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U.S. Farm Income Outlook: September 2020 Forecast

September 23, 2020

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R46539

CRS REPORT
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SUMMARY

R46539

September 23, 2020

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U.S. Farm Income Outlook: September 2020 Forecast

Two major indicators of U.S. farm well-being are net farm income and net cash income. Net farm income represents an accrual of the value of all goods and services produced on the farm during the year—similar in concept to gross domestic product. In contrast, net cash income uses a cash flow concept to measure farm well-being: only cash transactions for the year are included. Thus, crop production is recorded as net farm income immediately after harvest—irrespective of whether the crop is stored on farm or sold—whereas net cash income records a crop's value only after it has been sold in the marketplace.

This report uses the U.S. Department of Agriculture's (USDA's) farm income projections (as of September 2, 2020) to describe the U.S. farm economic outlook.

USDA Farm Income Projections as of September 2, 2020

The most recent aggregate national net farm income projections for calendar year 2020 were issued by USDA's Economic Research Service (ERS) on September 2, 2020. This is the second of three ERS forecasts for 2020: the first farm income forecast was announced on February 5, 2020. The third forecast is expected to be released on November 27, 2020.

According to the Economic Research Service (ERS), national net farm income is forecast at $102.7 billion in 2020, up $19.0 billion (+22.7%) from 2019, driven by projected record federal support of $37.2 billion, including $10.4 billion from farm programs authorized under the 2018 farm bill (P.L. 115-334) and $25.8 billion from ad hoc programs authorized outside of traditional farm omnibus legislation. An alternate measure, net cash income—focused on cash flows—is forecast at $115.2 billion (+4.5% from 2019).

Both projected net farm income and net cash income increase because of growth in government assistance in 2020, which includes $3.8 billion of 2019 Market Facilitation Program (MFP) payments, $5.8 billion from the Paycheck Protection Program (PPP), and $16 billion from the Coronavirus Food Assistance Program (CFAP). If realized, the 2020 government payments of $37.2 billion would represent a 65.7% increase from 2019's $22.4 billion in government support and would surpass the previous record of $23.2 billion (nominal dollars) in 2000.

Farm asset value in 2020 is projected at $3.1 trillion, up year-to-year by 1.1%. Farm asset values reflect farm investors' and lenders' expectations about long-term profitability of farm sector investments. Another measure of the farm sector's well-being is aggregate farm debt, which is projected to be at a record $433.8 billion in 2020—up 3.6% from 2019. Both the debt-to-asset and the debt-to-equity ratios have risen for eight consecutive years, potentially suggesting a continued slow erosion of the U.S. farm sector's financial situation. At the farm household level, average farm household incomes have been well above average U.S. household incomes since the late 1990s. However, this advantage derives primarily from off-farm income as a share of farm household total income.

The final prospects for the 2020 farm income outlook are still clouded by several critical uncertainties. First, the extent of weather-related effects on yields and harvested acres will not be known until the harvest is completed and the size of the major field crops has been assessed—most likely not before January 2021. Second, the extent to which the Coronavirus Disease 2019 (COVID-19) pandemic will resurge again in the fall when cooler weather forces more people indoors is unknown. Third, also related to the COVID-19 pandemic, is when and how the general economy will recover and consumer demand patterns return to normal. Fourth is whether agricultural and food supply chains emerge in a more resilient and responsive form that revives investment and growth at both the producer and retail levels. Finally, despite the signing of a Phase I trade agreement with China on January 15, 2020, it is unclear how soon—if at all—the United States may resume normal trade with China.

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Introduction

The U.S. farm sector is vast and varied. It encompasses production activities related to traditional field crops (such as corn, soybeans, wheat, and cotton) and livestock and poultry products (including meat, dairy, and eggs), as well as fruits, tree nuts, and vegetables. In addition, U.S. agricultural output includes greenhouse and nursery products, forest products, custom work,[1] and other farm-related activities. The intensity and economic importance of each of these activities, as well as their underlying market structure and production processes, vary regionally based on the agroclimatic setting, market conditions, and other factors. As a result, farm income and rural economic conditions may vary substantially across the United States.

Annual U.S. net farm income is the single most-watched indicator of farm sector well-being, as it captures and reflects the entirety of economic activity across the range of production processes, input expenses, and marketing conditions that have prevailed during a specific time period.[2] When national net farm income is reported together with a measure of the national farm debt-to-asset ratio, the two summary statistics provide a quick and widely referenced indicator of the economic well-being of the national farm economy.

USDA's September 2020 Farm Income Forecast

In the second of three official U.S. farm income outlook releases scheduled for 2020 (see box "ERS's Annual Farm Income Forecasts" in the **Appendix**), the U.S. Department of Agriculture's (USDA's) Economic Research Service (ERS) projects that U.S. net farm income will rise 22.7% year-over-year in 2020 to $102.7 billion, up $19.0 billion from last year (**Figure 1** and **Figure 2**).[3] This projected increase is driven largely by record government subsidies to the sector of $37.2 billion, including $10.4 billion from farm programs authorized under the 2018 farm bill (P.L. 115-334) and $25.8 billion from ad hoc programs authorized outside of traditional farm omnibus legislation.

The September forecast of $102.7 billion is 13.1% above the 10-year average of $90.8 billion (in nominal dollars) but is below 2013's record high of $123.7 billion. An alternate farm income measure, net cash income (calculated on a cash-flow basis), is projected at $115.2 billion in 2020, up 4.5% from 2019 but slightly below the 10-year average of $116.0 billion.[4]

The divergence in year-to-year changes between the two measures of net income is due to their different treatment of harvested crops. Net farm income includes a crop's value after harvest even if it remains in on-farm storage. In contrast, net cash income includes a crop's value only when it is sold. Thus, crops placed in on-farm storage are included in net farm income but not net cash income.

The 2020 net cash income forecast of $115.2 billion includes $1.1 billion in sales from on-farm inventories. This is in contrast with 2019 net cash income, when $13.7 billion in sales of on-farm crop inventories helped to inflate the 2019 net cash income value to $110.3 billion.

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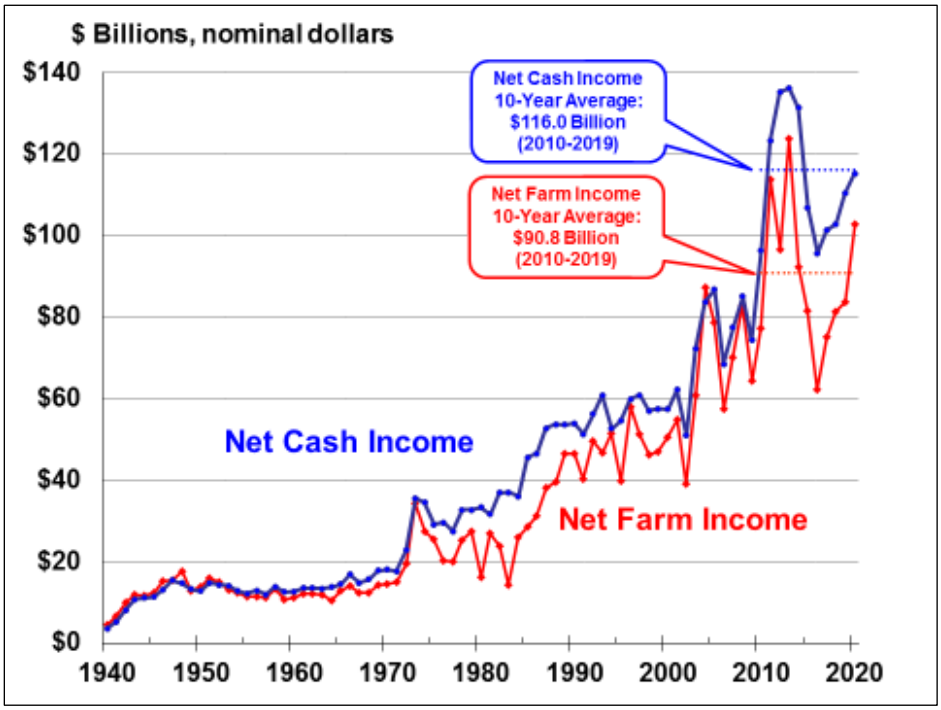
[1] Custom work involves performing all the machine operations for another landowner in exchange for a set fee or rate.

[2] See box "Measuring Farm Profitability" in the **Appendix** for a definition of *net farm income*. The appendix also includes supporting tables and charts that provide additional details on the Economic Research Service (ERS) farm income forecast.

[3] ERS's 2020 farm sector income forecasts are available at https://www.ers.usda.gov/topics/farm-economy/farm-sector-income-finances/farm-sector-income-forecast/.

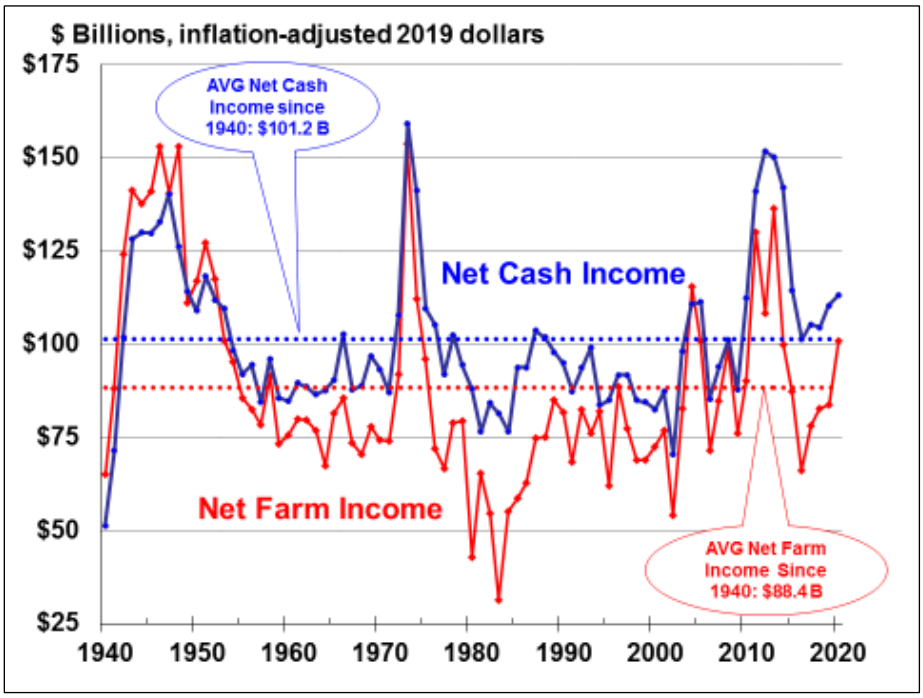
[4] See the **Appendix** for a description of the differences between net farm income and net cash income.

Figure 1. Annual U.S. Farm Sector Nominal Income, 1940-2020F



Source: Economic Research Service (ERS), "2020 Farm Income Forecast," September 2, 2020. All values are nominal—that is, not adjusted for inflation. Values for 2020 are forecast; F = forecast.

Figure 2. U.S. Farm Sector Inflation-Adjusted Income, 1940-2020F



Source: ERS, "2020 Farm Income Forecast," September 2, 2020. All values are adjusted for inflation using the chain-type gross domestic product (GDP) deflator, where 2019 = 100. Bureau of Economic Analysis, Real GDP Chained Dollars (accessed December 3, 2019). Values for 2020 are forecasts.

Highlights for the 2020 Farm Income Outlook

- For historical perspective, both net cash income and net farm income achieved record nominal highs in 2013 but fell to recent lows in 2016 (**Figure 1**) before trending higher during 2017-2020.
- When adjusted for inflation and represented in 2019 dollars (**Figure 2**), both the net farm income and net cash income for 2019 are projected to be above their average values since 1940 of $88.4 billion and $101.2 billion, respectively.
- Cash receipts for crop and livestock production activities in 2020 are projected to be down 3.3% (**Table A-1**) due to a forecast decline of $14.3 billion in livestock receipts, which more than offsets a modest $2 billion gain in crop receipts.
- USDA forecasts farm prices for grain crops to be 1% to 5% lower for the 2020-2021 marketing year; while prices for cattle and calves (-8.1%), hogs (-17.8%), and broilers (-20%) are projected down sharply in the 2020 calendar year. Prices for eggs, sorghum, and soybeans and products (soyoil and soymeal) are projected to be higher in 2020/2021 (**Table A-4**).
- Government farm subsidies are projected at a record $37.2 billion in 2020 (**Figure 10**). In 2020, support from traditional farm programs is bolstered by large, ad hoc direct government payments in response to the Coronavirus Disease 2019 (COVID-19) pandemic.[5] Government payments are projected to account for 36.2% of net farm income—the largest since a 31% share in 2005 (**Figure 9**).[6]
- Production expenses are forecast to be $4.9 billion lower in 2020 as costs for livestock and poultry replacements, pesticides, interest costs, and fuel are all projected to be lower.
- Farm asset values and debt levels are projected to reach record levels in 2020—asset values at $3.1 trillion (+1.1% year-over-year) and farm debt at $433.8 billion (+3.6%)—pushing the projected debt-to-asset ratio up to 14.0%, the highest level since 2002 (**Figure 17**).
- Abundant domestic and international supplies of grains and oilseeds, coupled with the severe demand shock related to COVID-19, are expected to contribute to a sixth-straight year of relatively weak commodity prices in 2020 (**Figure A-1** through **Figure A-4**). However, the commodity price projections for 2020 are subject to substantial uncertainty associated with as-yet-unknown domestic production and international commodity market developments.
- Economists project that the COVID-19 pandemic could trim global economic growth by 3.0% to 6.0% in 2020, with a partial recovery in 2021, assuming there is not a second wave of infections.[7] Global trade could also fall by 18%, depending on the depth and extent of the global economic downturn.
- The COVID-19 supply chain disruption dominated U.S. agricultural markets during the first half of 2020 and has contributed to uncertainty over the supply, demand, and price prospects for most major commodities. Prospects for large corn and soybean harvests and the outlook for large ending-of-year stocks

[5] CRS Report R46395, *USDA's Coronavirus Food Assistance Program (CFAP) Direct Payments*.

[6] Indirect subsidies such as crop insurance premium subsidies are not included in the $37.2 billion subsidy total.

[7] CRS Report R46270, *Global Economic Effects of COVID-19*.

(**Figure 3**) combine with lingering international trade disputes to reduce market optimism heading into the fall harvest.

Major Economic and Policy Developments Set the Stage

Several major economic and policy events have occurred since 2018 that have helped to shape the current U.S. farm income outlook for 2020. These events are briefly reviewed here.

- Since 2015, the corn, soybean, and wheat sectors have experienced relatively strong growth in both productivity and output, helping to build stockpiles at the end of several successive marketing years through the 2019 season (**Figure 3**), while upland cotton saw its end-of-year stocks surge in 2019.
- In 2018, the U.S.-China trade dispute emerged as an impediment to trade and contributed to lower soybean prices.[8] The U.S.-China trade dispute led to declines in U.S. exports to China—a major market for U.S. agricultural products—in 2018 and 2019 and have added to market uncertainty in 2020.
- The difficulties associated with the trade dispute were exacerbated in 2018 when U.S. farmers produced a record soybean harvest of 4.4 billion bushels and both record ending-of-year stocks and a record stocks-to-use ratio (22.9%) (**Figure 3**). The record soybean harvest combined with the sudden loss of the Chinese soybean market kept downward pressure on U.S. soybean prices. Despite a smaller crop and lower stocks in 2019, the reduction in U.S. soybean exports to China prevented a price recovery.
- Coming into 2020, the U.S. agricultural sector was holding relatively large stocks of corn, soybeans, wheat, and cotton—the four largest commercial crops produced annually in the United States in terms of area harvested, volume of output, and value.[9] The abundant supplies relative to demand contributed to weak commodity prices over this period (**Figure A-1** and **Figure A-2**).
- In response to the U.S.-China trade dispute, USDA used its authority under the Commodity Credit Corporation (CCC) Charter Act[10] to initiate successive direct payment programs in 2018 and 2019—referred to as Market Facilitation Programs (MFPs)—to partially offset the trade damage incurred by U.S. producers.[11] As of August 31, 2020, USDA had paid out $8.6 billion under the 2018 MFP and $14.5 billion under the 2019 MFP.[12]
- On January 15, 2020, President Trump signed a "Phase I" executive agreement with the Chinese government on trade and investment issues, including

[8] CRS Report R45929, *China's Retaliatory Tariffs on U.S. Agriculture: In Brief*.

[9] The U.S. hay crop exceeds the U.S. cotton crop in area, volume, and value but is less commercially traded and is used primarily by the livestock sector. In recent years, two specialty crops—grapes and almonds—have rivaled cotton for fourth place in terms of the value of production, depending on market prices and production.

[10] CRS Report R44606, *The Commodity Credit Corporation: In Brief*.

[11] The 2018 Market Facilitation Program (MFP) was authorized by Agriculture Secretary Sonny Perdue at up to $12 billion in financial assistance, including up to $10 billion in direct payments; see CRS Report R45310, *Farm Policy: USDA's 2018 Trade Aid Package*. The 2019 MFP was authorized by Secretary Perdue at up to $16 billion in financial assistance, including up to $14.5 billion in direct payments; see CRS Report R45865, *Farm Policy: USDA's 2019 Trade Aid Package*.

[12] Data are as of August 31, 2020; USDA, Farm Service Agency (FSA), "Market Facilitation Program," at https://www.farmers.gov/manage/mfp.

agriculture.[13] The agreement was expected to improve market access for U.S. products into China, including a commitment by China to import $32 billion worth of additional U.S. agricultural products (relative to a 2017 base of $24 billion) over a two-year period. The Phase I agreement was expected to provide improved opportunity for certain U.S. exporters; however, there is uncertainty over whether the agreement may lead to a rearrangement of global trading patterns rather than create new market demand.

- In mid-January 2020, COVID-19 first appeared in the United States and spread rapidly through the country. The COVID-19 pandemic produced an aggregate demand shock across the U.S. economy, including the agricultural sector.[14]
- The COVID-19 pandemic induced widespread business closures, massive lay-offs, and 2020 gross domestic product (GDP) declines of -4.8% for the first quarter (annualized basis) and -31.7% for the second quarter.[15] In August 2020, 24.2 million persons were unable to work because their employer closed or lost business due to the pandemic, and the overall U.S. unemployment rate was 8.4%.[16]
- COVID-19 lockdowns caused widespread supply chain disruptions that shifted, and in some cases stopped, the flow of agricultural commodities through the various supply chains and led to sharp price declines and considerable market uncertainty.
- The principal impact on feed grains, oilseeds, and fiber was primarily the result of the COVID-19 demand shock on food demand and retail purchasing.[17] The short-run impact was lower prices, stock building of grains and oilseeds, and a temporary backup of unmarketable surpluses of market-ready livestock and poultry, as well as perishable fruits and vegetables.
- In response to the COVID-19 pandemic, on April 17, 2020, USDA initiated the Coronavirus Food Assistance Program (CFAP1) valued at $19 billion, including $16 billion in direct payments to affected producers and $3 billion for food purchases and distribution.[18] As of September 20, 2020, USDA had made $10.1 billion in direct payments under CFAP1.[19]
- On September 18, 2020, USDA announced a second CFAP payment program (CFAP2) with funding of up to an additional $14 billion. Sign up for CFAP2 began on September 21 and runs through December 11, 2020.[20]

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[13] CRS In Focus IF11412, *U.S.-China Phase I Deal: Agriculture*.

[14] CRS Report R46347, *COVID-19, U.S. Agriculture, and USDA's Coronavirus Food Assistance Program (CFAP)*.

[15] GDP growth estimates are on an annualized basis, from U.S. Bureau of Economic Analysis, "Gross Domestic Product, 2nd Quarter 2020 (Second Estimate); Corporate Profits, 2nd Quarter 2020 (Preliminary Estimate)," BEA 20-41, news release, August 27, 2020.

[16] U.S. Bureau of Labor Statistics, "The Employment Situation—August 2020," USDL-20-1650, September 4, 2020.

[17] Todd Hubbs and Scott Irwin, "Crop Markets Suffer Massive Demand Shock from COVID-19," *Economic Impact of COVID-19 on Food and Agricultural Markets*, CAST Commentary, June 2020.

[18] For information on the April 17, 2020, USDA-initiated Coronavirus Food Assistance Program (CFAP1), see CRS Report R46395, *USDA's Coronavirus Food Assistance Program (CFAP) Direct Payments*.

[19] USDA, Coronavirus Food Assistance Program Data, "CFAP Dashboard," September 13, 2020, at https://www.farmers.gov/cfap/data.

[20] For more information, see USDA, "USDA to Provide Additional Direct Assistance to Farmers and Ranchers Impacted by the Coronavirus," press release no. 0378.20, September 18, 2020, at https://www.usda.gov/media/press-

- The Trump Administration announced several other new programs in response to the COVID-19 pandemic, including $349 billion in funding to support the Small Business Administration's (SBA's) lending programs and to create a new Paycheck Protection Program (PPP).[21] The PPP was intended to provide short-term, low-interest loans that could be forgiven under specified circumstances to qualifying small businesses (including agricultural firms) and nonprofits. As of August 8, 2020, the PPP had made $7.3 billion in potentially forgivable loans to agriculture-related enterprises.[22]
- The long-run impact of the COVID-19 pandemic will depend on how quickly the economy recovers from Depression-level high unemployment and widespread restaurant and retail business shutdowns. A slow economic recovery coupled with the extent of a resurgence of the COVID-19 pandemic in the fall loom over recovery prospects for both the U.S. economy and the U.S. agricultural sector.

Summary of the 2020 Economic Outlook

The final prospects for commodity prices and the farm income outlook in 2020 are still clouded by several critical uncertainties. First, the extent of weather-related effects on yields and harvested acres will not be known until the harvest is completed and the size of the major field crops has been assessed—most likely by January 2021. Second, the extent to which the COVID-19 pandemic will resurge again in the fall when cooler weather forces more people indoors is unknown. Third, also related to the COVID-19 pandemic, is when and how the general economy will recover and consumer demand patterns return to normal. Fourth is whether agricultural and food supply chains resuscitate themselves in a more resilient and responsive form that revives investment and growth at both the producer and retail ends. Finally, despite the signing of a Phase I trade agreement with China on January 15, 2020, it is unclear how soon—if at all—the United States may resume normal trade with China.

U.S. Crop Developments and Outlook for 2020

This section reviews the major highlights of the crop growing season from the pre-planting period until early September, just prior to major harvesting activity for corn and soybeans.

Key market developments in 2020 include the following

- U.S. crop producers entered the 2020 year with large stocks (held over from 2019 and earlier harvests) relative to demand for the major grains, oilseed, and fiber crops—corn, wheat, soybeans, and upland cotton (**Figure 3**).
- The United States and China signed the Phase I trade agreement on January 15, 2020. This fueled farmers' optimism for 2020 and contributed to early projections in March for large planted acres in 2020, including 97.0 million acres for corn (up 8.1% from 2019), 83.5 million for soybeans (+9.7%), 44.7 million

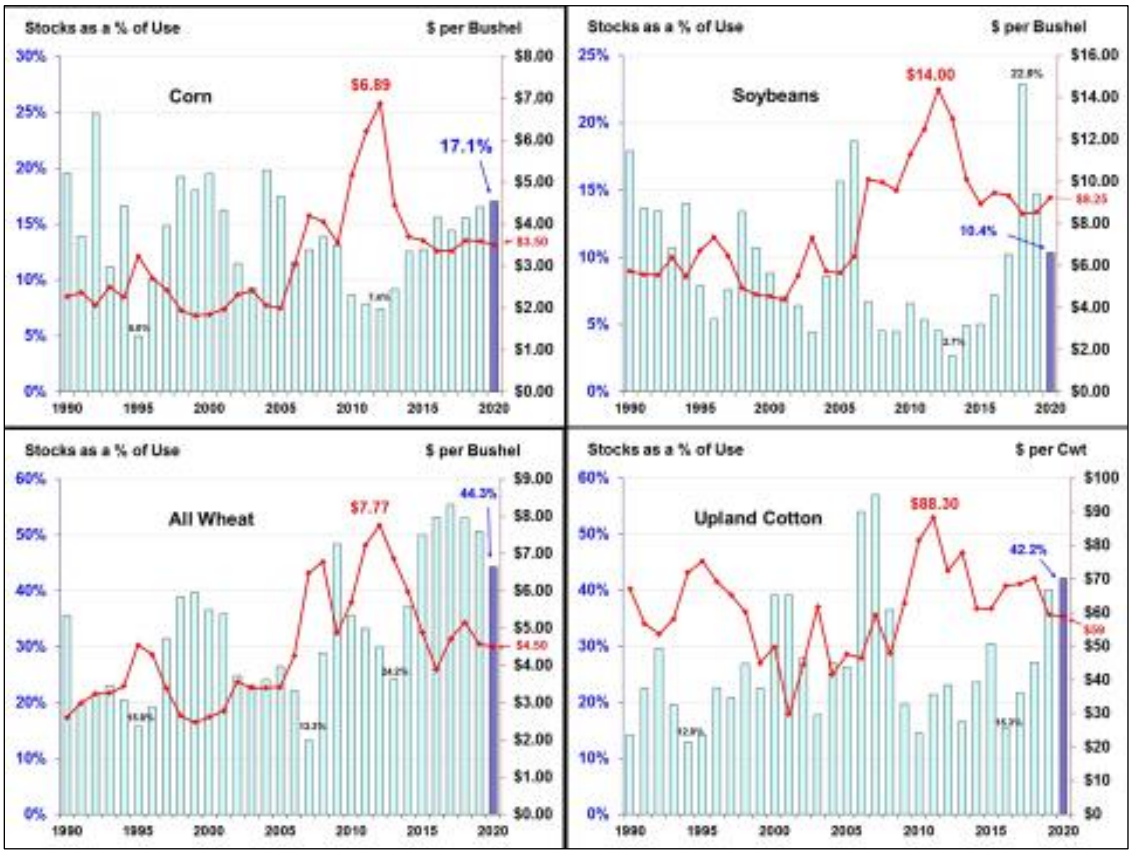
releases/2020/09/18/usda-provide-additional-direct-assistance-farmers-and-ranchers.

[21] For information on the federal response to the Coronavirus Disease 2019 (COVID-19) pandemic for different sectors of the U.S. economy, visit the CRS COVID-19 Resources page at https://www.crs.gov/Resources/coronavirus-disease-2019.

[22] The Small Business Administration (SBA) stopped taking Paycheck Protection Program (PPP) applications on August 8, 2020. Final loan data for PPP reported here were obtained via a Freedom of Information Act request by an anonymous nongovernmental organization and shared with CRS.

for wheat (-1.1%), 13.7 million for cotton (unchanged), and 319.1 million total area planted to principal crops (+5.4%).[23]

Figure 3. Stocks-to-Use Ratios and Farm Prices: Corn, Soybeans, Wheat, and Cotton



Source: USDA, World Agricultural Outlook Board, *World Agricultural Supply and Demand Estimates*, September 11, 2020. All values are nominal. Values for 2020 are forecasts, in dark blue, and separated from historical data.

Notes: Stocks-to-use equals the ratio of season-ending stocks relative to the season's total usage. Data are reported on a market-year basis—the market year is the 12-month period that begins at harvest time, during which the harvested crop is either stored or used on farm or sold in the marketplace. For corn and soybeans, the market year starts in September and runs through August of the following year. Wheat data are on a June-May market year basis, and upland cotton data are on an August-July market year.

- Planted acres were limited in 2020 for major field crops by a second year of above-normal prevented planting estimated at over 10 million acres.[24] In 2019, a record 19 million acres of prevented planting acres were recorded.[25] By comparison, from 2000 to 2018, prevent planting averaged 4.1 million acres annually.

[23] National Agricultural Statistics Service (NASS), USDA, *Prospective Plantings*, March 31, 2020. Principal crops include corn, sorghum, oats, barley, rye, winter wheat, Durum wheat, other spring wheat, rice, soybeans, peanuts, sunflower, cotton, dry edible beans, chickpeas, potatoes, sugarbeets, canola, proso millet, all hay, tobacco, and sugarcane; but also includes double cropped acres and unharvested small grains planted as cover crops.

[24] Farm Service Agency (FSA), USDA, "FSA Crop Acreage Data Reported to FSA, 2020 Crop Year," September 1, 2020.

[25] CRS Report R46180, *Federal Crop Insurance: Record Prevent Plant (PPL) Acres and Payments in 2019*.

- In June, farmers reported that 311.9 million acres were planted to principal crops (up 3.1% from 2019, but down over 7 million acres from the March survey of intentions) including 92.0 million to corn (+2.6%), 83.8 million to soybeans (+9.7%), 44.3 million to wheat (-2.0%), and 12.2 million to cotton (-11.3%).[26]
- Except for the prevent planting acreage mentioned earlier, most principal crops were planted on time and under good soil moisture conditions. In August, USDA's initial outlook projected a record corn crop of 15.3 billion bushels and a near-record large soybean crop of 4.4 billion bushels.[27] Forecasts for both crops included record yields of 181.8 and 53.3 bushels per acre, respectively, for corn and soybeans. This initial forecast included declines in market-year average farm prices (MYAPs) for corn to $3.10 per bushel (-13.9% from 2019) and for soybeans to $8.35 per bushel (-2.3%) for 2020.
- In mid-July, widespread hot, dry conditions set in over much of the western United States, including portions of the Corn Belt—that is, the Dakotas, Nebraska, Iowa, and northern Illinois (**Figure 4**). These poor growing conditions began to negatively impact yields for corn and soybeans.
- On August 10, a large derecho storm system plowed through the Midwest.[28] Early news reports suggested substantial damage, including approximately 10 million acres of corn and soybeans, roughly a third of Iowa's total cropland, damaged by rain, hail, and wind.
- As a result of the unexpected weather developments, USDA, in its September crop report, lowered yields, acres, and production for both corn and soybeans to reflect the hot, dry conditions and the effects of the derecho across Iowa. In particular, national corn and soybean estimated yields were reduced to 178.5 and 51.9 bushels per acre, respectively. The harvested-corn acreage estimate was lowered to 83.473 million acres, a reduction of 550,000 acres—all from Iowa. Soybean acres were left unchanged. MYAPs were revised substantially upward to $3.50 per bushel for corn and $9.25 per bushel for soybeans.
- Starting in mid-August, China began to make large purchases of U.S. corn and soybeans.[29] While much uncertainty remains about the eventual size of Chinese grain and oilseed imports, market optimism and concerns about weather-related production issues fueled a rise in commodity prices in the U.S. futures market that began in mid-August (starting on August 12) and have pushed soybean prices for the nearby futures contract to surpass $10 per bushel on September 14.[30]

[26] NASS, USDA, *Acreage*, June 30, 2020.

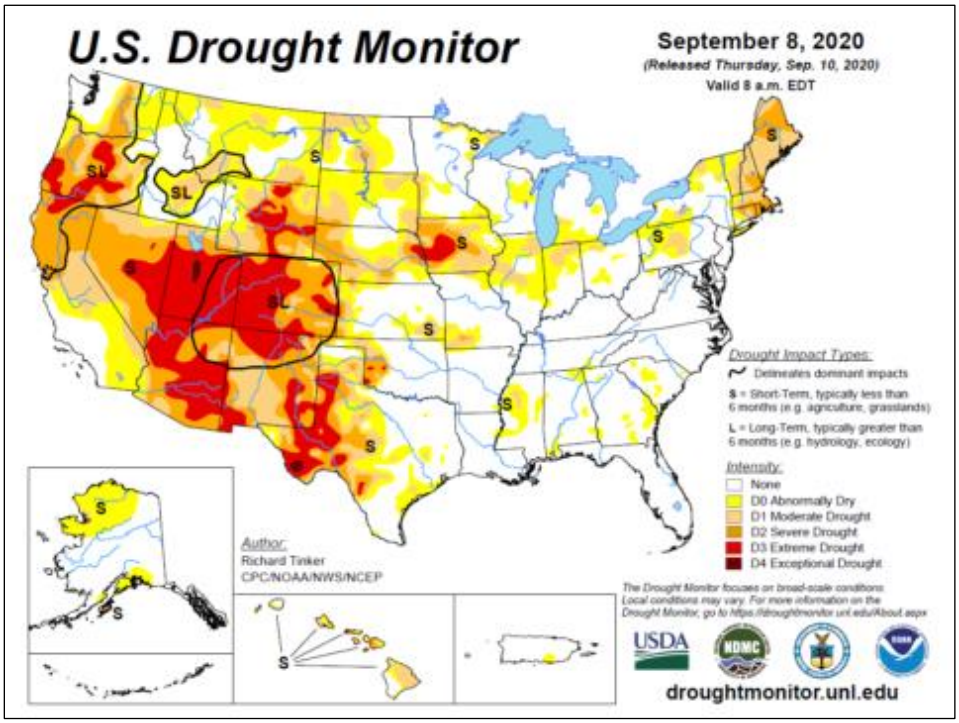
[27] USDA, World Agricultural Outlook Board (WAOB), *World Agricultural Supply and Demand Estimates (WASDE)*, August 12, 2020.

[28] A derecho is a weather event caused by severe thunderstorms and often characterized by 70-100 mph straight-line winds. Krissa Welshans, "Derecho storm causes widespread, significant damage," *Feedstuffs*, August 11, 2020.

[29] Keith Good, "China Could Become Largest Corn Importer, While Soybean Variables Come Into Focus," *Farm Policy News*, September 10, 2020.

[30] Chicago Mercantile Exchange, "Soybean Futures Quotes for the November 2020 contract," CME Group, accessed on September 15, 2020.

Figure 4. U.S. Drought Monitor for September 8, 2020



Source: The National Drought Mitigation Center, University of Nebraska-Lincoln, at https://droughtmonitor.unl.edu/.

Why the Emphasis on Corn and Soybeans?

Often the discussion of the U.S. agricultural situation focuses on what is happening with corn and soybeans to the exclusion of many other important crops. This is due largely to the fact that corn and soybeans are the two largest commercial crops in the United States in terms of both value and acreage. The corn and soybean crops provide important inputs for the domestic livestock, poultry, and biofuels sectors. In addition, the United States is traditionally one of the world's leading exporters of corn, soybeans, and soybean products—vegetable oil and meal.

Since 2010, the United States has used about 34% of its annual corn supply for feed, another 34% for biofuels, 12% for exports, and 9% for food processing, while 11% on average are retained as stocks. Similarly, since 2010, 49% of U.S. soybean supplies have been used domestically—"crushed" into soybean meal and oil, while 43% has been exported, and 8% has gone into stocks. As a result, the outlook for these two crops is critical to both farm sector profitability and regional economic activity across large swaths of the United States, as well as in international markets.

U.S. Livestock Developments and Outlook for 2020

Because the livestock sectors (particularly dairy and cattle, but hogs and poultry to a lesser degree) have longer biological lags and often require large capital investments up front, they are slower to adjust to changing market conditions than is the crops sector. Furthermore, once an animal or poultry is market-ready—that is, once it has attained the optimal weight gain and is ready to be sold—the producer will need to sell it to capture the maximum benefit of the weight gain and to avoid further costs associated with holding the animal or poultry for any additional period. In contrast, grain or oilseed producers can simply continue to store their commodities if market conditions change unexpectedly. As a result, the demand shocks related to COVID-19 impacted the livestock sector more severely than the crops sector.

COVID-19 Impacts the U.S. Livestock Sector

Starting in mid-April, a surge in infections among workers in meat packing plants and other food processing plants led to multiple plant closures and contributed to unexpected surpluses of ready-for-market hogs, cattle, and poultry at the farm level.[31] Producers were forced to either euthanize their animals or continue to feed them at a loss.

Meat processing plant closures have two opposing market effects: on the one hand, demand for livestock in the surrounding region is reduced, and this tends to depress cash and futures prices, lowering prices that producers receive and that packers pay for market-ready livestock; on the other hand, the supply of consumer-ready products is reduced, which tends to raise wholesale and retail prices for the affected products. As evidence of this, USDA reported a widening gap between farm and wholesale prices for beef in the spring.[32]

Most of the affected meat processing plants have been brought back on line but are operating under new safety guidelines and often with fewer workers on site at any given time. In many cases, these changes have slowed the operating line speed and the amount of throughput. An examination of the farm, wholesale, and retail price data for beef and pork suggests that the price spread between farm and retail prices peaked in May and June and has subsided somewhat in July but still remains at historically high levels.[33]

Beef and Egg Production Decline and Pork, Poultry, and Milk Expand in 2020

Growth in beef (-0.4%) and egg (-2.1%) production are expected to turn negative in 2020, while pork (+2.2%), poultry (+1.1%), and milk (+1.6%) production are projected up.[34] This is in contrast with 2019 when all five protein categories experienced robust year-over-year growth—beef (+1.1%), pork (+5.0%), poultry (+2.5%), eggs (+2.6%), and milk (+0.4%). USDA projects protein production under all five categories to return to positive growth in 2021.

Prior to COVID-19, nearly 54% of U.S. food consumption occurred outside of the home, including much of the consumption of meat products. A key uncertainty for the meat-producing sector is whether demand for meat products (in both the domestic and export markets) will return to pre-COVID-19 levels or whether a new equilibrium will be established that absorbs the growth in output projected for 2021. This balance between demand and supply will determine the direction of livestock, poultry, egg, and milk prices.

Livestock-Price-to-Feed-Cost Ratios Signal Lower Profitability Outlook

The changing conditions for the U.S. livestock sector may be tracked by the evolution of the ratios of livestock output prices to feed costs (**Figure 5**). A higher ratio suggests greater profitability for producers.[35] The cattle-, hog-, and broiler-to-feed ratios have all exhibited

[31] CRS Insight IN11366, *COVID-19 Disrupts U.S. Meat Supply; Producer Prices Tumble*.

[32] William Hahn, "Record increase in March farm-to-wholesale beef price spread driven by sharp wholesale price changes in mid-March 2020," *Chart of the Day*, USDA, ERS, April 23, 2020. See also "Cash Prices, Meat Cutout Diverge," *ProFarmer*, April 25, 2020.

[33] Michael Nepveux, "Pandemic Results in Record Farm-to-Retail Price Spreads in Beef and Pork," American Farm Bureau Federation (AFBF), Market Intel, September 4, 2020.

[34] WAOB, USDA, *WASDE*, Table—U.S. Meat Supply and Use; and Table—U.S. Egg Supply and Use, pp. 32-33, September 11, 2020.

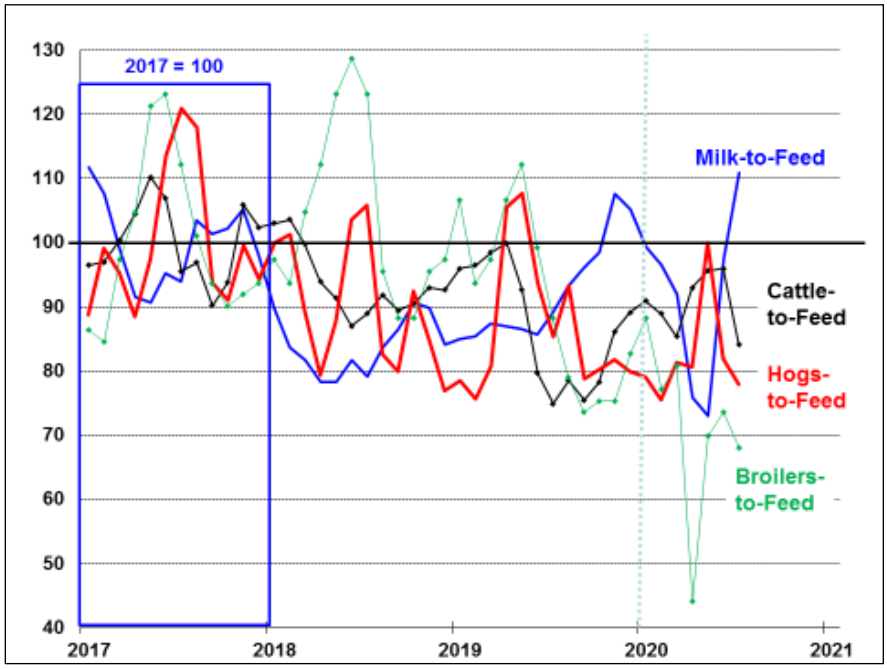
[35] The ratio is calculated as the farm price for milk, cattle (steers and heifers), hogs, and broilers compared with their major feed source: Cattle and hog feed cost is 100% corn; broilers feed cost is 58% corn and 42% soybeans; dairy feed

significant volatility during the 2017-2020 period but in general have trended downward during 2018 through 2020, suggesting eroding profitability.[36]

The milk-to-feed price ratio trended upward from mid-2018 into late 2019 before collapsing in early 2020. However, as the prospects for large corn and soybean crops in 2020 pushed feed prices lower, the profitability of milk production improved, and the milk-to-feed ratio rose into mid-2020. This trend may again reverse itself as USDA has recently raised its outlook for grain and oilseed prices in 2020, while continuing to forecast lower milk prices in 2020 and 2021.[37] These results vary widely across the United States. Many marginally profitable cattle, hog, broiler, and milk producers face continued financial difficulties.

Figure 5. Livestock Farm-Price-to-Feed Ratios, Indexed

(ratio of national average farm price per 100 lbs. of meat to per-unit feed cost; indexed, 2017 = 100.)



Source: National Agricultural Statistics Service (NASS), *Agricultural Prices*, August 30, 2020. Calculations by CRS.

Notes: The livestock feed price ratio is calculated as the farm price for milk, cattle (steers and heifers), hogs, and broilers to their major feed source: cattle and hog feed cost is 100% corn; broilers feed cost is 58% corn and 42% soybeans; and dairy feed cost is a mix of corn, soybean meal, and alfalfa hay.

Gross Cash Income Highlights

Projected farm sector revenue sources in 2020 include crop revenues (46% of sector revenues), livestock receipts (38%), government payments (9%), and other farm-related income (8%), including crop insurance indemnities, machine hire, and custom work (**Figure 6**). Total farm sector gross cash income for 2020 is projected up slightly (+0.2%) to $428.8 billion, as large

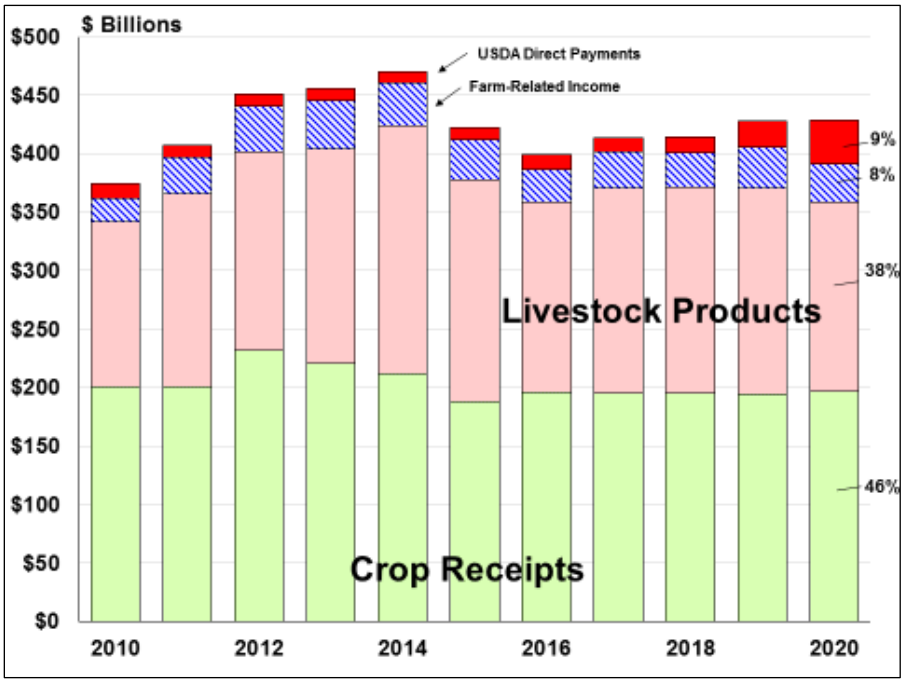
cost is a mix of corn, soybean meal, and alfalfa hay. Feed costs—at 30%-80% of variable costs—are generally the largest cost component in livestock operations.

[36] Broilers are chickens raised for meat. Layers are chickens retained for egg production.

[37] WAOB, *WASDE*, U.S. Dairy Prices, September 11, 2020, p. 34.

declines in cash receipts from livestock activities (down $14.3 billion or -3.3%) are offset by record government payments (up $14.7 billion or +65.7%).

Figure 6. Farm Gross Cash Receipts by Source, 2010-2020F



Source: ERS, "2020 Farm Income Forecast," September 2, 2020. All values are nominal—that is, not adjusted for inflation. Values for 2020 are forecasts. Gross farm income percentage shares (right-hand side) are for 2020; totals may not add to 100 due to rounding.

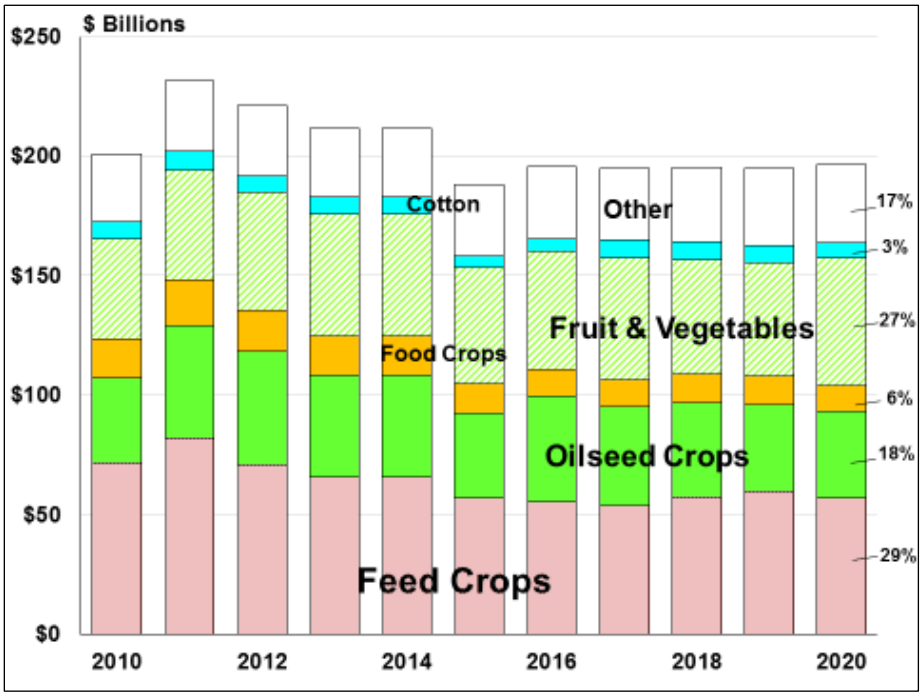
Notes: Farm-related income includes income from custom work, machine hire, agritourism, forest product sales, crop insurance indemnities, and cooperative patronage dividend fees.

Crop Receipts

Total crop sales peaked in 2012 at $231.6 billion when a nationwide drought pushed commodity prices to record or near-record levels. In 2020, crop sales are projected at $196.6 billion, up 1.0% from 2019 (**Figure 7**). Projections for 2020 and percentage changes from 2019 include the following

- feed crops—corn, barley, oats, sorghum, and hay: $57.0 billion (-4.5%);
- oil crops—soybeans, peanuts, and other oilseeds: $36.1 billion (-0.6%);
- fruits and nuts: $33.6 billion (+17.0%);
- vegetables and melons: $19.4 billion (+2.3%);
- food grains—wheat and rice: $11.0 billion (-6.7%);
- cotton: $6.6 billion (-7.3%); and
- other, including tobacco, sugar, greenhouse, and nursery: $32.9 billion (+2.6%).

Figure 7. Crop Cash Receipts by Source, 2010-2020F



Source: ERS, "2020 Farm Income Forecast," September 2, 2020. All values are nominal—not adjusted for inflation. Values for 2020 are forecasts. Percentage shares of crop receipts (right-hand side) are for 2020.

Livestock Receipts

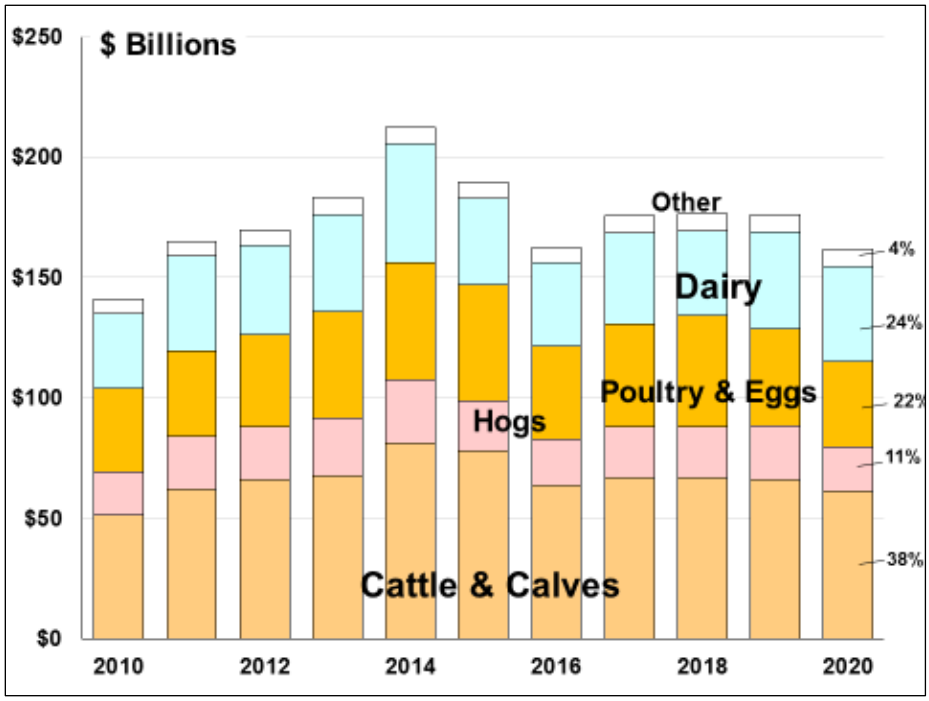
The livestock sector includes cattle, hogs, sheep, poultry and eggs, dairy, and other minor activities. Cash receipts for the livestock sector grew steadily from 2010 to 2014, when it peaked at a record $212.3 billion. However, the sector turned downward in 2015 (-10.7%) and again in 2016 (-14.1%), driven largely by projected year-over-year price declines across major livestock categories (**Table A-4** and **Figure 8**).

In 2017, livestock sector cash receipts recovered with year-to-year growth of 7.9% to $175.6 billion. Cash receipts increased slightly in 2018 (+0.4%) before declining in 2019 (-0.2%). In 2020, cash receipts are projected down sharply (-8.1%) for the sector at $161.7 billion (lowest value since 2010) due to declines in the four major categories: cattle, hogs, dairy, and poultry and eggs. Projections for 2020 (and percentage changes from 2019) include

- cattle and calf sales: $61.2 billion (-7.7%),
- dairy sales: $39.6 billion (-2.2%),
- poultry and egg sales: $35.5 billion (-12.1%),
- hog sales: $18.5 billion (-15.9%), and
- miscellaneous livestock:[38] $6.9 billion (+0.7%).

[38] Miscellaneous livestock includes aquaculture, sheep and lambs, honey, mohair, wool, pelts, and other animal products.

Figure 8. U.S. Livestock Product Cash Receipts by Source, 2010-2020F



Source: ERS, "2020 Farm Income Forecast," September 2, 2020. All values are nominal—that is, not adjusted for inflation. Values for 2020 are forecasts. Percentage shares of livestock receipts (right-hand side) are for 2020.

Government Payments to the U.S. Farm Sector

Government direct payments to U.S. farmers—projected at a record $37.2 billion in 2020—are expected to represent 36.2% of projected net farm income of $102.7 billion (**Figure 9**). The government share of net farm income reached a peak of 65.2% in 1984 during the height of the farm crisis of the 1980s. The importance of government payments as a percentage of net farm income varies nationally by crop and livestock sector and by region.

As shown earlier (**Figure 6**), federal farm subsidies of $37.2 billion would represent an 8.7% share of projected gross cash income of $428.7 billion in 2020.

Historically, direct government farm program payments have included[39]

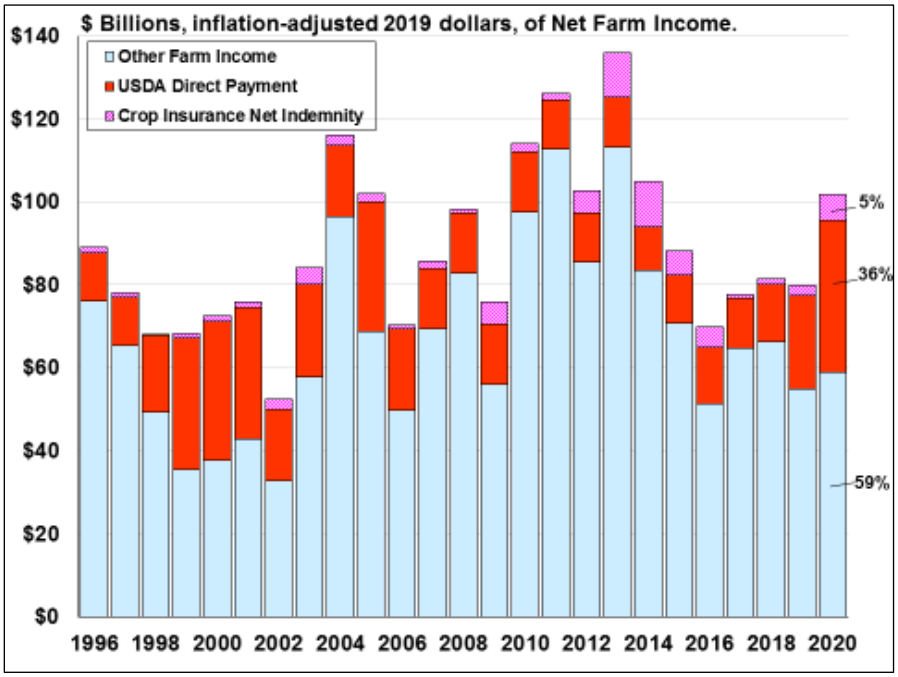
- direct payments (decoupled payments based on historical planted acres);[40]
- price-contingent payments (both coupled and decoupled program outlays linked to market conditions);
- conservation payments (including the Conservation Reserve Program and other environmental-based outlays);

[39] Government farm payments do not include premium subsidies or indemnities paid under the federal crop insurance program—indemnity payments are included as "farm-related income." Also, government payments do not include USDA loans, which are listed as a liability in the farm sector's balance sheet.

[40] *Decoupled* means that payments are not linked to current producer behavior and, instead, are based on some other measure outside of the producer's decisionmaking sphere, such as historical acres planted to program crops. Decoupling of payments is intended to minimize their incentives on producer behavior.

- ad hoc and emergency disaster assistance payments (including emergency supplemental crop and livestock disaster payments); and
- other miscellaneous outlays, including payments under ad hoc programs initiated by the Administration, outside of traditional farm-bill authorities, such as Market Loss Assistance (MLA) payments for relief of low commodity prices, the Market Facilitation Program (MFP) payments to offset retaliatory tariff damages, and the Cotton Ginning Cost-Share program—but also legislatively authorized programs, such as the biomass crop assistance program, peanut quota buyout, milk income loss, tobacco transition, and other miscellaneous programs.

Figure 9. Net Farm Income by Source, 1996-2020F



Source: Compiled by CRS from ERS, "2020 Farm Income Forecast," September 2, 2020. Sources of net farm income, expressed as percentage shares (right-hand side), are for 2020. Values for 2020 are forecasts.

USDA Direct Payments in 2019

In 2019, $22.4 billion in federal payments were made to producers. This was the largest taxpayer transfer to the agriculture sector (in nominal dollars) since 2005 (**Figure 10**). The surge in federal subsidies in 2019 was driven by large "trade-damage" payments made under the MFP initiated by USDA in response to the U.S.-China trade dispute.[41] MFP payments (reported to total $14.5 billion) include outlays from the 2018 MFP program that were not received by producers until 2019, as well as payments under the first and second tranches of the 2019 MFP program, some of which are expected to be paid in 2020.

[41] USDA has initiated two trade aid packages with up to $28 billion of financial support designed to partially offset the negative price and income effects of lost commodity sales to major markets. The 2018 trade aid package was valued at up to $12 billion (see CRS Report R45310, *Farm Policy: USDA's 2018 Trade Aid Package*), while the 2019 trade aid package was valued at up to $16 billion (see CRS Report R45865, *Farm Policy: USDA's 2019 Trade Aid Package*).

In 2020, MFP payments are projected to decline to $3.8 billion, representing the third and final tranche of payments from the 2019 MFP program. On September 9, 2020, USDA announced a new MFP-like program—referred to as the Seafood Trade Relief Program (STRP)—valued at $530 million, which targets U.S. seafood products that had been affected by retaliatory tariffs.[42] However, seafood is not included as part of ERS farm income forecasts. In addition, no further MFP payments have been announced for 2020 by the Administration.

USDA Direct Payments in 2020

Projected government payments of $37.2 billion in 2020, if realized, would represent a 65.7% increase from 2019 and would be the largest annual federal subsidy outlay to the agricultural sector on record in both nominal and inflation-adjusted dollars. The surge in federal subsidies in 2020 is driven by large ad hoc payments made under three Administration-initiated programs:

- The **2019 Market Facilitation Program (MFP)**: most of the 2019 MFP payments occurred in 2019 ($10.7 billion), but the final $3.8 billion in MFP payments are expected to be made in 2020.
- The **2020 Coronavirus Food Assistance Programs (CFAP1 and CFAP2)**: USDA has allocated $16 billion in funding for CFAP1 to address COVID-19-related damages that occurred during the first half of 2020. As of September 20, 2020, $10.1 billion of CFAP1 funding has been dispersed. USDA has allocated additional funding of up to $14 billion under CFAP2, also to address COVID-19-related damages to the U.S. agricultural sector.
- The **2020 Paycheck Protection Program (PPP)**: USDA expects that $5.8 billion of $7.3 billion of PPP loans to agriculture-related enterprises will be forgiven and counted as farm income in 2020.[43]

USDA permanent disaster assistance[44] is projected higher year-over-year in 2020 at $2.5 billion (+14.2%). Most of the $2.5 billion comes from a new, temporary program, the Wildfire and Hurricane Indemnity Program Plus, enacted through the Disaster Relief Act of 2019 (P.L. 116-20). Payments under the Price Loss Coverage program are projected at $3.9 billion in 2020, up from $1.9 billion in 2019. In contrast, Agricultural Risk Coverage outlays are projected to decline to $39 million, down from $641 million in 2019 (see "Price Contingent" in **Figure 10**).[45]

Conservation programs include all conservation programs operated by USDA's Farm Service Agency and the Natural Resources Conservation Service that provide direct payments to producers. Conservation payments are forecast at $4.0 billion for 2020, up 5.0% from $3.8 billion in 2019, and are expected to account for 11% of federal farm support in 2020.

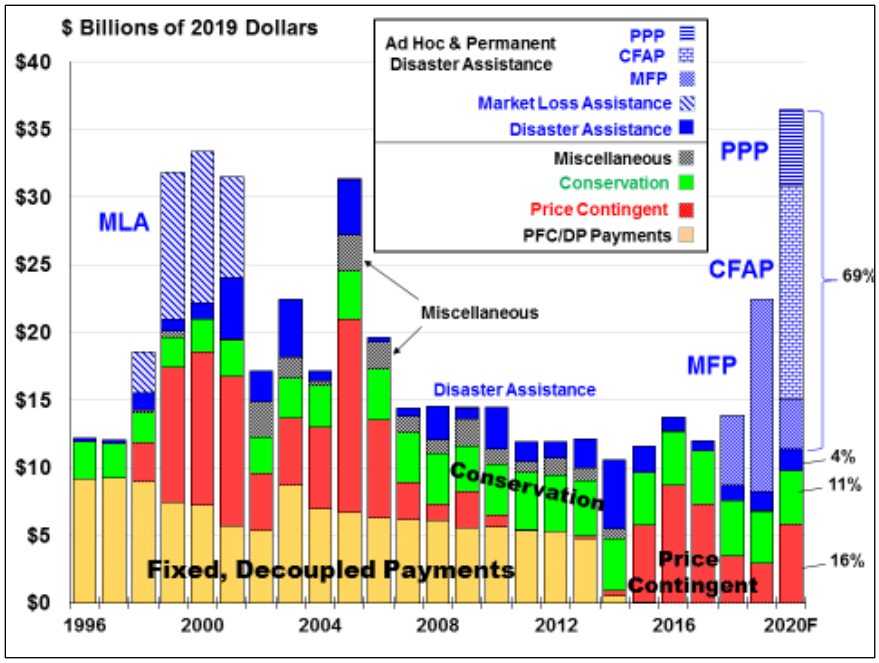
[42] USDA, "USDA Supports U.S. Seafood Industry Impacted by Retaliatory Tariffs," news release, September 9, 2020, at https://www.farmers.gov/Seafood.

[43] For information on the PPP loan forgiveness, see CRS Report R46397, *SBA Paycheck Protection Program (PPP) Loan Forgiveness: In Brief*.

[44] Fiscal year payments generally involve outlay commitments incurred during the previous crop year. For example, FY2019 disaster assistance payments are primarily related to disasters for crops that were grown and harvested in 2018. See CRS Report RS21212, *Agricultural Disaster Assistance*, for information on available farm disaster programs.

[45] For details, see CRS Report R43448, *Farm Commodity Provisions in the 2014 Farm Bill (P.L. 113-79)*.

Figure 10. U.S. Government Farm Support, Direct Outlays, 1996-2020F



Source: ERS, "2020 Farm Income Forecast," September 2, 2020. All values are nominal (not adjusted for inflation). Values for 2020 values are forecasts. Government payments as percentage shares (right-hand side) are for 2020.

Notes: Data are on a calendar-year basis and reflect the timing of the actual payment. "Direct Payments" include production flexibility contract (PFC) payments enacted under the 1996 farm bill and fixed direct payments (DP) of the 2002 and 2008 farm bills. "Price-Contingent" outlays include loan deficiency payments, marketing loan gains, counter-cyclical payments, Average Crop Revenue Election, Price Loss Coverage, Agricultural Risk Coverage, and the dairy Margin Protection program (MPP), and Dairy Margin Coverage (DMC) payments. "Conservation" outlays include Conservation Reserve Program (CRP) payments along with other conservation program outlays. "Ad Hoc and Permanent Disaster" is divided into payments under the Market Facilitation Program (MFP), Paycheck Protection Program (PPP), Coronavirus Food Assistance Program (CFAP), Market Loss Assistance (MLA), and "Disaster Assistance" programs, each of which is identified with a different blue pattern. "Disaster Assistance" is an aggregate category that includes supplemental crop and livestock disaster payments and other emergency payments to the agriculture sector, such as payment made under the Wildfire, Hurricane Indemnity Program (WHIP). "Miscellaneous" outlays include payments under the cotton ginning cost-share, biomass crop assistance, peanut quota buyout, milk income loss contract, tobacco transition, and other miscellaneous payment programs.

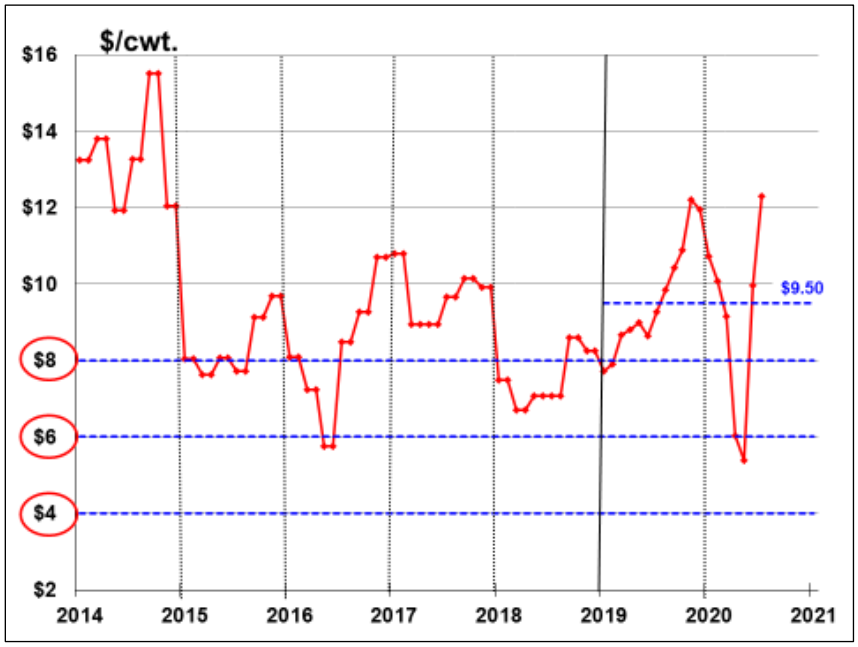
Dairy Margin Coverage Program Outlook

The 2018 farm bill (P.L. 115-334) made several changes to the previous Margin Protection Program (MPP) for dairy, including a new name—the Dairy Margin Coverage (DMC) program—and expanded margin coverage choices from the original range of $4.00-$8.00 per hundredweight (cwt.).[46] Under the 2018 farm bill, as a cushion against low milk prices, producers have the option of buying coverage to insure a margin between the national farm price of milk and the cost of feed up to a threshold of $9.50/cwt. on the first 5 million pounds of milk coverage.

[46] The margin equals the All Milk price minus a composite feed price based on the formula used by the Dairy Margin Coverage (DMC) of the 2018 farm bill starting January 2019 and, for all prior months, the Margin Protection Program (MPP) of the 2014 farm bill (P.L. 113-79). See CRS Report R45525, *The 2018 Farm Bill (P.L. 115-334): Summary and Side-by-Side Comparison*, and CRS In Focus IF10195, *U.S. Dairy Programs After the 2014 Farm Bill (P.L. 113-79)*.

Figure 11. The Dairy Output-to-Input Margin

(dairy margin equals the national average farm price of milk less average feed costs per 100 pounds of milk)



Source: NASS, *Agricultural Prices*, August 30, 2020. Calculations by CRS. All values are nominal.

Note: The margin equals the All Milk price minus a composite feed price based on the formula used by the DMC of the 2018 farm bill starting January 2019 and, for all prior months, the MPP of the 2014 farm bill (P.L. 113-79). See CRS Report R45525, *The 2018 Farm Bill (P.L. 115-334): Summary and Side-by-Side Comparison*.

The DMC margin differs from the USDA-reported milk-to-feed ratio (shown in **Figure 5**) but reflects the same market forces. In 2019, the formula-based milk-to-feed margin used to determine government DMC payments started the year near $8.00/cwt. but rose to over $12.00/cwt. by year's end, thus exceeding the newly instituted $9.50/cwt. payment threshold (**Figure 11**). In 2020, the DMC margin plummeted to below $6.00/cwt. in May before jumping to $12.30/cwt. in July. The volatility is a function of market uncertainty over feed prices, as described earlier in this report. USDA projects that the DMC program will make $219 million in payments in 2020, down from $295 million in 2019.

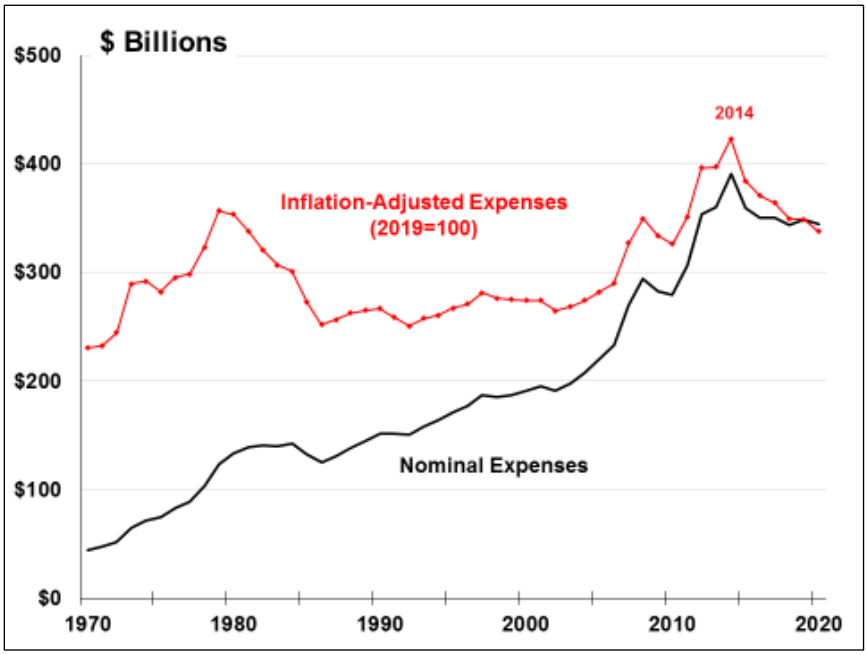
Production Expenses

Total production expenses for 2020 for the U.S. agricultural sector are projected at $344.2 billion in nominal dollars, down $4.6 billion (-1.3%) from 2019 (**Figure 12**). Production expenses peaked in both nominal and inflation-adjusted dollars in 2014, then trended lower through 2019 in inflation-adjusted dollars and are projected lower again in 2020.

Production expenses affect crop and livestock farms differently. The principal expenses for livestock farms are feed costs, purchases of feeder animals and poultry, and hired labor. In contrast, fuel, seed, pesticides, interest, and fertilizer costs are major crop production expenses.

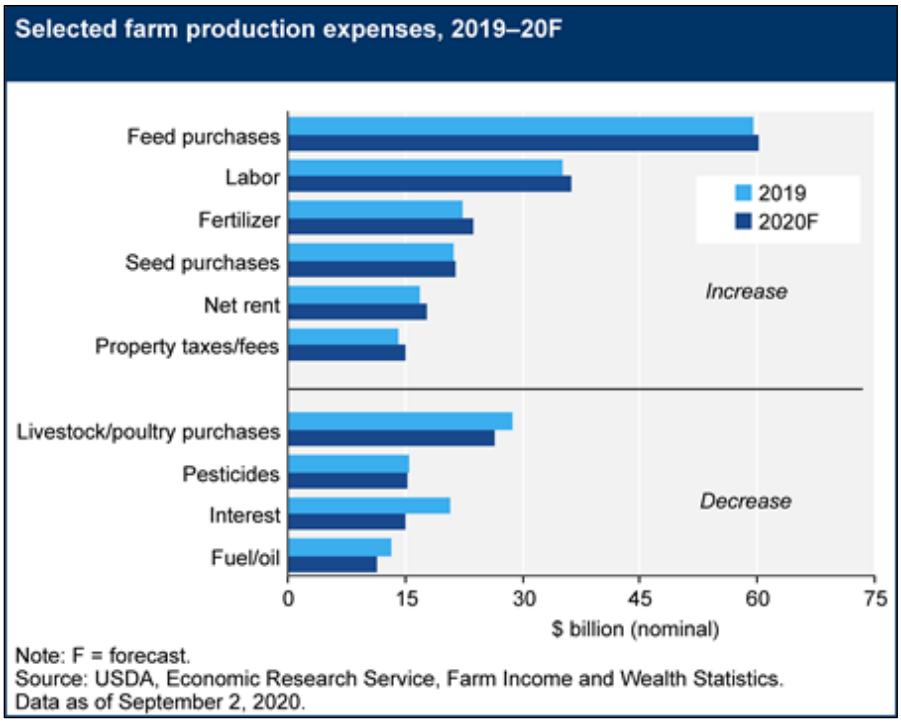
USDA projects that 6 of the 10 major expense categories will rise in 2020—including feed, labor, fertilizer, seed, net rent, and taxes (**Figure 13**). Expenses for livestock and poultry purchases, pesticides, interest, and fuel are expected to decline in 2020.

Figure 12. Total Annual Farm Production Expenses, 1970-2020F



Sources: ERS, "2020 Farm Income Forecast," September 2, 2020. Nominal values are not adjusted for inflation. Inflation-adjusted expenses are calculated using the chain-type GDP deflator set to 2019 = 100. U.S. Department of Commerce, Bureau of Economic Analysis (BEA), data accessed December 3, 2019. Values for 2020 are forecasts.

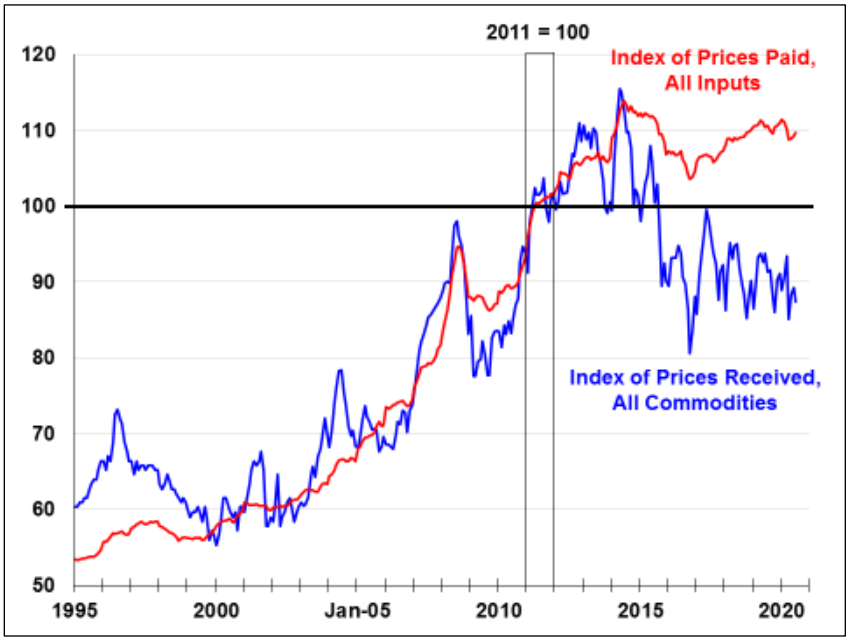
Figure 13. Farm Production Expenses for Selected Items, 2019 and 2020F



Source: ERS, "2020 Farm Income Forecast," September 2, 2020. Values are nominal. Values for 2020 are forecast.

How have production expenses moved relative to revenues? A comparison of the indexes of prices paid (an indicator of expenses) versus prices received (an indicator of revenues) reveals that, since 2014, the prices received index has generally declined, whereas the prices paid index has held steady, suggesting that farm sector profit margins have been decreased over the past six years (**Figure 14**).

Figure 14. Index of Monthly Prices Received vs. Prices Paid, 2005-2020



Source: NASS, *Agricultural Prices*, August 30, 2020. Calculations by CRS.

Note: Monthly indexes are adjusted to 2011 = 100 to permit relative comparisons.

Farm Asset Values and Debt

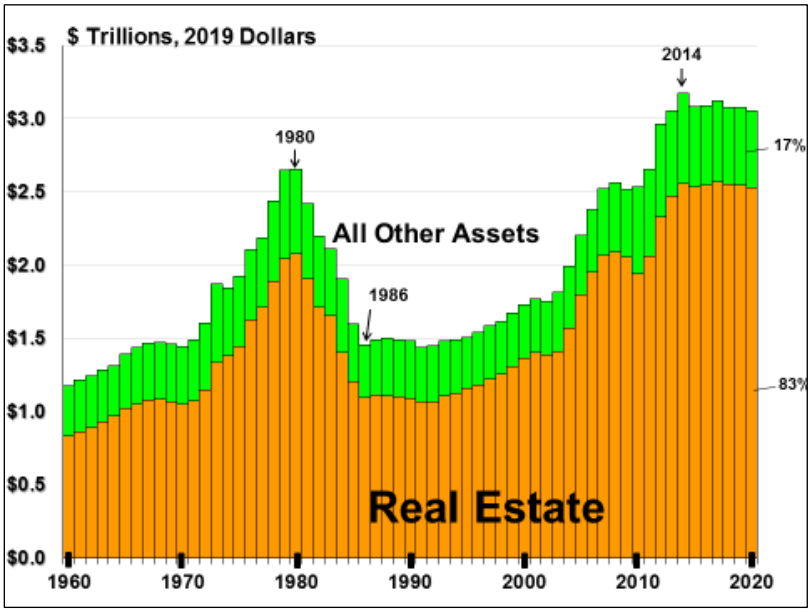
A measure of the farm sector's financial well-being is net worth as measured by farm assets minus farm debt. A summary statistic that captures this relationship is the debt-to-asset ratio.

The U.S. farm income and asset-value situation and outlook suggest a potential continuation of the slowly eroding financial situation for the agriculture sector as a whole that has been ongoing since 2012. Uncertainty clouds the economic outlook for the sector, reflecting the mixed outlook for prices and market conditions, an increasing dependency on international markets to absorb domestic surpluses, and an increasing dependency on federal support to offset lost trade opportunities due to ongoing trade disputes.

- Farm asset values (see box "Measuring Farm Wealth: The Debt-to-Asset Ratio")—which reflect farm investors' and lenders' expectations about long-term profitability of farm sector investments—are projected to be up 1.1% in 2020 to a nominal $3.1 trillion (**Table A-3**). The projected rise in asset value is due to increases in both real estate values (+1.2%) and nonreal-estate values (+0.8%). Real estate is projected to account for 83% of total farm sector asset value.
- Inflation-adjusted farm asset values (using 2019 dollars) are projected lower in 2020 (-0.8%). In inflation-adjusted terms, farm asset values peaked in 2014 (**Figure 15**).

- Crop land values are closely linked to commodity prices. The leveling off of crop land values since 2015 reflects stagnant commodity prices (**Figure 16**).

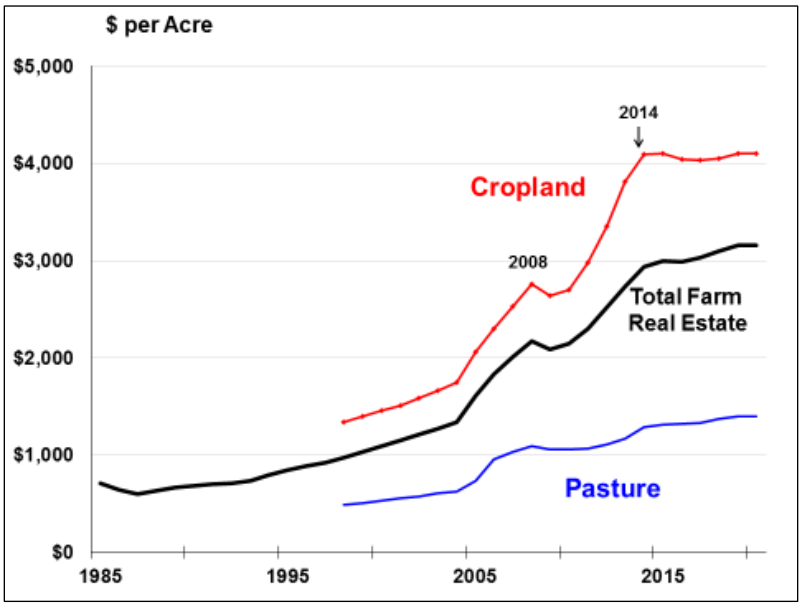
Figure 15. Real Estate Share of Total Farm Sector Assets



Sources: ERS, "2020 Farm Income Forecast," September 2, 2020. All values are adjusted for inflation using the chain-type GDP deflator such that 2019 = 100; BEA, accessed December 3, 2019. Values for 2019 and 2020 are forecasts. Percentage shares of total farm sector assets (right-hand side) are for 2020.

Note: All other assets include financial assets, inventories of agricultural products, and the value of machinery and motor vehicles.

Figure 16. U.S. Average Farm Land Values, 1985-2020



Source: NASS, *Land Values 2020 Summary*, August 2020.

Notes: Farm real estate value measures the value of all land and buildings on farms. Separate cropland and pasture values are available only since 1998. All values are nominal.

Measuring Farm Wealth: The Debt-to-Asset Ratio

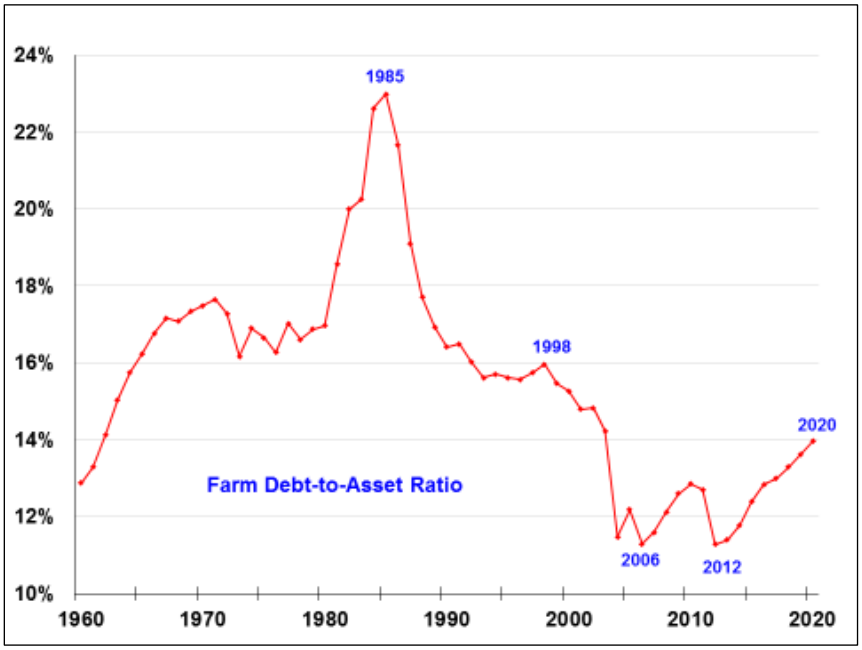
Farm assets include both physical and financial farm assets. **Physical assets** include land, buildings, farm equipment, on-farm inventories of crops and livestock, and other miscellaneous farm assets. **Financial assets** include cash, bank accounts, and investments such as stocks and bonds.

Farm debt includes both business and consumer debt linked to real estate and nonreal-estate assets (e.g., financial assets, inventories of agricultural products, and the value of machinery and motor vehicles) of the farm sector.

The **debt-to-asset ratio** compares the farm sector's outstanding debt related to farm operations relative to the value of the sector's aggregate assets. Change in the debt-to-asset ratio is a critical barometer of the farm sector's financial performance, with lower ratios indicating greater financial resiliency. A lower debt-to-asset ratio suggests that the sector is better able to withstand short-term increases in debt related to interest rate fluctuations or changes in the revenue stream related to lower output prices, higher input prices, or production shortfalls. The largest single component in a typical farmer's investment portfolio is farmland. As a result, real estate values affect the financial well-being of agricultural producers and serve as the principal source of collateral for farm loans.

- Total farm debt is forecast to rise to a record $433.8 billion in 2020 (+3.6%) (**Table A-3**).
- Farm equity—or net worth, defined as asset value minus debt—is projected to be up slightly (+0.7%), at $2.7 trillion in 2020 (**Table A-3**).
- The farm debt-to-asset ratio is forecast up in 2020 at 14.0%, the highest level since 2003 but still relatively low by historical standards (**Figure 17**). If realized, this would be the eighth consecutive year of increase in the debt-to-asset ratio.

Figure 17. U.S. Farm Debt-to-Asset Ratio, 1960-2020F



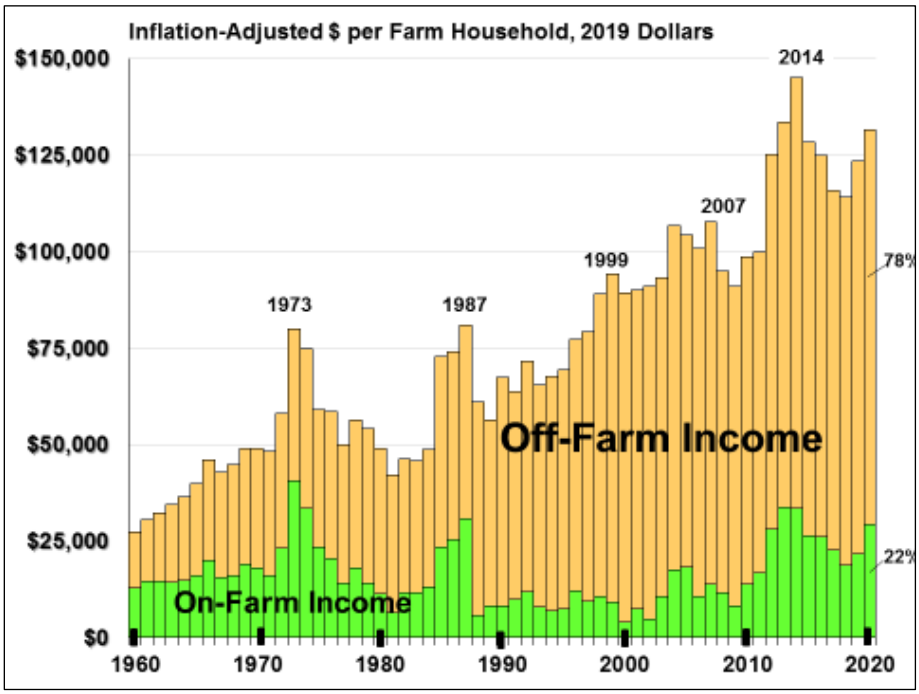
Source: ERS, "2020 Farm Income Forecast," September 2, 2020. Values for 2020 are forecasts.

Average Farm Household Income

A farm can have both an on-farm and an off-farm component to its income statement and balance sheet of assets and debt.[47] Thus, the well-being of farm operator households is not equivalent to the financial performance of the farm sector or of farm businesses because of the inclusion of nonfarm investments, jobs, and other links to the nonfarm economy.

- Average farm household income (sum of on- and off-farm income) is projected at $134,125 in 2020 (**Table A-2**), up 8.5% from 2019 and almost equal to the record of $134,165 in 2014.
- About 22% ($20,926) of total farm household income in 2020 is projected to be from farm production activities (including government payments), while the overwhelming majority, at 78% ($104,238), is earned off the farm (including financial investments).
- The share of farm income derived from off-farm sources had increased steadily for decades and peaked at about 95% in 2000 (**Figure 18**).

Figure 18. U.S. Average Farm Household Income, by Source, 1960-2020F



Sources: ERS, "2020 Farm Income Forecast," September 2, 2020. All values are adjusted for inflation using the chain-type GDP deflator, 2019 = 100; BEA, data accessed December 3, 2019. Values for 2020 are forecasts. Percentage shares of average farm household income (right-hand side) are for 2020.

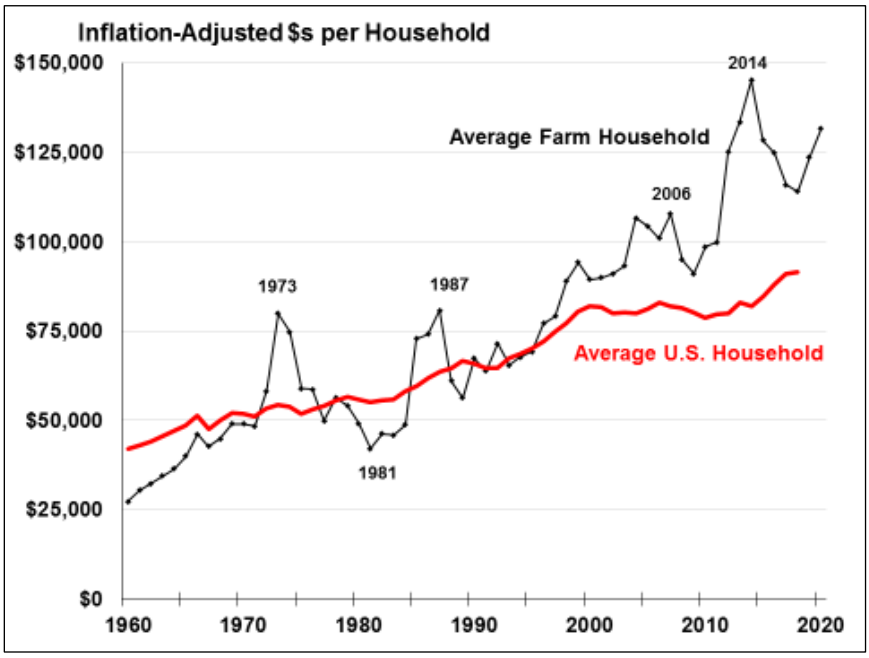
Total vs. Farm Household Average Income

Since the late 1990s, farm household incomes have surged ahead of average U.S. household incomes (**Figure 19**). In 2018 (the last year for which comparable data were available), the

[47] ERS, "Farm Household Well-Being," at http://www.ers.usda.gov/topics/farm-economy/farm-household-well-being.aspx.

average farm household income of $112,211 was about 25% higher than the average U.S. household income of $90,021 (**Table A-2**).

Figure 19. Average Farm Household Income Compared with U.S. Average Household Income



Sources: ERS, "2020 Farm Income Forecast," September 2, 2020. All values are adjusted for inflation using the chain-type GDP deflator, 2019 = 100; BEA, data accessed December 3, 2019. Values for 2020 are forecasts.

Appendix. Supporting Material on Farm Income

Measuring Farm Profitability

Two different indicators measure farm profitability: net cash income and net farm income.

Net cash income compares cash receipts to cash expenses. As such, it is a cash flow measure representing the funds that are available to farm operators to meet family living expenses and make debt payments. For example, crops that are produced and harvested but kept in on-farm storage are not counted in net cash income. Farm output must be sold before it is counted as part of the household's cash flow.

Net farm income is a more comprehensive measure of farm profitability. It measures value of production, indicating the farm operator's share of the net value added to the national economy within a calendar year independent of whether it is received in cash or noncash form. As a result, net farm income includes the value of home consumption, changes in inventories, capital replacement, and implicit rent and expenses related to the farm operator's dwelling that are not reflected in cash transactions. Thus, once a crop is grown and harvested, it is included in the farm's net income calculation, even if it remains in on-farm storage.

Key Concepts Behind Farm Income

- Net cash income is generally less variable than net farm income. Farmers can manage the timing of crop and livestock sales and purchase of inputs to stabilize the variability in their net cash income. For example, farmers can hold crops from large harvests in on-farm storage to sell in the forthcoming year when output may be lower and prices higher.
- Off-farm income and crop insurance subsidies, both of which have increased in importance in recent years, are not included in the calculation of aggregate farm income. Crop insurance indemnity payments are included.
- Off-farm income is included in the discussion of farm income at the household level at the end of this report.

National vs. State-Level Farm Household Data

Aggregate data often obscure or understate the diversity and regional variation that occurs across America's agricultural landscape. For insights into the differences in American agriculture, visit the Economic Research Service's (ERS's) websites on "Farm Structure and Organization" and "Farm Household Well-Being."[48]

ERS's Annual Farm Income Forecasts

ERS releases three farm income forecasts each calendar year. The first forecast is generally released in February as part of the President's budget process and coincides with USDA's annual outlook forum, which convenes toward the end of every February. The initial forecast consists primarily of trend projections for the year because it precedes most agricultural activity, which occurs later in the spring and summer. The initial projections rely heavily on assumptions of trend yields and USDA's baseline forecasts for market conditions.

ERS's second farm income forecast is generally released in late August or early September as part of what USDA refers to as the mid-session budget review. By late August, most planting of major program crops is finished, and crop growing conditions are better known, thus contributing to improved yield estimates. Domestic and international market conditions and trade patterns have also been established, thus improving forecasts for most commodity prices and potential farm revenue support outlays. It is not unusual for large variations in farm income projections to occur between the first and second farm income forecasts.

ERS's third farm income forecast is generally released in late November (in 2020, it is to be released on November 27) and represents a tightening up of the data: preliminary forecasts of planted acres and yields are gradually replaced with estimates based on actual field surveys and crop reporting by farmers to USDA. In most years, only small variations in farm income estimates occur between the second and third forecasts. The farm income forecast cycle then begins anew in the succeeding year. However, changes to estimates from previous years continue to occur for several years as more complete data become available.

This report discusses aggregate national net farm income projections for calendar year 2020, as reported by ERS on September 2, 2020.[49] It is the second of three USDA farm income forecasts for 2020.

[48] Economic Research Service (ERS), "Farm Structure and Organization," at http://www.ers.usda.gov/topics/farm-economy/farm-structure-and-organization.aspx; and ERS, "Farm Household Well-Being," at http://www.ers.usda.gov/topics/farm-economy/farm-household-well-being.aspx.

[49] For both national and state-level farm income, see ERS, "U.S. and State Farm Income and Wealth Statistics," at http://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics.aspx.

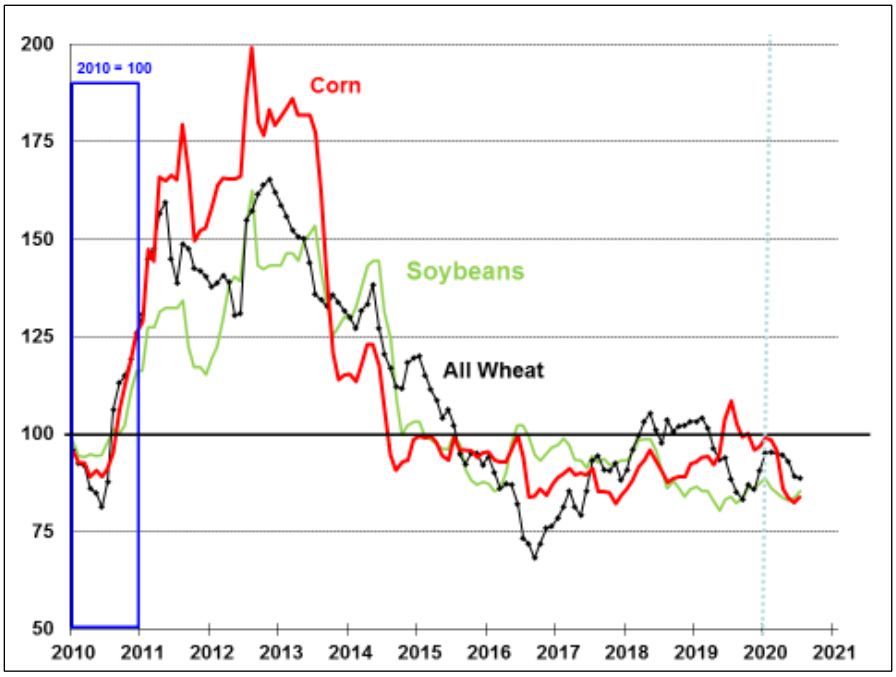
USDA Farm Prices Received Indexes for Selected Commodities

Figure A-1 to **Figure A-4** present USDA data on monthly farm prices received for several major farm commodities—corn, soybeans, wheat, upland cotton, rice, milk, cattle, hogs, and chickens. The data are presented in an indexed format where monthly price data for year 2010 = 100 to facilitate comparisons.

USDA Farm Income Data Tables

Table A-1 to **Table A-3** present aggregate farm income variables that summarize the financial situation of U.S. agriculture. In addition, **Table A-4** presents the annual average farm price received for several major commodities, including the USDA forecast for the 2020-2021 marketing year for major program crops and 2021 for livestock products.

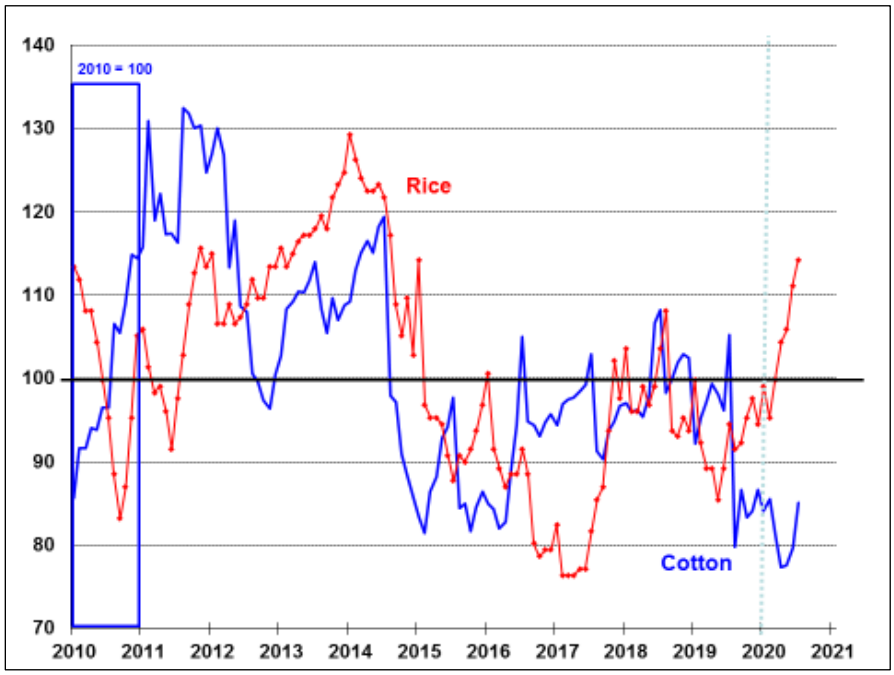
Figure A-1. Monthly Farm Prices for Corn, Soybeans, and Wheat, Indexed Dollars



Source: National Agricultural Statistics Service (NASS), *Agricultural Prices*, August 30, 2020. Calculations by CRS.

Notes: Monthly farm prices for the 2010-2020 period have been divided by the annual average price for 2010 and multiplied by 100 such that 2010 = 100. Such price indexing facilitates relative comparisons.

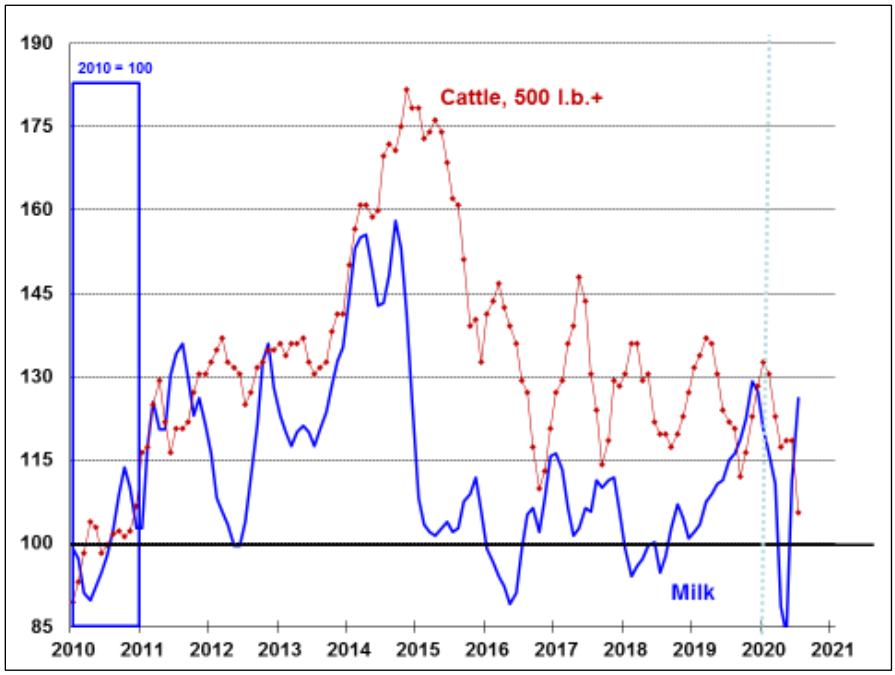
Figure A-2. Monthly Farm Prices for Cotton and Rice, Indexed Dollars



Source: NASS, *Agricultural Prices*, August 30, 2020. Calculations by CRS.

Notes: Monthly farm prices for the 2010-2020 period have been divided by the annual average price for 2010 and multiplied by 100 such that 2010 = 100. Such price indexing facilitates relative comparisons.

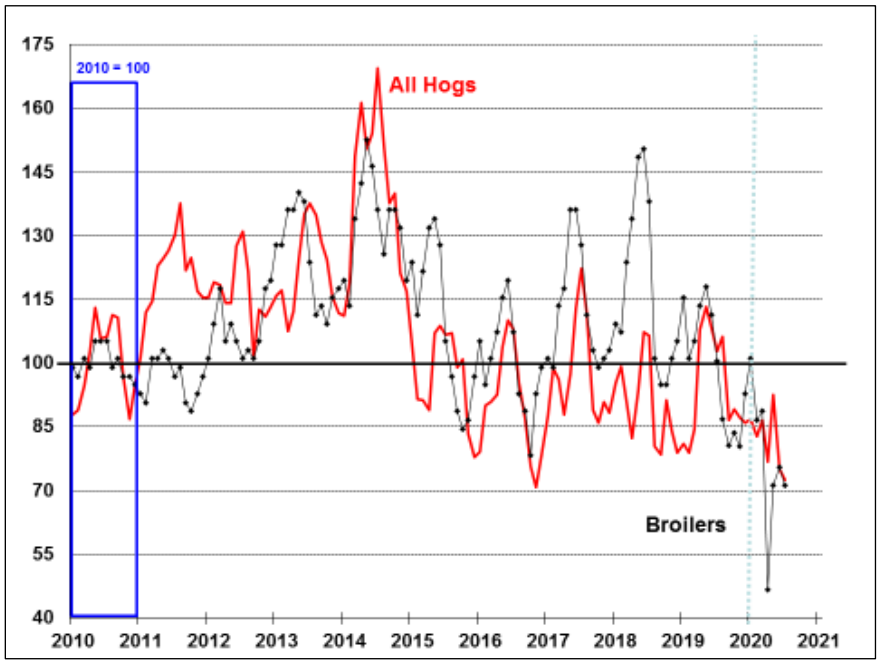
Figure A-3. Monthly Farm Prices for All-Milk and Cattle (500+ lbs.), Indexed Dollars



Source: NASS, *Agricultural Prices* August 30, 2020. Calculations by CRS.

Notes: Monthly farm prices for the 2010-2020 period have been divided by the annual average price for 2010 and multiplied by 100 such that 2010 = 100. Such price indexing facilitates relative comparisons.

Figure A-4. Monthly Farm Prices for All Hogs and Broilers, Indexed Dollars



Source: NASS, *Agricultural Prices*, August 30, 2020. Calculations by CRS.

Notes: Monthly farm prices for the 2010-2020 period have been divided by the annual average price for 2010 and multiplied by 100 such that 2010 = 100. Such price indexing facilitates relative comparisons.

Table A-1. Annual U.S. Farm Income ($ billions) Since 2015, Including 2020 Forecasts

						2020 Forecasts			2019 to 2020
Item	**2015**	**2016**	**2017**	**2018**	**2019**	**2-5-20**	**9-02-20**	**Nov. 20**	**Change (%)[a]**
1. Cash receipts	**377.4**	**358.5**	**370.4**	**371.4**	**370.6**	**384.4**	**358.3**	—	**-3.3%**
Crops[b]	187.9	195.8	194.9	195.1	194.6	198.6	196.6	—	1.0%
Livestock	189.5	162.7	175.6	176.3	176.0	185.8	161.7	—	-8.1%
2. Government payments[c]	**10.8**	**13.0**	**11.5**	**13.7**	**22.4**	**15.0**	**37.2**	—	**65.7%**
CCP-PLC-ARC[d]	5.3	8.2	7.0	3.2	2.7	3.9	4.8	—	81.5%
Marketing loan benefits[e]	0.2	0.2	0.0	0.0	0.0	0.5	0.9	—	NA
Conservation	3.6	3.8	3.8	4.0	3.8	4.2	4.0	—	5.0%
Ad hoc and emergency[f]	1.8	0.7	0.7	0.9	1.4	2.5	1.6	—	12.7%
All other[g]	0.0	0.4	0.0	5.6	14.5	4.3	25.8	—	77.9%
3. Farm-related income[h]	**34.4**	**27.9**	**31.2**	**29.1**	**34.7**	**31.5**	**33.3**	—	**-4.2%**
4. Gross cash income (1+2+3)	422.6	399.4	413.2	414.2	427.8	430.9	428.8	—	0.2%
5. Cash expenses[i]	315.8	303.8	311.9	311.4	317.5	321.3	313.5	—	-1.2%
6. NET CASH INCOME	**106.8**	**95.6**	**101.3**	**102.8**	**110.3**	**109.6**	**115.2**	—	**4.5%**
7. Total gross revenues[j]	440.8	412.3	425.4	425.1	433.4	451.3	446.8	—	3.3%
8. Total production expenses[k]	359.2	350.0	350.4	343.8	348.7	354.7	344.2	—	-1.3%
9. NET FARM INCOME	**81.6**	**62.2**	**75.1**	**81.3**	**83.7**	**96.7**	**102.7**	—	**22.7%**

Source: ERS, *Farm Income and Wealth Statistics*, U.S. and State Farm Income and Wealth Statistics, updated as of September 2, 2020. NA = not applicable.

Notes:

a. Change represents year-to-year projected change between 2019 and the September 2, 2020, forecast for 2020.
b. Includes Commodity Credit Corporation loans under the farm commodity support program.
c. Government payments reflect payments made directly to all recipients in the farm sector, including landlords. The nonoperator landlords' share is offset by its inclusion in rental expenses paid to these landlords and thus is not reflected in net farm income or net cash income.
d. CCP = counter-cyclical payments. PLC = Price Loss Coverage. ARC = Agricultural Risk Coverage.
e. Includes loan deficiency payments, marketing loan gains, and commodity certificate exchange gains.
f. Includes payments made under the Average Crop Revenue Election program, which was eliminated by the 2014 farm bill (P.L. 113-79).
g. Market facilitation payments, cotton ginning cost-share, biomass crop assistance program, milk income loss, tobacco transition, and other miscellaneous payments.
h. Income from crop insurance indemnities, custom work, machine hire, agritourism, forest product sales, and other farm sources.
i. Excludes depreciation and perquisites to hired labor.
j. Gross cash income plus inventory adjustments, the value of home consumption, and the imputed rental value of operator dwellings.

k. Cash expense plus depreciation and perquisites to hired labor.

Table A-2. Average Annual Income per U.S. Household, Farm vs. All, 2013-2020 Forecasts

($ per household)

	2013	2014	2015	2016	2017	2018	2019	2020
Average U.S. farm income by source								
On-farm income	30,639	31,025	24,740	24,731	21,842	18,425	21,730	29,887
Off-farm income	90,481	103,140	95,140	93,187	89,747	93,786	101,848	104,238
Total farm income	121,120	134,164	119,880	117,918	111,589	112,211	123,578	134,125
Average U.S. household income	75,195	75,738	79,263	83,143	87,643	90,021	NA	NA
Farm household income as share of U.S. avg. household income	**161%**	**177%**	**151%**	**142%**	**127%**	**125%**	**NA**	**NA**

Source: ERS, *Farm Household Income and Characteristics*, Principal Farm Operator Household Finances, data set updated as of September 2, 2020, at http://www.ers.usda.gov/data-products/farm-household-income-and-characteristics.aspx.

Notes: NA = not available. Data for 2020 are USDA forecasts.

Table A-3. Average Annual Farm Sector Debt-to-Asset Ratio, 2013-2020 Forecasts

($ billions)

	2013	2014	2015	2016	2017	2018	2019	2020
Farm assets	2,767.8	2,930.6	2,888.0	2,914.4	3,005.9	3,026.7	3,075.2	3,108.8
Farm debt	315.3	345.2	356.7	374.2	390.4	402.0	418.6	433.8
Farm equity	2,452.4	2,585.4	2,523.3	2,540.3	2,615.5	2,624.7	2,656.6	2,675.1
Debt-to-asset ratio	**11.4%**	**11.8%**	**12.4%**	**12.8%**	**13.0%**	**13.3%**	**13.6%**	**14.0%**

Source: ERS, *Farm Income and Wealth Statistics*; U.S. and State Farm Income and Wealth Statistics, updated as of September 2, 2020, at http://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics.aspx.

Notes: Data for 2020 are USDA forecasts.

Table A-4. U.S. Farm Prices and Support Rates for Selected Commodities Since 2015-2016 Marketing Year

Commodity[a]	Unit	Market Year	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021[b]	% Change 19/20-20/21	2021-2022[b]	% Change 20/21-21/22	Loan Rate[c]	Ref. Price
Wheat	$/bu	Jun-May	4.89	3.89	4.72	5.16	4.58	4.50	-1.7%	—	—	3.38	5.50
Corn	$/bu	Sep-Aug	3.61	3.36	3.36	3.61	3.60	3.50	-2.8%	—	—	2.20	3.70
Sorghum	$/bu	Sep-Aug	3.31	2.79	3.22	3.26	3.30	3.50	6.1%	—	—	2.20	3.95
Barley	$/bu	Jun-May	5.52	4.96	4.47	4.62	4.69	4.45	-5.1%	—	—	2.50	4.95
Oats	$/bu	Jun-May	2.12	2.06	2.59	2.66	2.82	2.70	-4.3%	—	—	2.00	2.40
Rice	$/cwt	Aug-Jul	12.10	10.40	12.90	12.60	13.20	12.60	-4.5%	—	—	7.00	14.00
Soybeans	$/bu	Sep-Aug	8.95	9.47	9.33	8.48	8.55	9.25	8.2%	—	—	6.20	8.40
Soybean Oil	¢/lb	Oct-Sep	29.86	32.48	30.0	28.26	29.50	32.00	8.5%	—	—	—	—
Soybean Meal	$/st	Oct-Sep	324.6	316.9	345.0	308.28	300.0	315.0	5.0%	—	—	—	—
Cotton, Upland	¢/lb	Aug-Jul	61.2	68.0	68.6	70.3	59.5	59.0	-0.8%	—	—	45-52	none
Livestock Products		**Calendar**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**% Chg 19-20**	**2021**	**% Chg 20-21**	—	—
Choice Steers	$/cwt	Jan-Dec	148.12	120.86	121.52	117.12	116.78	107.3	-8.1%	112.0	4.4%	—	—
Barrows/Gilts	$/cwt	Jan-Dec	50.23	46.16	50.48	45.93	47.95	39.4	-17.8%	44.0	11.7%	—	—
Broilers	¢/lb	Jan-Dec	90.5	84.3	93.5	97.8	88.6	70.9	-20.0%	82.0	15.7%	—	—
Eggs	¢/doz	Jan-Dec	181.8	85.7	100.9	137.6	94.0	114.9	22.2%	110.0	-4.3%	—	—
Milk	$/cwt	Jan-Dec	17.13	16.30	17.65	16.27	18.63	17.75	-4.7%	17.00	-4.2%	—	—

Source: Various USDA agency sources, as described in the notes below.

Notes: Ref. = reference, bu = bushels, cwt = 100 pounds, lb = pound, st = short ton (2,000 pounds), doz = dozen.

a. Price for grains and oilseeds are from USDA, World Agricultural Supply and Demand Estimates (WASDE), September 11, 2020. "—" = no value. USDA's out-year 2021-2022 crop price forecasts will first appear in the May 2021 WASDE. Soybean and livestock product prices are from USDA, Agricultural Marketing Service: soybean oil—Decatur, IL, cash price, simple average crude; soybean meal—Decatur, IL, cash price, simple average 48% protein; choice steers—Nebraska, direct 1,100-1,300 lbs.; barrows/gilts—national base, live equivalent 51%-52% lean; broilers—wholesale, 12-city average; eggs—Grade A, New York, volume buyers; and milk—simple average of prices received by farmers for all milk.

b. Data for 2020-2021 are USDA forecasts. Data for 2021-2022 are USDA projections.

c. Loan rate and reference prices are for the 2019-2020 market year as defined under the 2018 farm bill (P.L. 115-334). The loan rate for upland cotton equals the average market-year-average price for the two preceding crop years but within the range of 45 cents/lb. and 52 cents/lb. See CRS Report R45525, The 2018 Farm Bill (P.L. 115-334): Summary and Side-by-Side Comparison.

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