

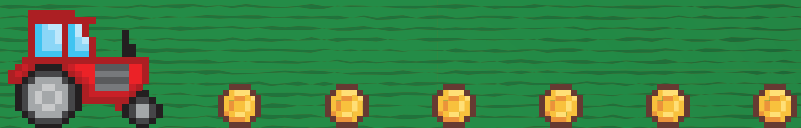


Where the Money Goes

THE DISTRIBUTION OF CROP INSURANCE AND
OTHER FARM SUBSIDY PAYMENTS

**Anton Bekkerman, Eric J. Belasco,
and Vincent H. Smith**

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AGRICULTURAL POLICY IN DISARRAY
REFORMING THE FARM BILL

AMERICAN ENTERPRISE INSTITUTE

Executive Summary

This study examines the distribution of Agricultural Risk Coverage (ARC) and Price Loss Coverage (PLC) program payments and crop insurance subsidy payments among US farms. Data from the United States Department of Agriculture (USDA) Agricultural Resource Management Survey, USDA Farm Service Agency, and USDA Risk Management Agency are combined to characterize farms in terms of the value of crop sales.

The results of the analysis indicate that farms in the top 10 percent of the crop sales distribution received approximately 68 percent of all crop insurance premium subsidies in 2014 and that farms in the top 2 percent receive approximately \$50 per acre in crop insurance subsidies, more than four times higher than the average per-acre subsidy of \$12.28. In addition, farms in the top 20 percent of the crop sales distribution received more than 82 percent of ARC and PLC payments in 2015. Farms in the top 5 percent of crop sales received close to the total amount of ARC and PLC payments (\$299 million) received by farms in the lowest 90 percent of crop sales (\$358 million). Finally, the top 10 percent of farms in crop sales were estimated to receive nearly \$3 billion in total ARC, PLC, and crop insurance subsidy payments in 2015, and farms in the bottom 80 percent of crop sales received approximately the same total amount of ARC, PLC, and insurance subsidy payments as farms in the top 2 percent.

The study also examines the effects and trade-offs of implementing payment restrictions. The results of the analyses indicate that a \$40,000 per-farm cap on crop insurance subsidies would have resulted in \$2.02 billion in savings (approximately 42 percent of all premium subsidy outlays) in 2014. However, the \$40,000 cap would affect less than 5 percent of all farms. Also, a lower \$30,000 cap on premium subsidies would have saved \$2.51 billion, and a less stringent \$50,000 cap would have saved \$1.74 billion in taxpayer outlays.

Meanwhile, a \$125,000 cap on per-farm ARC and PLC payments would affect 17.2 percent of enrolled farms, the majority of which fall in the top 10 percent of crop sales. Total savings would have been approximately \$70 million. A \$250,000 cap on per-farm ARC, PLC, and crop insurance subsidy payments would result in \$273 million in savings, of which 67 percent would come from farms in the top 1 percent of the crop sales distribution. Finally, a \$125,000 cap on per-farm ARC, PLC, and crop insurance subsidy payments would affect only 3 percent of farms in the 50th to 90th decile of the crop sales distribution. Lower payments to farms in the top 10 percent of crop sales would result in savings of nearly \$650 million, which represents 97 percent of the overall \$670 million savings from the \$125,000 cap.

Where the Money Goes

THE DISTRIBUTION OF CROP INSURANCE AND OTHER FARM SUBSIDY PAYMENTS

Anton Bekkerman, Eric J. Belasco, and Vincent H. Smith

Who receives what benefits from farm subsidy programs has been a focus of economics research throughout the evolution of US agricultural policy. The issue is politically controversial. However, economists have continued to examine the issue on an evidence basis, in part in response to D. Gale Johnson's call in the early 1970s that "any governmental program that involves substantial expenditures by taxpayers and consumers should be periodically evaluated."¹ In the mid- and late-2000s, the findings from these evidence-based analyses led to widespread criticisms of many agricultural support programs—including the Direct Payments (DP), Countercyclical Payment (CCP), Average Crop Revenue Election (ACRE), and Supplemental Revenue Assurance (SURE) programs—by economists, policymakers, and the media.²

The 2014 Farm Bill (the 2014 Agriculture Act) terminated the DP, CCP, ACRE, and SURE programs. However, the 2014 Farm Bill replaced CCP and ACRE with two new initiatives, the Price Loss Coverage (PLC) and Agricultural Risk Coverage (ARC) programs. Together with the federally subsidized crop insurance program—a new Stacked Income Protection Plan (STAX) for cotton and a new Dairy Margin Protection Program—ARC and PLC comprise what is widely described as the current farm safety net. Federal expenditures on ARC, PLC, and the federal crop insurance program are estimated to have averaged \$12–\$14 billion per year since 2014 and are expected to be similarly funded between 2018 and 2027.³ Further, those subsidies are targeted mainly to producers

of program crops.⁴ However, the Congressional Budget Office has also estimated that between 2017 and 2027, more than 70 percent of ARC, PLC, and crop insurance payments will flow to producers of just three crops: corn, soybeans, and wheat.⁵

In light of the substantial estimated public expenditures on these new agricultural support programs, this study also follows Johnson's call to evaluate the economic equity of the 2014 Farm Bill safety-net programs.⁶ We use farm-level data from the Agricultural Resource Management Survey (ARMS) to estimate distributions of subsidy payments by size of farm as measured by crop sales, and then we use these estimates to examine potential benefit-cost trade-offs for agricultural producers and taxpayers resulting from changes to the structure of current safety-net programs. We estimate that in 2014 and 2015, approximately 60 percent of total crop insurance subsidies and ARC and PLC government subsidies were paid to producers in the highest 10 percent of the crop sales distribution. Further, farm businesses in the top 5 percent of crop sales received nearly 40 percent of all program payments, but more than 50 percent of farms in the lower 70 percent of the crop sales distribution received no subsidy or program payments. Further, the results indicate that more stringent restrictions on existing agricultural programs and crop insurance subsidies considered here would affect only farm businesses in the top 5–7 percent of the crop sales distribution but would likely result in a 30–40 percent reduction in public expenditures.

Methods

The objective of this study is to estimate the extent to which small, medium, and large farm businesses receive subsidies under the ARC, PLC, and federal crop insurance programs. The focus is on farm size as measured by value of crop sales. We use this measure to characterize economic returns from agricultural farm operations because of both precedence⁷ and other measures that may be less informative for assessing the ARC, PLC, and crop insurance programs.⁸

The analysis uses farm-level data, which are obtained from the 2014 USDA ARMS, the most recent survey for which data are available. ARMS is a national survey of agricultural producers, conducted annually by the USDA National Agricultural Statistical Service. The survey collects information about farm finances, off-farm income, and household characteristics. The survey also provides information about each farm's elections with respect to enrollment in ARC and PLC programs and farm-level crop insurance expenditures.

Well-established statistical procedures are used to estimate and represent program payment and insurance subsidy receipts for a national population of farm businesses producing four commodities: corn, cotton, soybeans, and wheat.⁹ First, ARMS data on farms' crop insurance coverage level and expenses are linked with the USDA Risk Management Agency (RMA) county-level premium subsidy information to estimate farm-level subsidy rates. Next, we combine farms' ARC and PLC enrollment decisions with USDA Farm Service Agency (FSA) program payments data to calculate farm-level payment receipts. All the estimates are then validated to represent the US farm population using information from the 2012 Census of Agriculture, USDA RMA Summary of Business, and USDA FSA program payment database.¹⁰

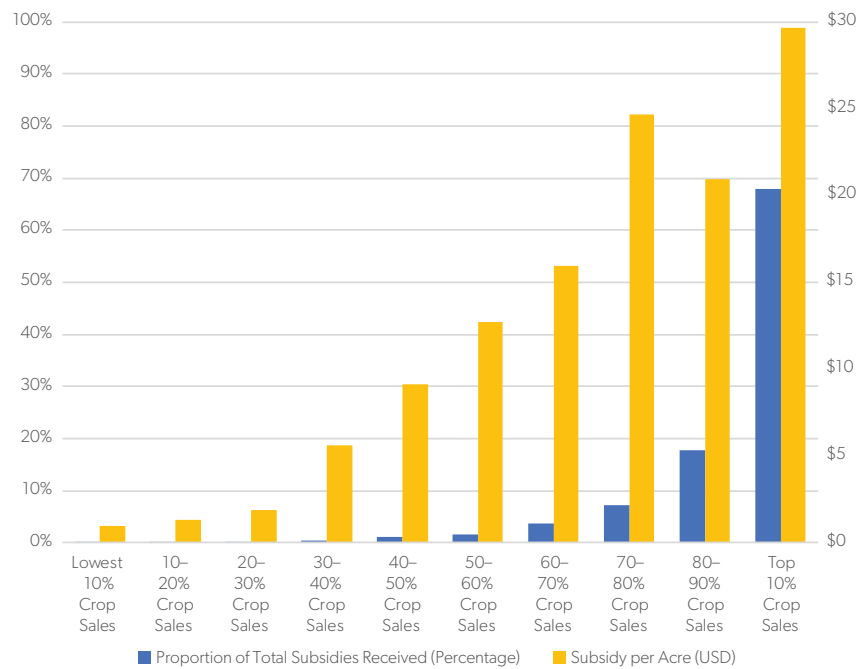
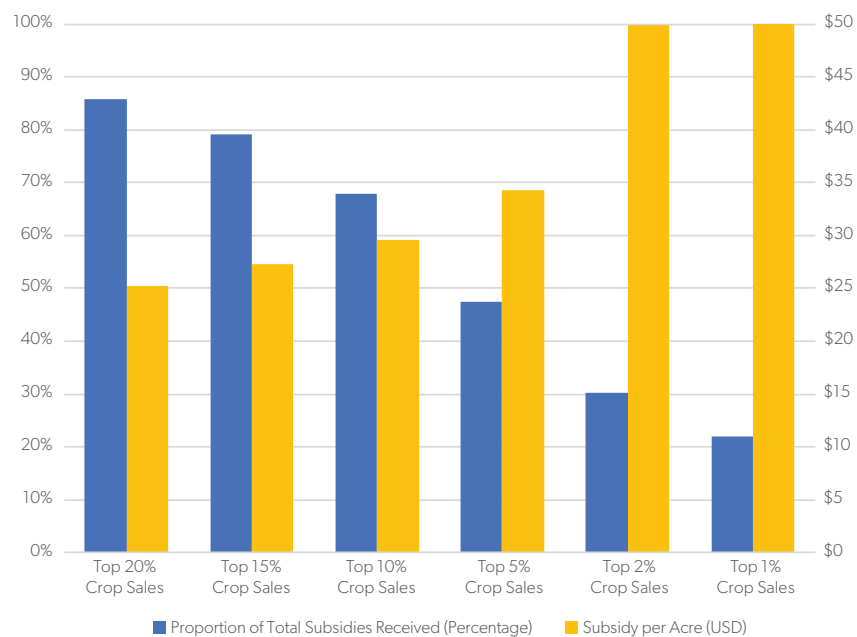
Distribution of Crop Insurance Subsidies and Program Payments

Figure 1 shows the average subsidy per acre¹¹ made to all farms in a crop sales decile and the proportion of total subsidies received by farms across the crop

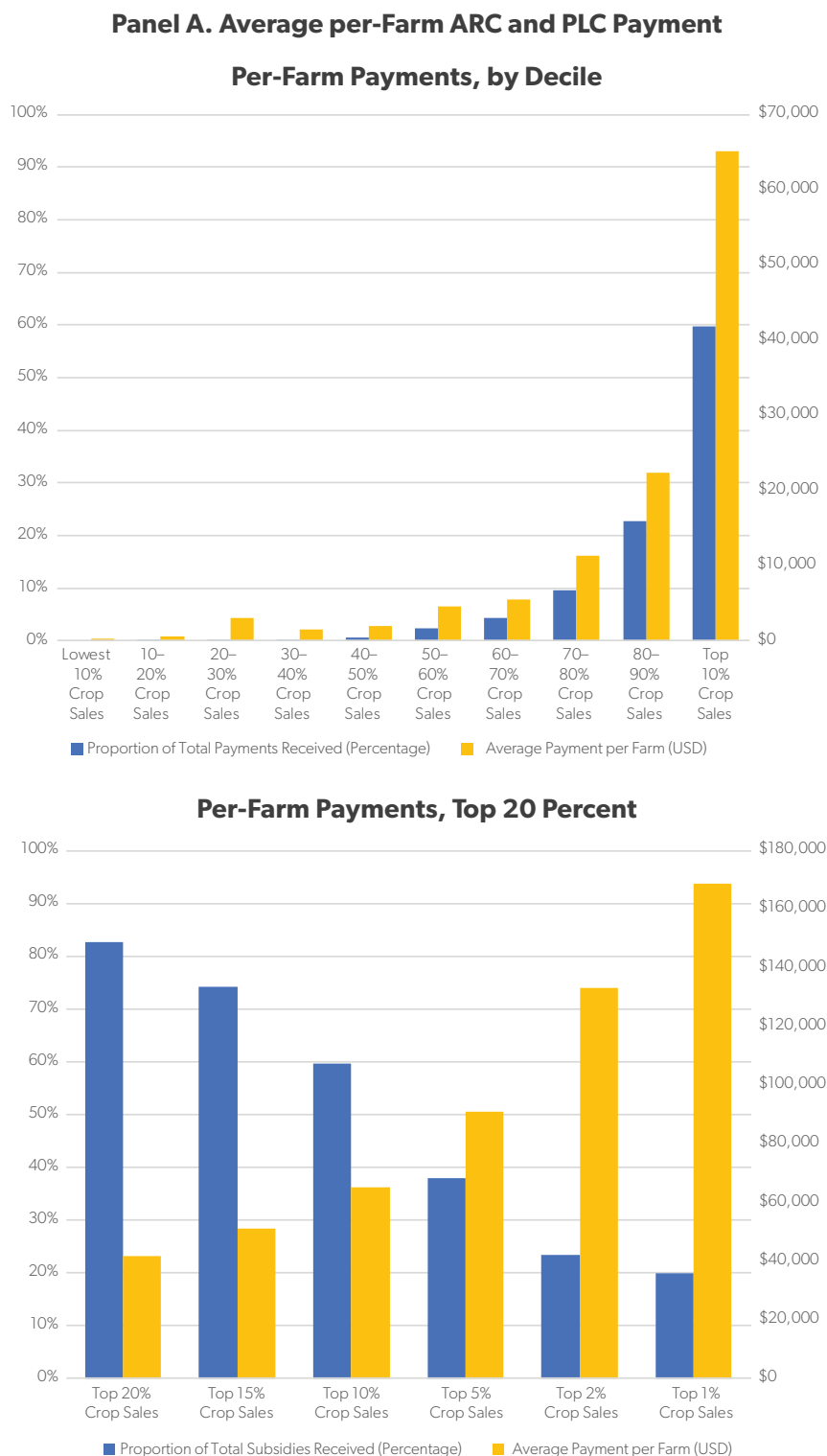
sales distribution. Farms in the top crop sales decile (i.e., the farms for which the value of annual crop sales ranked in the top 10 percent of crop sales values) receive 67.9 percent of all insurance premium subsidies. Additionally, subsidies per acre are 20 percent higher for farms in the top decile than for the next two deciles (70–80 percent and 80–90 percent), a consequence of higher per-acre insurance coverage levels (liabilities) that largely derive from higher per-acre sales. Figure 1 also shows that farms in the top 2 percent of crop sales receive 30.2 percent of all premium subsidy payments, at a rate of \$49.89 per acre. This amount is nearly double the average for those in the top 20 percent (\$25.27) and more than four times higher than the average per-acre subsidy of \$12.28.¹²

Figure 2 presents the distribution of 2015 ARC and PLC payments across the weighted crop sales distribution. The data indicate that farms in the lowest 70 percent of the crop sales distribution received total payments from ARC and PLC programs that were on average approximately \$2,500 per farm. In contrast, farms in the top decile received average payments of \$65,022 per farm.¹³ In total, farms in the top 10 percent of crop sales received an estimated 58.3 percent of all ARC and PLC payments made to corn, soybean, and wheat producers in 2015. Figure 2 also shows that the overwhelming majority of those payments are concentrated in the top 20 percent of the crop sales distribution. In 2015, 82.1 percent of all ARC or PLC subsidies were paid to those farms. The average ARC and PLC subsidy payment for farms in the top fifth percentile was approximately \$91,000, farms in the top 2 percent received average payments of \$133,000, and farms in the top 1 percent of crop sales received average payments of \$169,000, accounting for nearly 14 percent of all payments. In total, farms in the top 5 percent of the crop sales distribution received close to the same amount (\$299 million) of ARC and PLC payments as all the payments received by the bottom 90 percent (\$358 million).

Figure 3 shows farm-level receipts of the sum of ARC, PLC, and crop insurance premium subsidies estimated to have been received by farms in 2015.¹⁴ The total estimated payments to farms in the top

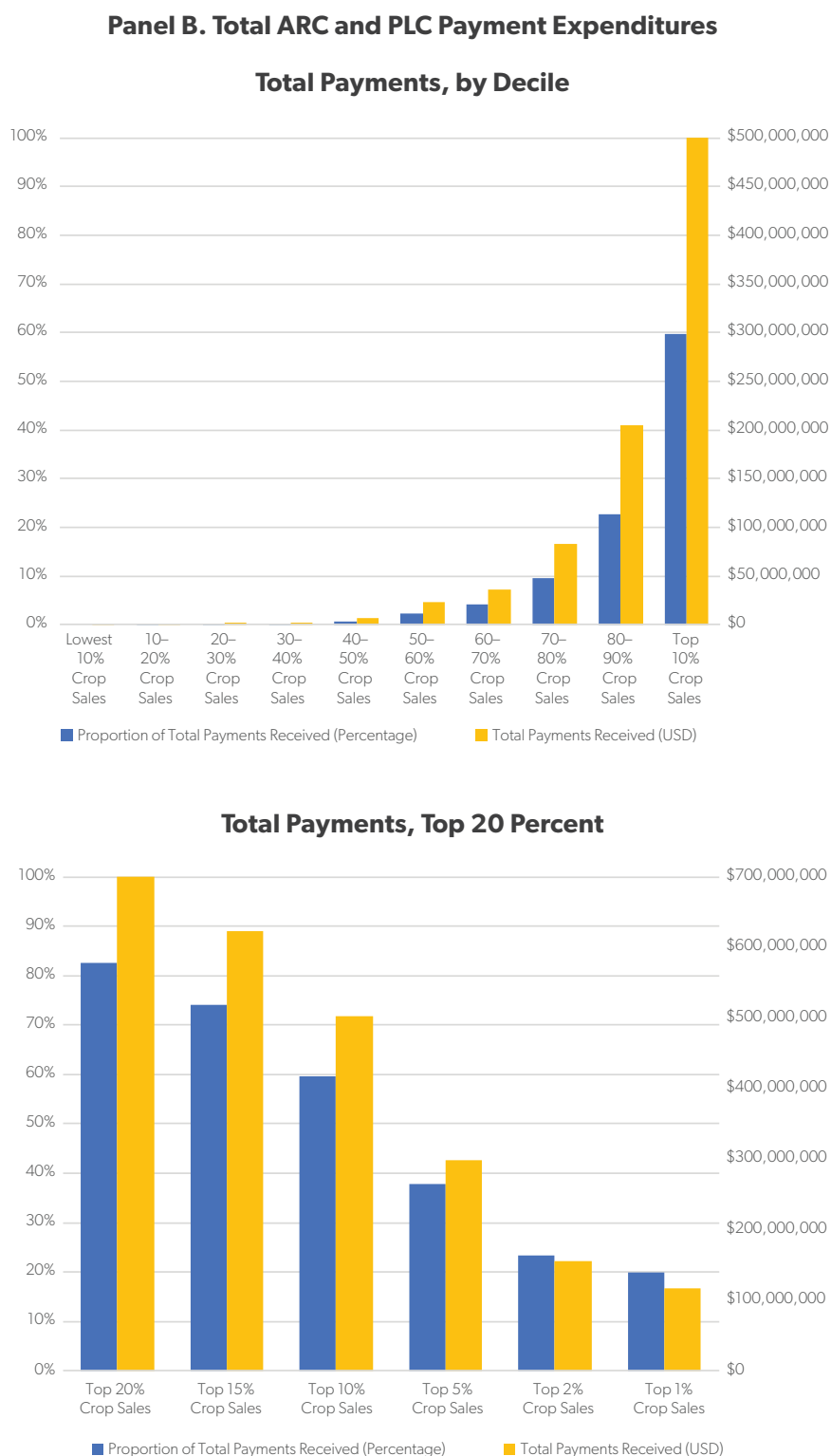
Figure 1. Crop Insurance Subsidy Payments Across Farms in the Weighted Crop Sales Distribution**Panel A. Crop Insurance Subsidy Payment Distributions by Crop Sales Deciles****Panel B. Crop Insurance Subsidy Payment Distributions for Farms in the Top 20 Percent of Crop Sales**

Source: Authors.

Figure 2. ARC and PLC per-Farm and Total Payments Across Farms in the Weighted Crop Sales Distribution

Source: Authors.

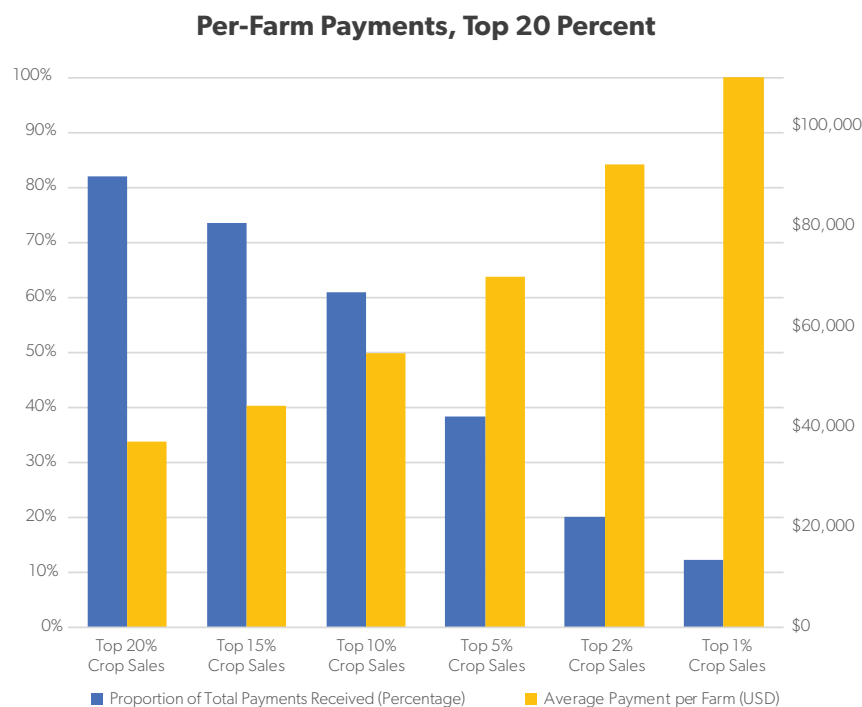
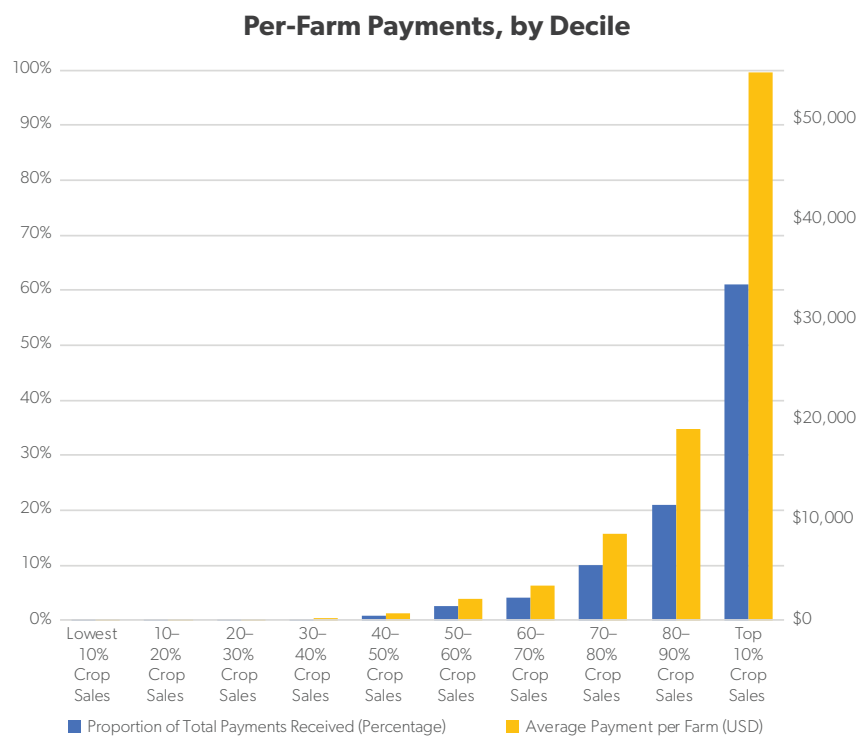
Figure 2. ARC and PLC per-Farm and Total Payments Across Farms in the Weighted Crop Sales Distribution (continued)



Source: Authors.

Figure 3. ARC, PLC, and Crop Insurance Subsidy per Farm and Total Payments Across Farms in the Weighted Crop Sales Distribution

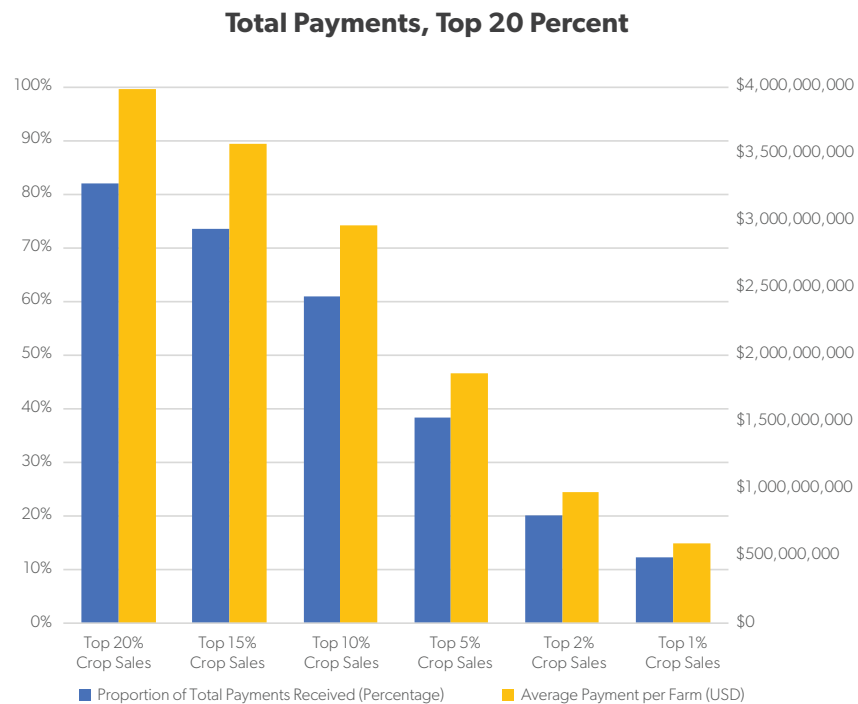
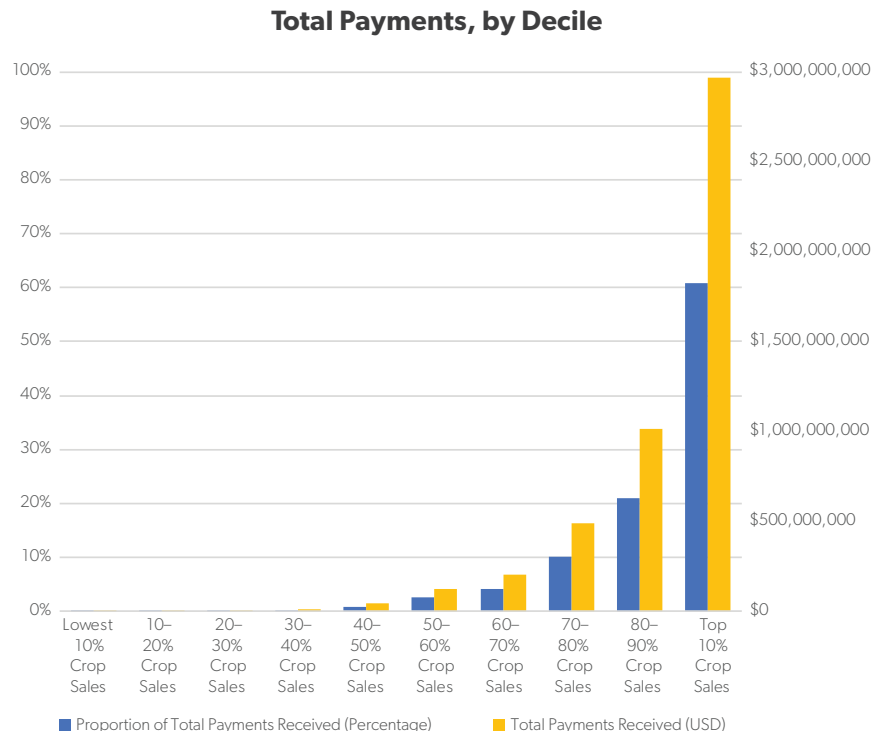
Panel A. Proportion of Farms Receiving Payments, Crop Sales Deciles



Source: Authors.

Figure 3. ARC, PLC, and Crop Insurance Subsidy per Farm and Total Payments Across Farms in the Weighted Crop Sales Distribution (*continued*)

Panel B. Proportion of Farms Receiving Payments, Farms in the Top 20 Percent of Crop Sales



Source: Authors.

10 percent of the crop sales distribution were nearly \$3 billion. The top 20 percent received nearly \$4 billion in program and subsidy payments, of which nearly half was paid to the top 5 percent of farms. The results presented in Figure 3 also show that farms for which crop sales are in the bottom 80 percent of the sales distribution received only 18.1 percent of total ARC, PLC, and crop insurance subsidy payments, approximately equal to the total payments received by farms in the top 2 percent.

Figure 4 shows the distribution of farms that received payments from each of the different programs in 2015. Fewer than 15 percent of farms in the bottom 40 percent of the crop sales distribution were recipients of any subsidy related to ARC, PLC, or crop insurance. Moreover, more than half the farms in the bottom 70 percent of the crop sales distribution received no payments or subsidies. Conversely, 51.5 percent of farms in the top 20 percent of crop sales received payments from at least one program, and 8.8 percent of those farms received payments from two of the three possible sources. This suggests that not only do corn, soybean, and wheat farms with large market sales have a better than 50 percent chance of receiving a government payment in 2015, but also that, as a group, their share of total program payments will almost certainly be larger than the share of those payments received by the vast majority of other farms. And while future payment probabilities would depend on relative market prices and farms' coverage level choices, the distributional characteristics of payments is likely to be roughly similar.

Analysis of Policy Changes on Payments Across the Farm Distribution

The data indicate that producers who receive the majority of total ARC and PLC programs and crop insurance subsidy payments also own the largest farms, generate the highest crop sales revenues, and have the highest amounts of wealth. However, these farms are also generally the least vulnerable to adverse shocks in production and market prices.¹⁵ While subsidized agricultural programs do aid these

producers in addressing financial challenges during unfavorable periods, a significant proportion of these payments may not be required to help these farms bridge periods of financial downturns. The burden of these excess payments falls on US taxpayers.

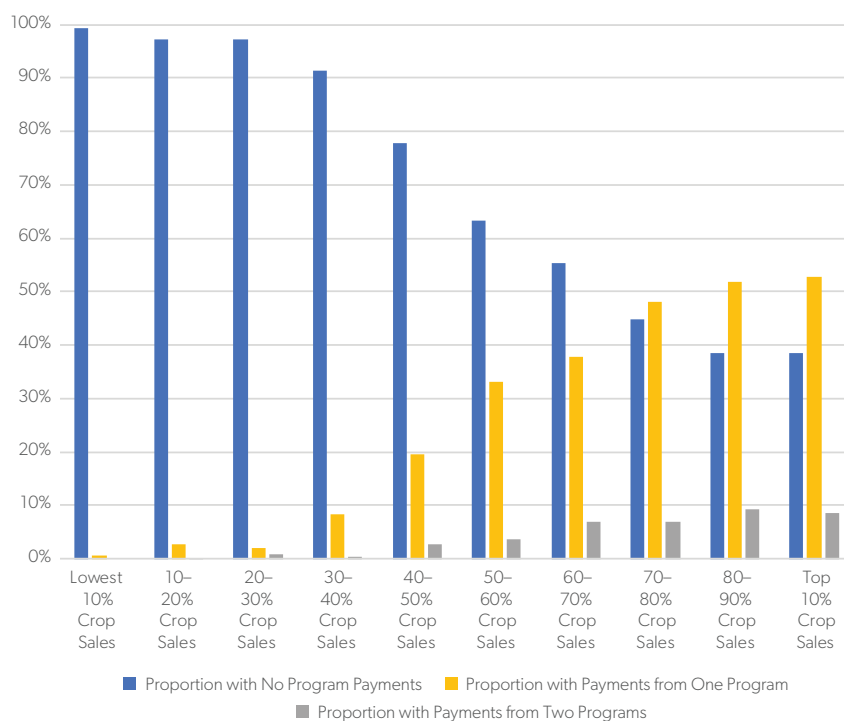
We investigate the effects on agricultural producers and taxpayer savings from expanded limits on government program payments and subsidies. Specifically, we consider four potential policy proposals:¹⁶

- Introducing caps of \$30,000, \$40,000, and \$50,000 on crop insurance subsidies;
- Reducing the total amount of ARC and PLC payments to a maximum of \$125,000 per farm;
- Limiting the sum of ARC, PLC, and crop insurance subsidy payments to \$250,000 (the current per-farm limit on ARC and PLC payments); and
- Limiting the sum of ARC, PLC, and crop insurance subsidy payments to \$125,000.

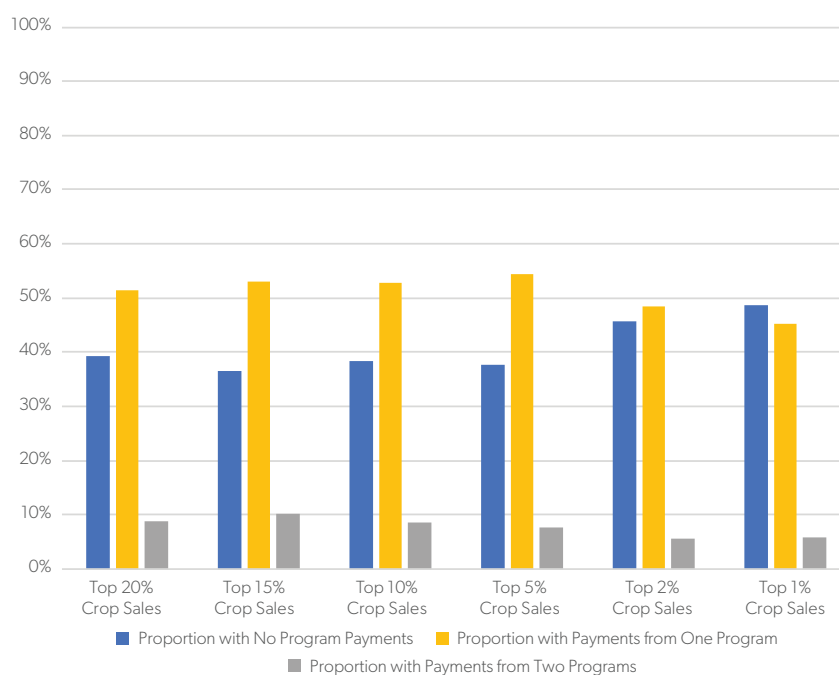
Table 1 presents estimates of the impact of imposing a cap of \$40,000 on insurance premium subsidies. If this cap had been in effect in 2014, total payment reductions would have been \$2.02 billion (42 percent of all premium subsidy outlays) but would reduce premium subsidies for only 4.97 percent of farms.¹⁷ The affected farms would experience an average reduction of \$13,168 in premium subsidies, and approximately 77 percent of savings would come from lower payments made to farms that received more than \$100,000 in premium subsidies in 2014. Under a lower \$30,000 cap, total taxpayer savings in 2014 would be approximately \$2.51 billion (43.2 percent of total 2014 subsidies), while a higher subsidy cap of \$50,000 would result in \$1.74 billion in savings (30 percent of total 2014 subsidies). The majority of savings will be realized by reducing payments to corn and soybean producers. Depending on the cap amount, reductions in payments to producers of these commodities account for 59 percent and 61 percent of savings; wheat and cotton producers would have experienced an approximately 33 percent reduction in 2014 subsidy payments.

Figure 4. Proportion of Farms Receiving Payments from ARC, PLC, or Crop Insurance Subsidies Across Farms in the Weighted Crop Sales Distribution

Panel A. Proportion of Farms Receiving Payments, Crop Sales Deciles



Panel B. Proportion of Farms Receiving Payments, Farms in the Top 20 Percent of Crop Sales



Source: Authors.

Table 1. Hypothetical Incidence of Proposed Insurance Subsidy Cap

Crop Sales Percentile	Average Payment Reduction per Farm (USD)	Total Payment Reduction (Million USD)	Proportion of Farms Affected in Percentile Group	Average Subsidies per Farm (USD)	Percentage of Payment Reduction as a Proportion of Total Subsidies
<i>\$40,000 Cap on Crop Insurance Subsidies per Farm</i>					
0–30%	\$0.80	\$0.2	0.01%	\$87.00	0.88%
30–40%	\$6.80	\$0.5	0.02%	\$482.70	1.41%
40–50%	\$68.90	\$5.1	0.30%	\$1,312.10	5.25%
50–60%	\$126.60	\$9.4	0.41%	\$2,116.80	5.98%
60–70%	\$754.30	\$55.8	1.19%	\$4,373.90	17.25%
70–80%	\$576.60	\$42.7	2.10%	\$7,625.30	7.56%
80–90%	\$2,474.00	\$183.0	9.58%	\$15,991.30	14.47%
Top 20%	\$13,167.90	\$1,947.9	22.84%	\$31,043.40	42.42%
Top 15%	\$17,001.10	\$1,885.9	28.32%	\$37,173.30	45.73%
Top 10%	\$23,857.00	\$1,764.9	36.09%	\$46,089.30	51.76%
Top 5%	\$35,815.80	\$1,323.8	43.87%	\$59,212.30	60.49%
Top 2%	\$55,991.00	\$827.4	45.66%	\$77,216.90	72.51%
Top 1%	\$77,937.30	\$575.8	41.93%	\$96,491.20	80.77%
All	\$2,347.10	\$2,016.4	4.97%	\$7,824.60	30.00%

Source: Authors.

Table 2 summarizes the distributional impacts from limits on combined ARC and PLC payments. The table presents results only for farms in the top 20 percent of crop sales, because such limits would not affect nearly any farm in the bottom 80 percent. For example, a \$125,000 cap on ARC and PLC payments would affect 17.2 percent of all farms enrolled in the programs. Of these, 40 percent (6.9 percent of all farms) are in the top 1 percent of crop sales, and 65 percent are in the top 2 percent of the crop sales distribution. In addition, the overwhelming majority of the reduction in ARC and PLC payments (99 percent) would result from payment reductions to farms in the top 10 percent of the crop sales distribution. Had a \$125,000 cap existed in 2015, total savings in government spending on payments to corn, soybean, and wheat producers would have been approximately \$70 million, and approximately \$64 million of those savings would be realized by reducing payments to farms in the top 5 percent of the crop sales distribution.

Imposing a \$250,000 per-farm cap on the sum of ARC, PLC, and crop insurance subsidy payments would result in the general patterns described above, but the estimated level of savings would be nearly four times larger; that is, \$273 million. Two-thirds of those savings would result from reducing payments to farms in the top 1 percent of the sales distribution, and nearly 80 percent of savings—more than \$217 million—would come from reductions in payments to the top 2 percent of farms in the crop sales distribution.

Finally, Table 2 presents the estimated savings and affected farms resulting from the policy that places a \$125,000 ceiling on the combined ARC, PLC, and crop insurance premium subsidies. This policy would not affect farms below the median of crop sales and would affect only 3 percent of farms with crop sales between the 50th and 90th percentiles of the crop sales distribution. For these farms, the average reduction in ARC, PLC, and premium subsidy payments would be \$70. For farms in the top 10 percent of crop

Table 2. Hypothetical Incidence of Proposed ARC, PLC, and Insurance Subsidy Caps, 2015 Crop Year

Crop Sales Percentile	Average Payment Reduction per Farm (USD)	Total Payment Reduction (Million USD)	Proportion of Farms Affected in Percentile Group
<i>\$125,000 Cap on ARC and PLC Payments</i>			
80–90%	\$8.96	\$0.62	0.03%
Top 20%	\$511.17	\$70.21	0.78%
Top 15%	\$681.55	\$70.21	1.04%
Top 10%	\$1,013.49	\$69.59	1.53%
Top 5%	\$1,874.39	\$64.39	2.80%
Top 2%	\$3,828.66	\$52.61	4.29%
Top 1%	\$6,812.60	\$46.79	6.88%
<i>\$250,000 Cap on ARC, PLC, and Crop Insurance Subsidies</i>			
80–90%	\$3.46	\$0.24	0.01%
Top 20%	\$1,987.43	\$272.97	1.04%
Top 15%	\$2,649.88	\$272.97	1.39%
Top 10%	\$3,971.88	\$272.73	2.07%
Top 5%	\$7,738.32	\$265.83	3.76%
Top 2%	\$15,851.82	\$217.84	6.12%
Top 1%	\$26,227.88	\$180.13	9.08%
<i>\$125,000 Cap on ARC, PLC, and Crop Insurance Subsidies</i>			
50–60%	\$4.13	\$0.28	0.02%
60–70%	\$18.00	\$1.26	0.04%
70–80%	\$44.63	\$3.07	0.15%
80–90%	\$211.86	\$14.55	0.72%
Top 20%	\$4,838.06	\$664.50	4.50%
Top 15%	\$6,369.12	\$656.09	5.75%
Top 10%	\$9,465.43	\$649.95	8.27%
Top 5%	\$16,662.35	\$572.39	11.87%
Top 2%	\$30,249.28	\$415.70	17.75%
Top 1%	\$46,328.95	\$318.18	22.62%

Note: The scenarios are based on realized 2015 ARC and PLC payments and approximate 2015 crop insurance subsidy rates. Affected farms are those that would have received payments or subsidies in 2015 but would not have under each hypothetical cap scenario. Total payment reduction represents the value of expenditures that were distributed as program payments or crop insurance subsidies in 2015 but would have not been distributed under each hypothetical cap scenario. Only crop sales percentiles in which farms would have been affected are presented.

Source: Authors.

sales, the average per-farm payment reduction would be approximately \$25,600, resulting in total savings of nearly \$650 million in government outlays. This represents more than 95 percent of the total savings that would have occurred with a \$125,000 cap on total program payments and subsidies in 2015.

Conclusion

In the early 1970s, Charles Schultze and Russell Martin Lidman reported that the largest 4–7 percent of all farms received more than 40 percent of agricultural price support program benefits, while farms in the lowest 40 percent of the sales distribution received less than 7 percent.¹⁸ More than 40 years later, the evidence presented in this study indicates that surprisingly little has changed, even though substantial adjustments have been made to farm subsidy programs. In fact, as farm sizes have continued to increase and agricultural production has become more consolidated, program payments have also become more concentrated.¹⁹ The persistence of these distributional impacts raises important questions about the inconsistency between the major rationale for farm safety-net programs—that they exist to protect all agricultural producers against production, price, and income risks—and the observed outcomes from those programs.

If the objective of cost-effective farm safety-net policies is to ensure a stable food supply by helping all farms manage otherwise volatile revenues, then the current programs do not direct taxpayer funds in ways

that effectively protect farm operations that are most vulnerable to such shocks. Market forces have provided incentives for farm operations to consolidate and recognize economies of scale and scope. However, we show that those farms are also most likely to be the largest beneficiaries of the three major farm programs, even though these farms are also likely to be the least vulnerable to shocks that adversely affect their revenues and costs.²⁰

Policies that limit payments could help reduce the disproportionate allocation of agricultural program benefits to farms that generally need less help managing financial risks. We show that policies capping crop insurance subsidies and ARC and PLC benefits could result in substantial reductions in federal outlays without any adverse implications for 90 percent (and in some cases, more) of US farms.

About the Authors

Anton Bekkerman is an associate professor in the Department of Agricultural Economics and Economics at Montana State University. **Eric J. Belasco** is an associate professor in the Department of Agricultural Economics and Economics at Montana State University and a visiting scholar at the American Enterprise Institute. **Vincent H. Smith** is a professor in the Department of Agricultural Economics and Economics at Montana State University and a visiting scholar and director of the Agricultural Studies Program at the American Enterprise Institute.

Notes

1. D. Gale Johnson, *Farm Commodity Programs: An Opportunity for Change* (Washington, DC: American Enterprise Institute, 1973), 21.
2. John Antle and Laurie Houston, “A Regional Look at the Distribution of Farm Program Payments and How It May Change with a New Farm Bill,” *Choices* 28, no. 4 (2013), http://www.choicesmagazine.org/UserFiles/file/cmsarticle_339.pdf; and David Orden and Carl Zulauf, “Political Economy of the 2014 Farm Bill,” *American Journal of Agricultural Economics* 97, no. 5 (2015): 1298–311.
3. Congressional Budget Office, “CBO’s June 2017 Baseline for Farm Programs,” 2017, <https://www.cbo.gov/sites/default/files/recurringdata/51317-2017-06-usda.pdf>.
4. Crops eligible for PLC and ARC payments include barley, chickpeas, corn, dry peas, grain sorghum, lentils, oats, peanuts, rice soybeans, wheat, and a wide range of minor oilseed crops including canola, crambe, flaxseed, mustard, rapeseed, safflower, sesame seeds, and sunflower. More than 130 crops are eligible for federal crop insurance subsidies. See Anton Bekkerman, Eric J. Belasco, and Vincent H. Smith, “Does Size Matter? Distribution of Crop Insurance Subsidies and Government Program Payments Across US Farms” (working paper, Montana State University Center for Regulation and Applied Economic Analysis, 2017), <https://www.agri-pulse.com/ext/resources/pdfs/Smith-distributions-paper-october-2017.pdf>.
5. In 2017, corn, soybeans, and wheat together received \$4.458 billion in crop insurance premium subsidies, 73 percent of the total amount of \$6.07 billion in premium subsidies paid to all 130 or more crops in the program. In 2016, ARC and PLC payments for all crops amounted to \$5.283 billion, of which corn (\$3.752 billion), wheat (\$756 billion), and soybeans (\$328 billion) received 85 percent (\$4.502 billion). Congressional Budget Office, “CBO’s June 2017 Baseline for Farm Programs.”
6. Johnson, *Farm Commodity Programs*.
7. James D. Johnson and Sara D. Short, “Commodity Programs: Who Has Received the Benefits?,” *American Journal of Agricultural Economics* 65, no. 5 (1983): 912–21.
8. We do also check the robustness of the crop sales measure by conditioning program and subsidy receipts on other possible economic status measures, including wealth, total farm acreage, or gross income from sales. The results are qualitatively nearly identical.
9. These four commodities accounted for 74 percent of total crop insurance liabilities between 2014 and 2016. For analyzing ARC and PLC program payments, we only consider corn, soybeans, and wheat, because cotton producers are ineligible for ARC and PLC.
10. A full description of the data, estimation, and validation procedures is presented in Bekkerman, Belasco, and Smith, “Does Size Matter?”
11. The average per-acre subsidy figures are computed based on the entire percentile, including those who did not receive any subsidies. When we compute averages that include only those who receive payments in each percentile range, the shape of the distribution is similar, albeit with higher rates.
12. When we compute average per-acre subsidies by excluding those who did not receive any premium subsidy payments in each percentile range, the top 20 percent received \$32.59 per acre, while the top 2 percent received an average subsidy of \$77.07 per acre, which is still more than double the top 20 percent.
13. When we compute average payment per farm with only those farms that receive a payment, the bottom 70 percent received an average payment of \$3,422, while those in the top 10 percent received an average payment of \$69,038.
14. The most recently available ARMS data do not report 2015 crop insurance election and insured acres information. As such, each farm’s crop insurance premium subsidies are assumed to be those they would have received if, in 2015, each farm’s crop insurance coverage level and out-of-pocket payments were approximately the same as those that were actually observed for 2014. There is only marginal inter-year variability between coverage levels and insured acres for producers of the four major row crops, and projected prices were also relatively similar in 2014 and 2015. The projected price for revenue protection policies was \$4.62 per bushel in 2014 and \$4.15 per bushel in 2015 for corn, \$11.36 per bushel in 2014 and \$9.73 per bushel in 2015 for soybeans, and \$7.02 per bushel in 2014 and \$6.30 per bushel in 2015 for wheat. See US Department of Agriculture, Risk Management Agency, “Informational Memorandum:

PM-14-041,” September 16, 2014; and US Department of Agriculture Risk Management Agency, “Informational Memorandum: PM-15-013,” March 3, 2015. Implied price volatility between 2014 and 2015 also remained relatively similar during the three-month period preceding the crop insurance closing date for each crop: For corn, price volatility was 20.12 in 2014 and 24.06 in 2015; for cotton, 21.62 and 22.08; for soybeans, 19.03 and 21.62; and for wheat, 24.39 and 27.75. While these prices are similar, we do acknowledge that our using 2014 ARMS data to approximate crop insurance subsidy payments in 2015 would likely marginally overestimate premium subsidies. However, because projected prices and price volatilities between 2014 and 2015 changed by only 11–15 percent, the potential upward bias is expected to be minimal. Moreover, the relative allocation of subsidy payments across the distribution of farms is not likely to change, because all farmers face the same price elections.

15. Bryan Schurle and Mike Tholstrup, “Farm Characteristics and Business Risk in Production Agriculture,” *North Central Journal of Agricultural Economics* 11, no. 2 (1989): 183–88; Barry M. Purdy, Michael R. Langemeier, and Allen M. Featherstone, “Financial Performance, Risk, and Specialization,” *Journal of Agricultural and Applied Economics* 29, no. 1 (1997): 149–61; and Peter J. Barry, Cesar L. Escalante, and Sharon K. Bard, “Economic Risk and the Structural Characteristics of Farm Businesses,” *Agricultural Finance Review* 61, no. 1 (2001): 74–86.

16. A \$40,000 cap on per-farm crop insurance premium subsidies was included in the Assisting Family Farmers Through Insurance Reform Measures Act, first introduced by Sens. Jeff Flake (R-AZ) and Jeanne Shaheen (D-NH) and Reps. Ron Kind (D-WI) and Jim Sensenbrenner (R-WI) in 2015 and reintroduced in 2017. The act would limit the total value of crop insurance subsidies to \$40,000 per person each year and end subsidies for those with an adjusted gross income of more than \$250,000.

17. Our analysis assumes that all caps are instituted after farms made their crop insurance and ARC and PLC allocation decisions. Farmers’ knowledge of payments caps could lead to re-optimization of enrollment and coverage-level decisions, which would alter the amount of program outlays and potential savings.

18. Charles L. Schultze, *The Distribution of Farm Subsidies: Who Gets the Benefits?* (Washington, DC: Brookings Institution, 1971); and Russell Martin Lidman, “The Distributional Implications of Agricultural Commodity Programs,” Institute for Research on Poverty, University of Wisconsin, 1972.

19. James Michael MacDonald, Penni Korb, and Robert A. Hoppe, *Farm Size and the Organization of US Crop Farming*, United States Department of Agriculture, 2013, https://www.ers.usda.gov/webdocs/publications/45108/39359_err152.pdf?v=41526.

20. Schurle and Tholstrup, “Farm Characteristics and Business Risk in Production Agriculture”; Purdy, Langemeier, and Featherstone, “Financial Performance, Risk, and Specialization”; and Barry, Escalante, and Bard, “Economic Risk and the Structural Characteristics of Farm Businesses.”