



# The Impact of Policy Design on Payment Concentration in Ad Hoc Disaster Relief

LESSONS FROM THE MARKET FACILITATION  
AND CORONAVIRUS FOOD ASSISTANCE  
PROGRAMS

**Eric J. Belasco and Vincent H. Smith**

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**AGRICULTURAL POLICY IN DISARRAY**  
**REFORMING THE FARM BILL**

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# Executive Summary

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This report examines the distributional implications of two recent ad hoc disaster aid programs, the 2018 and 2019 Market Facilitation Programs (MFP)—which have distinctly different program designs—and the federal crop insurance program. Farm-level data are used to estimate the relationship between farm size, measured by crop sales, and

the distribution of program benefits. Results indicate payments are more concentrated on larger farms that receive higher per-acre payments under the 2018 MFP and federal crop insurance program. Under the Coronavirus Food Assistance Program, with a design similar to the 2018 MFP, payments are also more heavily concentrated on larger farms.



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## LESSONS FROM THE MARKET FACILITATION AND CORONAVIRUS FOOD ASSISTANCE PROGRAMS

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Many industries have experienced catastrophic declines in revenues and profits because of the COVID-19 pandemic that to a greater or lesser extent have been mitigated by the provisions of emergency aid through the 2020 Coronavirus Aid, Relief, and Economic Security (CARES) Act. Most of those industries and companies have had limited or no experience with direct federal subsidies through disaster aid and other programs, although many have had extensive experience in lobbying about regulatory issues, tax policy, and other forms of federal support. In contrast, since 1942, agricultural producers have obtained an annual average of 13.3 percent of their real net cash income from direct government payments.<sup>1</sup>

Typically, government support payments to farmers have been linked to shortfalls in yields or relatively low prices for agricultural commodities through programs authorized by successive farm bills. However, since the 1970s, farmers have also regularly received ad hoc payments to compensate them for losses associated with exceptionally severe droughts, floods, hurricanes, and other natural perils.<sup>2</sup> More recently, in 2018 and 2019, farmers have also received substantial ad hoc disaster payments through two separate and distinct Market Facilitation Programs (MFPs) to compensate them for losses associated with the Donald Trump administration's trade disputes with

Canada, China, Mexico, the European Union, and other countries.

Under the 2018 and 2019 MFPs, US farmers and ranchers were paid \$9.6 billion for losses in 2018 and \$14.5 billion for losses in 2019. The Trump administration implemented these programs without congressional authorization using unallocated Commodity Credit Corporation (CCC) funds. The administration justified them as compensation for losses farmers incurred when China introduced higher tariffs on imports of US agricultural commodities in response to new US tariffs on steel, aluminum, and other commodities.<sup>3</sup> The Coronavirus Food Assistance Program (CFAP), introduced on April 17, 2020, as part of the CARES Act, initially authorized up to \$16 billion for payments to compensate farmers for losses linked directly to the COVID-19 pandemic during the 2020 agricultural marketing year. This new ad hoc disaster aid program immediately followed on the heels of the 2018 and 2019 MFPs.

While the two MFPs were associated with the same disruption (loss of access to export markets in China and elsewhere), they were implemented differently, providing a natural experiment to evaluate how the concentration of benefits among farmers is affected by changes in policy designs. The first MFP payments were limited to a handful of crops and two livestock commodities (hogs and dairy) with

commodity-specific payment rates directly tied to commodity-specific prices and the farm's production of each eligible commodity. In that respect, the 2018 MFP was similar to the federal crop insurance program, which also directly links benefits to the value of a farm's crop production.<sup>4</sup> The second MFP distributed payments based on total acres planted to all crops eligible for such subsidies at a generic per-acre payment rate established countywide.

Comparing the distributional outcomes of these two programs therefore could provide insights about the distributional impacts of program design relevant for current and future disaster aid declarations, including current and future COVID-19-related emergency aid programs. The CFAP, which had two phases,<sup>5</sup> has a similar design to the 2018 MFP in allocating payments among farmers and therefore seems likely to have a similar distribution of payments between large and small farm operations. Evidence presented in this report demonstrates the similarity in distributions between these two programs.

This report therefore explores the distribution of the 2018 and 2019 MFP subsidy payments, the CFAP payments, and, for comparison, the federal crop insurance program among farm businesses using data from the US Department of Agriculture (USDA) Agricultural Resource Management Survey (ARMS)<sup>6</sup> and, for the CFAP, the USDA Farm Service Agency (FSA). The ARMS is an annual nationally representative survey that provides financial, marketing, production, and resource use information at the individual farm level. We then compare the distributions of payments under each of the two MFPs estimated using the ARMS data with the distributions of actual payments, ordered by size of payment to each recipient farm business, using data on those payments obtained from the USDA FSA under a Freedom of Information Act (FOIA) request.<sup>7</sup>

We find that for each MFP, the results obtained using the ARMS and FSA data are relatively consistent. With the results from our analysis of the MFPs, we then use further data on payments made under the ad hoc COVID-19 CFAP, also obtained from the USDA FSA under a separate FOIA request,<sup>8</sup> to examine the distribution of those payments among farms. We find those results are consistent with the MFP analysis results.

Several findings are of interest. First, as has been the case for most federal subsidy programs over the past eight decades,<sup>9</sup> under both MFPs, the CFAP, and the federal crop insurance program, the largest 10 percent of farms received around half of all payments. Second, subsidy programs that directly link payments to the on-farm production of specific crops result in payments that are even more heavily skewed toward the largest farm businesses. These include the federal crop insurance program, the 2018 MFP, and the 2020 CFAP initiative. As Anton Bekkerman, Eric Belasco, and Vincent Smith reported, larger farm businesses tend to receive higher per-acre payments, most likely because of higher productivity levels.<sup>10</sup> The 2019 MFP— which linked subsidy payments to areas planted rather than farm-level, crop-specific production—resulted in a payment distribution somewhat less skewed to larger farm businesses.

### Background

Federal agricultural subsidy programs include a wide range of initiatives aimed at stabilizing farm incomes from adverse events. They include ad hoc disaster aid programs such as the 2018 and 2019 MFPs, 2020 COVID-19 initiatives, and the 2019 Additional Supplemental Appropriations for Disaster Relief Act.<sup>11</sup> As with the MFPs, funding is sometimes, but not always, obtained by an administration independently of explicit, narrowly defined congressional authorizations through the spending authority Congress grants annually to the CCC. The same pool of CCC funds is also used to support several long-standing or permanent farm income safety-net and other programs Congress authorizes. These include Agricultural Risk Coverage and Price Loss Coverage<sup>12</sup> and some conservation programs.<sup>13</sup> In most years, CCC outlays on such programs range from about \$10 to \$15 billion, far less than the \$30 billion made available to the CCC each year from 1986 to 2020.

The federal crop insurance program, the most expensive farm safety-net initiative through which subsidies are distributed to farms, is not funded through the CCC but directly out of general

**Table 1. MFP Payment Rates and Totals, by Commodity**

Commodity	Payment Rate			Estimated Total Payments (in Millions)	
	2018 MFP*	2019 MFP**	Unit	2018 MFP*	2019 MFP**
Cotton	0.06	0.12	Dollar per Pound	553.8	987.08
Corn	0.01	0.35	Dollar per Bushel	192.0	4,967.4
Soybeans	1.65	1.25	Dollar per Bushel	7,259.4	5,484.7
Sorghum	0.86	1.01	Dollar per Bushel	313.6	350.2
Wheat	0.14	0.69	Dollar per Bushel	238.4	1,336.1

Note: The 2018 MFP estimates do not include payments for shelled almonds (\$63.3 million), dairy (\$254.8 million), pork (\$580.6 million), and sweet cherries (\$111.5 million). The inclusion of these products implies a total estimate of \$9.567 billion for the 2018 MFP. \*Figures are based on the USDA press release. \*\*Figures are estimated using ARMS data by simulating the program parameters.

Source: Authors' calculations based on initial data from US Department of Agriculture, Farm Service Agency; US Department of Agriculture, Risk Management Agency; US Department of Agriculture, Agricultural Resource Management Survey, 2018; and US Department of Agriculture, "USDA Launches Second Round of Trade Mitigation Payments," press release, December 17, 2018, <https://www.usda.gov/media/press-releases/2018/12/17/usda-launches-second-round-trade-mitigation-payments>.

government funds. Crop insurance is aimed at providing yield and revenue assurance policies to farmers between the planting and harvest season. In contrast, ad hoc disaster aid programs are often used to compensate farmers for one-off events such as floods, hurricanes, and supply chain disruptions that generate widespread losses. The 2018 and 2019 MFPs are examples of such disaster programs because they compensated farmers for losses incurred because of the trade dispute between the US and China.

Under the 2018 MFP, payments were commodity specific and based on the estimated differences between the actual prices farmers received and those they would have obtained in a counterfactual environment in which no countervailing tariffs on US agricultural exports were imposed by China and other countries.<sup>14</sup> These payment rates, reported in Table 1, were then multiplied by the total estimated production of each eligible commodity by a farm to determine the payment the farm would receive.<sup>15</sup>

The 2019 MFP was substantially redesigned in three important ways. First, all payments were based on a fixed county-level per-acre payment rate that applied to all eligible crops. Thus, per acre, regardless of the eligible crop a farmer planted, the

farmer received the same amount of compensation for each acre dedicated to the crops covered by the 2018 MFP—corn, cotton, grain sorghum, soybeans, and wheat—and to a wide range of additional crops including alfalfa hay, barley, canola, crambe, dry peas, flaxseed, lentils, long- and medium-grain rice, mustard seed, dried beans, oats, peanuts, rapeseed, safflower, sesame seed, chickpeas, sunflower seed, temperate japonica rice, and some fruits, nuts, and vegetables. At the county level, payment rates were bounded at an upper limit of \$150 per acre and a lower limit of \$15 per acre, reflecting the widely different production conditions and crop mixes in different areas of the United States. Second, payments were based explicitly on the total acres a farm planted to all crops eligible for payments. As a result, any direct links between the prices and farm-level yields of individual crops were largely decoupled from the amount of payments to farmers.

The two programs were therefore substantially different in their potential impacts on the distribution of payments among farms. The 2018 MFP was based on a farm's actual production of each eligible crop, implying that within and across counties, farms with higher per-acre yields would receive larger

per-acre payments. The 2019 MFP made a fixed payment for each eligible crop in which per-acre payments only varied across counties. In each county, average per-acre losses were estimated by computing countrywide losses for each of the same limited number of crops for which compensation was paid under the 2018 MFP, weighted by the proportion of the total acres planted to those crops in the county.

Thus, the differences in countrywide payment rates were determined by the differences in countywide yields and shares of those crops and the imputed trade war-related losses associated with each crop. (For example, under the 2019 MFP, cotton raised in Georgia counties was estimated to have much higher per-acre losses than was soft red wheat in western Kansas counties.)<sup>16</sup> Second, the 2018 MFP covered losses for only seven crops (cotton, corn, sorghum, soybeans, wheat, shelled almonds, and sweet cherries) and two livestock products (dairy and hogs), while the 2019 MFP covered estimated losses for 41 crops and some livestock products. Thus, 2019 MFP payments were spread over a wider geographical area and more inclusive group of farms.

Finally, the total federal funds available for payments under the 2019 MFP are approximately 50 percent larger than for payments under the 2018 MFP. The differences in total funding may not have much impact on the proportional distribution of payments under the two programs. However, the differences in the basis for payments—crop production versus area planted to all eligible crops and crop-specific payments versus fixed-area payments at the county level—are likely to be an important source of any differences in the distributions of payments between the 2018 and 2019 MFPs.

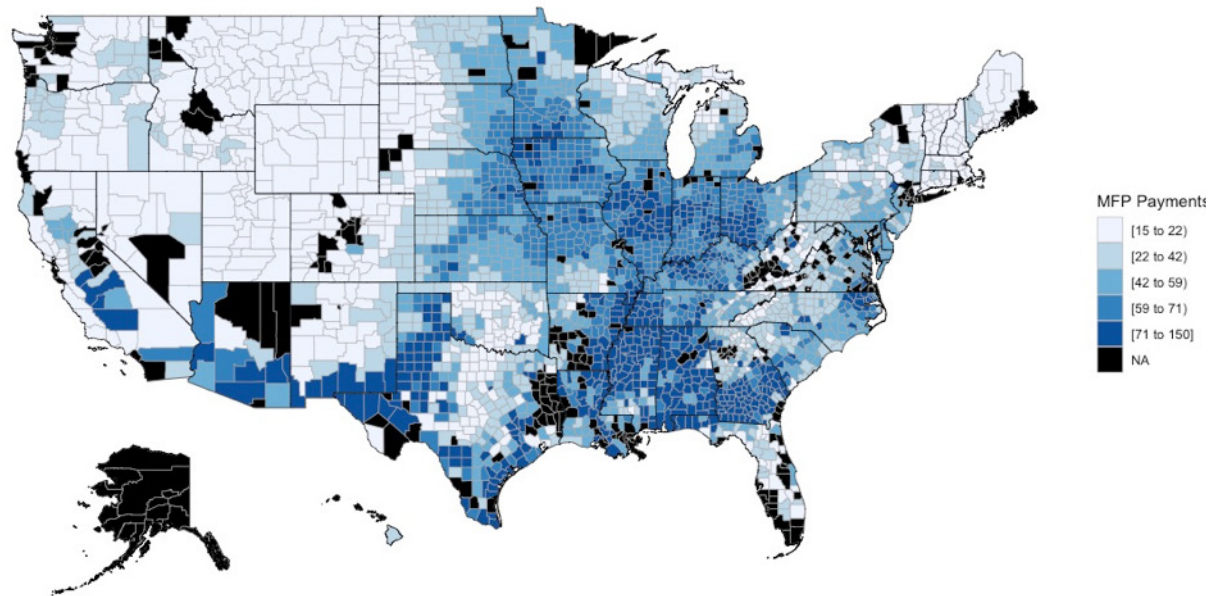
Two recent studies have evaluated the impact of the 2018 and 2019 MFPs on the financial situation at the farm level. Nicholas Paulson, Allen Featherstone, and Joleen Hadrich, using farm management association data from Illinois, Kansas, and Minnesota, reported that payments from the 2018 MFP accounted for between 40 and 60 percent of average net farm income.<sup>17</sup> These payments substantially improved farms' financial standing in liquidity, solvency, and debt repayment. They also estimated that, absent the

2018 MFP subsidies, 20 to 45 percent of farms would have reported negative net farm incomes.

Joseph Janzen and Nathan Hendricks investigated how much the amount of compensation paid in the 2018 and 2019 MFPs reflected actual losses incurred by the agricultural sector because of China's countervailing tariffs on soybeans and other crops.<sup>18</sup> Their results indicate that the MFP payments exceeded the short-run impacts associated with lower market prices while they note that payments may have under-compensated farms with potential multiyear longer-run effects, although such impacts would be dependent on the duration of, and terms under which, the trade dispute between China and the United States is resolved. The discrepancies between direct government aid and estimated short-run damages are identified for a wide range of commodities, but Janzen and Hendricks find they are the largest in counties that produced cotton and grain sorghum.

The studies by Janzen and Hendricks and Paulson, Featherstone, and Hadrich provide interesting insights about how MFPs affect farm financial performance. However, they do not evaluate the distribution of benefits across farms by farm size. In this analysis, we investigate that question to examine the impact of differences in MFP designs on payment distributions to inform future agricultural policies.

The concentration in farm production can largely be explained by changes in economies and scale and investments in laborsaving technology.<sup>19</sup> However, agricultural policy has largely ignored those fundamental changes in agriculture. An ongoing concern with the design of many farm programs is the growing concentration of benefits.<sup>20</sup> The concentration of subsidy benefits is of interest for at least two important reasons. First, conceivably, agricultural programs may add to the forces leading to increased concentration of production at the farm level and on larger farms. Second, when farm subsidy programs are primarily and overwhelmingly targeted to the largest farms, many of which are the most financially stable agricultural enterprises, then the program is unlikely to have much impact on farm bankruptcy and failure rates.

**Figure 1. 2019 MFP Payment Rates, by County**

Source: US Department of Agriculture, Farm Service Agency, "Market Facilitation Program: 2019 County per Acre Payment Rate," <https://www.farmers.gov/sites/default/files/documents/PaymentRates.pdf>.

## Data and Methods

Data for this analysis were obtained from three sources. First, responses from the 2018 ARMS were used to establish farm profiles in and across crop sales quantiles. ARMS is the only nationally representative survey implemented annually that includes production, financial, and demographic information on agricultural producers. Only farms with more than \$1,000 in crop sales are included.<sup>21</sup> Second, publicly available information was obtained from the FSA on the distribution of payments, payments rates, and rules of the 2018 and 2019 MFPs. Third, crop insurance subsidy rate data were collected from the Risk Management Agency using the county-level Summary of Business data and dividing subsidies by total premium.

To estimate the potential impact of the 2018 MFP, we used the 2018 ARMS data and applied the program-specific commodity payments rates reported in Table 1 to production totals reported in the ARMS data for each of the five eligible large-acre crops (corn, cotton, grain sorghum, soybeans, and wheat).

Payments to these five commodities amounted to an estimated \$8.6 billion (89 percent of the estimated total outlays under the 2018 MFP). Data received from USDA FSA indicated that under the 2018 MFP, \$8.6 billion had been paid to producers of crops, \$0.3 billion had been paid to producers of livestock, and \$76.6 million had been paid to producers of other crops (shelled almonds and cherries). Using the 2018 ARMS, 2018 MFP payments to these five crops are estimated at \$8.4 billion, which is 2.3 percent different from the actual payments received.

To estimate the impacts of the 2019 MFP, we apply the county-level payment rates, illustrated in Figure 1, to total planted cropland acres for farmers who reported growing eligible crops, as reported in the 2018 ARMS. Using this methodology, payments are estimated to be \$15.56 billion in our analysis, which is 75 percent higher than the \$14.51 billion total paid out.<sup>22</sup>

The amount of crop insurance subsidies each farm receives is calculated using the approach Bekerman, Belasco, and Smith developed by computing the average subsidy rate (subsidies divided by



total premium) for the county in which the farm is located using aggregated crop insurance policy data from the Risk Management Agency.<sup>23</sup> The average subsidy rate is computed for each county-crop combination for corn, cotton, grain sorghum, soybeans, and wheat using data from 2018. The subsidy rate applied to a farm in any county that produces multiple crops is based on the percentage of acreage devoted to each crop and the county-level average subsidy rate for each crop. This subsidy rate, which is weighted by the farm's allocation of land to each crop, is then applied to the farm's total federal crop insurance payments, as reported in the ARMS survey, to impute the implied subsidies for that farm. By using the county-level average subsidy rate, we can account for regional and commodity-specific differences in coverage levels and unit selection differences. For counties in which crop-commodity rates could not be computed, the national average subsidy rate of 62 percent was assumed to apply.<sup>24</sup>

## Results

The concentration of program payments can be measured in two ways: ordered by size of farm and size of payment. We first examine the distribution of payments across farm size, as defined by the value of crop sales reported in the ARMS data. Then, we examine the distribution of payments among all recipients by size of payment using data obtained from the USDA FSA.

**Distribution Across Farm Size.** Using data from the ARMS and simulating payments made under each of the three policies, Table 2 provides summary information on farm characteristics in each farm decile that are sorted by value of crop sales. These characteristics include average values for crop sales, area planted to crops, gross farm income and net worth, and average program payments in each decile under the 2018 MFP, 2019 MFP, and federal crop insurance programs. In addition, average payments per acre are reported for each of the deciles under each program.

Among all farms (whether or not they received a program payment), the largest 10 percent of farms,

with average annual gross farm incomes of \$2.14 million, received average subsidies of \$67,400 under the 2018 MFP, \$121,100 under the 2019 MFP, and \$42,200 under the 2018 federal crop insurance program, an average total of \$230,700 per farm across the three programs. Farms in the 50 to 60 percent quantile, relatively small commercial operations with average annual gross farm incomes of \$153,700 (about 7 percent of the average gross farm incomes of the largest decile of farms), received average subsidies of \$4,600 under the 2018 MFP, \$10,700 under the 2019 MFP, and \$2,700 under the federal crop insurance program for \$18,000 across the three programs. Small farm operations in the lowest decile, with average gross farm incomes of \$18,100, received almost nothing under the 2018 MFP and the federal crop insurance program and \$1,100 under the 2019 MFP. Small crop-producing operations, which on average farm about an acre of cropland, received at least some subsidies under the 2019 MFP, largely because a much wider range of crops was eligible for payments, including high-valued crops such as fruits, nuts, and vegetables.

Table 2 also presents information on these variables for the subset of farmers estimated to receive at least \$50,000 under each of the three programs. This group represents 14,821 farms for which data were reported from the 2018 ARMS survey that, when the ARMS weights are applied, represent 2.3 percent of all crop farms. Those farms are estimated to have received 23.0 percent of all payments made under the 2018 and 2019 MFP and crop insurance programs, including 31.5 percent of all crop insurance subsidy payments, 23.6 percent of all 2018 MFP payments, and 20.1 percent of all 2019 MFP payments. While many of the key farm characteristics with this group are similar to those in the top decile, in some areas they are notably larger. For example, the area planted to crops averaged 3,253 acres in this group, nearly twice the size of the average for the largest 10 percent of farms (1,712 acres) and nearly 10 times the average for all farms (254 acres).

The difference in farm size among this group, relative to all other groups, substantially increases the payments this group obtains from all three programs. For example, farms in this exclusive category were estimated to receive an average of \$134,373 for the

**Table 2. Summary of Key Variables, by Crop Sales Quantile (N = 651,607)**

Quantile	Crop Sales (Thousands of Dollars)		Net Worth (Millions of Dollars)	Gross Farm Income (Thousands of Dollars)	Average Payments per Farm (Thousands of Dollars)			Average Payments per Acre (Dollars)		
	Crop Acres	Crop Acres			2018 MFP	2019 MFP	Crop Insurance	2018 MFP	2019 MFP	Crop Insurance
0-10	1.5	1.0	0.5	18.1	0.0	1.1	0.0	0.9	46.7	0.1
10-20	3.2	4.3	0.7	28.2	0.1	2.0	0.1	3.7	46.2	0.8
20-30	6.8	20.3	0.6	87.4	0.4	2.8	0.2	8.3	46.1	3.8
30-40	14.9	39.3	0.9	76.0	1.0	4.6	0.6	12.6	46.5	5.1
40-50	29.9	75.2	1.1	101.5	2.4	7.3	1.1	22.0	50.0	7.2
50-60	58.3	135.2	1.3	153.7	4.6	10.7	2.7	26.9	51.4	15.9
60-70	103.8	244.9	2.0	227.1	8.0	18.1	5.4	27.2	53.5	24.3
70-80	199.9	395.0	2.1	351.8	14.2	26.2	8.1	27.2	51.9	23.6
80-90	419.0	768.7	2.9	604.5	29.1	51.1	15.5	32.5	57.3	21.3
90-100	1,715.7	1,715.2	6.7	2,140.0	67.4	121.1	42.2	28.4	55.4	34.5
Mean	254.3	339.1	1.9	377.6	12.7	24.4	7.6	18.9	50.5	13.6
Only Farmers Receiving over \$50,000 in All Three Programs	1,776.9	3,253.1	7.5	2,499.8	134.4	219.7	107.0	41.1	64.0	33.9

Note: Farmers in the subgroup that received over \$50,000 in all three programs represent 14,821 farms (2.3 percent of the full sample). Source: Authors' calculations based on initial data from US Department of Agriculture, Farm Service Agency; US Department of Agriculture, Risk Management Agency; and US Department of Agriculture, Agricultural Resource Management Survey, 2018.

**Table 3. Summary of Key Program Payments for Top Crop Sales Quantiles**

Percentile	Payments per Acre (Dollars)			Payments per Farm (\$1,000)			Proportion of Total Payments (Percentage)		
	Insurance Subsidy	2018 MFP	2019 MFP	Insurance Subsidy	2018 MFP	2019 MFP	Insurance Subsidy	2018 MFP	2019 MFP
20	27.82	30.49	56.39	28.8	48.1	85.8	75.86	75.79	70.28
15	29.97	29.76	56.64	33.5	55.7	99.3	66.17	65.79	60.99
10	34.48	28.44	55.42	42.2	67.4	121.1	55.28	52.72	49.23
5	42.40	27.14	56.15	53.7	87.1	156.8	35.39	34.28	32.08
2	46.29	23.69	57.94	72.2	108.5	198.2	19.03	17.09	16.23
1	58.27	17.42	55.35	83.5	113.0	220.7	10.89	8.81	8.94

Source: Authors' calculations based on initial data from US Department of Agriculture, Farm Service Agency; US Department of Agriculture, Risk Management Agency; and US Department of Agriculture, Agricultural Resource Management Survey, 2018.

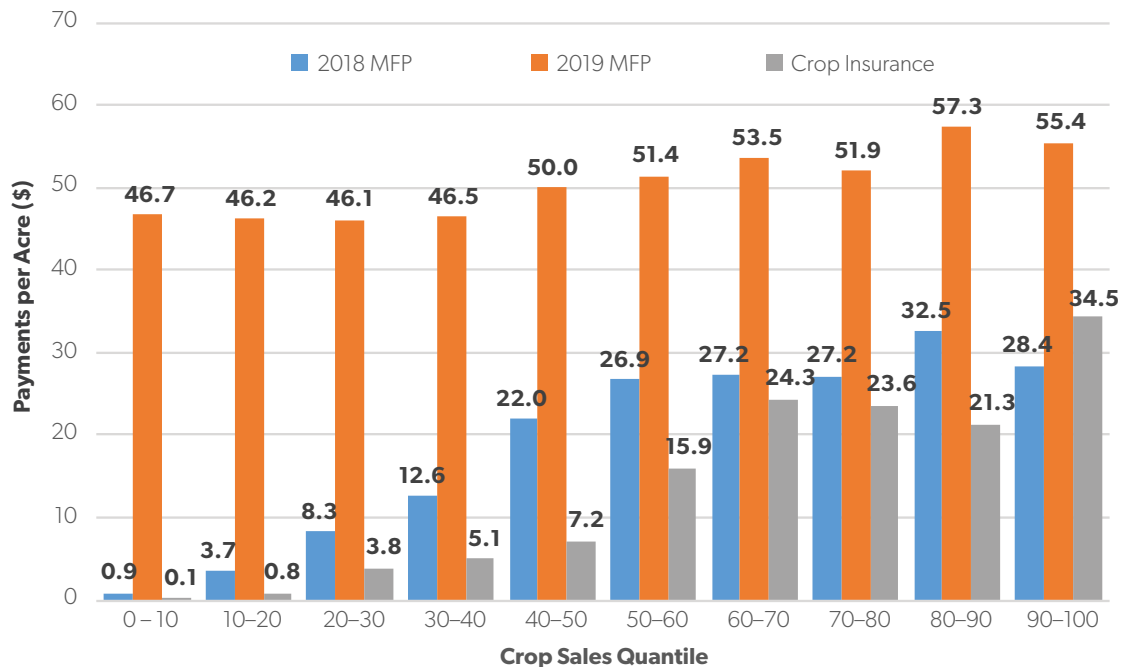
2018 MFP, \$219,727 for the 2019 MFP, and \$107,014 in crop insurance subsidies. Per farm, these payment amounts are nine to 14 times larger than the average payment received among the sample of all farms and at least 1.8 times greater than the average payment received by the largest 10 percent of farms. At the farm level, MFP payments were not effectively capped, and no farm-level caps apply to federal crop insurance premium subsidies.<sup>25</sup> Thus, while these differences in total subsidy payments among farms are large, they are not surprising and explicitly a result of tying outlays to each farm's size in acres and value of output.

The extent to which the proportions of total subsidies flow to large and very large farm businesses and the average size of payments to larger as opposed to smaller farms are other indicators of the extent to which payments are concentrated. Among farms receiving payments under a given program, the largest 10 percent of farms received 49.2 percent of all program payments under the 2019 MFP, 52.7 percent under the 2018 MFP, and 55.3 percent under the federal crop insurance program.

Regarding the degree to which the concentration of subsidy payments varies by program, while the range of commodities eligible for payments is of interest, the data on per-acre payments presented in Table 3 are relevant. The design of the 2018 MFP directly linked subsidy payments to a farm's total level of production

for each eligible crop, resulting in higher per-acre payments to more productive farms with higher yields. In that respect, the 2018 MFP is similar to the federal crop insurance program, as discussed by Bekkerman, Belasco, and Smith, who reported that per acre, larger farms received substantially higher subsidies than smaller farms did.<sup>26</sup> As reported in Table 2, under the 2018 MFP, per-acre payments increased from less than \$1 per acre for the smallest decile of farms to \$32.5 for farms in the 80 to 90 percent decile and \$28.4 to farms in the largest decile, with an average per-acre payment among all farms of \$18.9. Thus, in the 2018 MFP, per acre, the average payment for all farms was only 66.6 percent of the payment farms received in the largest decile. Payments per acre under the 2018 federal crop insurance program monotonically increased from \$0.1 for the smallest decile of farms to \$34.5 for the largest decile.

The amount paid on each acre for small and large farms was much less likely to vary substantially by farm size under the 2019 MFP, which provided an identical fixed per-acre payment for the area planted to any eligible crop in each county. Under the 2019 MFP, per-acre payments did vary to some degree among farms by size of farm. For all farms, on average, each farm received a payment of \$50.5 per acre, about 90 percent of the average per-acre payment of \$55.4 to farms in the top decile. Farms that received

**Figure 2. Estimated Payments per Acre, by Crop Sales Quantile, for the 2018–19 MFPs and Crop Insurance**

Source: Authors' calculations based on initial data from US Department of Agriculture, Farm Service Agency; US Department of Agriculture, Risk Management Agency; and US Department of Agriculture, Agricultural Resource Management Survey, 2018.

over \$50,000 from all three programs received an average of \$64.0 per acre. This result, which is driven by the crop mix of larger farms, tends to also occur in areas that produce cotton and other crops with the largest payment rates. This is illustrated in Figure 1, which shows that farms in areas where cotton is raised (west Texas and the southern regions) received the largest allowable county-based payments of \$150 per acre.

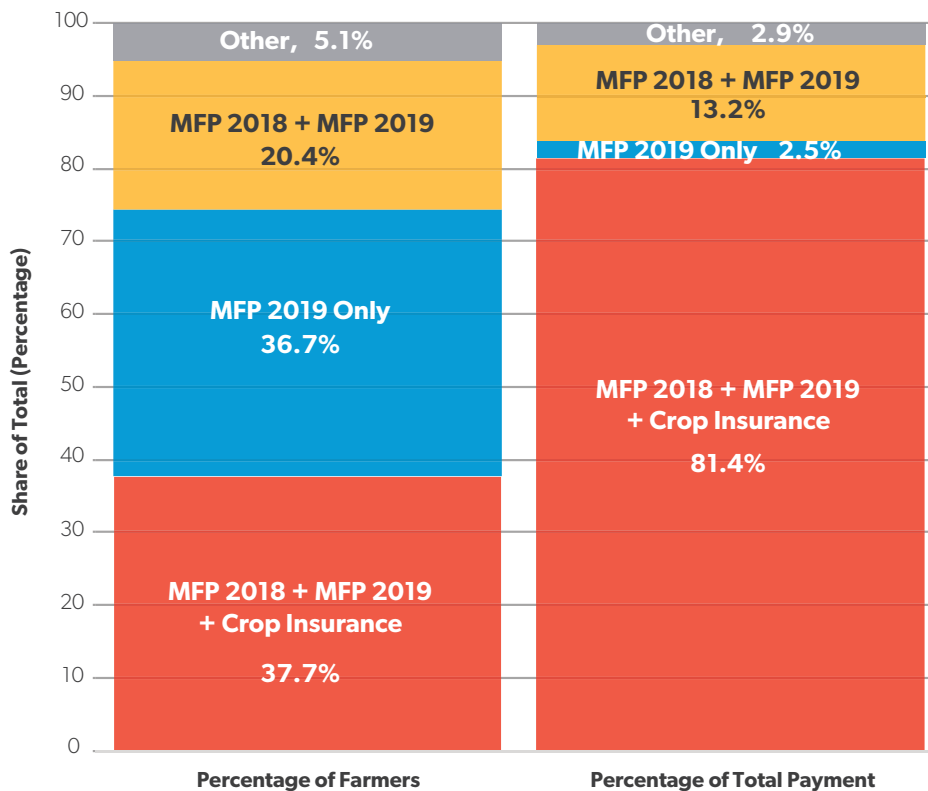
These payments are provided to farms with substantially higher gross farm incomes and net worths than the average farm. As reported in Table 2, the largest 10 percent of farms had an average net worth of \$6.7 million, 3.5 times larger than the average farm's net worth (\$1.9 million). Similarly, gross farm incomes for farms in the highest decile averaged \$2.1 million, over five times higher than for the average farm (\$339,000).

As discussed above, Table 3 reports results for the largest 20 percent of farms at a more granular level

by also providing information about payments for the largest 20, 15, 10, 5, 2, and 1 percent of farms by crop sales. The largest 20 percent of all farms received over 70 percent of all payments made under the three programs. However, in that group, payments are increasingly heavily concentrated among the largest farms. For example, the top 5 percent of farms received over 30 percent of all program payments under each of the three programs. Per acre, these payments were highest under the 2019 MFP at \$56.15 per acre, followed by crop insurance at \$42.40 per acre and the 2018 MFP at \$27.14 per acre. Average total payments for the largest 5 percent of all farms were \$53,726 under the federal crop insurance program, \$87,078 under the 2018 MFP, and \$156,843 under the 2019 MFP.

The growth in payments per acre across crop sales quantiles is even more pronounced when we include all crop sales quantiles, as shown in Figure 2. While the 2019 MFP exhibits a relatively flat relationship between crop sales and subsidies per acre, the nearly

**Figure 3. Distribution of Program Payments by Share of Payments and Recipients**



Note: Others include “MFP 2019 + Crop Insurance,” “MFP 2018 + Crop Insurance,” “MFP 2018 Only,” and “Crop Insurance Only.”  
 Source: Authors’ calculations based on initial data from US Department of Agriculture, Farm Service Agency; US Department of Agriculture, Risk Management Agency; and US Department of Agriculture, Agricultural Resource Management Survey, 2018.

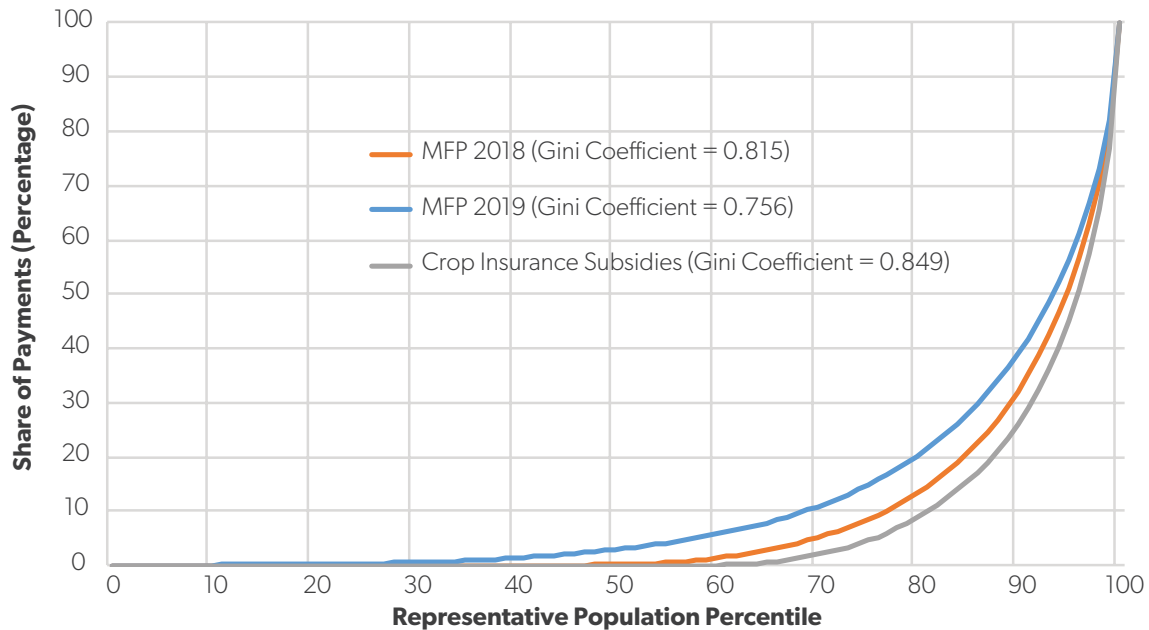
linear positive relationship is displayed in the 2018 MFP and crop insurance programs.

Finally, one important feature of these programs is the extent to which payments overlap between the three initiatives among farms and the overlap’s effect on payment concentration. This payment overlap is illustrated in the modified Venn diagrams provided in Figure 3. The left side shows the composition of the overlap between payments for farms. To illustrate, 2.5 percent of the payment amount across all three programs was made to farms that only received payments under the 2019 MFP, which comprise 36.7 percent of all farms (as shown on the right side). The largest payment category includes farms that received payments under all three programs. These farms comprise 37.7 percent of all crop farms and received 81.4 percent of all payments across the three programs.

**Distribution Across Recipients.** In Figure 4, empirical cumulative density functions (CDFs), widely referred to as Lorenz curves, are reported for simulated program payments by farm payment amounts for the 2018 and 2019 MFPs and the federal crop insurance program. The distributions include all farm households in the ARMS, whether or not they received an MFP payment.

The 2019 MFP was a more generous program in numbers of farmers who received payments. Under the 2019 MFP, at least some payments are estimated to have been made to 97 percent of all crop farms; under the 2018 MFP, payments were made to 58 percent of all crop farms. Under the federal crop insurance program, payments were made to 41 percent of all crop farms. The expansion of payments under the 2019 MFP was a direct result of the program’s design,

**Figure 4. Empirical CDF of Program Payments, by Program and Representative Population Percentile (N = 651,607)**



Source: Authors' calculations based on initial data from US Department of Agriculture, Farm Service Agency; US Department of Agriculture, Risk Management Agency; and US Department of Agriculture, Agricultural Resource Management Survey, 2018.

under which total funding was substantially increased and payments were made to producers of a much wider range of 41 separate commodities than the eight commodities covered under the 2018 MFP.

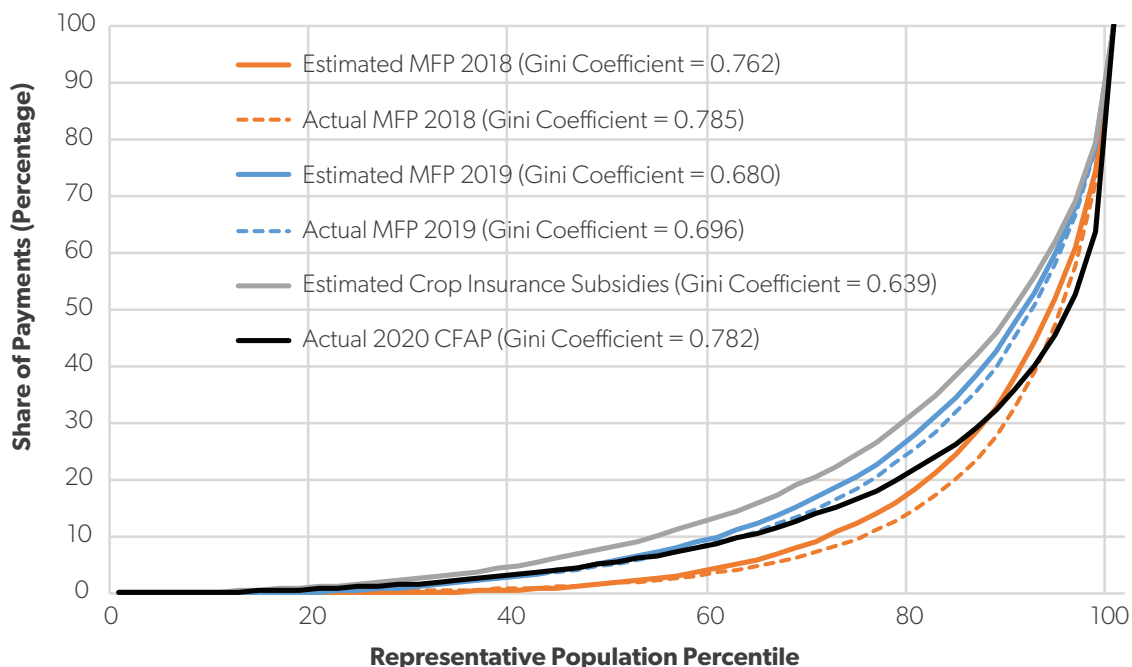
However, in both the 2018 and 2019 MFPs and the federal crop insurance program, payments were heavily concentrated among the largest farms, as illustrated by the extreme concavity of the Lorenz curves for each program presented in Figure 4 and the exceptionally high values of the Gini index coefficients associated with each distribution.<sup>27</sup> The results indicate that crop insurance subsidy payments were the most heavily concentrated among large farms, with a Gini index coefficient of 0.849, followed by the 2018 MFP (0.815) and the 2019 MFP (0.756). Thus, in addition to providing subsidies to more farms, the 2019 MFP payments were somewhat less heavily concentrated on the largest farms.

Figure 5 presents estimated CDFs for the 2018 and 2019 MFPs and crop insurance programs using only observations for farms estimated to have received any

payments under the programs. Simply because farms receiving no payments have been omitted from the population of interest, the Gini coefficients associated with these CDFs for each program are smaller but still large, indicating that payments remain heavily concentrated on the largest farms. The evidence from the CDFs based on payment recipients indicates that the 2018 MFP, with a Gini coefficient of 0.762, resulted in subsidy payments being most heavily concentrated on large farms, followed by the 2019 MFP (0.680) and the federal crop insurance program (0.639). Thus, that a higher proportion of farms received no crop insurance subsidies than no MFP payments is another important reason, among all farms, payments under that program are most heavily concentrated on large farms. Small-scale operations are less likely to participate in the federal crop insurance program because of fixed costs associated with program participation.<sup>28</sup>

Data on actual payments to individual farms under the 2018 and 2019 MFPs and the CFAP were obtained from the USDA FSA. These data were also used to

**Figure 5. Empirical CDF of Payments by Those Receiving Payments, by Program and Representative Population**



Note: Based on ARMS data, weighted 383,744 received MFP 2018, 631,777 received MFP 2019, and 271,787 received crop insurance subsidies.

Source: Estimated figures use data from the ARMS, while actual MFP data are from FOIA request 2020-FPAC-FSA-05508-F (data ending July 24, 2020) and actual CFAP data are from FOIA request 2020-FPAC-FSA-06416-F (data ending September 23, 2020). Authors' calculations based on initial data from US Department of Agriculture, Farm Service Agency; US Department of Agriculture, Risk Management Agency; and US Department of Agriculture, Agricultural Resource Management Survey, 2018.

compute CDFs for the 2018 and 2019 MFPs to evaluate the extent to which the distributions of payments estimated using the ARMS data are similar, providing some evidence about the extent to which the ARMS-based estimates are adequate representations of the distributions of program payments. Unlike the ARMS data, the FSA data do not include information on farm production, market sales, finances, or other farm-specific characteristics. Thus, the CDFs for the MFPs simply show the shares of total subsidy payments by quantile in which recipients are ordered from smallest to largest farm payments.

Thus, these CDFs are not directly comparable to the CDFs based on farm size. However, as shown in Figure 5, the CDFs for both the 2018 and 2019 MFPs based on the FSA data (the Lorenz curves with dotted

lines) are similar to those obtained using the ARMS data (the Lorenz curves with solid lines). Gini index values are also similar for the distributions obtained using the ARMS and FSA data. However, in both the 2018 and 2019 MFPs, the values based on the FSA data on actual payments are higher (0.785 compared to 0.762 for the 2018 MFP and 0.696 compared to 0.680 for the 2019 MFP), suggesting payments may actually be a little more heavily concentrated on larger farms than the simulated distributions based on the ARMS data suggest.

**Distribution Across CFAP Recipients.** To examine the robustness of the claims made using the MFP results and examine the distributional impacts of a current agricultural support program, we also

**Table 4. Summary of Key Program Payments, Sorted by Payment Amounts Among All Recipients**

Percentile	Payments per Farm (Thousands of Dollars)			Proportion of Total Payments (Percentage)		
	2020 CFAP	2018 MFP	2019 MFP	2020 CFAP	2018 MFP	2019 MFP
20	35.4	36.1	79.3	78.2	85.2	74.6
15	43.6	44.2	94.2	72.3	78.3	66.4
10	58.1	56.9	117.1	64.2	67.2	55.0
5	92.9	81.2	161.3	51.3	48.0	37.9
2	163.7	117.6	232.1	36.2	27.8	21.8
1	234.5	146.8	295.7	25.9	17.3	13.9

Source: MFP data are from FOIA request 2020-FPAC-FSA-05508-F (data ending July 24, 2020), and actual CFAP data are from FOIA request 2020-FPAC-FSA-06416-F (data ending September 23, 2020). See also US Department of Agriculture, Farm Service Agency.

collected individual recipient data on the CFAP. Payments under the CFAP are based on the amount of production, inventory, and estimated price damage. Thus, benefits will likely be distributed with a concentration pattern that is more similar to the 2018 MFP than the 2019 MFP. The results in this report suggest that payments made based on production, rather than base acreage, tend to be more concentrated.

These findings are consistent with the evidence provided with the Lorenz curves in Figure 5. The estimated Gini coefficient of 0.782 for the 2020 CFAP payments is almost identical to the Gini coefficient for the 2018 MFP (0.785) and 12 percent higher than for the 2019 MFP (0.696). A second set of results that supports the hypothesis that payments are similar across the 2018 MFP and 2020 CFAP are reported in Table 4.

Payments under the CFAP are substantially more concentrated than under the 2019 MFP, as illustrated by consistently higher proportions of payments made under the CFAP to the highest farm percentiles. About half of all payments under the 2020 CFAP and 2018 MFP went to the top 5 percent of recipients, while under the 2019 MFP the top 5 percent of recipients received only 37.9 percent of those payments. While average payments under the 2019 MFP are substantially larger at every percentile level, the concentration of payments is tempered by the program's

design. In contrast, at the top 5 percent level of recipients, the CFAP becomes more concentrated than the 2018 MFP, with 25.9 percent of all payments going to the top 1 percent of recipients.

### Policy Implications

It is important to understand how disaster program payments flow throughout the US agricultural system and why program design affects the distribution of those payments. The issue is especially important if a major purpose of such initiatives is to protect financially vulnerable farms from the adverse consequences of catastrophic events. This report provides insights about the distributional impacts of the 2018 and 2019 MFPs that may inform how future ad hoc and other subsidy programs could be more effectively targeted, given policymakers' objectives.

The major findings of this report are as follows. First, payments from both the 2018 and 2019 disaster MFPs and the federal crop insurance program are heavily concentrated on larger farms, with few resources flowing to midsize and smaller-scale farm operations. The same finding also holds for pandemic relief payments made under the CFAP. The heavy focus on payments to large-scale farm businesses is a direct consequence of the programs' designs, which



determine payments using either the total amount of production for crops affected by the catastrophe (2018 MFP, federal crop insurance program, and 2020 CFAP) or the number of acres planted to such crops (2019 MFP).

To illustrate, the largest 5 percent of all farms received 34.3 percent of all 2018 MFP payments and 32.1 percent of all 2019 MFP payments. Per farm, payments under the 2019 MFP were substantially larger than under the 2018 MFP because funding for the 2019 MFP was substantially larger. Payments per farm averaged \$12,693 for the 2018 MFP and \$24,427 for the 2019 MFP. Farms in the top decile received payments that were approximately an average of five times more than the average farm payment.

Second, both MFPs gave larger farms higher payments per acre, but especially under the 2018 MFP in which payments were directly tied to a farm's total production of a crop and therefore to per-acre yields. Under the 2018 MFP, the average farm received a payment of \$19 per acre, but farms in the top decile received average payments of around \$30 per acre. Therefore, under the 2018 MFP—and under the federal crop insurance and CFAP that base payments on farm-level production—payments were even more heavily concentrated with large farms than under the 2019 MFP. Under the 2019 MFP, per-acre payments received by the average farm (\$51) were proportionally much closer to per-acre payments received by the largest 10 percent of farms (\$55). The reason for the much smaller difference in per-acre payments was that, in any given county, under the 2019 MFP each farm received the same per-acre payment for every acre planted to an eligible crop, regardless of crop yields or crop mix. As a result, payments were more heavily concentrated on larger farms under the 2018 MFP, the CFAP, and the federal crop insurance program than under the 2019 MFP.

Third, there is a great deal of overlap in payments made under the MFP and federal crop insurance program. As discussed above, the extent to which benefits are concentrated on large farms in each program has been documented. When the number of benefits each farm receives under one or more of the three programs is considered, the share of total payments

under all three programs is even more heavily concentrated on large farm businesses than midsize and small farm operations. While only 37.7 percent of all farms received payments under all three programs, those farms received 81.4 percent of all the total payments across the three programs. In contrast, 36.7 percent of all farms only received payments under the 2019 MFP, and those payments represented only 2.5 percent of all federal outlays under the three programs.

These findings suggest that the main beneficiaries of the 2018 and 2019 MFPs were already managing risk through federally subsidized crop insurance programs and, in effect, triple-dipping into taxpayer monies to cover losses for which they were already being at least partially compensated mainly through revenue insurance coverage for major crops such as corn, cotton, rice, soybeans, and wheat. Those crop insurance programs cover losses against revenue losses that derive from decreases in price and lower than expected yields. While it may not be good policy to exclude farms that purchase crop insurance from all benefits associated with future agricultural disaster programs, currently such ad hoc programs provide most of their benefits to farm businesses that also are the major beneficiaries from other lucrative farm safety-net programs authorized by Congress through the 2018 Farm Bill. These include the federal crop insurance and the Price Loss Coverage and Agricultural Risk Coverage initiatives.<sup>29</sup> Small and midsize farm operations are unlikely to receive much, if any, financial help from such programs.

These results are also reflected in the distribution of the 2020 CFAP. Like the 2018 MFP, the CFAP also used farm-level crop production and inventories as the basis for making payments to individual farm businesses, rather than simply the area planted to a crop. Under the CFAP, as with the 2018 MFP, payments have been more heavily concentrated on large farm operations than midsize and small operations, which received few benefits from the program. This degree of payment concentration on large and very large farm businesses is problematic if an ad hoc agricultural disaster aid program is meant to limit financial bankruptcies and other forms of farm failure such

as foreclosures, ensure food security, or stabilize the food system. These payments are not targeted to smaller and midsize farms that, because of their asset bases, are much more likely to need help from a safety net when catastrophic events occur.

### **About the Authors**

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# Notes

1. This measure does not include any measures of crop insurance premium subsidies or net indemnities, which, in recent years, have averaged about \$6 billion a year. Eric J. Belasco, “Moving Agricultural Policy Forward: Or, There and Back Again,” *Journal of Agricultural and Resource Economics* 45, no. 3 (2020): 397–409, <https://ageconsearch.umn.edu/record/304764/files/JARE%2C45.3%2CSeptember2020%2C%231%2CBelasco%2C397-409.pdf>.

2. Barry K. Goodwin and Vincent H. Smith, *The Economics of Crop Insurance and Disaster Relief* (Washington, DC: AEI Press, 1995); Vincent H. Smith and Joseph W. Glauber, “Agricultural Insurance in Developed Countries: Where Have We Been and Where Are We Going?,” *Applied Economic Perspectives and Policies* 34, no. 3 (2012): 360–90, <https://onlinelibrary.wiley.com/journal/20405804>.

3. Joseph Glauber and Nathan Hendricks and Joseph Janzen, among others, have estimated that the 2018 and 2019 Market Facilitation Programs (MFP) substantially overcompensated producers of many commodities, up to and including soybeans, for any actual losses incurred because of trade dispute–related declines in their prices. Joseph W. Glauber, *Agricultural Trade Aid: Implications and Consequences for U.S. Global Trade Relationships in the Context of the World Trade Organization*, American Enterprise Institute, November 19, 2019, <https://www.aei.org/research-products/report/agricultural-trade-aid-implications-and-consequences-for-us-global-trade-relationships-in-the-context-of-the-world-trade-organization/>; and Joseph P. Janzen and Nathan P. Hendricks, “Are Farmers Made Whole by Trade Aid?,” *Applied Economic Perspectives and Policy* 42, no. 2 (2020): 205–26, <https://onlinelibrary.wiley.com/doi/abs/10.1002/aep.13045>. The MFP payments were also widely viewed by many observers as measures the Donald Trump administration used to shore up political support for the president and his party among agricultural producers with respect to the 2018 midterm congressional elections and the 2020 presidential election. Philip Bump, “How Much Government Money Does Trump Plan to Spend on His Reelection?,” *Washington Post*, October 8, 2020, <https://www.washingtonpost.com/politics/2020/10/08/how-much-government-money-does-trump-plan-spend-his-reelection/>; and Alan Rappeport, “Trump Funnel Record Subsidies to Farmers Ahead of Election Day,” *New York Times*, October 12, 2020, <https://www.nytimes.com/2020/10/12/us/politics/trump-farmers-subsidies.html>.

4. While area-based federal crop insurance products link subsidy benefits to countywide yields, about 94 percent of all crops are insured under crop-specific multiple peril contracts in which insurance premium coverage, subsidies, and indemnities are based on the farm’s planted acres and yields. See, for example, Vincent H. Smith, Joseph W. Glauber, and Barry K. Goodwin, “The U.S. Federal Agricultural Insurance Program: Time for Reform?,” in *Agricultural Policy in Disarray, Volume II*, ed. Vincent H. Smith, Joseph W. Glauber, and Barry K. Goodwin (Washington, DC: AEI Press, 2018): 71–107.

5. The initial Coronavirus Food Assistance Program (CFAP), widely known as CFAP1, was implemented between late May and mid-September 2020 and covered a relatively limited number of commodities including historically heavily subsidized large-acre crops such as corn, cotton, and wheat; beef cattle, hogs, and wool; and a few other specialty commodities such as frozen eggs. The second CFAP, initiated in late September 2020, expanded coverage to many other crops, including fruits, vegetables, and nuts, to compensate producers for price declines that occurred between January 13, 2020, and July 27, 2020, if such price declines exceeded 5 percent of the January price.

6. To ensure the Agricultural Resource Management Survey sample is nationally representative, observations are adjusted using stratified weights. These weights are also used in this report in estimating payment distributions by farm size.

7. Data provided for the MFP were received under Freedom of Information Act (FOIA) request 2020-FPAC-FSA-05508-F with data ending July 24, 2020. These data include individual recipient information accounting for all \$8.6 billion payments under the 2018 MFP and 99 percent of the \$14.509 billion under the 2019 MFP.

8. Data for CFAP payments were received under FOIA request 2020-FPAC-FSA-06416-F with data ending September 23, 2020. These data include \$10.157 billion in payments, which amounts to 98 percent of the currently reported \$10.377 billion in CFAP payments.

9. J. T. Bonnen, “The Distribution of Benefits from Selected U.S. Farm Programs,” in *Rural Poverty in the United States*, National Advisory Commission on Rural Poverty, May 1968, 461–505; James D. Johnson and Sara D. Short, “Commodity Programs: Who Has

Received the Benefits?," *American Journal of Agricultural Economics* 65, no. 5 (December 1983): 912–21, <https://www.jstor.org/stable/1240391?seq=1>; Nigel D. Key and Michael J. Roberts, "Do Government Payments Influence Farm Size and Survival?," *Journal of Agricultural and Resource Economics* 32, no. 2 (August 2007): 330–48, <https://www.jstor.org/stable/40987367?seq=1>; Randall A. Kramer, "Federal Crop Insurance: 1938–82," *Agricultural History* 57, no. 2 (1983): 181–200, <https://www.jstor.org/stable/3743155?seq=1>; and Charles L. Schultze, *The Distribution of Farm Subsidies: Who Gets the Benefits?*, Brookings Institution, 1971.

10. Anton Bekkerman, Eric J. Belasco, and Vincent H. Smith, "Does Farm Size Matter? Distribution of Crop Insurance Subsidies and Government Program Payments Across U.S. Farms," *Applied Economic Perspectives and Policy* 41, no. 3 (2019): 498–518, <https://ideas.repec.org/a/oup/apecpp/v41y2019i3p498-518.html>.

11. Through the 2019 disaster aid legislation, Congress authorized \$17.2 billion in new funds, of which \$3 billion was targeted for agriculture, to redress losses incurred by farmers and other businesses associated with hurricanes, floods, wildfires, earthquakes, and volcanic eruptions. The act provided funding for losses of crops and vines and planting that was prevented because of fire, floods, and other natural disasters in 2018 and 2019.

12. The federal crop insurance program was first introduced in 1938 to cover losses for wheat and corn in a limited number of counties but, in its current complex form, covers over 130 individual crops and is available nationally for all major crops. See Kramer, "Federal Crop Insurance: 1938–82"; and Smith and Glauber, "Agricultural Insurance in Developed Countries."

13. Commodity Credit Corporation funds are used to support the Conservation Reserve Program, which is managed by the US Department of Agriculture (USDA) Farm Service Agency. Other appropriated funds are used for the other major conservation program, the Conservation Stewardship Program, managed by the USDA Natural Resources Conservation Service.

14. US Department of Agriculture, Office of the Chief Economist, "Trade Damage Estimation for the Market Facilitation Program and Food Purchase and Distribution Program," September 13, 2018, [https://www.usda.gov/oce/trade/USDA\\_Trade\\_Methodology\\_Report\\_2018.pdf](https://www.usda.gov/oce/trade/USDA_Trade_Methodology_Report_2018.pdf).

15. Thus, the 2018 MFP payments were directly linked to a farm's actual production of each eligible crop and therefore, under the terms of the World Trade Organization Agreement on Agriculture, likely to be reported into the category of production distorting "amber box" payments. Glauber, *Agricultural Trade Aid*.

16. In the 2019 MFP, eligible crops included alfalfa hay, barley, canola, corn, crambe, dried beans, dry peas, extra-long staple cotton, flaxseed, lentils, long-grain and medium-grain rice, millet, mustard seed, oats, peanuts, rapeseed, rye, safflower, sesame seed, small and large chickpeas, sorghum, soybeans, sunflower seed, temperate japonica rice, triticale, upland cotton, and wheat and the following fruit and nut specialty crops: almonds, cranberries, cultivated ginseng, fresh grapes, fresh sweet cherries, hazelnuts, macadamia nuts, pecans, pistachios, and walnuts. Hogs and milk production were also eligible for payments, as in the 2018 MFP. At the farm level, limitations on total payments also applied. Total payments for all non-specialty crops were limited to \$250,000 per eligible person or legal entity, with the same total limit applying for all specialty crops and dairy and hog production. Payments to eligible persons and entities that raised a mix of specialty crops, non-specialty crops, or hogs and dairy were capped at \$500,000. However, such payment limits are widely viewed to be largely ineffective.

17. Nicholas D. Paulson, Allen M. Featherstone, and Joleen C. Hadrach, "Distribution of Market Facilitation Program Payments and Their Financial Impact for Illinois, Kansas, and Minnesota Farms," *Applied Economic Perspectives and Policy* 42, no. 2 (May 2020): 227–44, <https://onlinelibrary.wiley.com/doi/abs/10.1002/aepp.13055>.

18. Janzen and Hendricks, "Are Farmers Made Whole by Trade Aid?"

19. James M. MacDonald, Robert A. Hoppe, and Doris Newton, *Three Decades of Consolidation in U.S. Agriculture*, US Department of Agriculture, Economic Research Service, March 2018, <https://www.ers.usda.gov/publications/pub-details/?pubid=88056>.

20. Key and Roberts, "Do Government Payments Influence Farm Size and Survival?"; Barrett E. Kirwan, "U.S. Farm Dynamics and the Distribution of U.S. Agricultural Subsidies," *Applied Economic Letters* 24, no. 3 (2016): 138–64, <https://www.tandfonline.com/doi/abs/10.1080/13504851.2016.1178837>; and Ashok Mishra, Hisham El-Osta, and Jeffrey M. Gillespie, "Effect of Agricultural Policy on Regional Income Inequality Among Households," *Journal of Policy Modeling* 21, no. 3 (2009): 325–40, <https://www.sciencedirect.com/science/article/abs/pii/S0161893809000040>.

21. The focus here is on crops, partly because while cattle and some other livestock operations receive crop insurance subsidies

under a pasture and range insurance program based on rainfall indexes, payments under other price protection-oriented livestock programs are modest, amounting to at most \$20 million annually relative to total premium subsidies for all products in excess of \$6 billion.

22. Payments as of November 2, 2020, were reported in Farmers.gov, “Market Facilitation Program Data,” [https://www.farmers.gov/sites/default/files/2020-11/FarmersGov-Managed\\_Market-Facilitation-Program-Data.pdf](https://www.farmers.gov/sites/default/files/2020-11/FarmersGov-Managed_Market-Facilitation-Program-Data.pdf).

23. Bekkerman, Belasco, and Smith, “Does Farm Size Matter?”

24. Bekkerman, Belasco, and Smith, “Does Farm Size Matter?”

25. Glauber, *Agricultural Trade Aid*.

26. Bekkerman, Belasco, and Smith, “Does Farm Size Matter?”

27. Gini coefficients for each distribution were estimated using the method Joseph Gastwirth proposed. A Gini index value of zero implies that each share of the population of interests receives an identical share of the total payments; a value of one implies that all payments go to only one group (e.g., the top 1 percent of farms by sales) and none to the rest of the population. Joseph L. Gastwirth, “The Estimation of the Lorenz Curve and Gini Index,” *Review of Economics and Statistics* 54, no. 3 (1972): 306–16, <https://www.jstor.org/stable/1937992?seq=1>.

28. Smith and Glauber, “Agricultural Insurance in Developed Countries.”

29. Bekkerman, Belasco, and Smith, “Does Farm Size Matter?”