA	6.4	NA
Nonreal estate	165.1	168.6	166.9	159.2	158.9	147.9	-0.2	-6.9
Commercial banks	81.6	80.1	80.0	73.8	66.7	NA	-9.6	NA
Farm Credit System	55.0	55.9	57.0	55.5	56.4	NA	1.5	NA
Farm Service Agency	4.2	4.3	4.2	4.0	3.9	NA	-2.6	NA
Individuals and others	24.3	28.2	25.8	25.9	31.9	NA	23.4	NA
Farm sector equity	2,830.3	2,859.6	2,802.8	2,785.3	2,830.2	2,809.7	1.6	-0.7
Ratios	Percent							
Debt/asset ratio	12.84	12.99	13.28	13.65	14.02	13.64	NA	NA
Debt/equity ratio	14.73	14.93	15.32	15.8	16.3	15.8	NA	NA
Equity/asset ratio	87.16	87.01	86.72	86.35	85.98	86.36	NA	NA

Notes: Values are adjusted for inflation using U.S. Department of Commerce, Bureau of Economic Analysis gross domestic product price index rebased to 2021 by USDA, Economic Research Service, 2021 = 100. F = forecast. NA = not applicable.

Source: USDA, Economic Research Service (ERS) Farm Income and Wealth Statistics data as of September 2, 2021.