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ACHIEVING RATIONAL FARM SUBSIDY RATES

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EXECUTIVE SUMMARY

Several proposals to reform the heavily subsidized Federal Crop Insurance Program have received considerable attention. However, one initiative that has not been given much consideration is a straightforward cut in the amount by which the federal government subsidizes the premiums farmers pay for their crop insurance coverage. Currently, the government pays an average of 62 percent of the total premiums paid into the crop insurance pools from which indemnities are provided to farmers who experience reimbursable losses. This policy study examine the effects of reducing the federal subsidy rate to either 50 or 40 percent of the total premium, with corresponding increases in farmers' share of the premium payments. Results indicate that reducing the average subsidy rate to 50 percent would reduce annual federal spending on the crop insurance program by as much as $2.14 billion annually, a roughly 25 percent reduction relative to current subsidy costs. Reducing the average subsidy rate to 40 percent would likely generate annual savings well in excess of $3 billion, amounting to about $34 billion over 10 years.

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INTRODUCTION

There is no empirical evidence that private insurance markets would offer multiperil crop insurance of the sort currently offered through the Federal Crop Insurance Program at prices sufficiently low that farmers would be be willing to buy it.[1] Yet because of subsidies that amount to 70 percent of the product's commercial cost, farmers insure almost 90 percent of the total area of planted crops in the United States. In effect, this means that, through the crop insurance program, the federal government has artificially created a substantial market—$10 billion a year in gross revenues from premiums—for a product that no one would want if they have to pay the actual cost of it themselves.[2] Currently, the program costs U.S. taxpayers about $8 billion a year. Given that farmer demand without subsidies is effectively zero, if subsidies were eliminated entirely, government spending on the program would also be zero and overall reductions would be roughly $8 billion a year and $80 billion over 10 years. This is a substantial amount of money, even on Capitol Hill.

However, the total elimination of subsidies is incredibly unlikely. The present study thus seeks to explore the impacts on program costs if crop insurance subsidies in the United States were to be reduced from today's average of 62 percent of each farmer's premiums to 50 percent, or even 40 percent—amounts more consistent with those established in the 1990s.

Analysis of impacts in the five largest states that produce corn and soybeans, and the five largest states that produce wheat, indicates that a reduction in the premium subsidy rate from the current 62 percent to 50 percent reduces government spending by at least 20 percent.[3] Moreover, a reduction in the premium subsidy rate to 40 percent of a farm business's total premium would have correspondingly larger impacts. Here, reductions would amount to about 65 percent of current (2017) levels. Premium subsidies would decline by between 48 and 50 percent, which, if applied across the entire Federal Crop Insurance Program, would save taxpayers roughly $2.9 billion a year ($29 billion over 10 years).

Further, as subsidies decline, it is likely that farmers would substantially reduce their participation in the program. This would lead to further reductions and more taxpayer savings. For example, at the 40 percent level of total premiums, participation rates would decline by about 20 percent. This would create additional savings of between $500 and $600 million a year, or $5 to $6 billion over 10 years. Given such significant potential for savings, the case for reform is clear. Accordingly, this paper provides a brief overview of the history of crop insurance subsidies, their continued justifications, issues they create and viable options for reform.

CROP INSURANCE SUBSIDIES: HISTORY AND STRUCTURE

In 1980, Congress passed the Crop Insurance Act, which mandated that farmers would receive a 30 percent subsidy for premiums charged when their crop yields fell below 65 percent of expected. So, for example, if a farmer's expected yield was 100 bushels of corn per acre, they would be eligible for an indemnity if the actual yield fell below 65 bushels. If the required premium for such coverage was set at $20 an acre, the farmer paid $14 of it, while the government contributed the remaining $6 as a premium subsidy.

Before 1981, only farmers in specific geographic areas could obtain federal crop insurance, and only for a limited number of commodities. In addition to such restrictions, Congress also stipulated that, on average, premiums paid into the insurance pool should equal losses paid out. The government subsidized the program by covering all administrative expenses, but farmers paid all of the premiums that were necessary to cover their expected losses.[4] As manager of the program, the U.S. Department of Agriculture's Federal Crop Insurance Corp. was responsible for setting premiums accordingly.

Throughout the 1980s and much of the 1990s, farmers could buy lower or higher coverage levels, with a floor of 50 percent coverage and a ceiling of 75 percent. No premium was charged for 50 percent coverage contracts. For 75 percent contracts, Congress mandated that farmers should receive the same dollar amount of subsidy as they would under the 65 percent coverage contract. The premium subsidy rate was lower because the contract with the higher level of loss coverage had higher premiums. Thus, if a farmer wanted to buy a 75 percent coverage contract, the farm's expected loss-

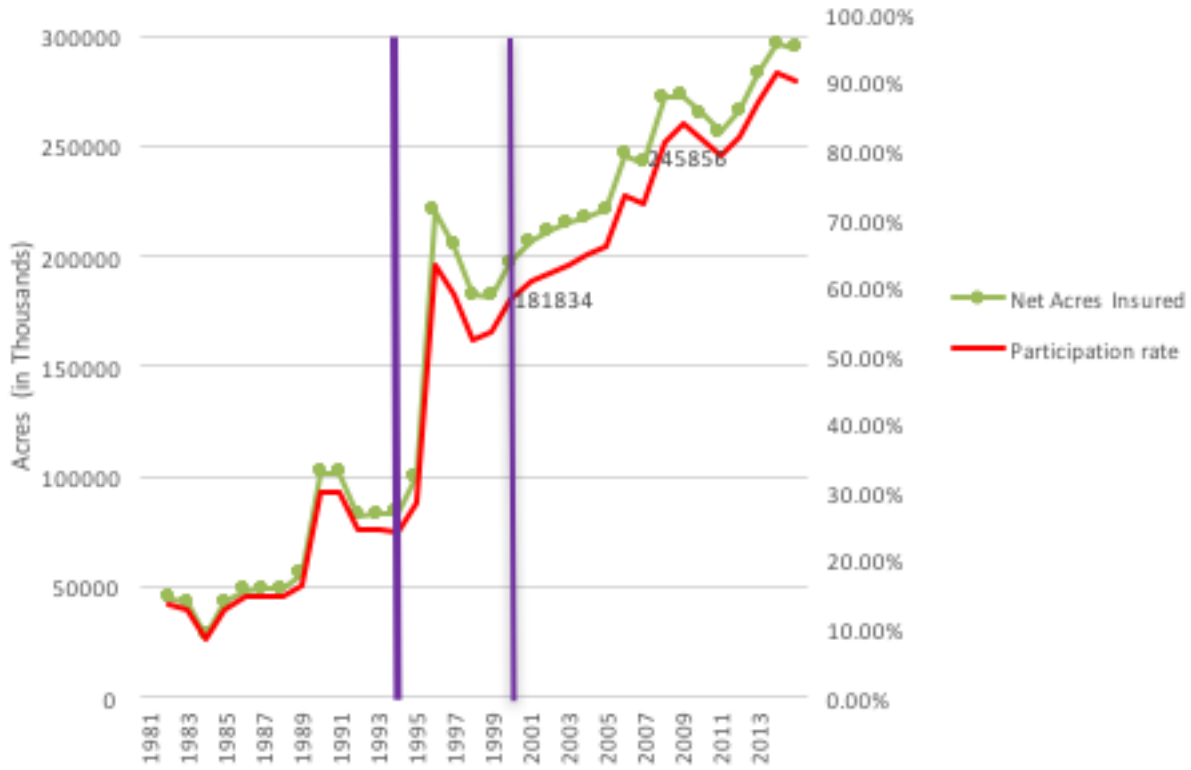
1. On the contrary, the empirical evidence suggests that with respect to farm-level insurance products, insurance companies require larger premiums than most, if not all, farmers are willing to pay. See, e.g., Vincent H. Smith and Myles A. Watts, Index Based Agricultural Insurance in Developing Countries. Report prepared for the Bill and Melinda Gates Foundation, 2009; Mario J. Miranda and Katie Farrin, "Index Insurance for Developing Countries," *Applied Economic Perspectives and Policy* 34:3 (2012), 391-427; 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 Policy* 34:3 (2012), 363-90; B.K Goodwin and Vincent H. Smith, "What Harm Is Done by Subsidizing Crop Insurance?" *American Journal of Agricultural Economics* 95:2 (2013), 489–97.

2. In general, Congress is the issue when it comes to feckless spending on agricultural subsidies. This is particularly the case with crop insurance. In contrast, Presidents Donald Trump, Barack Obama and George W. Bush all have recommended substantial cuts to crop insurance subsidies and have questioned the overall value of the program. See, Vincent H. Smith and Barry K. Goodwin, "The Environmental Consequences of Subsidized Risk management and Disaster Assistance Programs." *Annual Review of Resource Economics* 5 (2013), 35-60.

3. This assumes that farm businesses continue to insure their crops at current levels. However, many farms are likely to lower coverage levels or drop federal crop insurance coverage. In that case, the results suggest that for corn, soybeans and wheat, a reduction in premium subsidy rates to 50 percent would reduce total subsidy payments for farmers to between 62 percent and 68 percent of current levels.

4. Barry K. Goodwin and Vincent H. Smith, "The Economics of Crop Insurance and Disaster Aid," American Enterprise Institute, 1995.

FIGURE I: TOTAL ACRES INSURED AND ESTIMATED PROGRAM PARTICIPATION RATES, 1981-2014



SOURCES: Net acres insured obtained from RMA summary of business reports and total acres planted to crops from the NASS 2012 Census, Tables 9-12. Acres planted are estimated in years in which there was no census, as census data are collected every five years.

es must be higher,[5] as would the per-acre premium. So, for example, if the per-acre premium was set at $30, the farmer would receive a $6 premium subsidy, pay the full increase in the premium rate associated with the higher coverage level, and have to pay $24 per acre for the 75 percent coverage contract. Under this model, in the years between 1982 and 1994, average annual premium subsidy rates for the entire Federal Crop Insurance Program[6] ranged between 20 and 27 percent. The average premium subsidy rates were lower than 30 percent because premium rates for contracts purchased by farmers with coverage levels in excess of 65 percent were also lower than 30 percent.

The same principle was included in the 1994 Crop Insurance Reform Act (CIRA), through which Congress increased the subsidy rate for 65 percent coverage level crop insurance contracts from 30 percent to 42 percent. Farmers who purchased higher levels of coverage would ideally receive the same dollar-per-acre amount of subsidy as one at the 65 percent coverage level. Defined as "catastrophic coverage contracts,"[7] those that offered the lowest-yield coverage level and valued losses at a low amount on a per-unit basis were offered at zero premium. However, farmers were required to pay a $100 per-crop administrative fee.

In 1995 and 1996, CIRA required farmers to have insurance coverage on a crop in order to benefit from other federal programs, including emergency disaster aid. For this reason, average premium subsidy rates rose nearly 60 percent. Many farmers responded to the mandate by purchasing catastrophic coverage, which carried a 100 percent subsidy for premiums, or levels of coverage for multiperil contracts below 65 percent, which also had higher premium subsidy rates.

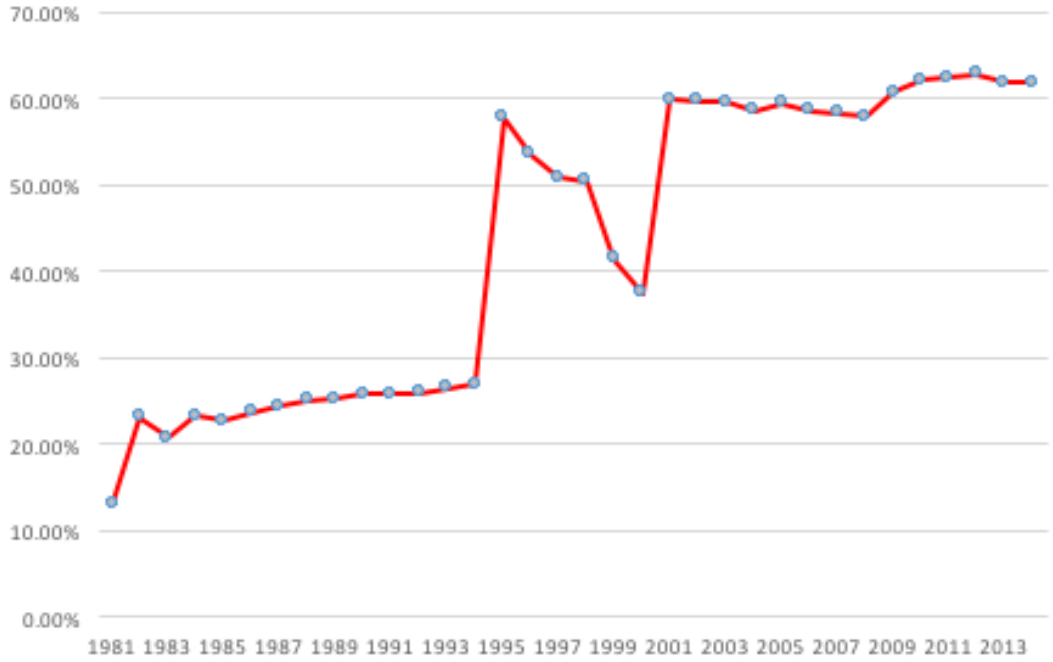
The impact of CIRA's increased participation in the crop insurance program, coupled with the requirement that a farm have at least some crop insurance to participate, was immediate and substantial, as shown in Figure 1.

5. As now, the farmer would receive a payment if per-acre yields fell below 75 bushels.

6. This is calculated as the ratio of total subsidy payments to total premiums for all federal crop insurance.

7. A catastrophic coverage contract pays a farmer for losses only if per-acre yields for the insured crop fall below 50 percent of the farm's estimated expected yield. It also values each unit of loss at 55 percent of the price determined by the USDA to be the likely market price for the crop. Thus, a farm that experiences a complete crop loss (zero yield) would get a check for 22.5 percent of the expected value of the crop when the farm bought the coverage.

FIGURE 2: ANNUAL AVERAGE PREMIUM SUBSIDY RATES



SOURCE: Computed by the author from USDA RMA annual data on total premiums and subsidy payments, and from RMA Federal Crop Insurance Summary of Business Reports for 1989-1992, 1993-2002, 2003-2012, and 2013-2015.

The area of crops insured by farmers increased from less than 100 million acres in 1994 to about 220 million acres in 1997, before moderating to about 180 million in 1998 and 1999. The participation rate also increased from less than 30 percent to between 50 and 60 percent of all U.S. cropland. Congress in 1997 terminated the provision that all farmers had to have insurance to participate. At that point, annual premium subsidy rates also dropped to about 40 percent, as shown in Figure 2.

Provisions of the 2000 Agricultural Risk Protection Act (ARPA) further increased crop insurance premium subsidies and established an explicit schedule for the rates to be applied to farm-specific, multiperil and yield-based contracts (now called actual production history or APH contracts) at different coverage levels. As a result, between 1995 and 2000, the average subsidy rate for the Federal Crop Insurance Program increased substantially from between 40 and 50 percent to about 62 percent after 2000 (Figure 1). In response, participation in the program also increased substantially to between 85 and 90 percent by 2006, with corresponding increases in total subsidy payments to farmers.

CURRENT ISSUES WITH CROP INSURANCE SUBSIDIES

The basic subsidy schedule created under the 2000 ARPA is shown in the "optional units" column in Table 1.

TABLE I: PREMIUM SUBSIDY RATES FOR ALTERNATIVE APH CONTRACT COVERAGE LEVELS

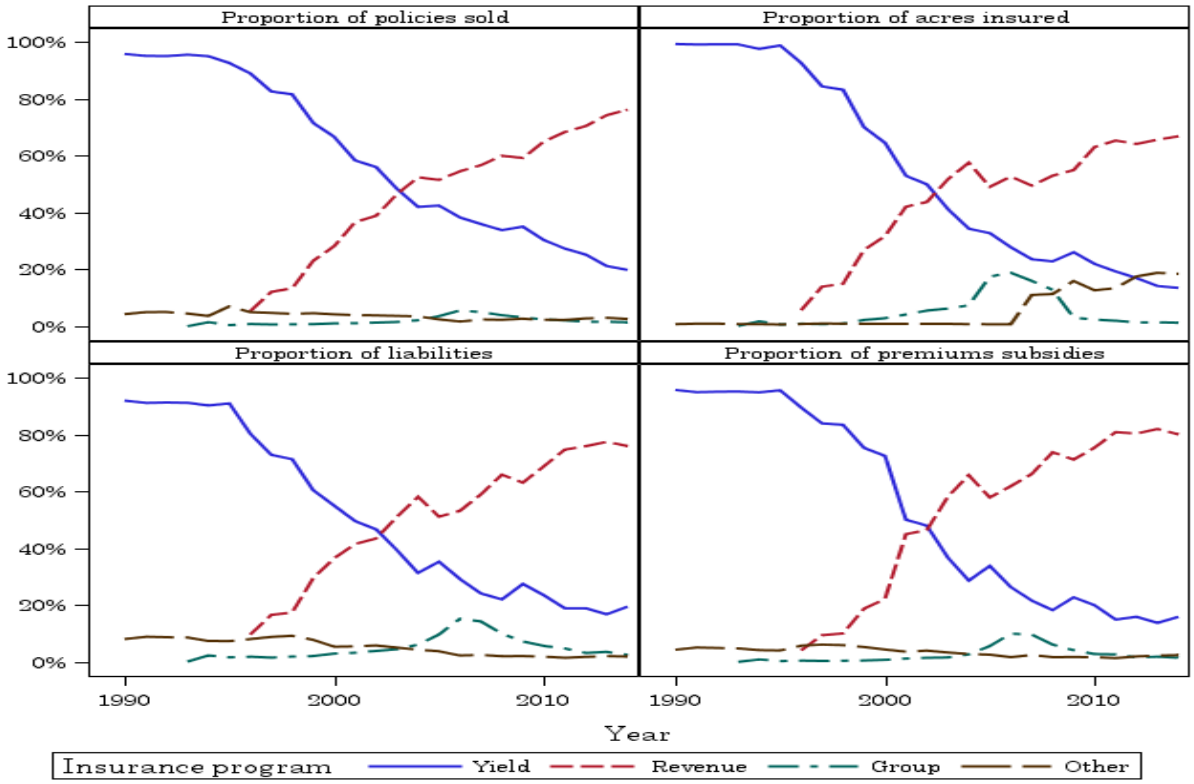
APHCoverage Level (%)	APH Average Premium Subsidy Rate (%)	
	Optional Units	Enterprise Units
50	67	80
55	64	80
60	59	80
65	59	80
70	55	80
75	55	77
80	48	68
85	38	53

SOURCE: USDA Risk Management Agency

Three features of these subsidy rates require some discussion. First, explicit subsidy rates are specified for each coverage level, including the one at 50 percent. However, under the 50 percent coverage-level contract to which the subsidy rate applies, a farmer may value losses at more than 55 percent (and up to 100 percent) of the expected harvest price established by the USDA Risk Management Agency. Farmers may also still obtain a catastrophic-coverage contract in which losses are valued at 55 percent of a crop's expected price for zero premium and an administrative fee of $300 per crop.[8]

8. This may be done for no more than three crops within any given county.

FIGURE 3: EVOLUTION OF DEMAND FOR CROP INSURANCE BY TYPE OF POLICY, 1988 TO 2015



SOURCE: USDA Risk Management Agency

Second, a distinction is now made between a farm that insures what are called "optional units for a crop," of which there may be several within a given farm, or at the farm-enterprise unit level, which includes all land planted to the crop by a farm within a given county. Enterprise-based contracts receive much higher premium-subsidy rates than optional units. One rationale for this is that, on a per-acre basis, expected losses for enterprise contracts are lower than for those for optional-unit ones. This means that, on a dollar-per-acre basis, the same premium-subsidy rate generates lower per-acre dollar subsidy payments for units insured at the enterprise level. For this reason, in order to give farmers who opt for the enterprise level the same dollar amount of premium subsidy, a higher subsidy rate is required.

Third, the same rate schedules apply to all multiperil APH contracts, irrespective of their types. There are three types of multiperil contracts: yield-based contracts, per-acre revenue contracts and per-acre revenue contracts with the "harvest price option" (HPO). Using recent historical information on the farm's actual yields for a crop, a yield contract makes a payment to a farmer when there is a yield shortfall relative to the coverage level selected by the farmer. A revenue contract establishes a farm's yield in the same way, but then uses future markets to predict what the price of the crop will be at harvest time. The projected harvest time price is then multiplied by the farm's yield to establish the expected revenue for the crop. If the estimated revenue falls below the farm's liability per-acre, the farm receives an indemnity

For many crops, when one farm has a loss, other farms also have losses. At the margin, this tends to raise the price of the crop at harvest time, typically by small amounts. Revenue contracts account for this "natural hedge"[9] through premium pricing that is modestly lower per-acre than for yield contracts.

However, despite the USDA Risk Management Agency's subtle and disturbing promotional sleight of hand—which now refers to a revenue contract with the HPO, using the same terms, as a pure "revenue contract"—the HPO contract is a different beast. For this reason, it is often referred to as a "Cadillac" insurance contract.

In the HPO contract, if prices fall between planting and harvest time, the contract operates in the same way as a standard revenue contract (now referred to by the Risk Management Agency as the "harvest price exclusion contract"). However, if prices increase during those times, under the HPO, the farm's per-acre liability is automatically increased to reflect

9. Lower yields are associated with somewhat higher prices.

the higher value of the crop at harvest time. This substantially increases the expected losses associated with an HPO revenue contract, as compared to either a yield contract or a standard revenue one.

For example, in 2012, when corn production in the Midwest Corn Belt was adversely affected by a widespread 100-year drought, the national corn crop fell by 12 percent, while corn prices rose by substantially more than that. Under a standard revenue contract, many farmers would have received no indemnity payments, due to the natural hedge through which higher prices (in this case) more than offset the adverse effect of lower crop yields. However, most farmers in those states insured their crops under an HPO contract and thus received substantial indemnities because of the adverse crop-yield impacts of the drought. By itself, the HPO contract cost taxpayers several billion dollars in 2012.[10] Accordingly, the Congressional Budget Office (CBO) has estimated that ending the HPO would reduce average annual subsidies by about $1.8 billion.

The bottom line is that, at any given coverage level, the HPO premium rate for the same level of coverage is higher than for either a yield contract or a standard revenue one.[11] This makes the HPO the most desirable contract for farms that wish merely to maximize the subsidy they receive from the Federal Crop Insurance Program.

Originally, revenue contracts were not available for every crop. As shown in Figure 3, more than 95 percent of all crop insurance in earlier periods consisted of multiperil yield contracts. The remaining options were "group" insurance products wherein payments for losses occurred when county yields for a crop fell sufficiently below expected levels.

However, as a result of a congressional mandate, revenue contracts became available in 1997, including those including an HPO component that initially was not subsidized. As Figure 3 shows, many farmers moved into revenue contracts between 1997 and 2000, with about 40 percent of the national crop ultimately covered under such contracts. However, a majority of the area insured through the Federal Crop Insurance Program remained covered under yield contracts. That changed in 2000, however, when ARPA required the USDA to subsidize HPO contracts at the same rate as a standard revenue contract. In relatively short order, most shifted into revenue insurance. By 2010, more than 60 percent of the total insured area of crops was covered in this manner. These contracts accounted for more than 70 percent of the liability and more than 80 percent of the premium subsidies paid to farmers.

Today, if taken together on a national basis, revenue and yield insurance contracts account for more than 95 percent of policies sold, more than 95 percent of the total liability covered by the Federal Crop Insurance Program and more than 95 percent of total premium subsidies paid to farmers.

CURRENT JUSTIFICATIONS FOR CONTINUATION

Despite the astronomical cost to taxpayers of this kind of coverage and the fact that there would be little to no demand among farmers for these insurance options without subsidies, many proponents argue that they continue to be necessary to prop up the U.S. agricultural industry. The most three most prevalent of these arguments are that to remove subsidies would cause a major market failure; that the subsidies are necessary to maintain adequate income distribution; and that to remove subsidies would have an adverse effect on overall food supply.

Major market failure

Supporters of crop insurance subsidies argue that market failure and crop losses in agriculture are highly correlated, because adverse weather events, pest infestations and crop diseases affect many farmers across a region. As a result, insurance companies that offer coverage for crops cannot hold enough reserves to meet their indemnity obligations in the event of a major drought or other crop losses. However, this "systemic risk" argument has consistently been debunked.[12] Further, such an argument ignores the role of reinsurance, which spreads risks among multiple sectors of the global economy. To primary insurance companies, reinsurance is a normal cost of doing business in almost all lines of insurance.[13]

Reinsurance companies hold portfolios that include many different forms of liability—for example, homeowners insurance, auto insurance, workers' compensation insurance, medical malpractice insurance and terrorism insurance. Agricultural insurance losses are generally either

10. N. Paulson, B.A. Babcock, et al., "The Potential for Crop Insurance Reform" *Agricultural Finance Review* 74 (2014).

11. Vincent H. Smith, Joseph W. Glauber, et al., "Time to Reform the US Federal Agricultural Insurance Program," American Enterprise Institute, 2017 (forthcoming).

12. See, e.g., Brian D. Wright and Julie A. Hewitt, "All Risk Crop Insurance: Lessons from Theory and Experience," in *Economics of Agricultural Crop Insurance: Theory and Evidence*, ed. Darell L. Hueth and William H. Furtan, (Boston: Kluwer Academic Publishers, 1994), pp. 73-109; Goodwin and Smith, 1995; Brian D. Wright, "Multiple Peril Crop Insurance." *Choices: The Magazine of Food, Farm, and Resource Issues* 29:3 (2014). http://www.choicesmagazine.org/choices-magazine/theme-articles/3rd-quarter-2014/multiple-peril-crop-insurance; Goodwin and Smith, 2013; and Smith and Glauber, 2012.

13. See, e.g., Vincent H. Smith and Barry K. Goodwin, "Private and Public Roles in Providing Agricultural Insurance in the United States," Private and Public Roles in Insurance ed. Jeffrey Brown (Washington D.C.: AEI Press, 2011); Brian D. Wright, "Multiple Peril Crop Insurance." *Choices: The Magazine of Food, Farm, and Resource Issues* 29:3 (2014). http://www.choicesmagazine.org/choices-magazine/theme-articles/3rd-quarter-2014/multiple-peril-crop-insurance.

uncorrelated or only weakly correlated with any of these. As a result, agricultural risks are relatively attractive to reinsurers. Some proponents of crop insurance subsidies claim that reinsurers do not have the financial strength to cope with the excessively large losses associated with catastrophically large crop insurance events. However, even if reinsurers took on all of the risk associated with U.S. crop insurance, they almost certainly would not have to pay out more than $20 billion in indemnifiable losses in excess of premium revenues.[14] As a point of comparison, in 2012—the worst year for the Federal Crop Insurance Program in the past 25 years—total indemnities amounted to about $18 billion and net indemnities to about $12 billion.[15] Further, agricultural insurance represents a small portion of the portfolios held by large reinsurance companies, which frequently cope with even larger losses in other lines of business—such as property claims in the wake of a major hurricane.[16]

Income distribution

Another argument offered in favor of continuing subsidies is that crop insurance funds flow to farm households in need and that eliminating them would be detrimental to small farmers who already struggle to get by. Currently, however, more than 70 percent of all subsidies flow to the largest 10 percent of all farm operations (measured by value of sales) and more than 80 percent flow to the largest 20 percent of operations. These operations are owned and operated by households with incomes well above the national average and with levels of wealth that are more than 10 times those of the average U.S. family.[17] In fact, only 2 percent of all farm households have incomes below the federal poverty line and most of the farm operations managed by those households receive either no or negligible benefits from the Federal Crop Insurance Program.

Decreased food production

Another argument, put forward in 2017 congressional hearings on the 2018 farm bill by the chairs of both the House and Senate agriculture committees is that, without the federally subsidized crop insurance program, the U.S. food production system would potentially face financial collapse and food security for domestic households would be seriously threatened. As House Agriculture Committee Chairman K. Michael Conaway, R-Texas, put it in February 2017:

> Farmers and ranchers have endured a 45 percent drop in net farm income over the last three years, the largest three-year drop since the start of the Great Depression. Overall, ERS is forecasting a 50 percent drop in net farm income since 2013. It's hard for any of us to imagine our income being sliced in half. We are told that 1 in 10 farms are now highly or extremely leveraged. Nominal debt levels are at all-time highs and real debt levels are approaching where they were prior to the 1980s' farm financial crisis [...] There is real potential here for a crisis in rural America.[18]

Annually, however, the United States exports about one-third of its agricultural production, even as it uses 40 percent of its corn crop for ethanol production. Further, more than 40 percent of agricultural output consists of nonfood crops, and thus the United States is, in fact, the most food-secure country in the world.[19] Moreover, in 2017, the U.S. agricultural sector enjoyed market revenues at near record levels, close to record high levels of financial security[20] and wealth—with real incomes close to or above the sector's longer-run average levels.[21]

Given such weak justifications for its continuation and compounded by the fact that the market would almost certainly disappear if left to its own devices without government intervention, there is simply no reason to continue the program as is. In fact, at this point, the only reason to do so is the considerable influence of interest groups — especially farm commodity groups, the crop insurance and reinsurance industries and lending institutions that serve agricultural farms and related businesses.[22] Such interests have sway with legislators on both the House and Senate agriculture committees who rely on farm votes and, by extension, on the campaign contributions of those in agribusiness and related industries.

14. See, Goodwin and Smith (2013).

15. Ibid.

16. Ibid.

17. Vincent H. Smith, Joseph W. Glauber, et al., "Agricultural Policy in Disarray: Reforming the Farm Bill – An Overview," American Enterprise Institute, 2017 (forthcoming).

18. Opening Statement of Chairman K. Michael Conaway, "Rural Economic Outlook: Setting the Stage for the Next Farm Bill," House Committee on Agriculture, Feb. 15, 2017. https://agriculture.house.gov/news/documentsingle.aspx?DocumentID=3651

19. Bruce A. Babcock, "Covering Losses with PLC, ARC and STAX," American Enterprise Institute, 2017 (forthcoming).

20. As indicated by debt-to-asset ratios and other measures of financial leverage.

21. Total agricultural sector revenues from the market amount to around $400 billion a year. See. e.g., Smith 2017. See also, Economic Research Service, "Highlights from the August 2017 Farm Income Forecast: Upturn in Farm Sector Profits Expected in 2017," U.S. Department of Agriculture, Aug. 30, 2017. https://www.ers.usda.gov/topics/farm-economy/farm-sector-income-finances/highlights-from-the-farm-income-forecast/. Annual government payments from all subsidies account for another $19 billion. See, e.g., Congressional Budget Office, *An Analysis of the Presidents 2018 Budget*, July 2017, p. 9. https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/52846-apb.pdf. Further, crop insurance subsidies for farmers are estimated to average $6 billion a year over the next 10 years under the current program structure—less than 3 percent of total farm revenues. See, e.g., Congressional Budget Office, CBO's June 2017 Baseline for Farm Programs, p. 27. https://www.cbo.gov/sites/default/files/recurringdata/51317-2017-06-usda.pdf. Most studies that have examined the impact of the loss of crop insurance subsidies on total U.S. agricultural production suggest a net effect of less than 1 percent.

22. Smith, 2017.

TABLE 2: CORN, SOYBEANS AND WHEAT SHARE OF FEDERAL CROP INSURANCE, 2017

	Liabilities ($B)	Total Premium ($B)	Subsidy ($B)	Share of Total Liabilities (%)	Share of Total Premium (%)	Share of Total Subsidy (%)
2016						
Corn	39.58	3.53	2.20	39	38	38
Soybeans	22.16	1.85	1.16	22	20	20
Wheat	6.77	1.11	0.70	7	12	12
Corn, soybeans and wheat total	68.51	6.49	4.06	68	70	69
U.S. Total	100.54	9.32	5.86	100	100	100
2017						
Corn	39.18	3.43	2.13	41	34	34
Soybeans	28.18	2.53	1.60	30	25	25
Wheat	5.86	0.89	0.56	6	9	9
Corn, soybeans and wheat total	73.22	6.86	4.29	77	69	68
U.S. Total	95.02	9.99	6.30	100	100	100

SOURCE: USDA Risk Management Agency Survey of Current Business Reports

OPTIONS FOR REFORM

If the influence of interest groups and the congressional committees that support their objectives is too extensive to terminate the program outright, it is perhaps more reasonable to assess the outcomes that might be achieved by reducing the size and scope of crop insurance subsidies. Several options have been identified by successive presidents and their administrations. These include:

- *Caps on per-farm premium subsidies* – To institute caps on per-farm subsidies in the range of $30,000 to $50,000 annually would result in substantial budget savings, while having modest or no effects on the benefits to all but a few very large-scale farm operations.[23]
- *Changes in eligibility rules* – Another suggested option is to restrict households with substantial taxable adjusted gross incomes from receiving any crop insurance subsidies. This is known as "means testing."
- *'Double-dipping' prohibitions* – This would prohibit farms from claiming indemnities from both crop insurance and the newer Price Loss Coverage/Agricultural Risk Coverage "shallow loss" programs to cover the same crop losses.
- *Termination of subsidies for the harvest price option* – The HPO is crop revenue insurance, a Cadillac form of multiperil crop insurance. Ending the HPO subsidy would reduce crop insurance subsidies by about $1.8 billion a year, given the current structure of crop insurance subsides.[24] The other changes would add up to an additional $1.2 billion in annual savings.

A BETTER WAY FORWARD

An option that has not received much attention is a straightforward, across-the-board reduction in crop insurance premium subsidies. Currently, the federal government pays an average of 62 percent of the total premiums associated with the policies purchased by farmers through the Federal Crop Insurance Program, while farmers pay the remaining 38 percent. This paper will consider likely outcomes if subsidy rates were lowered first to an average of 50 percent of total premiums, and then to an average of 40 percent. These alternatives have been selected because they were the previous rates upon which subsidies were calculated—at 40 percent after the 1994 Crop Insurance Reform Act and at 50 percent between 1995 and 1999 (see, e.g., Figure 1). For this reason, a rollback of subsidies to one of these levels is a viable and tested alternative to the current structure. In order to assess the likely outcomes, we must first examine what would happen to the amount of crop insurance purchased by farmers at each of these levels, both in terms of area insured and amount of insurance purchased. We will incorporate that projection into estimates of budgetary savings.

23. Smith, 2016; See, e.g., Congressional Budget Office, *CBO's June 2017 Baseline for Farm Programs*. https://www.cbo.gov/sites/default/files/recurringdata/51317-2017-06-usda.pdf.

24. *CBO's June 2017 Baseline*. https://www.cbo.gov/sites/default/files/recurringdata/51317-2017-06-usda.pdf.

TABLE 3: TOP FIVE STATES FOR CORN, SOYBEAN AND WHEAT FEDERAL CROP INSURANCE SALES, 2017

Corn						
	Area Insured	Liabilities	Total Premium	Area Insured	Liabilities	Total Premium
	Acres	($M)	($M)	Share of U.S. Total (%)		
Iowa	12,226,602	7,440	435	16	19	13
Illinois	9,561,669	5,853	435	12	15	13
Nebraska	8,733,572	4,462	346	11	11	10
Minnesota	7,607,964	4,327	302	10	11	9
Indiana	4,305,424	2,466	206	6	6	6
Five-state total	42,435,231	24,548	1,725	54	63	50
United States	78,136,881	39,033	3,422	100	100	100
Soybeans						
	Area Insured	Liabilities	Total aPremium	Area Insured	Liabilities	Total Premium
	Acres	($M)	($M)	Share of U.S. Total (%)		
Iowa	9,288,654	4,150	247	12	15	10
Illinois	8,861,635	3,924	222	11	14	9
Minnesota	7,765,410	2,862	246	10	10	10
North Dakota	7,058,471	1,805	289	9	6	11
South Dakota	5,397,637	1,728	214	7	6	8
Five-state total	38,371,807	14,468	1,218	49	52	48
United States	78,923,628	28,080	2,525	100	100	100
Wheat						
	Area Insured	Liabilities	Total Premium	Area Insured	Liabilities ($)	Total Premium ($)
	Acres	($M)	($M)	Share of U.S. Total (%)		
North Dakota	6,493,909	1,212	212	18	21	24
Kansas	6,815,839	927	149	18	16	17
Montana	4,564,337	570	77	12	10	9
Washington	2,014,040	527	38	5	9	4
Oklahoma	2,865,381	292	62	8	5	7
Five-state total	22,753,506	3,528	539	61	60	61
United States	37,005,010	5,846	885	100	100	100

SOURCE: USDA Risk Management Agency Survey of Current Business Reports

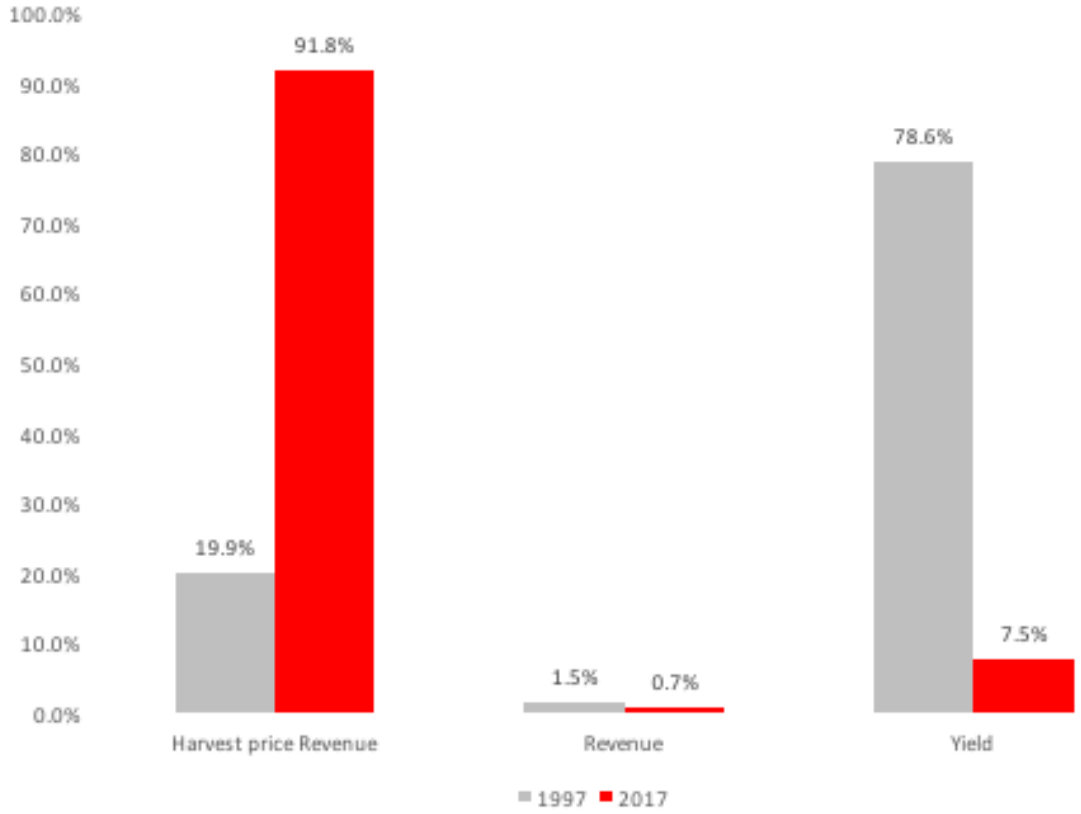
METHODOLOGY

In terms of crop-insured liability, corn, soybeans and wheat accounted for 77 percent of the total insured value under the Federal Crop Insurance Program in 2017 and 68 percent in 2016 (as shown in Table 2). They also accounted for similar shares of total premium and total premium subsidies in those years. For these reasons, the scope of this analysis is limited to those crops.

The geographic scope of the analysis is also restricted to the five states with the largest insured areas of each of the selected crops. For corn, in 2017, the five states with the largest joint coverage areas are Iowa, Illinois, Nebraska, Minnesota and Indiana, which together account for 54 percent of total U.S.-insured corn acreage, 62 percent of total liability and 50 percent of total premium (Table 3). For soybeans, the five largest states are Iowa, Illinois, Minnesota, North Dakota and South Dakota. Together, these account for 49 percent of total U.S.-insured soybean acres, 52 percent of total liability and 48 percent of total premium. Thus, Iowa, Illinois, Minnesota, South Dakota and North Dakota have the largest total areas of insured corn and soybean acreage and comprise the focus of this analysis.

For wheat, the five largest states in terms of federal crop insurance in 2017 were North Dakota, Kansas, Montana, Washington and Oklahoma. These account for 61 percent of total U.S.-insured wheat acres, 60 percent of total liability

FIGURE 4: ALLOCATION OF U.S. CORN ACREAGE ENROLLED IN REVENUE INSURANCE AND YIELD CONTRACTS IN 1997 AND 2017



SOURCE: Data on areas enrolled in alternative crop insurance contracts are from the USDA Risk Management Agency

and 61 percent of total premium. Therefore, these five states have been selected as the focus of the analysis of the impacts of premium subsidy reductions for wheat.

Perhaps surprisingly, under the current structure of the Federal Crop Insurance Program, relatively little is known about how changes in premium rates will affect the total amount of liability purchased by farmers. This problem is exacerbated by the fact that earlier studies may no longer be relevant, given that subsidy levels are much higher now than when the initial research was conducted.[25] Moreover, revenue policies have largely replaced yield policies, and coverage levels of up to 85 percent are now available.[26]

Most studies have reported that the demand for crop insurance is moderately sensitive to changes in premium rates. Estimates suggest that reductions in participation in the crop insurance program (in terms of area insured) range from 2 percent to 10 percent in response to a proportional increase of 10 percent in the price a farm pays out of its own pocket for coverage.[27]

However, shifts in the use of crop insurance have been complex. The data presented in Figure 4 and Figure 5 illustrates the complex issues involved. Figure 4 shows the use of crop insurance by U.S. farmers who raised corn in 1997 and in 2017.

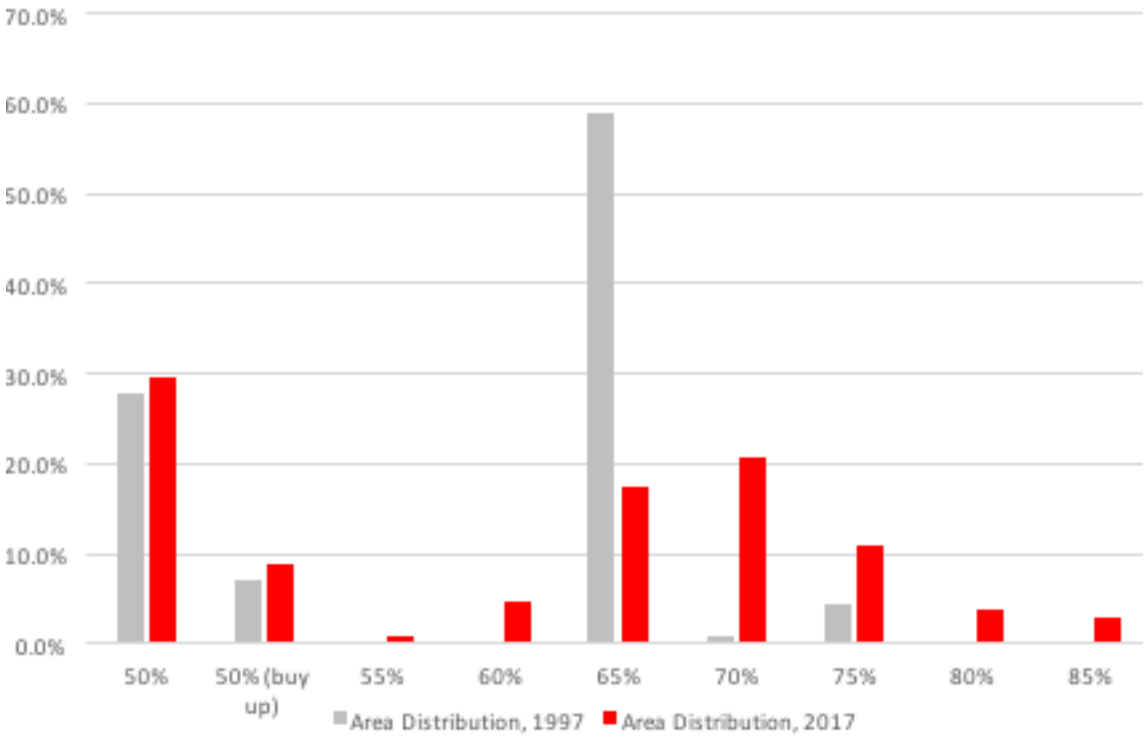
In 1997, U.S. farmers enrolled less than 22 percent of insured corn in yield-based revenue-insurance contracts, which themselves largely consisted of HPO contracts wherein the

25. Barry K. Goodwin, Monte L. Vandeveer, et al., only covers the period between 1986-93, for example. See, e.g., "An Empirical Analysis of Acreage Effects of Participation in the Federal Crop Insurance Program." *American Journal of Agricultural Economics*. 86:4 (2004), 1058-77.

26. A similar problem is created by the fact that many cited studies of the demand for crop insurance used data on farm behavior from the early 1990s, when subsidy rates were much lower and farm-based crop insurance options beyond yield insurance were not available. See, e.g., Barry K. Goodwin, "An Empirical Analysis of the Demand for Multiple Peril Crop Insurance," *American Journal of Agricultural Economics* 75:2 (1993), 425-34; Vincent H. Smith and Alan E. Baquet, "The Demand for Multiple Peril Crop Insurance: Evidence from Montana," *American Journal of Agricultural Economics* 78:1 (1996), 75-83; and Richard E. Just, Linda Calvin, et al., "Adverse Selection in Crop Insurance: Actuarial and Asymmetric Information Incentives," *American Journal of Agricultural Economics* 81 (1999), 834–49.

27. In technical terms, elasticities of demand for crop insurance generally fall in the range of -0.2 to -1. There has been recent suggestion that these estimates are too low, because they fail to account for shifts from higher to lower coverage levels. See, e.g., Joshua D. Woodard, "Estimating Demand for Government Subsidized Insurance: Evidence from the U.S. Crop Insurance Program," Working Paper, Dyson School, Cornell University, 2017. Currently, however, there is no clear evidence about the magnitude of those effects.

FIGURE 5: DISTRIBUTION OF AREA OF WHEAT ENROLLED IN ALTERNATIVE REVENUE AND YIELD INSURANCE CONTRACTS BY COVERAGE LEVEL, 1997 AND 2017



SOURCE: Data on areas enrolled in alternative crop insurance contracts are from the USDA Risk Management Agency

harvest price option was not subsidized.[28] At that same time, more than 78 percent of total U.S. corn acreage was enrolled in yield-insurance contracts. In contrast, in 2017, more than 91 percent of corn acreage is enrolled in HPO revenue contracts where the HPO endorsement is subsidized, while less than 8 percent is enrolled in yield contracts.

Figure 5 further illustrates the complex shifts that occurred in coverage levels between 1997 and 2017. In 1997, for example, no wheat was insured at the 80 and 85 percent coverage levels, because the option was not available. Instead, 59 percent of all insured wheat acres were covered at the 65 percent level, and only 5.4 percent at the 70 and 75 percent coverage levels. In contrast, only 17 percent of wheat acres in the Federal Crop Insurance Program today are covered at the 65 percent level, while 36 percent are insured at the 70 and 75 percent level.

It is difficult to assess the effects of these substantial changes in premium subsidy rates on both participation in the program (insured area) and coverage levels. Further, a credible method is required. Accordingly, in the present study, across-the-board premium rate subsidy reductions, which reduce subsidies at all coverage levels by the same relative amounts, are assumed to have no impact on the shares of total cropland allocated to farm-based yield, revenue and harvest price option contracts, and within those contracts to each coverage level. Those shares are assumed to be the actual observed shares for the 2017 crops. This assumption is made because across-the-board identical and proportional subsidy cuts seem unlikely to have major impacts on any incentive to select between contracts and coverage levels.

However, such reductions in subsidy rates for all contracts are likely to have substantial impacts on participation, in terms of areas enrolled in the crop insurance program. The current average premium subsidy rate is 62 percent. A cut in the subsidy rate to 50 percent represents a proportional cut in premium subsidy rates of about 19 percent; a cut to 40 percent represents a proportional cut of 35.4 percent. The effect of these average 12-point and 22-point cuts in premium subsidies is to increase the out-of-pocket prices paid by farmers for their insurance substantially – by 32 percent and 58 percent, respectively.

If a 10 percent increase in the price of crop insurance reduces insured acres by about the same percentage (within the estimated range of responses, as discussed above), then insured areas would fall by 32 percent in response to a 32 percent increase in prices paid by farmers, and by 58 percent in

28. At that time, the HPO contract was called "crop revenue coverage."

TABLE 4: CROP INSURANCE PARTICIPATION RATES BY STATE AND CROP IN 1997 AND 2017

	Insured Acres	Planted Acres	Participation Rate (%)	Insured Acres	Planted Acres	Participation Rate (%)	Acreage Adjustment Factor (%)
Corn	1997			2017			
IA	9,198,478	12,200,000	75.4	12,167,591	13,500,000	90.1	83.7
IL	6,338,121	11,200,000	56.6	9,026,621	11,100,000	81.3	69.6
IN	2,411,987	5,900,000	40.9	3,798,588	5,500,000	69.1	59.2
MN	5,485,805	7,000,000	78.4	7,595,458	8,000,000	94.9	82.5
NE	6,755,825	8,900,000	75.9	8,733,135	9,800,000	89.1	85.2
Soybeans	1997			2017			
IA	8,015,361	10,500,000	76.3	9,232,069	10,500,000	87.9	86.8
IL	5,584,857	10,000,000	55.8	8,266,715	10,400,000	79.5	70.3
IN	2,079,606	5,350,000	38.9	4,277,371	5,900,000	72.5	53.6
MN	5,534,085	6,600,000	83.8	7,757,610	8,200,000	94.6	88.6
NE	2,641,776	3,000,000	88.1	5,266,156	5,700,000	92.4	95.3
Wheat	1997			2017			
KS	8,548,980	11,400,000	75.0	6,812,793	7,500,000	90.8	82.6
MT	5,295,314	6,150,000	86.1	4,564,337	4,880,000	93.5	92.1
ND	4,227,509	6,700,000	63.1	6,493,909	6,500,000	99.9	63.2
OK	1,640,299	2,890,000	56.8	2,865,177	4,500,000	63.7	89.1
WA	10,787,958	11,625,000	92.8	2,014,040	2,210,000	91.1	100.0

SOURCES: Data on planted acres for each crop were obtained from the USDA National Agricultural Statistical Service's annual survey database. Data on the area of crops insured in each state were obtained from the USDA Risk Management Agency. Participation rates for 1997 and 2017 and computed by the author by dividing the insured area by the planted area for each crop in each state.

response to a 58 percent increase. If a 10 percent increase in premium prices paid by farmers caused a 2 percent drop in insured acres (the low end of the range), then insured area would fall by 6.4 percent in response to a 32 percent increase in prices paid by farmers, and by 11.6 percent in response to a 58 percent increase.

Table 5 reports crop insurance participation rates in 1997 and 2017 for the five corn states, five soybean states and five wheat states that are the focus of this analysis.

Table 4 includes calculations of the acreage adjustment factor, which represents the ratio of the 1997 crop insurance participation rate to the 2017 participation rate for each crop in each state. For corn, these range from a low of 59.2 percent in Indiana to 85.2 percent in Nebraska. For example, farms in Indiana insured 40.9 percent of the acreage planted to corn in 1997 and 69 percent in 2017, while farmers in Nebraska insured 75.9 percent of corn acres in 1997 and 89.1 percent in 2017. Similarly, for soybeans, acreage adjustment factors range from a low of 53.6 percent (Indiana) to 88.6 percent (Minnesota). For wheat in that same period, acreage adjustment factors range from a low of 63.2 percent in North Dakota to 100 percent (or no change) in Washington. These shifts generally fall within the ranges that might be expected, given the range of estimated impacts of price increases on insured areas reported in the academic literature.

Therefore, to obtain a range of estimates of the impacts of reducing crop insurance premium subsidy rates from their current average of 62 percent, four scenarios are considered. In scenarios one and three, crop insurance subsidy rates are reduced to 50 percent. In scenario one, however, farmers are assumed to continue to insure the same area of crops and allocate the proportions of those areas between alternative coverage levels in the same way as in 2017. In scenario three, while maintaining the same proportional allocations of insured crops to each coverage level, in each state, participation rates are assumed to return to the rates observed in 1997, when on-average premium subsidy rates were in the 40 to 50 percent range. In scenarios two and four, premium subsidy rates are reduced to 40 percent. However, as in scenario one, in scenario two, participation and coverage levels remain at their 2017 levels and, as in scenario three, in scenario four participation rates fall to the levels observed in 1997 (as shown in Table 4).

Estimates of changes in subsidy expenditures for each crop in each state are obtained as follows: The USDA Risk Management Agency reports total premiums paid into the

TABLE 5: ESTIMATED PREMIUM SUBSIDY OUTLAYS FOR CORN UNDER FOUR ALTERNATIVE SCENARIOS

	Baseline	Scen 1	Scen 2	Scen 3	Scen 4	Scen 1	Scen 2	Scen 3	Scen 4
Corn	Subsidy Outlays ($M)					Percentage Reduction in Subsidy Outlays (%)			
Iowa	188.5	152.0	121.6	127.2	101.8	19.4	35.5	32.5	46.0
Illinois	176.9	142.6	114.1	99.3	79.4	19.4	35.5	43.9	55.1
Indiana	79.1	63.8	51.0	37.8	30.2	19.4	35.5	52.3	61.8
Minnesota	144.1	116.2	93.0	95.9	76.7	19.4	35.5	33.4	46.7
Nebraska	177.9	143.4	114.8	122.2	97.8	19.4	35.5	31.3	45.0
Five-state total	766.5	618.1	494.5	482.3	385.9	19.4	35.5	37.1	49.7

SOURCE: Computed by the author using USDA Risk Management Agency and National Agricultural Statistical Service data

TABLE 6: ESTIMATED PREMIUM SUBSIDY OUTLAYS FOR SOYBEANS UNDER FOUR ALTERNATIVE SCENARIOS

	Baseline	Scen 1	Scen 2	Scen 3	Scen 4	Scen 1	Scen 2	Scen 3	Scen 4
Corn	Subsidy Outlays ($M)					Percentage Reduction in Subsidy Outlays (%)			
Iowa	108.3	87.4	69.9	74.0	59.2	19.4	35.5	31.7	45.4
Illinois	93.2	75.2	60.1	52.8	42.2	19.4	35.5	43.3	54.7
Indiana	60.8	49.0	39.2	23.8	19.1	19.4	35.5	60.8	68.6
Minnesota	119.5	96.4	77.1	85.4	68.3	19.4	35.5	28.5	42.8
Nebraska	71.5	57.7	46.2	55.0	44.0	19.4	35.5	23.1	38.5
Five-state total	453.4	365.6	292.5	293.4	234.8	19.4	35.5	35.3	48.2

SOURCE: Computed by the author using USDA Risk Management Agency and National Agricultural Statistical Service data

TABLE 7: ESTIMATED PREMIUM SUBSIDY OUTLAYS FOR WHEAT UNDER FOUR ALTERNATIVE SCENARIOS

	Baseline	Scen 1	Scen 2	Scen 3	Scen 4	Scen 1	Scen 2	Scen 3	Scen 4
Wheat	Subsidy Outlays ($M)					Percentage Reduction in Subsidy Outlays (%)			
Kansas	80.8	80.8	80.8	80.8	80.8	19.4	35.5	33.4	46.7
Montana	42.7	34.5	27.6	31.7	25.4	19.4	35.5	25.8	40.6
North Dakota	116.6	94.0	75.2	59.4	47.5	19.4	35.5	49.1	59.3
Oklahoma	33.1	26.7	21.3	23.8	19.0	19.4	35.5	28.1	42.5
Washington	15.5	12.5	10.0	12.5	10.0	19.4	35.5	19.4	35.5
Five-state total	288.7	232.8	186.2	181.2	144.9	19.4	35.5	37.2	49.8

SOURCE: Computed by the author using USDA Risk Management Agency and National Agricultural Statistical Service data

insurance pools for each crop in each state at each coverage level by type of insurance contract. To obtain estimates of total subsidies at each premium subsidy rate (the rates provided in 2017), under the baseline, at each coverage level for each type of individual farm contract (HPO revenue, revenue and yield), the total premium in each category is multiplied by the premium subsidy rate specified for the contract (as defined for optional units in Table 1).

In scenarios one and two, where participation rates remain unchanged from their 2017 levels, subsidy levels for each category (type of contract and coverage level) are lowered by the proportional reduction in subsidy rates implied by a 12-point cut in average subsidy rates to 50 percent (a 19 percent proportional reduction) in scenario one and to those implied by a 22-point cut in average subsidy rates (a 35 percent proportional reduction) in scenario two. In scenarios three and four, the estimates in scenarios one and two are multiplied by the acreage adjustment factors reported in Table 4 for each state to reflect the lower participation rates that are likely to be observed as a result of the lower premium subsidy rates.

RESULTS AND IMPLICATIONS

Scenario One

Results for each crop and state under the baseline and each of the four scenarios are reported in Tables 5 (corn), 6 (soybeans) and 7 (wheat).

While the scenarios in which there are no changes in participation (scenarios one and two) are of some interest, the findings in those scenarios are simple and predictable. In scenario one, the average reduction in premium subsidy rates of 12 points from 62 to 50 percent (a 19.4 percent proportional cut in premium subsidies) simply reduces total premiums by the same proportion in each state for each crop.

Scenario Two

Similarly, in scenario two, the average reduction in premium subsidy rates of 22 points from 62 to 40 percent (a 35.5 percent proportion cut in premium subsidies) simply reduces total premiums by that proportion in each state for each crop.

Were such cuts applied to the entire Federal Crop Insurance Program, which the CBO estimates to cost taxpayers an average of about $6 billion a year over the period between 2018 and 2027,[29] a reduction in the premium subsidy rate to 50 percent would reduce those subsidies to about $4.85 billion, generating about $1.15 billion in annual savings. To reduce the average premium subsidy rate to 40 percent would reduce annual premium subsidies to about $3.85 billion, with savings to taxpayers of $2.15 billion annually and $21.5 billion over 10 years.

However, as the results for scenarios three and four indicate, total savings are likely to be much more substantial, because the areas insured by farmers are also likely to fall by relatively substantial amounts.

Scenario Three

In scenario three, in the five states considered for each crop, when changes to the areas insured for each are taken into account (participation rates are assumed to decline to 1997 rates in each state), a reduction in the average rate of premium subsidy to 50 percent results in the following decreases in total premium subsidy outlays among those five states:

- A decrease to 62.9 percent of the baseline level for corn, from $766 million to $482.3 million (Table 5);
- A decrease to 64.7 percent of the baseline level for soybeans, from $453 million to $293 million (Table 6); A decrease to 62.8 percent of the baseline level for wheat, from $289 million to $191 million (Table 7).

Impacts vary among states. For example, in this scenario, proportional reductions in total subsidies paid to wheat producers in the state of Washington are considerably lower than in other states, because crop insurance program participation rates among wheat producers in that state were almost identical in 1997 and 2017, but were substantially lower for the other states in 1997 (Table 4). For corn and soybeans, subsidies fall by substantially more in Indiana (to 47.7 percent and 31.4 percent of 2017 levels, respectively) than in other states, and well below the five-state averages of 62.9 percent of the baseline for corn and 64.7 percent of the baseline for soybeans.

Scenario Four

In scenario four, where premium subsidy rates are reduced to 40 percent and farmers lower their participation rates to 1997 levels, decreases in premium subsidies are more substantial than in scenario three. In this scenario, in the five states considered for each crop, changes to the areas insured for each are taken into account (participation rates are assumed to decline to 1997 rates in each state), and thus a reduction in the average premium rate subsidy to 40 percent results in the following decreases in total premium subsidy outlays:

- A decrease to 50.3 percent of the baseline level for corn, from $766 million to $386 million
- (Table 5);
- A decrease to 51.8 percent of the baseline level for soybeans, from $453 million to $235 million (Table 6);
- A decrease to 50.2 percent of the baseline level for wheat, from $288.7 million to $145 million (Table 7).

As in scenario three and for the same reason (differences in changes in participation rates between 1997 and 2017) impacts vary among the states for each commodity. However, what is remarkable is the similarity in the proportional changes in subsidy levels for each commodity at the five-state level. For corn, soybeans and wheat, a reduction in the premium subsidy rate from 62 percent to 50 percent reduces total subsidies to between 62 and 65 percent of 2017 baseline levels. A reduction in the premium subsidy rate to 40 percent—essentially the level proposed in the 1994 Crop Insurance Reform Act—reduces total subsidies to between 50 and 52 percent for the three crops.

These results indicate that when changes in participation rates are taken into account, a reduction in the premium subsidy rate to an average of 50 percent will reduce total subsides to about 63 percent of current levels to an annual average of $3.78 billion. This will generate annual savings for taxpayers of $2.14 billion, or $21.4 billion over 10 years. A deeper cut in the premium subsidy rate to 40 percent would still mean that a farmer would pay only 60 percent of the actuarially fair premium rate and none of the crop insurance policy's administrative costs. However, this reform would reduce

29. *CBO's June 2017 Baseline*. https://www.cbo.gov/sites/default/files/recurringdata/51317-2017-06-usda.pdf.

premium subsidies to about 52 percent of current levels, to an annual average of about $3.12 billion and would generate a savings of $2.88 billion annually ($28.8 billion over 10 years).

Further, if farmers substantially reduce their participation in the Federal Crop Insurance Program, the impacts on total federal spending would be larger than the reductions in premium subsidy expenditures, because spending on subsidies to crop insurance companies would also decline. For example, if subsidies were reduced to 50 percent or 40 percent (on average) of total premiums and farmers reduced the area insured under the federal program to 1997 levels, participation rates would decline by about 20 percent. Given that, to some degree, underwriting gains and subsidies for administrative and operating (A&O) expenses that are paid directly to crop insurers are proportional to total premiums and participation, additional program savings would be realized.

These would be considerable, but are difficult to estimate. Despite the fact that A&O subsidies are notionally proportional to total premiums, at an approximate rate of 18 percent, they are currently capped at about $1.4 billion a year and the cap is binding.[30] In addition, the impacts on company underwriting gains, which currently average about $1.2 billion annually, are difficult to calculate, as farmers are perhaps more likely to leave acres with lower risks of losses uninsured as premium subsidy rates decline. This would reduce underwriting gains more rapidly than insured acres.[31] Nevertheless, such savings could be on the order of $500 million to $600 million a year—roughly 20 percent of current crop insurance industry revenues from A&O subsidies and underwriting gains, if participation rates returned to levels observed in the mid and late 1990s (in aggregate about 70 percent, almost 20 percentage points less than in 2016 and 2017).

Several caveats apply to the estimates presented here. First, it is not clear that across-the-board changes in premium subsidy rates would leave the shares of total insured acres allocated to any given coverage level unaltered. Second, there is considerable uncertainty about the impact of substantial increases in the premiums paid by farmers on their participation in the program. To the extent that the assumption that participation rates would return to levels observed in the late 90s underestimates or overestimates actual reductions in participation, the estimates presented here may be too low or too high.

CONCLUSION

On average, the heavily subsidized Federal Crop Insurance Program currently costs taxpayers around $6 billion a year in premium subsidies paid to farm businesses, most of which flows to farm businesses that are financially stable and owned by wealthy U.S. households. One simple way to reduce those outlays is to reduce premium subsidy rates, which currently average 62 percent of the total premiums paid in to insurance pools. In addition to subsidizing the premiums, the government also pays a substantial direct subsidy to crop insurers to reinsure their risks. As a result, over the medium and longer term, the companies are guaranteed substantial underwriting gains.[32]

In this study, two simple policy reform options are considered: reductions in the premium subsidy rate to 50 percent and 40 percent from the current level of 62 percent. Even under the larger cut in premium subsidy rates to an average of 40 percent, farmers would still only pay 60 percent of the premium costs associated with their policies, and those premiums would cover only indemnities, not administrative costs like agent commissions and adjuster fees.

Lowering the average crop insurance subsidy rate from 62 percent to 50 percent would likely reduce total premium subsidy payments by between 35 and 27 percent to between 63 and 65 percent of the current subsidy levels to farmers raising corn, soybeans and wheat in the five largest states for those commodities. Reducing the average crop insurance subsidy rate to 40 percent would reduce total subsidy rates by between 48 and 50 percent. These results suggest that, at the national level, similar proportional reductions in subsidies are likely to be achieved.

Thus, to reduce the premium subsidy rate to an average of 50 percent would be likely to reduce total premium subsides paid to farmers to an annual average of $3.78 billion, which generates an annual savings for the taxpayer of $2.14 billion, or $21. 4 billion over 10 years. A deeper cut in the premium subsidy rate to 40 percent would reduce premium subsidies to about 52 percent of current levels to an annual average of $3.12 billion and would generate budget savings of $2.88 billion annually ($28.8 billion over 10 years).

These savings would be augmented by reductions in direct subsidies and underwriting gains that currently accrue to crop insurers. Those additional savings could well amount to an additional $0.5 to $0.6 billion annually. Thus, for example, annual savings in government outlays from simply shifting to a 40 percent premium subsidy rate would amount to around

30. Vincent H. Smith, Joseph W. Glauber, et al., "Rent Dispersion in the US Agricultural Insurance Industry," *International Food Policy Research Institute Discussion Paper* 01532.

31. Goodwin, 1993; Smith and Baquet, 1996; Thomas O. Knight and Keith Coble, "Survey of U.S. Multiple Peril Crop Insurance Literature since 1980," *Review of Agricultural Economics* 19:1 (1997), 128.

32. This is achieved through side deals with insurance companies, through a direct payment to cover administrative and operating costs and a gerrymandered reinsurance agreement (known as the Standard Reinsurance Agreement). Effectively, under the 40 percent subsidy rate policy, farmers would only pay about 50 percent of the full commercial cost of the crop insurance policies they buy.

$3.4 billion, or $34 billion over 10 years. Further, all of those savings could be obtained with merely the stroke of a legislative pen by reducing the subsidy rates applied to current premium rates for federal crop insurance policies.

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