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Theme Overview: Current Issues in Risk Management and U.S. Agricultural Policy

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JEL Classifications: G22, Q12, Q14, Q18
Keywords: 2013 Farm Bill, Agricultural policy, Federal crop insurance, Risk management

This *Choices* thematic issue focuses on current issues in risk management and agricultural policy and includes an assessment of important issues surrounding the ongoing farm bill negotiations. With farm bill negotiations underway, issues surrounding agricultural risk management and policy are currently front and center, and 2013 will surely be an important year for the future of agricultural policy in this country. In 2012, the Senate passed a 2012 farm bill proposal. The House Agriculture Committee likewise passed a competing proposal, however, that proposal never made it to the House floor for a vote. With a fiscal cliff looming in 2012, the farm bill negotiations stalled and on January 2, 2013, President Obama signed into law the American Taxpayer Relief Act of 2012—the so-called "Fiscal Cliff" legislation—within which included a provision to extend the 2008 Farm Bill until the end of 2013. Negotiations are ongoing, and the House passed in July 2013 a farm bill which stripped out nutrition programs.

Risk management issues in particular have taken a central focus in the current agricultural policy debate as the policy environment has shifted from one that historically was more focused on direct payment programs and other income support measures to one that, today, is focused more on revenue insurance-based commodity title programs with risk management as the focus, in conjunction with federal crop insurance (FCI). The FCI program has grown from a small pilot in the 1980s to what is now the cornerstone of agricultural support in the United States, and the drastic growth in this program has drawn much attention recently to the functioning and distribution of subsidies under the program. Furthermore, it is projected that the FCI program will be left as the single largest program in terms of expected expenditures under any new farm bill proposals. Given that there are a variety of proposals under consideration for the next farm bill that cover risk management activities, issues surrounding the interaction of those programs and crop insurance are of great policy interest.

There are several reasons for this shift toward a risk management focus, but chief among them is the fact that farm incomes are at an all-time high, rendering it difficult to defend direct payment and income support programs. This has opened the door for risk management programs to take a more central role in terms of how government supports agriculture in the United States, as risk management programs are arguably more politically palatable.

Articles in this Theme:

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In 2012, both the Senate and the House Agriculture Committee farm bill proposals proposed eliminating current commodity title programs including direct payments, proposed creating new revenue-based commodity program options designed to cover "shallow" revenue losses, and proposed introducing supplemental crop insurance coverage for shallow revenue losses. How these programs will function, their economic benefits, and their impacts on existing crop insurance market dynamics are relatively unknown currently, and research in this area will be of great interest to policy makers and the public.

There have also been several developments on the dairy front. The 2012 House and Senate farm bill proposals each included revamped dairy support programs and a controversial supply management/control component. How these new, revamped programs will function relative to existing dairy support programs, and who will benefit, are also of great interest currently.

The first article, by Joshua D. Woodard and Dustin Baker of Cornell University, highlights and compares some important aspects of the currently competing dairy title proposals with each other and with current policy, and discusses differences in the context of who are the apparent beneficiaries of the various programs. Several observations are made that suggest that the previously front-running proposal, the Dairy Security Act—which passed out of the House Agriculture Committee in May 2013 but failed on the House floor—appears to redistribute program benefits toward states/regions with larger farms relative to the main competing proposal, as well as relative to current policy.

The second article, by Thomas P. Zacharias, president of National Crop Insurance Services (NCIS), and Keith J. Collins, retired chief economist at the U.S. Department of Agriculture (USDA) and policy advisor to NCIS, present an industry view of crop insurance and its increased role in farmers' risk management decisions and agricultural policy. Their article lays out several reasons for this increased role in farm policy, but acknowledges that the program's support and growth has engendered significant criticism for its level of subsidization and other aspects. They conclude with some thoughts on the current structure and direction of the crop insurance program.

The third article, by Octavio A. Ramirez and Gregory Colson of the University of Georgia-Athens, asks the question, "Can we do better than crop insurance?" They argue that despite persistent improvement efforts since its inception, crop insurance remains costly to taxpayers and is perceived by many as an ineffective and inequitable agricultural safety net. Their paper reviews some key criticisms of crop insurance and discusses an alternative approach based on the concept of farmer-owned crop insurance savings accounts, a recurring subject during farm bill debates throughout the years.

The fourth article, by Jennifer Ifft, Todd Kuethe, and Mitchell Morehart of USDA's Economic Research Service (ERS), investigates the use of debt by farms that use crop insurance. They suggest that the FCI program could lead to increased use of debt financing by U.S. farms through its impacts on lender and producer behavior. Using nationally representative farm survey data, they find that participation in FCI is associated with higher farm leverages and a higher probability of credit default.

The fifth article, by Thomas W. Sproul of the University of Rhode Island, David Zilberman of the University of California, Berkeley, and Joseph C. Cooper of USDA's ERS, discusses and analyzes the shallow-loss crop insurance policies that have taken center-stage in many proposals for the current farm bill. They examine the choice of deductible coverage vs. coinsurance to show that risk premiums and loss adjustment costs matter little when comparing policies and, thus, conclude that policy makers should base decisions more on costs to taxpayers than specific risk management features of alternative programs.

The sixth and final article, by Keith Collins and Harun Bulut of NCIS, likewise investigates the supplemental shallow-loss programs in the farm bill proposals, and provides a discussion of the complementarities of the programs with existing underlying crop insurance coverage. They find that the highly subsidized crop insurance supplemental revenue programs in the farm bill proposals may reduce demand for underlying crop insurance coverage at high coverage levels, and that the combination of the two may substitute for current county crop insurance plans. They also argue that, for crop insurance companies, their sales efforts would be complicated by many more farmer choices, reduced sales of high coverage levels on individual policies, and reduced sales of current county plans, but that companies would also see increased sales of both supplemental county policies and low-coverage individual policies, as buyers of current area plans shift to the new supplemental plan in combination with individual coverage.

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2013 Farm Bill Dairy Title Proposals Redistribute Program Benefits toward States with Larger Farms

Joshua D. Woodard and Dustin Baker

JEL Classifications: Q14, Q18
Keywords: 2013 Farm Bill, Dairy Policy, Dairy Security Act, MILC, Risk Management

The Food, Conservation and Energy Act of 2008 has a plethora of price support, market development, and market stabilization programs designed to support dairy prices, enhance risk management, and improve farm revenues. Chief among programs that pay producers directly is the Milk Income Loss Contract Program (MILC), which functions similar to a counter-cyclical payment program by paying producers when milk prices are low. The MILC program was slated to expire on September 30, 2012 but was later extended retroactively by the American Taxpayer Relief Act of 2012, which authorizes MILC payments through September 30, 2013.

While a new farm bill was not realized in 2012, the Senate's failed 2012 Farm Bill proposal would have enacted a significant overhaul of the Dairy Title. Among other changes, it proposed replacing MILC with a new margin insurance program called the Dairy Producer Margin Protection Program (DPMPP). The DPMPP included a fully subsidized option that would pay producers if the margin between the bi-monthly All-U.S. Milk Price and a feed cost formula were to fall below $4.00, and also included partially subsidized buy-up options allowing producers to insure a margin of up to $8.00. In addition, participating producers in the DPMPP would be automatically enrolled in a new and controversial supply control program known as the Dairy Market Stabilization Program (DMSP). The DMSP had the intent to encourage producers to scale back production if specified national milk-feed margin triggers were exceeded, and would penalize producers if they did not cut production when the triggers were in effect.

The 2013 Dairy Title negotiations have largely picked up where they left off in 2012, and two competing proposals are in play. The first is billed as the Dairy Security Act (DSA). The DSA includes a DPMPP margin insurance program similar to the 2012 proposal to replace MILC, but with slightly different premium rates for buy-up coverage. It also includes a version of the DMSP supply control program. The competing proposal is the Goodlatte-Scott Amendment, or the Dairy Freedom Act (DFA). The DFA proposes a margin insurance program similar to the DSA, but most notably does not include a supply control program. DSA passed out of committee in the House but the Goodlatte-Scott Amendment was adopted on the floor. As of the writing of this article, the House has passed a farm bill, but with nutrition programs stripped out, and Senate leaders have indicated they are unlikely to move forward without the nutrition title included.

DFA also proposes slightly different producer premiums and coverage options in its DPMPP margin insurance program than DSA, and no free DPMPP option for operations that produce more than 4 million pounds of milk annually. While the DSA has been billed by supporters as a more "fiscally responsible" program, opponents generally view it as a heavy-handed government intervention that would only serve to limit farm growth and unfairly redistribute government support toward certain regions/farms. Some have even gone as far as to brand such programs as "Soviet" in nature.

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Economic Incentives and Support for Supply Controls under the DMSP

Virtually all dairy groups support the margin insurance programs in the DFA and DSA; however, the DMSP supply management provisions in the DSA have been more controversial. The DMSP appears to typically be supported by cooperatives and opposed by other processing and retailer groups. However, stated support among prominent producer interest groups—non-cooperative producer groups—remains split. A cursory look at the supporters and opponents indicates that producer groups in states that tend to support the DMSP supply controls (e.g., California, Idaho, New Mexico, Washington, Oregon, and Arizona) tend to also have higher feed costs, import a large proportion of their feed, have a higher concentration of large farms, or may not currently be seeking to significantly expand production. Meanwhile, states/regions that have a higher proportion of small farms or that grow much of their own feed, on balance tend to reject the idea of supply controls (e.g., New York, Wisconsin, Pennsylvania, and Minnesota). While it is true that there is some mixing of producers, processors, and cooperatives within groups—as well as differences in opinion among producers within groups—and that group membership is not strictly cut and dry, we have used our best judgment in making qualitative assessments of membership and stated positions, and believe them to be reasonable on balance.

From an economic standpoint, it is perhaps not difficult to see why certain groups have partitioned into their respective camps regarding supply controls. Cooperatives likely view the DMSP as a useful program to buoy prices and perhaps aid in the management of marketing channels that can be negatively affected by temporary supply imbalances. Retailers and other food processors, on the other hand, arguably have the incentive to keep the cost of raw milk low, and may be concerned that they will be unable to make ongoing supply commitments if they have to worry about policy-driven reductions in their milk inputs.

Understanding the incentives of producers themselves is a bit more difficult. Many producer groups—that is, non-cooperative-based producer associations—purport to oppose supply controls due to the fundamental belief that the government should not engage in such interventions. However, other groups may oppose the program because it is counterproductive to the group's ultimate goals. In New York State, for example, considerable momentum was created after Governor Cuomo's *Yogurt Summit* in August 2012, a reflection of the growing demand for Greek yogurt processed in the region. Since 2000, New York has nearly doubled its total number of yogurt plants from 14 to 27 and has nearly tripled its production of Greek yogurt over the past six years to become the nation's largest producer. As a result of this increase in yogurt production—coupled with the fact the popular Greek variety requires three times more milk than regular yogurt to produce—the commonly held notion in New York is that milk production must increase and that failure to do so will put the yogurt boom in jeopardy. Indeed, many producer groups in the Northeast, including the Northeast Dairy Producers Association, fear that a supply control program will limit the opportunity for regional farm growth. On the other hand, certain Western, Southwestern, and Southern states are perhaps approaching their peak capacity for dairy production in the current market environment, and so a supply control program would arguably not be perceived to be negative. The opposite is true for regions that see opportunity in growth.

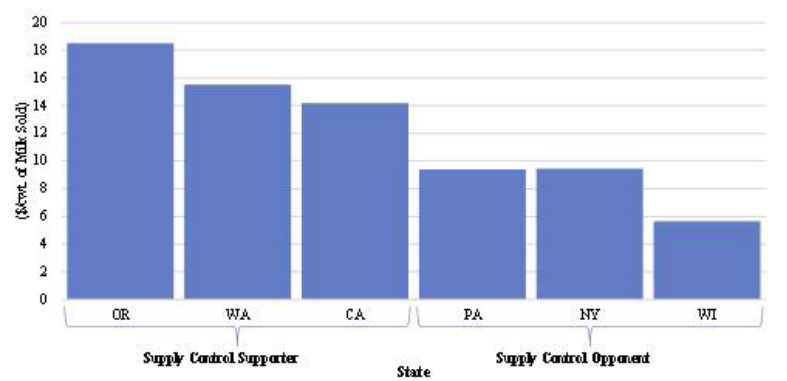
While the "desire to grow" may be at play in determining producer preferences for supply controls, there is another explanation that relies on the fundamentals of how changes in variable and fixed costs impact profit margins and how farms are distributed in this respect throughout the United States. Many states in the West, South, and Southwest—which tend to be dominated by larger farms—have been exposed to episodes of very high feed costs—that is, variable costs—due to structural changes in grain prices in recent years. Coupled with the fact that farms in these areas typically do not grow as much of their feed as do farms in other regions, this has led to low margins for some. However, these farms also tend to have lower fixed costs per unit of capacity than do smaller farms, implying that they have a lower opportunity cost of idling production capacity. In other parts of the country, such as Wisconsin and New York, farms are significantly smaller on average, but also tend to produce more of their own feed. Therefore, they typically have higher fixed costs per unit of capacity, but are arguably less sensitive to increases in variable feed costs than the typical large farm in the West, South, or Southwest.

In this light, it is fairly obvious what producer incentives/preferences would be regarding a supply control program, on the margin, for a large farm with lower per-unit fixed costs that buys much of its feed vs. a small farm with higher per-unit fixed costs that grows much of its feed. The former has a lower opportunity cost of idling production and, on the margin, benefits more than the latter when a nationwide benchmark price margin widens. The process of halting production under supply controls will also decrease demand for feed, thus pushing down its price. On the margin, this is clearly more beneficial to the former type of farm than the latter. Considering where we tend to observe the presence and concentration of such farms across the U.S., it is no mystery why different producer

groups tend to be on the side of the fence where they are regarding supply controls.

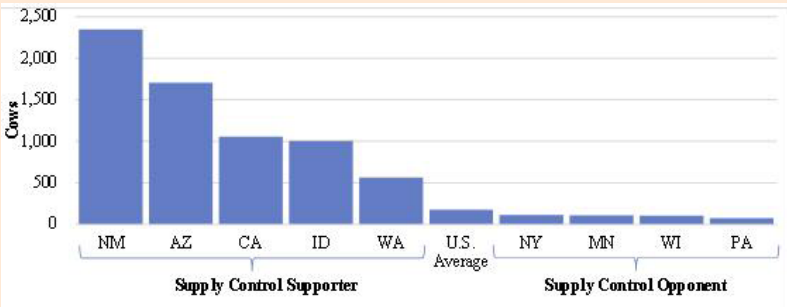
Several significant, non-cooperative-based state producer groups have declared their support or opposition to the DSA and its supply control measures. Figures 1 and 2 highlight several of these notable, high-production states. Figure 1 presents purchased feed costs by state for states with major proponents and opponents of DSA, and indicates that states with higher purchased feed costs tend to support supply controls under the DSA. The opposite appears to be true for states with producer groups who oppose the DSA. Figure 2 suggests a similar trend in those states with larger average herd sizes which tend to support the supply control measures in the DSA (New Mexico, Arizona, California, Idaho, and Washington), and vice versa for states with smaller herd sizes, such as those in New York, Pennsylvania, Wisconsin, and Minnesota. While there are exceptions—for example, Florida, which is a deficit and undeclared state—on balance, it is fair to observe this dichotomy is probably at play.

Figure 1: Purchased Feed Cost (2012) and Producer Group Support for DSA by State



Source: Economic Research Service (ERS), Milk cost of production by State, 2013, Available online at http://www.ers.gov/data-products/milk-cost-of-production-estimates.aspx#Uazb2HdjWkN

Figure 2: Average Farm Size (2012) and Producer Group Support for DSA by State



Source: National Agricultural Statistics Service (NASS), Milk Production, February 2012, Available online at: http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1103

Comparison of Expected Payment Rates under DFA, DSA, and MILC

While much of the 2012 and 2013 farm bill debates regarding dairy have focused on the merits of supply controls, equity issues related to the redistribution of program benefits among producers of various sizes under the MILC program vs. the proposed DPMPP programs have perhaps received less attention recently. MILC functions economically as a broad price insurance program that pays producers when milk prices fall below a specified level, but has some aspects of a margin insurance program in that the base trigger price, $16.94/hundredweight (cwt.), is adjusted upward by a feed cost formula when feed prices are above a certain level. The DPMPP proposals incorporate a margin insurance scheme more explicitly and also allow producers to buy-up to higher coverage levels. The other major difference between the existing MILC program and the proposed DPMPP programs is that payments under MILC are capped to apply to a maximum of 2.4 million pounds of production over a 12-month period.

Between 2000 and 2012, the MILC program would have made payments in about 50% of the months (45% in years 2009-2012). Given that the average U.S. dairy farm produced just over 21,000 pounds of milk per cow in 2012, farms with more than 100 cows are at risk of hitting their 2.4-million-pound-payment cap in any given 12-month period under MILC. The new DPMPP proposals, on the other hand, have no such production caps on payments. The expected magnitude and frequency of payments also vary substantially between MILC and DPMPP. We calculated expected annual payments for a 100-cow dairy under MILC, and the basic DPMPP at the free $4.00 trigger in the DSA and DFA, assuming annual production of 21,000 pounds per cow. The

results are derived from simulations of the various milk price and feed price complexes, and are calibrated with relevant futures and options market data in order to provide the best estimates of expected prices and volatilities looking forward. Expected basic DPMPP payments are approximately $3,900 and $3,600 per year for DSA and DFA, respectively, and are significantly lower than those for MILC ($7,400/yr), for smaller producers. DPMPP also has a lower payout frequency, about 30%, vs. about 63% for MILC. Note that these are forward-looking, not historical, estimates.

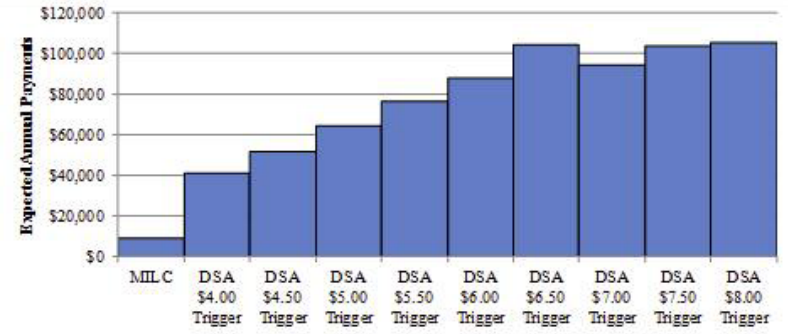
Figure 3 presents expected annual payments for a 1,000-cow dairy for DPMPP under the DSA proposal for all available buy-up coverage levels net of premium paid, as well as for MILC. In stark contrast to that for smaller farms, DPMPP payments are much higher than MILC for larger producers. For example, the net expected subsidy capture for the DSA $6.50 margin trigger coverage is over $104,000 for a 1,000-cow dairy, while total expected MILC payments are only about $9,000.

The divergence between large- and small-producer results is due to the production caps under MILC being lifted under DPMPP. Not taking into account production caps, expected payments per cwt are much lower under DPMPP than under MILC, and MILC will also pay out more frequently. However, larger farms can typically hit their payment cap when MILC is triggering in only a handful of months. The net effect is that payments are generally much lower under the basic DPMPP than under MILC for small producers, while the opposite is true for large producers. For large producers, the expected subsidy capture (net of premiums) is much greater under the DSA's DPMPP than under MILC—over 11 times larger in some cases for a 1,000 cow farm. For small producers, on the other hand, the expected payments net of premiums are typically less than what they are under MILC— except at high coverage levels (see Figure 4). Even then, the payment multiple is still not nearly that for larger producers.

As a last point of comparison between the DSA and DFA proposals, Figure 5 presents expected loss ratios for the two programs for a 1,000-cow dairy. Note that under the DPMPP proposals in the DSA and DFA, a premium is required for buy-up coverage. The expected loss ratio is the ratio of expected payments divided by premiums and, thus, it represents the multiple of losses the government expects to pay relative to premiums paid by producers. In general, the government loss ratio is significantly higher for the DSA proposal than it is under the Goodlatte-Scott DFA proposal. For example, for $4.50 margin coverage, the expected loss ratio is 20.56 for DSA vs. only 6.71 for DFA. The loss rates converge above the $6.50 trigger, although the subsidy take is typically maximized at about the $6.50 trigger and it's not unreasonable to suspect that volume will be lower when above that trigger.

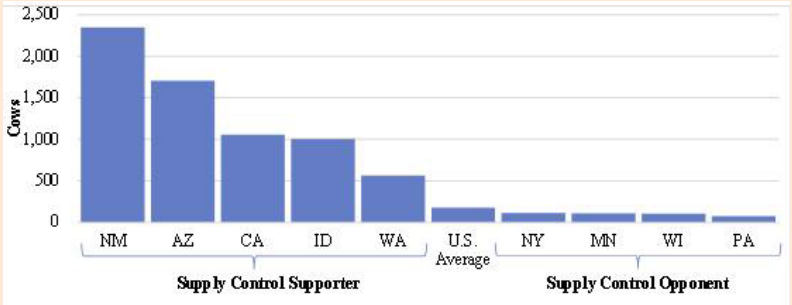
This comparative analysis was conducted under the assumption of common price volatility for both the DSA and DFA analyses, and the imposition of supply controls under DSA could perhaps alter the relative expected loss ratios presented here for the programs. However, it is questionable whether the supply controls will be effective enough on a national scale to sufficiently reduce the payments under the DSA relative to the DFA, particularly if producers in

Figure 3: Expected Annual Payments under MILC and DPMPP (DSA Proposal), 1,000 Cow Dairy



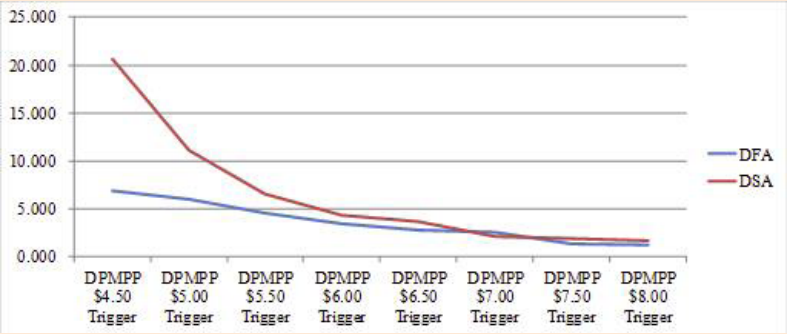
Source: Author's Calculations

Figure 4: Expected Annual Payments under MILC and DPMPP (DSA Proposal), 100 Cow Dairy



Source: Author's Calculations

Figure 5: Expected DPMPP Government Loss Ratio, DFA and DSA Comparison, 1,000 Cow Dairy



Source: Author's Calculations

states dominated by smaller operations—such as those in the Northeast—choose not to participate in the program. In such a scenario, regional price/premium differentials may respond to supply controls, but perhaps not the national level prices upon which the DPMPP programs are based. This implies that DSA might not create the significant savings on the DPMPP portion of the program as claimed by proponents. This would result in a situation in which prices and, thus, costs of the DSA do not decline in tandem with the imposition of mandated supply cuts. The implication of this would be further government flows toward regions dominated by larger producers—many of which are arguably in the process of contracting production growth—at the expense of consumers, taxpayers, and regions dominated by smaller producers.

For More Information:

Schnepf, R., (September 18th, 2012). "Dairy Policy Proposals in the 2012 Farm Bill," *Congressional Research Service*.

U.S. Department of Agriculture, Farm Service Agency (2013), *Milk Income Loss Contract Program*. Available online at http://www.fsa.usda.gov/FSA/webapp?area=home&subject=prsu&topic=mpp-mi

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Ten Considerations Regarding the Role of Crop Insurance in the Agricultural Safety Net

Thomas P. Zacharias and Keith J. Collins

JEL Classification: Q18
Keywords: Agricultural Policy, Crop Insurance, Public Support, Subsidies

Crop insurance is widely supported, and the program has expanded to become the primary component of the farm safety net. Yet, the program's support and growth has engendered significant criticism for its level of subsidization and other aspects. Such a tension, especially during development of a new farm bill, seems natural and appropriate for a program with rapidly growing taxpayer exposure. From our vantage, employed by National Crop Insurance Services, a 501(c)(6) non-profit organization funded by the crop insurance industry, in this article we offer a within-the-industry perspective on the program status and key issues.

The 10 Considerations

1) Is there a public interest in a resilient, financially sustainable and competitive industry that produces the nation's food and is subject to natural disasters and other shocks?

Without relying on formal empirical support or a social welfare metric, and understanding the vagueness of the term, we believe there is such an interest. An issue of "public interest" usually merits acknowledgement and protective action by the government and is fundamental to government programs across all major essential industries, such as energy, housing, and health care. Based on legislation and the mission and goals of the U.S. Department of Agriculture (USDA), there appears to be a public benefit or, at a minimum, a public interest in maintaining a resilient and financially sustainable national agriculture by assisting producers in need or helping to make available the tools for them to protect their operations. Of course, specific actions taken to serve the public interest should be subject to cost-benefit analysis and standards which may also serve as evidence of a public interest.

2) Should there be taxpayer (government) support for a farm safety net?

If there is a "public interest" in financial stability in agriculture, should there be public support? This is, of course, a normative question. History of most developed nations indicates a socially revealed preference for some form of public economic support for agriculture, specifically for farmers. Critics of farm programs call for reduced, if any, federal support for the safety net, citing interference with the efficiency of free markets and relative farm prosperity. At this juncture in our history, based on recent farm bill actions, some level of substantive support to agriculture, although reduced, appears definite.

3) What is the willingness and ability to spend on the farm safety net?

Total taxpayer expenditures on the farm safety net—as measured by a deflated index of prices received for crops—have trended down since the late 1990s (Figure 1). The next major funding cut is expected to be direct payments. Congressional funding targets are measured as cuts from a "baseline" of projected spending. The baseline for the safety net plays out on a couple of levels for the crop insurance program. One level is on the supply side, how much to spend on the delivery system? Recent renegotiations of the Standard Reinsurance Agreement (SRA) between USDA and the approved insurance providers (AIPs) reduced baseline funding for the delivery system. Administrative and Operating (A&O) expense payments have been reduced

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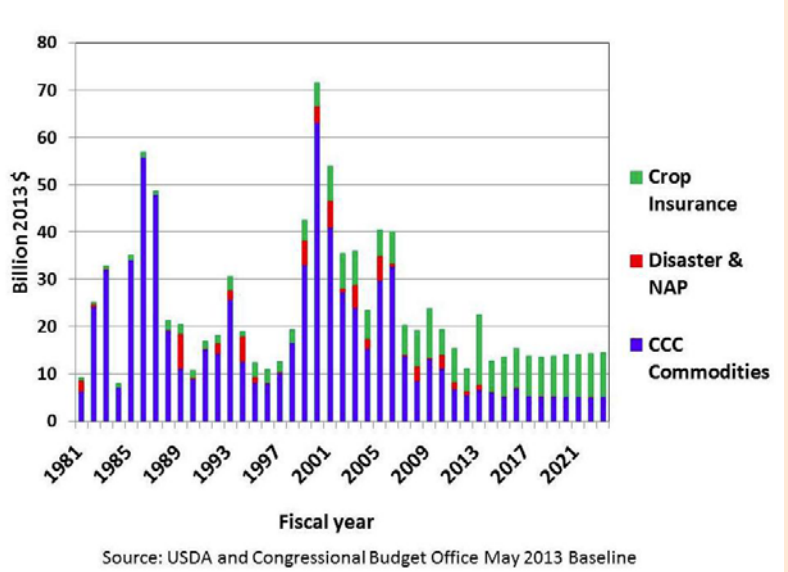
and capped. Potential underwriting gains for the AIPs have also been reduced. At the same time, the program coverage and complexity has generally expanded. From an industry perspective, this means "more bricks, less straw." However, high commodity prices and low loss ratios in the late 2000s led to unsupportable increases in A&O payments and raised questions as to the true level of industry expected underwriting gains.

On the demand side, how much is the taxpayer willing to subsidize the producer to purchase crop insurance? Beginning with the 1994 Crop Insurance Reform Act, most legislation has increased subsidy levels to encourage greater participation. Critics are challenging these support levels and have proposed alternatives to roll back producer subsidies. Just as funding for AIPs has been reduced in SRA renegotiations and the 2008 Farm Bill, continuing federal budget pressures are likely to result in increasing political interest to reconsider the level and form of premium support. In summary, there is now less willingness and ability to support the safety net.

4) Should the safety net be *ex ante* or *ex post*?

The current crop insurance system is *ex ante* in the sense that all program stakeholders are essentially required to proactively manage their respective risks. Government, via the Risk Management Agency (RMA), along with the AIPs and crop insurance agents, enroll farmers prior to planting of the crop. Liability and premiums are established prior to the determination of indemnities. Because of the contract between the farmer and the AIP, the farmer knows coverage per acre, the policy deductible, and the policy's insured perils. This stands in stark contrast to *ex post* ad hoc disaster assistance in which some form of disaster determination must make its way through the political process. The farmer does not know if a loss is payable and the timing of a payment is uncertain. These *ex ante* features of crop insurance seem attractive from the perspective of both the government and the farmer. Recent literature indicates *ex ante* crop insurance may be preferred from government's perspective (Innes, 2003; and Bulut, and Collins, 2013).

Figure 1: Total Taxpayer Expenditures on the Farm Safety Net (Deflated by Crop Prices Received)



Source: USDA and Congressional Budget Office May 2013 Baseline

5) Is the safety net income support or risk management?

Although the distinction between income support and risk management seems apparent—raising income vs. redistributing income across time—it is useful to contrast a few concepts. Income support programs have been free and the farmer has not necessarily had to experience a natural disaster or even an economic loss to receive a payment. With crop insurance, farmers pay a portion of the premiums and do not receive a payment unless there is a verifiable loss under the terms of the crop insurance policy. The current direction of the 2013 farm bill strongly favors the crop insurance model. It would appear that traditional price and income support programs may ultimately be phased out, although the risk associated with multi-year price declines is not well accommodated in the current crop insurance program.

Considerations 1 through 5 have basically led us to where we are today: a U.S. farm safety net now characterized as a risk-management-based crop insurance system. Given the farm bill debate, we argue that questions 1, 2, 4, and 5 have been answered in the affirmative with a nod toward ex ante risk management. In the case of 3—the budget constraint—we are in the process of determining how much the nation is willing and able to spend on farm support, acknowledging an overall reduction in farm safety net spending as a percent of total crop value, and its division between risk management and direct income support.

The remaining five considerations, in our opinion, are where we think answers to the following questions have the potential to positively contribute to the policy debate in the future.

6) Is current risk sharing optimal?

The U.S. crop insurance program is characterized as a "public-private partnership." The partnership consists of farmers, taxpayers—represented by USDA and RMA—and the private sector insurance industry comprised of crop insurance agents, adjusters, crop insurance company personnel, and the reinsurance community. How do these entities share risk? Descriptively, the current risk-sharing arrangements are set out contractually at several levels: a) the SRA, the risk sharing arrangement between the AIPs and USDA; b) the actual crop insurance policy between the farmer and the AIP; c) the contractual arrangements between the crop insurance agents and the AIPs; and d) the reinsurance treaties between the reinsurers and the AIPs.

The fundamental arguments for risk sharing are: a) government sets rates and underwriting standards, b) government requires a policy to be sold to any producer who desires one, c) private sector risk sharing reduces taxpayer exposure, and d) risk sharing incentivizes companies to reduce losses.

Beyond some assigned risk pool to deal with the risky policies that private companies are forced to take at government-set rates, the choices are: a) all risk borne by the government—as in flood insurance, b) risk shared between the government and private companies, or c) all risk borne by the companies. Under the first choice, if a company could not augment its rate of return through risk sharing under the current program structure, the government would have to pay companies a fee to cover delivery costs plus a reasonable return, a total which may not turn out much different than current total returns, although that is an empirical question. The second choice is the current approach, and the balance of risk held by each party continues to evolve and is subject to change. The third choice is a viable option for an SRA negotiation, which would require greater reliance on more costly private reinsurance markets.

But in what sense is any risk-sharing arrangement "optimal"? There has been some empirical work related to the SRA with an emphasis on program outlays and the underwriting gain or loss potential for the AIPs, but the outcome is a negotiated solution without a clear determination of what constitutes an optimal level of risk sharing between the private and public sectors. With the expectation of further federal budget pressure, the issue of public-private risk sharing should be an area of further investigation.

7) What is the role of area versus individual plans?

Given the advancement of supplemental area plans in the farm bill, it is useful to address some issues about these plans. Area plans do not fall under the traditional definition of insurance. The indemnity paid under an area plan is the result of the area experience, not the experience of the individual. Conversely, a farmer may not receive a payment under an area plan while incurring a large loss on the farm. Our work (Bulut, Collins, and Zacharias, 2012) and others suggest area plans are not necessarily "incentive compatible," and with actuarially fair premium rates, farmers would not demand area coverage relative to individual plans. Currently, there is very little market penetration of area plans relative to individual coverage.

Curiously though, current farm bill alternatives, some policy analysts, and commodity organizations have proposed large scale area plans in lieu of existing farm programs. Perhaps the most compelling reason is program costs, as area plans are less expensive to administer. It has also been argued that area plans are subject to less moral hazard and adverse selection. These are supply-side arguments and beg the question of effective demand. Just as the 2008 Farm Bill's Supplemental Revenue Assistance Payments program was phased out and the Average Crop Revenue Election program is slated for termination, it will be interesting to observe the development of the large-scale "shallow-loss" area plans and their coexistence with individual coverage.

8) Should the safety net be incentivized?

Use of economic incentives in government programs is a way to achieve efficiency and outcomes that benefit people individually and collectively. The U.S. crop insurance program is incentivized at several, but not all levels. Sales of crop insurance are incentivized through the use of producer premium subsidies and company sales incentives. While producer support has steadily increased, the most recent SRA imposed constraints on overall AIP compensation for delivery expenses and agent compensation. The SRA also reduced the underwriting gain potential of the participating AIPs but also lowered the maximum possible level of underwriting loss. In general, incentivization should be viewed positively, and it can be argued that sales incentives have increased participation and that risk-sharing provides companies the incentive to pay claims accurately, thereby reducing the potential for program fraud, waste, and abuse. If the program is to be national in scope through private delivery, it is also important that the private sector be incentivized to provide delivery in all regions. A key issue going forward will be whether the government budget for a delivery system will provide adequate economic incentives for meaningful, nationwide private sector participation.

9) Can the current incentive structure be improved?

The U.S. crop insurance program is incentivized, in large part, by the use of producer subsidies, sales

commissions, and risk sharing, with the incentive structure based on an insurance delivery system model. To be clear, the premise here is on risk management on the part of the farmer, not farm income support. If income enhancement is the primary goal, crop insurance is not the best way to achieve direct income support. A check in the mail, like the lump-sum direct payment, or a negative income tax, are probably more efficient transfers.

Given an incentive-based insurance delivery system, and leaving aside optimal risk-sharing which was previously discussed, the two remaining key elements of the system are producer premium subsidy and A&O producer subsidy of delivery expenses. With respect to producers, how should the subsidy be optimized? Subsidy rates currently vary by plan and unit, decrease by coverage level, and range from 38% of premium to 100%. Subsidy levels remain a function of the premium rate and insured liability; high risk crops receive a higher nominal level of subsidy than low risk crops. Farm Bill proposals seek reductions in the producer subsidy schedule and one proposal specifically calls for the elimination of the producer subsidy for tobacco. Historically, the subsidy schedule has been motivated by the political desire for increased participation and coverage. The future subsidy schedule will likely be guided by the economic impacts of alternative structures and the public willingness to support producers.

A&O payments to AIPs are sometimes misconstrued or misrepresented as an industry subsidy or profit. We argue that A&O delivery payments are another component of farmer subsidy. With regard to the current A&O delivery expense subsidy, should it be re-evaluated in light of the impacts from the present SRA? Caps on payments to agents and the method of distributing A&O payments, which are sensitive to commodity price fluctuations, have created unintended consequences by blunting marketing incentives and arbitrarily reallocating payments across states. It may be time to seriously reconsider the traditional insurance "incentive structure" as we go forward, including alternative approaches.

10) Is crop insurance distortionary?

The incentive structure of crop insurance and the potential for distortionary effects are interrelated. Some literature indicates major farm programs in the past decade or two have had positive but not large effects on overall production and trade. Moreover, some recent literature indicates record-high commodity prices are the primary cause of recent acreage shifts, not subsidized crop insurance. While some impact can be expected from risk reduction and premium support, in aggregate, a program that covers most crops, where farmers pay part of the cost and may not get a payment, and has deductibles that average 20-25%, might not result in land-use distortions or effects as great as the farm programs it is replacing. No doubt economic research will continue to inform this issue on both aggregate and micro levels.

The Road Ahead

The 10 considerations presented here are by no means exhaustive or presented in depth. Rather, the point is to lay out concerns and issues facing the private and public sectors arising in the farm bill's development of the farm safety net and in program regulation.

It will be interesting to observe and participate in the direction of agricultural policy in light of the expected increasing prominence of crop insurance. The sway of the political pendulum will determine short-run directional shifts in policy. However, U.S. farm policy appears to be transitioning from direct income support to a risk-management-based system dependent upon both public and private sector participation. Perhaps noted historian Murray Benedict was on to something more than a half century ago when he wrote, "There are indications, however, that crop insurance is gradually emerging as one of the more settled features of American farm policy." (Benedict, 1953, p. 496). Yet, as we outlined above, key issues remain in play, and particularly the level and use of taxpayer funds in determining a proper balance between the roles of the public and private sector in agricultural risk management.

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Can We Do Better than Crop Insurance? The Case for Farmer Owned Crop Insurance Savings Accounts

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Keywords: Agriculture, Crop Insurance, Farm Bill, Fiscal Responsibility, Savings Accounts

For many decades, the federal government has recognized the extreme and uncontrollable revenue risks associated with agricultural production systems and the need to provide a financial safety net that keeps farmers afloat after catastrophic events and ensures a stable food supply. Beginning with a few select crops in the early 1980s, the U.S. crop insurance program has become a major tool to help producers deal with severe yield shortfalls due to natural disasters such as drought, flood, hail, pests, or extraordinary declines in agricultural commodity prices. In fact, it appears that the next farm bill will rely heavily on an expanded crop insurance program as the primary, and in many cases only, source of income support for U.S. farmers. While this expansion of crop insurance has strong supporters, there are others who argue the program alone may not provide an effective and equitable safety net for all agricultural producers.

In addition, the incremental cost to taxpayers is likely to be substantial. During 2003-2012, the government subsidized about 54% of the indemnities paid to farmers at a cost of $33.7 billion. In other words, the premiums collected from producers have only been enough to cover half of the program's claims. Furthermore, the government reimbursed nearly $12 billion on administrative and operation expenses to the private companies in charge of implementing the program. In 2012, the indemnity subsidy was over $13 billion.

Given the escalating costs of crop insurance to taxpayers and the lingering doubts of whether it can provide an effective and equitable safety net for all producers, the natural question emerges: Is there an alternative safety net scheme that could be broadly applicable at a lower cost to taxpayers? One possibility, which has been debated off and on during farm bill discussions since the mid-1990s, is a system based on individually owned savings accounts that would serve as a backstop in times of negative revenue shocks. This concept of farmer-owned crop insurance savings accounts (CISA) has recently been analyzed (Colson, Ramirez, and Fu, 2013). In this review, we discuss the shortcomings of the current crop insurance program and how a CISA-based alternative could potentially alleviate some of those problems and deliver a risk management tool for producers at a lower cost to taxpayers.

Crop Insurance Savings Accounts

The proposed CISA system is similar to programs already used in the United States and internationally for health and unemployment insurance, but is designed to mimic the current crop revenue insurance programs with which farmers are now so familiar. Under CISA, producers would be eligible to annually deposit a pre-determined percentage of their before-tax income in an interest-bearing personal savings account. Farmers could then withdraw money from the account when their revenue in a particular year falls below a pre-specified threshold. For example, akin to traditional crop insurance, if a producer's revenue is just 65% of his or her past five-year average and the pre-selected revenue guarantee was 75%, then he or she would be able to withdraw an indemnity equal to the 10% difference. If the farmer, at some point, does not have a sufficient CISA balance to cover a justified withdrawal, the required funds are lent to the account by the overseeing government agency at the same interest rate earned on savings.

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To prevent farmers from building up CISA reserves in excess of what is needed to cover even remote catastrophic losses, CISA balances would be capped at some maximum level. For example, the cap could be equal to the selected revenue guarantee—such as 75% of the farmer's past five-year revenue average—which would be sufficient to cover one year of total loss. The benefit of the cap feature is to limit the overall lifetime annual average contributions of producers who are subject to below-average revenue risks. As well, the system would require catch-up contributions for farmers who have a negative account balance. Such contributions would only be made in years when farm revenue exceeds the previous five-year average to avoid burdening producers who recently suffered losses. The benefit of the catch-up contributions is that they help to more rapidly replenish accounts that are in deficit and compel farmers who reveal to be subject to higher risk, on average, to contribute more than those who are not. Just as with Individual Retirement Accounts (IRAs), farmers who permanently cease operations with positive account balances would be able to withdraw their funds without penalty. For producers who have a negative terminal balance and thus still owe money to the overseeing agency, two alternative policy designs are possible, each with its own advantages and disadvantages. One possibility is that the government forgives the debt and suffers a loss on the unpaid funds. Alternatively, repayment could be required via an added tax on earnings, assets, or farmland when it is sold, leased, or transferred to heirs.

Criticism #1 of Crop Insurance - It May Cause Moral Hazard

An open question surrounding crop insurance is whether it leads to moral hazard. That is, farmers with insurance may take on added risks or fail to take costly actions to reduce risks such as adopting riskier crops, cultivation practices, or cropping patterns. As with all insurance products, moral hazard can lead to higher costs for insurers or, in the case of crop insurance, the taxpayer. The current crop insurance program has two features that should help mitigate moral hazard: (1) available insurance coverage levels are less than 100%, thus farmers must incur losses before making a claim, and (2) when producers suffer a loss, future premium rates increase. The proposed CISA system goes one step further in reducing potential moral hazard problems: if a farmer chooses to take on higher risks, he or she is risking his or her own money, not the insurer's money. By internalizing the full cost of risky choices, CISA may reduce distortionary effects on risk-taking activities. However, as with crop insurance, the CISA program could be subject to abuse through deceptive revenue reporting by farmers. Thus, just as with IRAs and 401(k)s, CISA would require monitoring by an overseeing agency and potential audits, a feature that would incur program costs and might not be popular with farmers.

Criticism #2 of Crop Insurance - It is Difficult to Determine Fair Farmer Premiums

Agricultural yields and prices are highly volatile and the correlation between historic and future outcomes is limited due to weather variability, unforeseen pest problems, frequent changes in technology, and unpredictably shifting commodity markets. As a consequence, it is difficult for both the insurer and the producer to accurately assess the level of risk associated with a particular farm operation. For example, yield insurance premium estimation errors of 40% to 60% might not be unlikely at the farm level (Ramirez, Carpio, and Rejesus, 2011).

Under CISA, the overseeing agency would establish revenue guarantee levels and associated periodical contribution rates with the objective that only a small fraction of producers potentially end their farming careers with a negative account balance. Once a reasonable set of rates is established, the design of the CISA system automatically adjusts individual farmers' required contributions based on their actual farm revenue realizations. For "riskier" farmers, the CISA system automatically adjusts the long-term average contributions to their accounts through the requirement of catch-up payments. Hence, if a farm reveals that it suffers losses of such frequency and severity that the regularly required annual contributions are insufficient, the catch-up provision kicks in and, in effect, raises the producer's required contribution. In the converse case, if a farm reveals through its revenue stream that, in fact, it is a low-risk operation, the CISA balance cap kicks in and, in effect, reduces the farmer's required contribution. However, it is important to note that if the overseeing agency were to mistakenly set CISA contribution rates substantially below what is required to achieve a low percentage of negative terminal account balances, many retiring farmers could face sizable negative residuals that would have to be settled. Furthermore, this potential for a small subset of producers to build significant negative account balances despite the catch-up contributions raises the thorny question of whether a loan limit should be implemented. This would further reduce any potential liability of the U.S. government, but might drive some growers into bankruptcy and put the program in a difficult light politically.

Criticism #3 of Crop Insurance - It Requires Massive Subsidies to Get Farmers to Buy It

It remains a fiscal dilemma that massive premium studies are still required to achieve high participation rates in the program. The relevant question is why must the government subsidize in excess of 50% of the annual premiums to get a large percentage of producers to purchase crop insurance? While the answer is inconclusive, there is evidence that farmers feel crop insurance premiums are too expensive and would not purchase it without substantial subsidies. If a producer only purchases coverage when he or she thinks that the premium quoted by the insurer is fair or better, substantial subsidies are needed to achieve high participation rates.

The proposed CISA system eliminates the need for annual premium subsidies to induce farmers to purchase a mispriced insurance plan. Given the tax-free nature of the CISA contributions—crop insurance payments may also be tax-deductible—and that farmers keep any positive balances upon retirement, they have a financial incentive to participate in the program. Compared to the alternative of no insurance, farmers could be better off by participating in CISA. Under CISA, however, producers must cover losses out of their account balance which can cause their total wealth to be more volatile than with crop insurance. Some farmers, particularly those with smaller operations, could prefer the certainty of crop insurance to the potentially higher terminal wealth but greater volatility of CISA. As well, beginning farmers who are not well-capitalized and are renting cropland may have cash-flow difficulties under CISA, particularly if they suffer major losses early in their farming careers. Additional support for them to build up CISA balances may be required at an additional expense to taxpayers.

Criticism #4 of Crop Insurance - It May Systematically Favor Certain Crops and Regions

An unresolved issue that has affected the U.S. crop insurance program for many years has been complaints from farmers, producer organizations, and legislators about the rating structure not being fair across crops, cropping systems, and geographical regions. Research has shown that the geographic and systematic differences in loss patterns observed are predictable to a degree, and there are significant aspects of the rating methodologies used historically that bring about those patterns (Woodard et al., 2012). As a result, there has been a lot of discontent about the program delivering substantial benefits to some participating producers while being ineffective in providing a safety net for others. This debate was exacerbated during the recent farm bill negotiations where direct payments where proposed to be replaced by expanding the role and breadth of crop insurance and commodity title risk management programs.

In its current form, crop insurance gives farmers the choice of coverage levels ranging from 50% to 85% of their recent historical averages, and the premiums corresponding to the lower coverage levels are more heavily subsidized than those for the higher levels. Nevertheless, while a low (60%) coverage level could provide plenty of net revenue risk protection for a particular cropping system, even the highest available coverage (85%) might not be enough to protect against what would be a severe financial loss in another one. In other words, a 40% gross revenue loss might not be unlikely and could be financially tolerable in one system, but a 15% decline could be rare and potentially devastating in another.

The proposed CISA would alleviate these "favoritism" complaints since there are no government subsidies involved (except implicit tax subsidies) and the money producers are paying into their accounts actually belongs to them. However, while the cap on account balances would help ameliorate this problem, there could be potential disparities in terms of the tax-free saving benefits growers receive. Furthermore, because different contribution rates and revenue guarantee schedules would still have to be set for the various cropping systems and areas, there is the potential that the percentage of farmers ending with a negative CISA balance could differ across regions. This would be more of an issue if the government were to forgive any negative terminal balances.

Criticism #5 of Crop Insurance - It is Perceived by Many Farmers to be Unfairly Expensive

Although the cost of crop insurance is a recurring complaint among farmers, due to the high level of subsidization it is unlikely many farmers are paying more than their actuarially fair premium. However, premium estimation inaccuracy does result in an unequal distribution of subsidies across participating producers. Under moderate levels of uncertainty about actuarially fair premiums, it is probable that a producer could receive more than twice as much premium payment support from the government as another "identical" operator (Colson, Ramirez, and Fu, 2013). For example, assume that the actuarially fair premium is $20/acre but the insurer estimates it at $14/acre for one and $26/acre for the other. At a 50% level of subsidization, these two farmers would be offered rates of $7/acre and $13/acre, respectively. Because of the high subsidization, both are likely to conclude that this is a good deal and participate in the program. However, although they have an identical risk profile, one would receive a subsidy that is nearly twice as high.

In short, even if crop insurance is conceived as an agricultural subsidy program, because of premium estimation inaccuracy, it is randomly, and, in some cases, systematically inequitable in the way it distributes the intended subsidies. Regardless of the merit of the criticism of crop insurance being too expensive for some, the proposed CISA system has a distinct advantage: farmers keep their own money. If it turns out the contribution is more than what was necessary to cover farm losses, then farmers actually benefit through the pre-tax nature and the interest earned on the CISA contributions.

CISA Advantages and Challenges

At first glance, it appears that the proposed CISA system could alleviate many of the commonly cited criticisms of crop insurance. In particular, CISA may be subject to less moral hazard and adverse selection problems and not require substantial external subsidies to induce broad participation. Also, because farm-level risk would not have to be accurately priced and sliding subsidy rates would not have to be set for increasing coverage levels, CISAs should be easier to generalize and apply to production systems for which designing widely appealing crop insurance programs has been a challenge. In addition, since there would be no major recurring subsidies involved, favoring certain crops and regions with higher subsidies would be less of an issue. Finally, because of the tax savings on the contributions, the individual ownership of the accounts, the interest earned on the balances, and the cap feature, producers should be less likely to complain if they feel they are over-contributing during a certain time period.

However, a number of challenges would need to be addressed in order to implement CISA. The program would still require setting contribution rates and revenue guarantee schedules for different cropping regions and systems, and a credible monitoring agency would need to be established. To assist beginning farmers who might suffer losses early in their careers, it may be necessary to help them build up some CISA reserves at the taxpayers' expense via subsidized loans. Furthermore, there are two potentially unpopular design issues: (1) how negative CISA balances would be dealt with once a farmer retires, and (2) whether a limit should be placed on the dollar amount of loans available to farmers. Also it is unknown how those who currently participate in crop insurance would view an alternative program that could increase the volatility of their total asset/liability base through time. Finally, there is a reasonable concern about whether there would be political will to avoid reverting to ad hoc disaster payments if many CISA balances turn substantially negative during an extended period of time.

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Farm Debt Use by Farms with Crop Insurance

Jennifer Ifft, Todd Kuethe, and Mitchell Morehart

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A potential economic impact of federal crop insurance (FCI) on the farm sector could be through its effect on debt financing. Debate over FCI covers many potential benefits and drawbacks of the program. Amongst many other arguments, proponents note that FCI could be addressing a market failure for crop insurance because private insurance markets alone would not provide the level of crop insurance demanded by farmers and that FCI helps producers manage risk in today's volatile commodity markets. Detractors note the high cost to taxpayers of subsidizing FCI premiums and potential distortions to planting decisions. Premium subsidies in 2012 were $6.96 billion.

The focus of this article is on the relationship between farm-level debt use and FCI participation. Farm debt levels and leverage have been increasingly covered in both the farm media and popular press. Parallels are often made between rising farm sector income over the last decade and the farm boom of the 1970s, which was followed by a severe downturn. The farm sector debt crisis in the 1980s led to many farm bankruptcies and bank failures, as well as broad changes to agricultural lending practices and the creation of Farmer Mac. Although farm sector debt has been increasing, it has been outpaced by growth in farm asset values, and the farm sector debt-to-asset ratio is currently at a historic low. Many of the current concerns about farm debt are related to concentration of debt or the risk of farm leverage increasing if farm income or farm asset values decline.

Federal Crop Insurance and Farm Policy

As U.S. farm sector income has risen over the last decade, the role of government programs has evolved. In this environment, FCI has been widely adopted and is now a risk management tool used by the majority of field crop producers in the United States, as well as some specialty crop and livestock producers. Based on the U.S. Department of Agriculture's (USDA) Risk Management Agency and the USDA's National Agricultural Statistics Service data, almost 84% of all corn acreage in the United States was enrolled in FCI in 2012, up from 74% in 2002 and 28% in 1992. Although premium subsidies do not represent total federal crop insurance expenditures, they are one proxy measure of the size of the program. We compare premium subsidies to nonconservation farm program payments, which include payments made under the direct payments, countercyclical payments, loan deficiency payments (LDPs), and disaster assistance programs, as well as payments for various other farm program payments paid directly to farmers within the calendar year, excluding conservation program payments. These nonconservation programs are generally designed to boost farm income, especially in years when income might otherwise sharply decline due to low crop yields or market prices dropping below the level set in legislation. In 2002, federal crop insurance premium subsides were $1.74 billion, as compared to nonconservation farm program payments of $10.45 billion. In 2012, federal crop insurance premium subsides had grown to $6.96 billion, which was nearly equal to total nonconservation farm program payments of about $7.15 billion that year.

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Strong commodity prices as well as rising production expenses have led to a decline in the relative importance of many nonconservation farm programs. For example, commodity-price-dependent farm programs, such as countercyclical payments and LDPs, provide less of a safety net in today's farm economy than when they were initially introduced because even a substantial drop in prices might not trigger payments and any potential payments would be relatively small in relation to current farm expenses, at least for most crops. Payments linked to market prices averaged about 22% of total farm program payments in the past decade but have been lower in recent years. Countercyclical payments and LDPs were less than 1% of farm program payments in 2012, and are expected to remain negligible in 2013, even under the assumption of lower prices driven by expected yields in 2013.

Many farm organizations, as well as the crop insurance industry, have lobbied to maintain or bolster FCI in proposed 2012 and 2013 farm bill legislation, while accepting the elimination of direct payments, which are not linked to current prices but are made based on historic production and prices set in legislation. In addition to the declining importance of nonconservation farm programs, this strong support for FCI may be in part related to the role it plays in access to credit. One traditional justification for farm programs, particularly direct payments, has been to facilitate access to credit (Westcott and Young, 2004). Because the amount and timing of direct payments were known to producers and lenders, they essentially served as a reliable income source to service debt. Direct payments have remained relatively steady and, similar to payments linked to commodity prices, are much smaller relative to revenues and expenses for most eligible crops than a decade ago.

How Federal Crop Insurance Impacts Debt Financing

As a predominant risk management tool, FCI may lead to increased use of debt financing. Debt financing can increase financial risk, but can also increase returns. Agricultural lenders protect themselves from credit default risk through a variety of measures. Some level of collateral is usually required for most farm loans and could be used to make loan payments if income levels are lower than expected. Hence, farms with a high value of assets relative to debts would be considered more creditworthy. FCI participation lowers revenue risk and might allow lenders to accept loan applications with lower collateral or for operations that are more leveraged. FCI can also increase expected revenue through premium subsides.

Lenders might require producers with higher debt levels to purchase FCI in order to obtain a loan or increase their line of credit. This relationship could also be driven by producer response to FCI availability. An increase in debt levels in response to FCI availability would be consistent with risk balancing theory (Featherstone et al., 1988). Policies that increase farm income or decrease the variability of farm income could induce farm operators to increase leverage. If a farm is operating at an optimal level of risk, a decline in business risk due to policies could make additional leverage (financial risk) acceptable. In other words, the operator "balances" reductions in business risk with an increase in financial risk. With this increase in financial risk, such policies might ultimately *not* decrease the total risk in the farm sector.

FCI Participation, Debt Use and Financial Risk

Debt levels between farms with and without FCI coverage can be compared using data from the USDA Agricultural Resource Management Survey (ARMS), which is the only nationally representative farm survey that collects data on farm financial characteristics and crop insurance participation. FCI participation is determined by whether or not a farm had some acres enrolled in FCI in 2011. We consider only farm businesses, or farm operations with sales of over $250,000 or smaller operations where farming is reported as the primary farm operator's principal occupation. Farms with significant sources of nonagricultural income and wealth might not face the same lending constraints.

In 2011, approximately 228,000 farm businesses specialized in field crop production including wheat, corn, soybeans, sorghum, rice, tobacco, cotton, peanuts, other cash grains, and oilseeds. Although FCI does cover many specialty crops and livestock (through pasture and margin insurance programs), coverage is more widespread among farms that specialize in field crops and so we limit our analysis to this subset of farms. As there may be large scale effects in both FCI participation and use of debt, we consider three acreage classes for field crop farm businesses: small, medium, and large acreage classes, which, respectively, have cropland acres less than 500; from 500 to 1500; and greater than 1,500.

Participation in FCI does vary by farm size, with larger farms more likely to participate. Further, most debt is held by farms with FCI coverage. As illustrated in Figure 1, approximately 62% of small acreage field crop farm businesses participated in FCI in 2011, 85% of medium acreage farms, and 92% of large acreage farms. About $54.4 billion of debt was held by farm businesses that specialized in field crops in 2011, and 88% of this debt was held by farm businesses that participated in FCI. For small acreage farms, $5.6 billion of debt was held by farms that participated in FCI, or about 79% of all debt held by the acreage class. For medium acreage

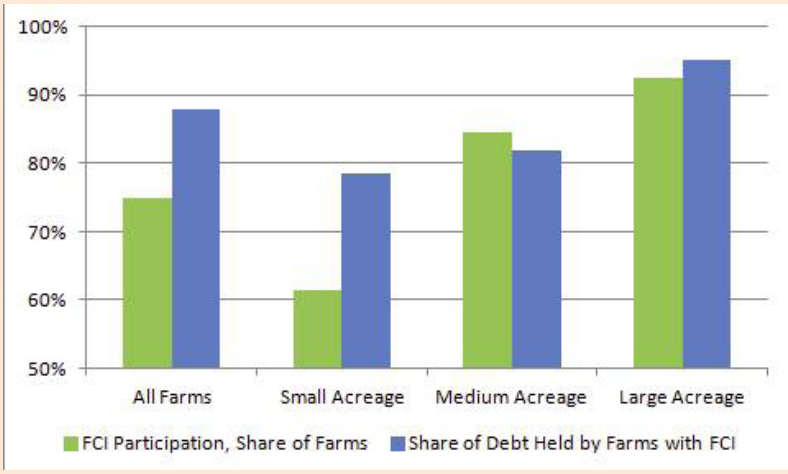
farms, $16.7 billion of debt was held by farms that participated in FCI, or about 82% of all debt held by the acreage class. For large acreage farms, $25.6 billion was held by farms that participated in FCI, or about 95% of all debt held by the acreage class. Regardless of farm size, farms that participated in FCI accounted for a larger share of debt than farms that did not participate.

Farms that purchased FCI are more leveraged. Debt to asset ratios by acreage class and FCI participation status are reported in Figure 2. Debt-to-asset ratios are statistically different and higher for all farm businesses, as well as small and large acreage class farms. However, debt-to-asset ratios are *not* statistically different for medium acreage farms. These relationships generally hold when we look separately at debt-to-asset ratios for (noncurrent) real estate debt only and non-real estate debt only. This relationship is consistent with risk balancing behavior, as well as lenders encouraging farms with higher leverage to participate in FCI. However, lenders may consider several factors beyond leverage in making credit decisions.

We find that farms with FCI participation have a higher default risk, using a comprehensive measure of the probability of default (Brewer et al., 2012). The estimate of default risk that we use is similar to a credit score in that it takes into account several measures of farm financial status, including debt coverage measures, owner equity ratios, working capital, current ratio, and others. As shown in Figure 3, about 78% of farm businesses that do not participate in FCI had a less than 1% probability of default (the <0.5% and 0.5-1% categories), compared to 64% of farm business that participated in FCI. The average probability of default for farms without FCI coverage was 1.9%, compared to 2.2% for farms with FCI coverage, and these estimates are statistically different.

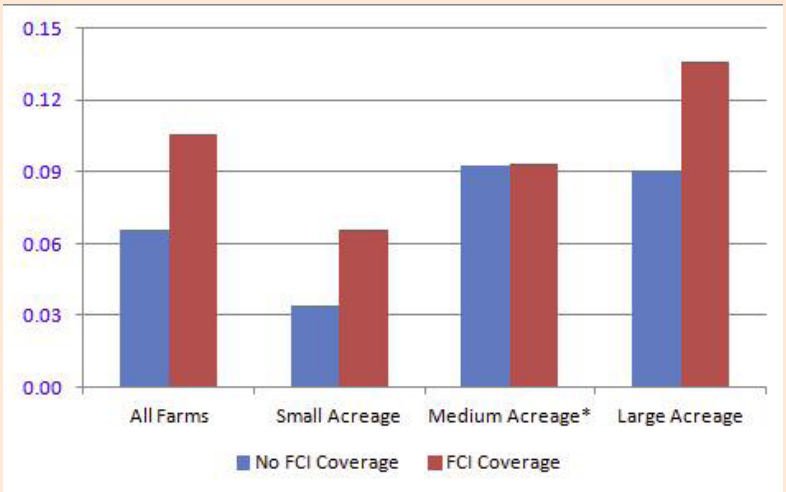
While FCI could also be lowering the cost of credit through lowering default risk, the relationship between interest rates reported in ARMS and FCI participation is ambiguous. This finding is consistent with the higher financial risk of farms with FCI, which would have an upward effect on interest rates. For short-term loans, non-real estate loans, and real estate loans, only real estate loan interest rates were significantly different for field crop farm businesses by FCI participation status (5.6% for farms without FCI vs. 5.2% for farms with FCI). When we compared interest rates by acreage classes for different types of loans, they were generally not statistically different by FCI participation status.

Figure 1: Field Crop Farm Business and Federal Crop Insurance Participation



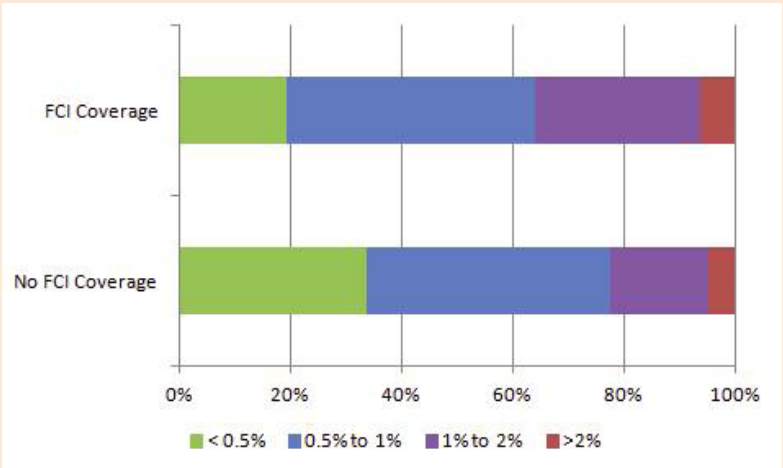
Source: USDA Agricultural Resource Management Survey (2011)

Figure 2: Debt-to-Asset Ratios for Field Crop Farm Businesses, by Acreage Class and Federal Crop Insurance Participation



Note: * Debt-to-asset ratios for farms with and without FCI coverage are not statistically different for this acreage class
Source: USDA Agricultural Resources Management Survey

Figure 3: Probability of Credit Default for Field Crop Farm Businesses, 2011



Souce: USDA Agricultural Resource Management Survey (2011)

Other Potential Effects

FCI participation has both direct and indirect impacts on farm wealth and investment, which could affect use of credit. To the degree that FCI participation creates value for farm operations, that value could be capitalized into farmland values, increasing owner equity and collateral, and potentially impacting debt use. Through altering the expected returns and risks of different production choices, FCI participation could also lead to new investments that affect overall farm production decisions and structure, such as increasing concentration in production. Further, farms that purchase FCI might be able to have low cash reserves or savings and make additional investments. Farm operations that are more specialized or efficient might be considered more creditworthy and increase use of debt financing. Alternatively, if farmers prefer equity financing, these changes could lead to lower use of debt financing.

The potential sector-wide impacts of a linkage between farm debt use and FCI are important to recognize. If FCI participation does increase debt use, there could be positive or negative consequences for the farm sector. An example of a positive consequence would be that farm sector profitability increases through relaxed credit constraints or, in other words, increasing use of debt by creditworthy producers that otherwise would not have had access to credit. In 2005, about 30% of U.S. farms reported some issues with access to credit (Briggeman, Towe, and Morehart, 2009), although more recently bankers have reported low loan demand. An example of a negative consequence would be that some producers take on higher levels of debt than they would have without FCI availability and debt repayment difficulties potentially increase farm bankruptcies.

Going Forward

Financing decisions and FCI participation decisions are related, as FCI participants have higher levels of financial risk. Yet, several questions remain. Has FCI availability caused producers to take higher levels of debt, or do farms that want to take on higher levels of debt or access a higher line of credit purchase FCI based on lender preferences? Both effects may be influencing our findings. Impacts of FCI participation may differ across loan types as well. Production loans are of particular interest, as farm production expenses have more than doubled over the past decade. If credit market imperfections exist and crop insurance addresses these issues, the FCI program could be creating considerable value for the farm sector. Likewise, FCI could be supporting financial positions that are riskier than they would have been otherwise, and thus not lead to a reduction in the total risk faced by the farm sector.

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Deductibles vs. Coinsurance in Shallow-Loss Crop Insurance

Thomas W. Sproul, David Zilberman, and Joseph C. Cooper

JEL Classifications: Q14, Q18
Keywords: Crop Insurance, Farm Bill, Risk Premium, Shallow-Loss

Since the advent of the Supplemental Revenue Assistance Program (SURE) as a free supplement to crop insurance in the 2008 Farm Bill, shallow-loss policies—insurance that covers only the very top segment of losses—have become an area of increasing focus in the farm safety net. These policies provide coverage for smaller revenue losses in the range where revenues remain higher than the guarantee provided by crop revenue insurance, and are more politically palatable than direct payments in times of record-high farm revenues. While SURE is history, debate continues in Congress over a range of policy alternatives including deductible and coinsurance-style revenue insurance, area coverage, whole farm vs. single crop, and even price supports, all of which are heavily subsidized (Shields and Schnepf, 2013).

With so many alternative insurance policies proposed for the new farm safety net, it is easy to assume that the exact risk-management features of each policy should drive the discussion. This is not the case. If it were, we would expect to see both differences in administrative costs of adjusting claims (the loss adjustment costs of an insurer) and a willingness by farmers to accept higher insurance premiums for better risk management (a risk premium), each of which could potentially be passed on as savings to taxpayers. However, using the deductible versus coinsurance choice as a motivating example, we find that both risk premiums and changes in loss adjustment costs are economically insignificant across a broad range of shallow-loss policies, crops, and counties, relative to differences in the expected value of claims payments. This result is driven largely by the nature of shallow-loss policies, which act on smaller, more frequent claims around the peak of the revenue distribution. Our research suggests that policy specifics can be ignored if they do not materially affect the level of claims payments, and policy makers should focus almost exclusively on the expected cost of proposed shallow-loss programs.

Description of Insurance Terms:

Shallow loss—A small farm revenue loss, too small to be covered under traditional crop insurance.

Deductible—An insurance policy feature which acts as a loss limit; the insurer generally pays all losses beyond the deductible.

Coinsurance—An insurance policy feature where the policyholder pays a percentage of every loss; can be combined with a deductible or administered separately.

Risk Premium—A dollar value for better risk management, when comparing two insurance policies with the same average value of claims payments.

Loss Adjustment Expenses—Also known as loss adjustment costs or claims adjusting costs; the administrative costs an insurer incurs in the process of adjusting claims.

Deductibles vs. Coinsurance

The choice of deductible versus coinsurance policy leads to changes in both risk characteristics and claims adjusting costs, even when expected claims payments are held constant. A risk-averse decision maker will strictly prefer deductible insurance to coinsurance when the two policies have the same expected value of payments and the same premium. Figure 1 compares the cumulative distribution of revenues under deductible insurance and a coinsurance of the same fair value; since the outcomes under coinsurance are more spread out to the downside, the coinsurance policy exposes the policyholder to additional risk relative

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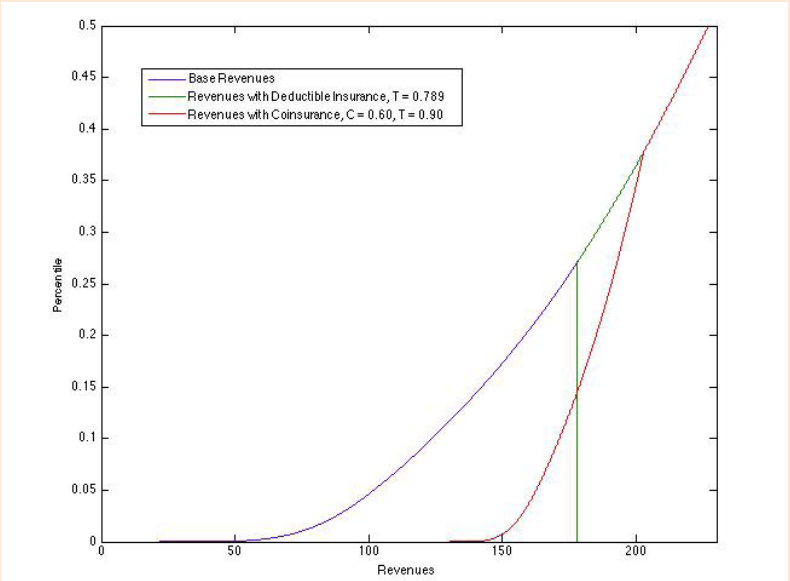
Figure 1: Effect of Deductible and Coinsurance on the Cumulative Distribution of Revenues



to a deductible. The risk premium is then defined as the amount of higher expected value, in terms of claims payments, that the coinsurance policy must provide to attain indifference between the two policies. This comparison applies to shallow-loss crop insurance policies as well, which are generally written "stacked" on top of an underlying deductible coverage.

For example, consider a farmer who takes the standard crop insurance with a guarantee of 80% of mean revenue per acre. This arrangement would provide dollar-for-dollar payments for losses below the 80% threshold. If we choose a shallow-loss insurance policy identical to the original SURE policy, but ignoring the disaster component, we would have a coinsurance policy with a shallow-loss coverage threshold at 90% of mean revenue, and with a 60% reimbursement rate. In the insurance literature, this policy would be identified as carrying 40% coinsurance, which is the insured party's share of the loss. The policy would pay 60 cents for every dollar of losses below the 90% threshold, down to the 80% threshold where the standard crop insurance kicks in. In contrast, the farmer may view a shallow-loss deductible policy with an 86% threshold as equally appealing, or *indifferent*. The deductible policy pays dollar-for-dollar losses below 86% of mean revenue, effectively just increasing the crop insurance guarantee. The indifferent deductible threshold will always be lower than the coinsurance threshold, but its exact level will depend on the farmer's risk aversion. For winter wheat farmers with moderate risk aversion in Hyde County, S.D., we estimate that the expected value of claims payments is $17.23 per acre under the coinsurance program above, but only $17.22 under the indifferent deductible program with an 86% threshold, so the risk premium is $0.01 per acre.

The deductible versus coinsurance choice also affects the size and frequency of claims, which may affect the administrative costs associated with claims payments. When comparing insurance policies of equal expected value, the coinsurance guarantee must be higher than the deductible guarantee, so switching from deductible to coinsurance will lead to more frequent claims of smaller sizes. A well-known model for claims adjustment costs (Raviv, 1979) includes a fixed cost per claim, a variable cost based on the size of the claims payment, and, possibly, returns to scale, whereby each additional claim becomes cheaper to adjust because of efficiencies in an organization dedicated to adjusting claims. Thus, whether the change from deductible to coinsurance will lead to higher loss adjustment costs depends on the exact cost structure of the insurer.

Estimating the Distribution of Revenues Per Acre

To evaluate these trade-offs, we started by estimating probability distributions of per acre revenues for representative farmers of various crops in a number of U.S. counties. County-level and national-level yield data are drawn from the National Agricultural Statistical Service (NASS) for the period 1975-2011, with expected and realized prices taken from grain futures prices, according to USDA Risk Management Agency (RMA) definitions. We used statistical methods to estimate the joint distribution of yields and prices at the county level, following Cooper, Delbecq, and Davis (2012), and to forecast that distribution for the 2012 crop year, just following the final year of the dataset. A sample of our estimated revenue distribution for winter wheat in Hyde County, S.D., is shown in Figure 2.

Risk Premiums

To calculate risk premiums, we identified the deductible guarantee that makes a representative farmer indifferent to exchanging this deductible plan for the coinsurance parameters of SURE. The indifferent guarantee results from the level of risk aversion assigned to the farmer, for which we examined a range of levels following Babcock, Choi, and Feinerman (1993). We found that the indifferent deductible guarantee was quite stable, often varying by less than 0.1%

Figure 2: Kernel Density of the Empirical Revenue Distribution for Winter Wheat, Hyde County, S.D.

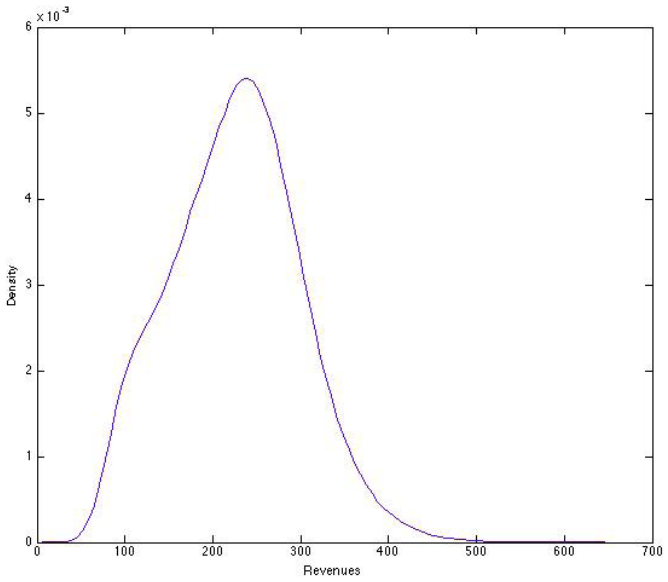


Table 1: Means, Standard Deviations, and Maximum Risk Premiums Estimated, Select Counties and Crops

County	Crop	Mean	Std. Dev.	Max Risk Premium
DeKalb, IL	Corn	$974.44	$304.25	$0.19
McLean, IL	Corn	$1,009.80	$202.87	$0.17
Howard, NE	Corn	$905.61	$449.42	$0.13
Beadle, SD	Corn	$619.02	$319.81	$0.06
Montgomery, MS	Cotton	$942.76	$512.72	$0.13
Hoke, NC	Cotton	$850.92	$364.65	$0.12
Howard, TX	Cotton	$373.59	$373.89	$0.01
Logan, IL	Soy	$697.53	$198.33	$0.11
Sumner, KS	Soy	$395.42	$306.86	$0.02
Sanilac, MI	Soy	$570.16	$256.83	$0.06
Logan, KY	Winter Wheat	$470.77	$248.70	$0.04
Marion, OH	Winter Wheat	$449.92	$165.73	$0.04
Hyde, SD	Winter Wheat	$225.34	$74.48	$0.03

of mean revenues across most of the range of risk aversion coefficients when baseline coverage was 70% or above, and by less than 0.2% at extreme levels of risk aversion.

Estimated risk premiums were stable as well, and small. For nearly all combinations of crop, county, underlying coverage, and risk aversion, risk premiums were estimated to be less than $0.15 per acre and, in many cases, were less than $0.05 per acre. These values are economically insignificant when compared to insurance policies with fair values ranging from $10 up to $100+ per acre in some high-revenue corn counties. The maximum risk premium estimated was $0.19 per acre for DeKalb, IL, where per acre revenues were $974.44 and the 90/60 coinsurance policy had a fair value of $48.31. Table 1 shows estimated means and standard deviations of revenues for select crops/counties, and the highest risk-premium estimated. The highest risk premiums were observed when risk aversion was sufficient to turn down a $100 gamble with 3:1 odds of winning.

Loss Adjustment Expenses

We obtained crop insurance performance data from the RMA Summary of Business for years 1995-2010. These data included premiums, indemnities, and number of units with claims by crop, county, coverage level, and year for all U.S. counties. We also obtained a crop insurance industry report—the 2011 Grant-Thornton Report—which uses a survey of U.S. crop insurers to estimate loss adjustment expenses as a percentage of gross premiums (also for 1995-2010). Loss adjustment expenses were only available on a national aggregate basis, so we aggregated the RMA data and combined the two into a simple regression model estimating the structure of loss adjustment costs, as described above.

We estimated per-claim fixed costs of $132.41, variable costs of 4.39% of indemnity payments, and returns to scale of 0.025 cents per claim, on a national scale. Given estimated distributions of per-acre revenues, these results can be used to estimate expected savings (or costs) from switching between deductible and coinsurance shallow-loss coverage. Variable costs will be identical for two policies with

the same fair value, so comparing deductibles versus coinsurance means assessing fixed costs saved against lost economies of scale. Using our data for wheat in Hyde County, S.D., we estimate that moving from our sample—SURE-style coinsurance policy—to a deductible policy of equal fair value should result in higher claims costs, on average, of about $0.002 per acre per year.

As with the risk premium differences estimated above, these values are economically insignificant, even when extended to policies with different expected values of claims payments. If we consider an 89% shallow-loss deductible guarantee with base coverage at 80%, it has an expected value of $2.11 per acre higher than our sample 90/60 coinsurance policy. In this scenario, the higher expected value of payments will lead to higher variable loss adjustment costs, averaging $0.033 per acre. So, while variable costs are likely their largest component, any changes in loss adjustment costs are likely to be dwarfed by increases in expected claims payments.

What Next?

As we witness the continued transition of the farm safety net away from direct payments and towards subsidized insurance-style products like shallow-loss policies, it is important to remember that risk management may not be the primary concern driving these innovations. This article has presented evidence that farmers are not likely to care about the exact risk management characteristics of shallow-loss crop insurance, and that efficiency gains from saved loss adjustment expenses are not likely to arise from subtle differences between policies.

We do not, however, address distributional issues of which constituencies are the primary recipients of subsidies, a complicated political reality. Smith, Babcock, and Goodwin (2012) explain how the Senate version of the Farm Bill favors corn, wheat, and soybean producers, but the House version favors rice, peanut, and cotton producers. They also point out that both bills' programs are tied to the amount of land farmed, meaning that the bulk of farmer subsidies go to the largest farms. Given the heavy crop insurance subsidies to farmers, it is not clear whether risk premiums would ever actually be passed on as savings to taxpayers. Beyond the financial benefits to farmers themselves, Smith, Babcock, and Goodwin (2012) estimate $3 billion per year in subsidies to crop insurance companies, which begs the similar question of whether taxpayers would ever see savings in loss adjustment costs. These issues clearly need to be addressed—as does the decision behind large taxpayer subsidies in general—but these discussions are far beyond the scope of this article. Nonetheless, assuming distributional considerations are managed appropriately, shallow-loss policies can be judged almost exclusively on the expected value of claims and subsidy payments.

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How Will the Farm Bill's Supplemental Revenue Programs Affect Crop Insurance?

Keith Collins and Harun Bulut

JEL Classifications: Q12, Q18
Keywords: Agricultural Policy, Crop Insurance, Farm Programs, Supplemental Revenue Programs, 2013 Farm Bill

The U.S. Senate and the U.S. House of Representatives Committee on Agriculture each reported out farm bills during 2012. Final action was not completed, and the 2012 Farm Bill was extended through September 2013. In early 2013, the Senate and House each passed a farm bill, but the resolution of the differing bills remains uncertain. Both bills include new farm and crop insurance programs designed to supplement current crop insurance by providing protection from small revenue losses. This article examines how these programs may perform and their consequences for the demand for crop insurance.

Supplemental Revenue Farm Programs

The Senate and House farm bills eliminate the Average Crop Revenue Election Program (ACRE), Supplemental Revenue Assistance Program (SURE), Counter-cyclical Payment Program, and Direct Payment Program. Instead, the Senate bill gives a producer of program crops, excluding cotton, the choice between (1) the Agriculture Risk Coverage (ARC) program based on a county's revenue loss or on an individual farm's revenue loss, and (2) the Adverse Market Payments (AMP) program, which makes a payment when market prices are below 55% of historical farm prices. ARC covers "shallow losses" between 12% and 22% of the historical or "benchmark" revenue on a portion of the producer's acreage.

The House bill gives program crop producers, excluding cotton, a choice of (1) Revenue Loss Coverage (RLC), or (2) Price Loss Coverage (PLC). RLC covers losses on 15% to 25% of a county's benchmark revenue, which is based on historical yields and the higher of a fixed reference price or historical farm prices, and is paid on part of the producer's acreage. PLC pays when farm prices during the first five months of the crop year are below the reference price.

Supplemental Revenue Crop Insurance Programs

In addition to the supplemental revenue farm programs, to be delivered by the U.S. Department of Agriculture's (USDA) Farm Service Agency, both bills provide new crop insurance programs, to be delivered by the crop insurance companies, to supplement existing crop insurance. The Stacked Income Protection (STAX) program is only for upland cotton and the Supplemental Coverage Option (SCO) would be for all insured crops. Both STAX and SCO protect against a shortfall in county revenue, use crop insurance prices, cover the crop insurance deductible, and require the producer to pay a premium, unlike the farm program choices. Premiums for STAX are subsidized at an 80% rate and for SCO, 65%. STAX coverage can vary from 70% to 90% of expected county revenue, may be purchased alone or with an underlying crop insurance policy, but cannot overlap with crop insurance. Similarly, SCO cannot overlap crop insurance, so its coverage ranges from the underlying policy's coverage up to 90% of expected county revenue. SCO has a deductible of 22% if the producer is in ARC and 10% otherwise. A producer in RLC may not purchase SCO.

The New Programs: Complements or Substitutes for Crop Insurance?

Crop insurance currently permits a producer to protect from 50% to 85% of the individual farm's expected yield

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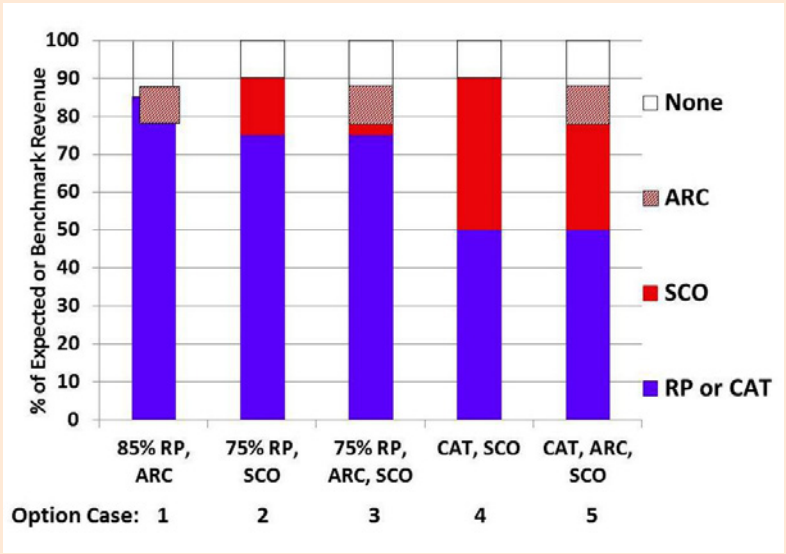
or revenue for major crops, or from 65% to 90% of expected county yield or revenue in some counties. The two farm bills' revenue programs provide farmers with a host of new and complex risk management choices. A producer's choices could include a plan of crop insurance, such as individual or county revenue or yield plans; a crop insurance level of coverage; a farm program supplemental plan; and a crop insurance supplemental plan. Consider the Senate bill. A producer selecting individual crop insurance could choose among three major plans of insurance, eight coverage levels for each, four supplemental program options—none, ARC county coverage, ARC individual coverage, or AMP—and three SCO choices—none, 10% deductible, and 22% deductible if ARC is chosen—for a total of 192 possible options.

Figure 1 illustrates some of the trade-offs inherent in these options by using the Senate bill. Case 1 shows a producer selecting the current Revenue Protection (RP), or the RP plan of crop insurance, at 85% coverage along with the ARC program. ARC, either individual (ARCI) or county (ARCC) option, covers 78% to 88% of historical revenue and there is no coverage on 12% of revenue. ARC coverage is shown as offset to indicate that the RP and ARC coverage bands can overlap, but indemnities and ARC payments are not deducted from one another, so there is a potential redundancy in coverage. Case 2 shows the producer with 75% RP coverage, opting out of ARC but purchasing SCO with its 10% deductible, which cannot overlap with RP. Case 3 shows the producer with 75% RP along with ARC and SCO. The deductible on SCO is now 22%, which is required if ARC is elected, in order to avoid an overlap of SCO and ARC. If the producer did not buy SCO, there would be a coverage gap for the 75% to 78% band, which is assumed to be filled by the purchase of SCO. Case 4 shows a producer electing minimal Catastrophic Coverage, known as CAT, which protects 50% of expected yield at 55% of the expected price, along with SCO. SCO covers 50% to 90% of expected county yield. Case 5 shows the CAT participant electing ARC and filling the rest of the coverage gap with 22% deductible SCO.

These examples raise the issue of whether producers will use the new supplemental programs to replace part of their existing crop insurance protection or add to it. We started out expecting that ARC and RLC, which are free and have coverage bands similar to the upper range of crop insurance, would cause farmers to reduce crop insurance coverage at high coverage levels. Previous work (Bulut, Collins, and Zacharias, 2012) showed that in the absence of restrictions on coverage, a producer would replace a portion of fairly priced individual crop insurance with an underpriced area plan, with the extent depending on the correlation between farm and area yields. However, even though the program options are free, there are factors that reduce their potential substitution with crop insurance: the farm program options cover different prices than crop insurance, area plans are a limited substitute for the risk protection of individual insurance plans due to yield basis risk, the farm program option payments and crop insurance indemnities are not offset against one another, and the Senate version is subject to payment limits, while crop insurance is not.

The crop insurance supplemental options, SCO and STAX, also cover the upper ranges that crop insurance covers, have high premium subsidies, have no payment limits, but cannot overlap crop insurance, suggesting they may displace crop insurance. Both are area plans which have yield basis risk, which may limit buy down. The higher deductible on SCO required if a producer participates in the Senate's ARC may cause some producers to skip that farm program option and opt for the lower deductible SCO policy.

Figure 1: Example Coverage Bands for RP, CAT, ARC & SCO



Simulating a Producer's Choice among Program Options

Several studies have examined producer appeal for supplemental revenue programs based on expected payments from these programs. In order to delve into producer behavior,

we look more closely at the interaction effects by valuing and ranking a representative farmer's choice among farm bill and crop insurance options using the farmer's Certainty Equivalent, or CE, measure of wealth. CE is the minimum amount of money a farmer is willing to accept to be indifferent between undertaking farming revenue risk with a farm policy option and not taking the farming revenue risk and keeping the money instead. The farmer's CE value for an option is computed as net of the CE value without the option, which emphasizes the option's contribution to the CE over and above that when there is no government support.

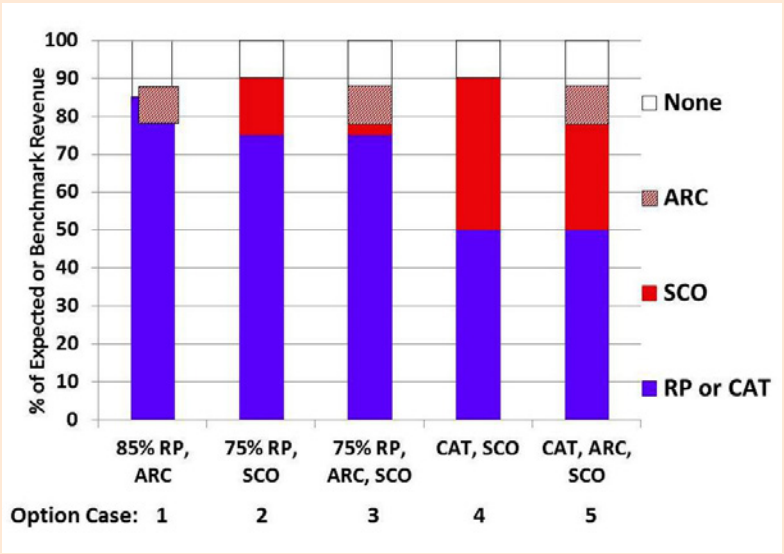
We simulate a corn producer's decisions with the use of a standard economic model of financial well-being. For each possible crop insurance and farm program option a farmer may choose, crop insurance indemnities and farm program payments are computed using 10,000 simulated observations of yields and prices. Then the producer's CE values for each option are determined and ranked. A paper providing the model; simulation methods; results, including other counties, crops, and scenarios with alternative farm characteristics; and a discussion of previous literature's findings is available on request from the authors.

Figure 2 illustrates some key simulated outcomes using the case for a corn producer with $50,000 initial income, operating on 100 acres in Champaign County, Ill., for 2013. This base case uses standard assumptions about farmer risk aversion and examines the provisions and subsidy rates as specified in the 2012 versions of the House and Senate farm bills, with a base insurance price of $5.68 per bu., and a farm expected yield equal to the county expected yield.

So What May a Farmer Do?

Figure 2 shows the producer's valuation of participating in farm bill options in terms of the CE of wealth in dollars per acre, net of the CE of wealth under no government support. The CE is shown at high coverage levels for RP alone, the most popular current revenue plan of insurance for corn producers, and for RP in combination with the farm bill supplemental revenue options. ARC is not shown with SCO, because SCO coverage is not available with ARC when the producer buys crop insurance at 80% and 85% coverage because of SCO's high deductible. AMP was not modeled, as it was just recently introduced; moreover, its reference prices—which are very low relative to prices used in ARC, RLC and PLC—mean it is likely a less attractive participation option.

Figure 2: Producer's Value of Farm Bill Options (Certainty Equivalent Net of its Value under No Government Support)



The simulated data suggest a series of conclusions:

- Indemnities paid under current crop insurance are generally much higher on average than indemnities or payments for the supplemental programs. However, SCO has the highest frequency of a payment of any option—41% of the simulations—reflecting its high, upper end of coverage of 90%. ARC, RLC and PLC all make modest average payments and trigger payments less frequently than SCO, reflecting their use of historical revenue or reference prices that are low relative to the expected 2013 corn price. Of course, lower market prices in future years would increase the preference for these options. As expected, individual ARC triggers payments more frequently than county ARC, 28% of the time compared with 21%, and both trigger more often than the House county plan, RLC, which has a lower upper bound on coverage than ARC and pays 18% of the time. PLC rarely triggers a payment, only about 4% of the time.
- In the absence of the new farm bill programs, a producer values RP at 85% coverage above other individual crop insurance choices and area plans. The preference for high crop insurance coverage is generally consistent with observed behavior of Illinois corn producers who had 50% of insured acres and 60% of total premium enrolled in RP at 80% and 85% coverage levels in 2012. Other scenarios show exceptions to this finding, such

as when farm and area yields are very highly correlated, the farmer is risk-neutral, or the farm has a very low yield relative to the area yield.

- Offering the crop insurance supplemental option, SCO, changes the producer's preference for crop insurance. With SCO, the producer values RP with 80% coverage more than at 85% coverage. Other scenarios not reported here indicate that if a producer is initially in an existing county crop insurance plan, the producer would prefer to switch to an individual plan, such as RP, in combination with SCO. For example, a risk neutral farmer initially prefers a crop insurance county plan at 90% coverage. But with the farm bill options, the producer achieves greater value with RP at 75% along with SCO and PLC. The upshot is that SCO is likely to substitute for individual crop insurance coverage at high coverage levels, resulting in reduced individual coverage levels, and causing a shift from crop insurance county plans to individual plans at lower coverage levels.
- Unlike the crop insurance supplemental programs, offering the farm program supplemental revenue options does not change the producer's preference for RP coverage levels. The producer values 85% RP coverage with each supplemental revenue farm program more than with lower levels of RP coverage. The Senate's ARC plans are valued more than the House's RLC plan. In some scenarios, the farmer's highest valuation was RP at 85% coverage but with the ARC individual plan, while in others it was RP at 80% with SCO and the House's PLC. For coverage less than 85%, the producer maximizes value across all options by choosing RP at 80% coverage with SCO and PLC.

These results both address and raise a number of policy issues. A basic question is whether the new supplemental programs reduce risk and add much value for producers. The results indicate the farm program supplemental options ARC and RLC appreciably add value for the farmer when combined with crop insurance. PLC provides only a modest benefit. However, an underlying crop insurance policy combined with SCO alone provides a higher farm value than crop insurance combined with the other options over almost all coverage levels (with the exception of 85% coverage in certain scenarios when underlying crop insurance is combined with ARC). This raises the issue of whether all these options are needed. Proponents of the farm program options argue that a county-based insurance product such as SCO does not provide the multiyear price protection that the farm program options provide.

Another issue is whether supplemental revenue programs' high subsidies and overlap with crop insurance would undermine the risk protection that can be provided by crop insurance coverage. The producer examined here who participates in farm program supplemental revenue options would increase expected income at no cost and continue to manage risk with crop insurance, as if the supplemental program was not available. However, when buying crop insurance supplemental revenue protection, the producer is likely to substitute that new area plan for higher coverage of individual crop insurance. This choice would expose a farmer to greater tail risk—lower income in the event of low probability events—than under full crop insurance coverage with an individual plan. In catastrophic years, a producer may incur large revenue losses which may cause disaffection for crop insurance and result in calls for additional disaster assistance. Alternatively, the results show a likely shift out of the current county crop insurance plans and into an individual plan coupled with the supplemental crop insurance option SCO. However, this shift is limited by the small number of producers in the Midwest who currently use county plans. For crop insurance companies, their sales efforts would be complicated by many more farmer choices; reduced sales of high coverage levels on individual policies; reduced sales of current county plans; but increased sales of both supplemental county policies and low-coverage individual policies, as buyers of current area plans shift to the new supplemental plan in combination with individual coverage.

Finally, there is the issue of taxpayer cost. The new farm program supplemental options are more costly than the 2008 Farm Bill's supplemental programs, ACRE and SURE, although these costs are more than offset by the elimination of Direct Payments. Similarly, the crop insurance supplemental options increase projected spending of crop insurance (Chite, 2013). While the farm bills' new choices would provide producers with greater income protection, and some also provide multiyear risk protection, the overlap and substitution potential with crop insurance, as well as program costs, are issues that are likely to garner continued scrutiny, if these or similar options are enacted.

For More Information

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