

Crop insurance without subsidies: market-based alternatives to perverse government programs

Agricultural Risk Management or Income Enhancement?

By Jerry R. Skees

Crop insurance reform is once again on the agenda of agricultural policymakers. Some members of Congress want to add at least \$1 billion in subsidies to a program that is currently budgeted at approximately \$1.7 billion annually. Others want to introduce subsidized livestock insurance for the first time ever. The President is also on record calling for crop insurance reform in his 1999 State of the Union address. Everyone is talking about shoring up the safety net with more subsidized insurance.

For at least the past 20 years, every secretary of agriculture has had crop insurance reform as a major agenda item. However, risk management took on new significance after the 1996 Farm Bill. The 1996 legislation was designed to end government price supports tied to product decisions in agriculture markets over a six-year period through a program of declining transition payments fixed in law. Farmers' cropping decisions would no longer be influenced by government payments. As a result, farmers would need to learn to manage their own risk. The "old game" of protecting subsidies that were tied to price movements appeared to be largely over. The "new game," which sounded as though it were oriented more to the market and less toward rent seeking, allegedly was risk management accompanied by a limited "safety net."

The federal multiple-peril crop insurance program now insures much more than crop yields. After being introduced in 1996, gross revenue insurance grew quickly

from regional experiments to national programs. Revenue insurance, insurance against declines of any combination of within-year price declines times farm-level yields shortfalls, is now a major component of the federal crop insurance portfolio. Approximately 17 percent of the 1998 federal crop insurance premium was for gross revenue insurance programs. Some congressional members are calling for conversion of all yield insurance into revenue insurance. Others in the policy realm are calling for whole-farm (multiple-crop) revenue insurance. The United States is now pilot-testing revenue insurance for a basket of crops. A pilot program that uses income tax gross revenue is underway for 1999. New crops are being added every year. The nursery insurance program has been enhanced and expanded. When we insure woody ornamentals and fresh-cut flowers using taxpayer subsidies, one may ask how this fits into a "food and fiber policy."

Before Congress moves forward with yet more subsidies in the name of risk management, it is important to take stock of the existing programs and their subsidies. What experience have we had? Are the risk management

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programs reaching their goals? Are there unintended consequences? To what extent might the programs be putting downward pressure on commodity prices? Do subsidized insurance programs affect production decisions? If risk management were the goal, how can we move toward improved risk management alternatives with fewer subsidies?

Performance of U.S. Agricultural Risk Management Programs

Subsidized Insurance Will Not Take the Risk out of Agriculture Risks can and do create inefficiencies in markets. Having effective risk-sharing markets is important for improving the efficiency of the farm sector. Kenneth Arrow demonstrated long ago that society can gain from insurance (and other contingent claims) markets. When decision-makers are risk averse, they are willing to give up some income to protect themselves from future events that may cause them to lose large amounts of income. Well-functioning risk-sharing markets allow firms to protect themselves from risk and pursue the advantages that come from specialization. Since Adam Smith, it has been a fundamental argument of economists that society gains from the specialization of firms.

Although there are good economic arguments that governments might be necessary to help the formation of risk-sharing markets, it is unlikely that either Adam Smith or Kenneth Arrow would advocate subsidies for risk-sharing instruments. When decision makers must pay for risk protection, at least what they expect to get back over the long term, then the risk will be internalized into the decision processes. When they pay less than they will get back in indemnities resulting from insurance subsidies, society is paying people to take on additional risk. The resources used in taking on those additional risks, by farmers, for example, really cost the economy much more than just the income transfer imbedded in the subsidy. The additional cost becomes the inefficiency created by the subsidy.

Public sector subsidies to various markets often reflect the political and cultural desire to raise the incomes found in a particular sector in the economy to a level above that created by simple market forces. Such political rationales, however, reflect a profound lack of understanding about how subsidies affect the operations of markets. Insurance subsidies are no different and, may in fact, be worse.

A fundamental truth about markets is that “good deals” cannot persist, be they jobs with higher than expected wages or assets with greater than normal profits. Once markets become aware of such deals people compete for the good jobs and reduce the wage or compete for the desirable asset and bid up its price. When the government uses agricultural subsidies, the rewards to the land, labor, and capital involved in agriculture are

greater than they otherwise would be, but the “good deal” does not persist because people compete to get it.

Competition to get the “good deal” reduces wages, raises asset values, and lowers the prices of outputs from the subsidized sector just enough to offset the benefits of the subsidies. Further competition restores wages, profits, and land rents to their presubsidy levels. The effect of the subsidy is to reallocate factors from one part of the economy to another (to induce more land, labor, and capital to be devoted to farming than would occur under simple market forces), but it is the owner of the assets who is advantaged by the subsidy. Profits and wages are the same as before the subsidy. In addition to benefiting landowners, the subsidies also induce too much land, labor, and capital to be used in the subsidized sector, and too little in the other taxed sectors of the economy.

Under such conditions one must ask who is really being helped. About half the land that is farmed is farmed by a nonowner. If agricultural subsidies were properly characterized as transfers from taxpayers to landowners, many of whom are not farmers, raising land prices and making entry into farming more difficult for the small

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farmer, political support might diminish.

As decisionmakers recognize the value of crop insurance subsidies, the effects on risk-taking behavior become counterintuitive. Economists have demonstrated that attempts to force people to reduce risk simply cause people to take on more and different risks until their risk level returns to the pre-policy intervention level. Consider tractor accidents. Twenty years ago farmers often died or suffered serious injury when pinned beneath wayward tractors. After examining the problem, engineers found a straightforward solution—a steel-reinforced bar over the driver’s seat would prevent the tractor from crushing the driver. A few years after mandated roll bars on tractors were in place, the death rate and rate of serious injury remained roughly the same. People with roll bar-equipped tractors were driving harder, faster, and on steeper slopes, resulting in the same rate of fatal accidents as before the engineered response.

Analogously, farmers with subsidized risk management will push harder and faster and take on more risk. They will borrow at higher rates. The likely result is the same failure rate as before the existence of the subsidies. For example, when farmers have access to subsidized crop insurance, their bankers will lend them more

money. Lending more will reduce the access to credit when there is a problem. With lower debts, lenders will be more likely to lend when there are temporary shocks. Again, such credit reserves are one way farmers manage risk. Subsidized crop insurance replaces many management practices that farmers use to manage risk.

In short, the public provision of a subsidy that mitigates risk creates incentives for farmers to restructure their operations to produce roughly the same level of risk that existed before the subsidy. This is particularly true when decisionmakers fully recognize the value of the subsidy. The most common response may be to borrow more and expand production either into the riskier part of the farm or into new and more risky farms. The risk subsidy makes society neither more efficient nor more equitable. Farmers are at just as much risk as they were previously and the subsidy has been bid into asset values to create barriers to entry for new farmers.

The efficiency consequences of crop insurance subsidies may be even more perverse than the tractor-safety story suggests. Crop insurance subsidies are greater on an absolute basis for those farmers whose premiums are greater because they are calculated as a percentage of the premium. Free disaster payments can be thought of as no different than a 100 percent subsidy on crop insurance. Subsidies that are a direct function of premium will transfer relatively more money to the highest-risk farmers and the highest-risk regions. Is that the reward structure we want for U.S. agriculture? Even more troublesome may be the farmers who abuse the risk-management programs. As will be discussed below, risk-management programs that are tied to individual farm yields are more easily abused than the traditional price programs that were tied to national prices.

Can Congress Resist Giving Free Disaster Aid? Since 1980, Congress has provided numerous “fixes” for the federal crop insurance program—arguing that if more farmers were buying crop insurance, Congress would not need to provide ad hoc disaster aid during years with major crop failures. Although federal crop insurance dates to 1938, by 1980 Congress abandoned a standing program of federal funding of crop-disaster assistance in favor of a subsidized crop insurance program. With the new crop insurance, farmers and the government would share in the cost of protecting against natural disasters through privately provided insurance. During the passage of the 1980 Crop Insurance Reform Act, Congress explicitly set a goal of 50 percent participation on an acreage basis.

By 1988, only 25 percent of the acreage was insured. A major Midwest drought created significant hardships. Despite strong language in the 1980 act saying there would be no more disaster aid, Congress provided ad hoc disaster aid at a record level of nearly \$4 billion. One reason many farmers do not purchase crop insurance is that they believe that when things get bad enough, the government will provide free insurance in the form of disas-

ter payments. And the evidence, of course, suggests that the farmers are correct.

After the 1988 drought and ensuing ad hoc aid, there were calls to reform crop insurance. A congressional commission investigated the issue over a two-year period. Many administrative and legislative reforms were made in 1989 and 1990. Still, some form of ad hoc assistance was provided in every crop year between 1988 and 1994. In one year, the assistance was even retroactive to a previous crop year.

In 1994 another major crop insurance reform was undertaken. That legislation added the average historical funding of ad hoc disaster assistance, approximately \$1 billion, to the crop insurance program that was already costing nearly three-quarters of a billion. Much of the \$1 billion was used to provide catastrophic (CAT) insurance to farmers for no premium cost—farmers were required only to pay some of the administrative cost (\$50 per crop). Some of the additional subsidy was also used to encourage participation in higher levels of coverage.

Even though the CAT insurance, in effect, was free disaster aid, it had potential to be subject to less abuse than disaster aid for several reasons. First, more “underwriting” is involved and farmers are required to enroll early and provide some evidence that they actually are growing the crops and have some records to prove their yield potential. Second, Congress once again attempted to precommit not to fund disaster assistance. Budget constraints were imposed to add teeth to these commitments. Farmers who chose not to “sign-up” for the CAT insurance policies were required to sign statements saying they understood they were waiving their rights to any future disaster assistance.

By the 1998 crop year all bets were off again. Serious drought in Texas was once again hurting the cotton crop. Cotton prices were flat. Persistent disease problems in the Red River Valley of North Dakota and Minnesota were hurting wheat. Wheat prices were down. The President and secretary of agriculture were basically saying “no farmer should go out of business because of an act of God.”

By going “off budget,” Congress was able to pass an emergency aid packet last year that approached \$6 billion. About \$2.4 billion was disaster aid for crop losses. Some of those funds will be used to pay for losses in previous years. Another \$400 million was allocated to reduce already subsidized premiums by another 30 percent for the 1999 crop year.

By continually breaking its commitment not to fund ad hoc disaster aid, Congress has undermined the incentive for farmers to pay for crop insurance. When the 1998 appropriations were added, Congress ignored the fact that many farmers had signed statements saying they would no longer be eligible for disaster aid. Education programs that were designed to help farmers understand that they would have to manage their own risk must look foolish to the savvy farmers who understood agricultural policy far bet-

ter than their instructors. The central message that flows from congressional action over the past two decades is that subsidies for taking risks increase and when things get bad Congress provides still more free aid.

Actuarial Performance and Taxpayer Costs The loss experience for the federal crop insurance program has been so bad that Congress has nearly abandoned the goal of actuarial soundness. According to the new congressional definition, actuarial soundness exists as long as losses are not more than 107.5 percent of premiums (a loss ratio—indemnities divided by premiums—of 1.075). Even with a built-in subsidy of 7 percent, a number of regions have

miums will be reduced another 30 percent, an additional \$400 million in subsidies. With the same participation as 1998, the total cost of the crop insurance program will exceed \$2.5 billion in 1999. Farmers will pay about \$650 million, 25 cents on a dollar.

Again, despite the current heavy burden on taxpayers, members of Congress and others are calling for still more subsidies—arguing that with higher subsidies more farmers will “buy” crop insurance and that will reduce the likelihood that free disaster aid will be needed. This is a familiar argument. The more than doubling of subsidies that came with the 1994 reform did not prevent the 1998 ad hoc disaster aid. Are we destined to

simply move our insurance programs to something that looks more like a multibillion-dollar standing disaster assistance program to which farmers pay even fewer pennies on the dollar?

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Complexity of Program Constrains the Opportunities to Fix Problems Federal multiple-peril crop insurance is complex. Farmers can get paid for

not yet reached the 1.075 loss-ratio target, meaning that even more unintended subsidies are present because of poor actuarial experience. When the intended subsidies are taken from the total premium, the expected loss ratio was 1.57 in 1998, meaning the average farmer could expect to get \$1.57 back over time for every \$1.00 of premium. Of course, there are no average farmers—some expect to get much more and many less.

To be fair, recent national experience of the program has been very good. Since the 1993 floods, the national loss ratio has exceeded 1 in only one of the five years. However, there were no major disasters in those years. Some unpublished work at the U.S. Department of Agriculture suggests that the expected national loss ratio is now about 1.08. Again, some areas have expected loss ratios that are much higher.

Because costs are tied to how good or bad the crops are in any given year, actual costs of the risk management programs can vary greatly from year to year. When all sources of subsidies are summed, the expected taxpayer cost of the risk management programs is close to \$1.7 billion. This \$1.7 billion is distributed roughly as follows: (1) \$130 million for the excess losses; (2) \$950 million for intended farmer premium subsidies; (3) \$400 million for delivery cost reimbursements to the crop insurance industry; (4) \$160 million for crop insurance industry returns from the government for taking on risk; and (5) \$63 million to U.S. Department of Agriculture administrative costs.

Farmers paid \$930 million in premiums in 1998, or about 35 cents on a dollar, for the expected total cost of the program. When free disaster aid is added to taxpayer contributions, farmers paid about 20 cents on a dollar for the actual totals in 1998. For the 1999 crop year only, pre-

individual field losses that are as little as 15 percent below their proven average yield. In addition, they can get paid for quality problems, prevented planting, and replanting. With the advent of revenue products, they can receive payments when price times yield drops below a specified level. One of the revenue products will pay for lost bushels at the harvest price rather than the forecasted price when the insurance is sold. Many levels can be selected. Between 60 and 70 crops are now eligible for some type of subsidized crop insurance.

The complexity of the crop insurance programs increases the difficulty of considering sensible reforms. One objective in using the private sector to deliver federal crop insurance was to allow for more innovation. However, when the private companies do not bear the full responsibility for the risk there is a problem. Companies can be very creative in designing products that will increase sales when they do not have to take the full responsibility for the increased risk. Government oversight is needed.

Government oversight makes change difficult and increases the cost for private companies attempting to introduce new products. The government must approve insurance rates. The government must also approve new products, considering whether they put the government at even more risk. Because it is a government program, it is rare that new products will be abandoned. When things go bad in a particular region or for a particular crop because of mistakes, abuse, or simply bad weather, just about the only correction processes available are rate increases or reductions in coverage. Rates are based on 20 years of loss experience. Thus any unanticipated losses in newly designed products will ultimately result in

increased rates. In many cases, higher rates will not address the underlying reason for unanticipated losses.

To make matters worse, political intervention is pervasive, as one should expect because the program is funded and supported by Congress and all politics are local. Heavy pressures come from members of Congress to cover uninsurable crops in their districts. When constituents complain about rule changes that are designed to fix some problems that are creating unanticipated losses, congressional pressures prevail and the “fix” is either never tried or abandoned. A recent example involved an attempt to classify the most grievous abusers who persistently collected on crop insurance policies, in good and bad years. After a few years the special program was dropped because of political pressures. All farmers who buy insurance in the same county as the bad performers must now pay more because their experience will be added to rates. The cycle repeats itself time and again.

As another example, consider the recent administrative decision to allow farmers who planted fall wheat to buy insurance this spring. Because the additional subsidy was only announced in January, to be fair the sales closing was extended into the spring. Many farmers who planted wheat in the fall may have already experienced weather that will undoubtedly create a loss. This is akin to insuring a house when the house is already on fire. There are many cases where sales closing dates were extended to increase participation. And although one may ask how the private companies respond to those changes that put them at increased risk, the fact is that they are generally made whole. No one can fault the private companies for seeking political means to assure compensation under those circumstances.

Adverse Selection and Moral Hazard Farmers always know more about their yield potential and risk than anyone from the outside (either the government or a private insurer). Such asymmetry in information creates the dual problems of adverse selection and moral hazard. Adverse selection occurs when there are problems in classifying risk of potential purchasers. Because farmers know the most about their potential yields, they will look at the insurance offer and decide if it is fair or maybe even more than fair. Those who conclude that it is more than fair will buy. Those who conclude it is overpriced for their risks will stay out.

In the federal crop insurance program, farmers are required to have records to back up their reported historic yields. It is not uncommon for them or the agents who sell to them to conveniently “lose” some historical yields to make the offer yield higher. Further, as few as four years of records can be used to set the average yield for the contract. Any student of statistics knows that significant measurement error can exist with such a limited number of observations. The errors can work in favor of the farmer or against the farmer—thus compounding adverse selection.

While adverse selection potential is in motion before

the purchase, moral hazard occurs after the purchase. Moral hazard occurs when farmers who are insured change their behavior in ways that increase the chances of loss beyond the insurance contract terms. Farmers having insurance may not spray for insects as quickly as uninsured farmers. Or farmers may prove their yields from acreage with good soils and then plant to the poorer soils once they purchase insurance. Beyond the rational and totally understandable changes in behavior, some fraud also exists because it is not difficult to misrepresent realized yields.

Controlling adverse selection and moral hazard requires more information. Obtaining information is costly. Those costs are higher per unit when insured acreage is smaller. Information cost will also be greater when a new crop is insured or when few farmers grow an insured crop in a particular area. None of these considerations is built into the current crop insurance program. The government reimburses insurance-company expenses as a flat percentage of total premium—no matter what crop or what part of the country. This too contributes to a willingness on the part of private companies to simply accept the fact that some problems will never be fixed. Fixing some of the problems would require more monitoring, and more monitoring would require more reimbursement expenses than those currently provided.

Sharing Risk with the Government By now the reader should be asking why the private insurers are not more diligent in pushing the government to improve the underwriting of the federal insurance program. This is a particularly curious question because the private sector now shares the risk on \$1.6 billion of the \$1.88 billion of premiums sold in 1998. Obviously the private sector has been diligent in some regions and there are many parts of the country where the program is actuarially sound. But Congress wants universal availability of crop insurance. No farmer can be denied. No region can be eliminated.

How can the dual goals of high participation and actuarial soundness coexist? Because the program is not actuarially sound in many parts of the country, how can a private sector with \$1.6 billion at risk survive? The government offers a special reinsurance arrangement.

The Standard Reinsurance Agreement (sra) is the heart of the federal-private partnership in the federal crop insurance program. The sra allows the private companies to pick and choose the risks that they wish to retain. The essence of the sra is that it allows the companies to pass the policies that are expected to be losers to the public sector and keep in their portfolios those policies that should make money. Through a complex set of quota shares and stop losses, the sra shares risk across three different reinsurance funds, with settlement on a state-by-state basis.

Although the companies are certainly at significant risk, they and the international reinsurance community have learned to optimize the sra in ways that provide

expected profits even in areas where the expected indemnities exceed premiums.

The sr.a illustrates classically the arguments of public choice economists about the design of public programs. There is limited transparency; there are considerable start-up costs to understand the sr.a. Even the government, which designed the instrument, has had limited understanding and no real analytical model to understand the sr.a until only recently. Information is power and information on how to use the sr.a enhances the power of the astute crop insurance companies. The balance of power is with the private companies.

Still, the private sector simply would not make crop insurance universally available without an arrangement like the sr.a. The sr.a, however, provides limited incentives for the private sector to help clean up the actuarial and underwriting problems that exist in some of the worst areas. Thus, in the worst-performing states, it is little wonder that the private sector is generally willing to help farmers change the rules to make the program more attractive and increase participation, even though doing so may increase the aggregate loss ratio in those states. The private companies must make the program attractive to a large number of farmers to maintain political support. Is that the type of public-private relationship we want?

More on Unintended Consequences Federal insurance programs are largely income transfer programs whose social

objectives are unlikely to be fulfilled because of the logical response of market decisionmakers. As potential owners of farmland recognize the subsidies, they will bid more for farmland. That situation creates barriers to entry for new farmers. Although those unintended consequences are common with subsidies in agriculture, there are more serious unintended consequences when the subsidies are tied to farm-level yield risk. It is easy to convince congressional colleagues to vote for a program that will help save farmers in their districts. That is likely true even when the newly converted members of Congress are unaware that the very policies they are voting for will disadvantage farmers in their districts. Policy is complex. Short-versus long-term consequences are difficult to understand. To highlight some of the issues, let us consider how the subsidies have increased production, where the increases have occurred, and what the implication is the aggregate price of some basic commodities.

Let us focus on the top six crops in acreage in the United States—corn, wheat, soybeans, grain sorghum, cotton, and barley—and compare net transfers with gross revenues for the years 1988 through 1992. The six crops account for nearly 90 percent of the crop acreage in the United States. For purposes of this discussion, net transfers in crop insurance and disaster payments are defined as all payments made to farmers minus all payments made by farmers. Some 300 Crop Reporting Districts are examined across the United States—less than 58 crds comprise more than

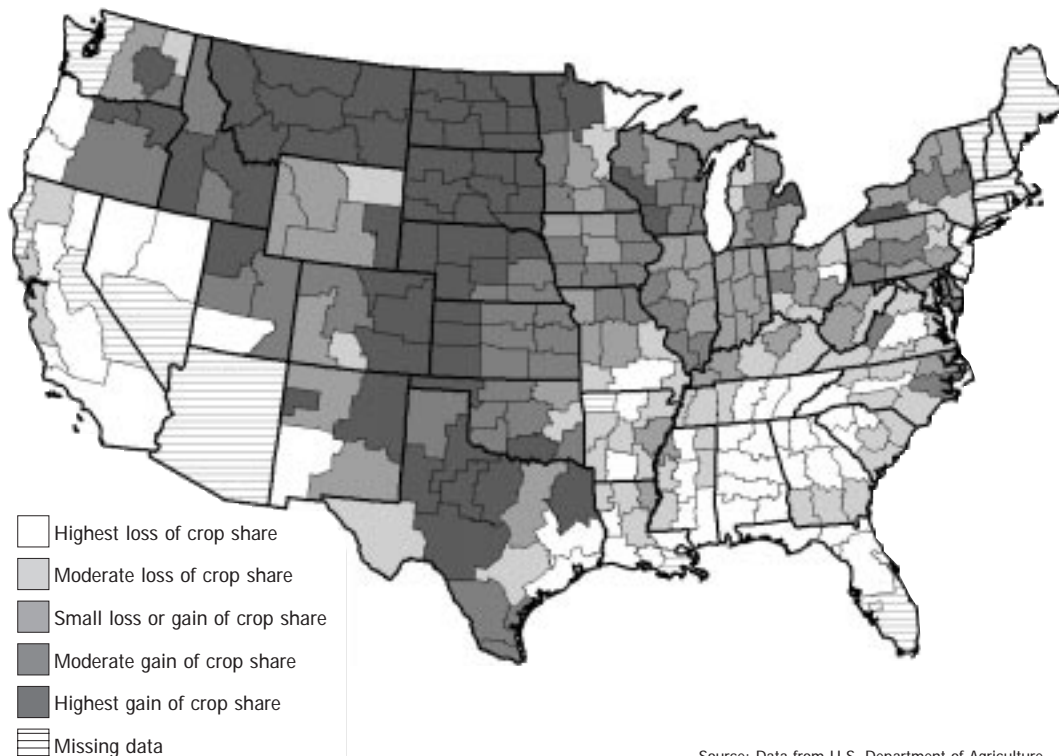
half of the acres for these six crops. There are net transfers of 10 cents per \$1 of gross revenue in 20 crop reporting districts. In 4 districts, the transfers exceed 20 cents on a dollar. A similar examination of 1998 subsidies on crop insurance transfers gives the same pattern with similar transfer levels. Increasing insurance subsidies will compound the numbers.

The risk subsidies alter farmers' production decisions. Figure 1 compares the change in land use from the late 1970s to the late 1980s. Again, the top six crops are used to compare the shift in production. The national share of the acreage used for the crops and for major federal acreage retirement programs is calculated for two five-year time periods—1978 through 1982 and

Figure 1

Gains and Losses in Crop Share for the Top Six US Crops

Between 1978-82 and 1988-92



Source: Data from U.S. Department of Agriculture.

1988 through 1992. The base is the national total of the six crops plus the national total of federal acreage retirement programs. Thus the ratio reflects the percent of the national total in each crd. To show how the acreages change between the two time periods, the 1978-82 crd share numbers are subtracted from the 1988-92 share numbers. Positive numbers indicate a growth in national share for the crd over the decade.

The map is clear. Acres have shifted from the South and the eastern Midwest to the Plains states. These are the states with more risk transfers as well. Even after controlling for alternative explanations of the use of land for various crops in a regression model, risk transfers explain part of these land use changes. The models suggest that for every 10 percent increase in risk transfers there is a 5 percent increase in planted acreage.

Given the subsidy transfers expected for 1999, wheat, cotton, and grain sorghum acreage is likely to be between 2 and 3 percent higher than it would be without the risk subsidies. Corn and soybean acreage is estimated at 1-2 percent greater than would be the case without the subsidies. One can also estimate the price effects due to the extra production that is occurring because of risk subsidies. The production should be added at the margin as part of the carryover stocks of basic commodities. Conservative estimates would suggest that prices are about 3 percent lower than they would be in the absence of the risk subsidies. *The price declines hurt the regions that are most productive and the risk transfers help the regions that are most risky.*

Risk management transfers do influence production decisions. They are not decoupled programs. Thus, unlike the subsidies enacted by Congress in the Freedom to Farm Act in 1996, which were decoupled from planting decisions, the crop insurance subsidies do affect production decisions. Therefore, the subsidies likely will come under increased scrutiny in negotiation of future international trade agreements.

Unknown local environmental degradation may also be created as farmers extend their plantings to the margin. Keep in mind that the increased plantings occur regionally as well as on many individual farms that convert acres from pasture to cropland because of the risk management transfers. The marginal land may be subject to more erosion than is land with better soils. Converting from pasture to cropland will almost always result in more erosion. Thus, to the extent that our risk management programs cause farmers to farm these marginal soils, we are also causing more local environmental degradation in some regions.

The Prospects for Reforms

in the current political atmosphere, the prospects are dim for reforms that are motivated by improving eco-

nomonic efficiency. Nonetheless, we should still ask whether private risk-sharing markets for agriculture work optimally. To a large extent, the argument that government needs to assist the formation of risk-sharing markets is not consistent with the agricultural experience. Agriculture has a number of well-functioning risk-sharing markets.

The commodity futures markets in the United States are the envy of the world. With the exception of some heavily supported commodities like tobacco and peanuts, all major commodities (crops or livestock) are traded in these markets. Major exchange markets reside in Chicago, New York, Minneapolis, and Kansas City.

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Countless studies confirm that these markets are efficient in price discovery. There is no systemic bias in the futures prices versus cash prices. There are few examples of fraud in the markets. Farmers and others who are at risk from price movements of basic commodities may use the markets either to lock in a price with a futures market transaction or to protect against large price movements with an option on the futures prices. The options markets essentially offer price insurance. Farmers pay for the right to exercise the option if prices either drop to a selected low level or rise to a selected high level.

Some use the argument that because many farmers do not directly use the futures markets to protect price, government is needed. Among the many reasons futures markets are not used more by farmers is that government has provided free price protection and enhancement in various ways for more than 60 years. Government actions crowd out the use and development of many risk-sharing markets. Many of the new revenue insurance products may crowd out the use of futures exchange markets by farmers even more. Some farmers still do not trust the markets. Others are intimidated by the perceived complexity.

Yet many farmers are using futures markets indirectly as they contract with local elevators to deliver grain in the future at a specified price. The local elevator is able to enter into the contracts because the owners are using the futures markets. With some changes in regulatory restrictions on trading of off-exchange agricultural options, more of this would occur. Many direct contracts could emerge as writers of such over-the-counter contracts could incur the transactions cost to "bundle" risk management contracts that are tailor made for specific farmers. The bundled

products could include a crop insurance policy with price insurance offered in the futures options markets. Such a combination would offer protection similar to many of the new revenue insurance contracts.

Hail Insurance In addition to the many futures markets for agricultural commodities that offer price protection, a private market for hail insurance has existed in the United States for well over 100 years. Why have private companies offered hail insurance successfully but not multiple-peril crop insurance?

First, hail damage is relatively easy to identify. It is hard to “create” the damage and it is truly an “act of God.” In contrast, multiple-peril insurance is characterized by adverse selection and moral hazard issues that make it difficult to determine if one is insuring an “act of God” or an “act of bad management.”

Second, a characteristic of well-working private insurance markets is that the losses among insured clients be independent in a statistical sense. That is, the probability of an insured client suffering losses is not statistically related to the losses of other insured clients. The losses from hail meet the test. They are generally geographically concentrated and largely independent. If farmers over several states were at risk from significant crop losses from a single hail storm, the market for private hail insurance would not have developed.

The higher the potential of large losses across clients from a single event, the more difficult it is to organize a private insurance market. Losses from drought, freeze, excess moisture, and so forth, occur across wide geographical areas. Thus, the probabilities of losses of insured clients are correlated across clients, making the development of a private market for multiple-peril crop insurance much more difficult than the development of a market for hail insurance.

To summarize, private markets may be incomplete for multiple-peril crop insurance because (1) government has crowded out market development; (2) the cost of monitoring to control for the asymmetric information that causes adverse selection and moral hazard is too high; and (3) correlated (systemic) risks are too great for insurance companies to take the risk.

Vouchers Only regulatory change will obviate the crowding out problem. As long as the government provides a high level of subsidies, private companies will not offer multiple-peril crop insurance. However, even with the current system of high subsidies, improvements are possible. If the government would simply give the farmers all the subsidies in the form of a voucher and let the farmers select the risk management services offered by a wide range of private companies (others in addition to crop insurance companies), there would be improvements. At least with that system the companies could offer private products that they could rate and underwrite with limited government oversight. Serious consideration should

be given to quickly phasing these voucher subsidies into flat dollar amounts per crop acre, which would reduce the incentives to produce more in the highest-risk regions and reward the highest-risk producers. A timeline might also be put in place to phase out the subsidies completely. While the private sector is developing the new products, the basic federal crop insurance product could remain in place to ease the transition.

And although some argue that private companies will never be able to control adverse selection and moral hazard, progress in classification and underwriting is significant in some areas. The problems of adverse selection and moral hazard are likely now manageable in many crops and areas. New technologies will reduce the monitoring cost even more in the future. Precision agriculture has grown quickly in recent years. That technology provides a low-cost means to monitor the inputs used in crop production and the actual crop yield, field by field.

Future Markets The most serious challenge for private companies wishing to offer multiple-peril crop yield insurance is likely the systemic risk. Even here market mechanisms have emerged in the last 10 years. If the international insurance markets are able to insure hurricanes and earthquakes with limited government involvement, why not crop yields? The maximum exposure from a major hurricane or earthquake is much greater than the worst crop losses we have experienced. There has been significant progress in making the risk-sharing markets more efficient. The key is to turn risks that have been previously considered nondiversifiable into diversifiable risks that can be spread around the world. If the United States has crop losses, it is unlikely that some other parts of the world will be experiencing the same problems.

Crop yield insurance contracts were introduced on the Chicago Board of Trade in 1995. In essence, the contracts offered the opportunity to protect against state yield shortfalls for major corn producing states. The contracts were offered to give private insurers another means of protecting against the widespread risks that are present when insuring crop yields. Although the contracts have not traded well, there has never been a good test of their potential because the government offers subsidized reinsurance to crop insurance companies.

Here again, the existing arrangement offered in the Standard Reinsurance Agreement could be improved. Although the government may allow the sras to exist for a limited time, it could also facilitate more private risk-sharing in the transition. One means for doing so would be for the government to sell very low insurance contracts on state crop yields.

Such contracts could facilitate excellent reinsurance. For the major crops constituting more than 90 percent of the exposure for the federal multiple-peril crop insurance program, nearly 80 percent of the insurance volume is in states where there is significant correlation between state

yield shortfalls and loss ratios. For example, Iowa corn yield shortfalls are 99 percent correlated to the state loss ratio on corn yields. If the government auctioned low-level insurance on state crop yields to primary insurers, reinsurers, and others offering risk products there would be no need for a complex reinsurance agreement that offers significant barriers to entry and unique rent-seeking opportunities.

Under the current subsidy structure, those with the highest risk and those in the highest-risk regions gain the most.

Companies insuring multiple perils for crop yields could be innovative while practicing diligence in designing products where the systemic risk would be covered by the state put options and futures markets for price-related products. That, in combination with international reinsurance partnerships, could offer significant efficiencies. If the government were selling only low-level put options on state yields, that would reduce the role of government oversight and the current constraints on innovation. Finally, once the government demonstrates the usefulness of the options, there is every reason to believe that private firms could begin offering the state yield contracts as over-the-counter products. The way could be cleared for reducing the role of government even further.

In short, there is no reason that markets could not be structured to offer multiple-peril crop insurance and revenue insurance. Further consideration should be made about how to facilitate market development for sharing risk across time. Agriculture is subject to significant cycles. Futures markets are generally structured to protect price only one to one-and-a-half years into the future. In a sustained period of low prices, that is not adequate. When the sector is in a slump, asset values also will adjust downward. Is it possible to develop futures markets for land prices that might trade several years into the future? In the absence of government subsidies, it is likely that such markets would emerge.

Conclusion

reform in agriculture policy has been difficult. Recent changes in the price-support mechanisms for basic commodities were touted as moving agriculture toward markets. Now it seems that everyone thinks we can fix the problems in agriculture with risk-management instruments like crop and revenue insurance. To the extent that the markets are built with subsidies, we will be no better off, and possibly worse off, than we were before the reform in the 1996 Farm Bill.

Like other subsidies, insurance subsidies will not reach the ultimate objective. Over time, the beneficiaries are landowners, who are in many cases not family farmers. Further, farmers will take on more risk to reach a level of risk that is similar to what they had before the risk subsidies were introduced. Congress cannot take the risk out of U.S. agriculture. Risk subsidies are different than price subsidies, however. Under the current subsidy structure, those with the highest risk and those in the highest-risk regions gain the most. Even more troublesome is that the current program does not allow for adequate underwriting to control abuses. Thus, the most abusive farmers will gain the most. There is little doubt that the risk subsidies have encouraged additional production and reduced commodity

prices. The programs are not decoupled and they will likely undergo increased scrutiny in future international trade agreements.

Despite the significant problems with the current risk-management programs, striving to introduce risk-sharing without government subsidies is a reasonable goal for society. Effective risk-sharing markets are important for U.S. agriculture. With some moderate changes in the regulatory environment, significant improvements could occur in private-sector offerings of bundled risk-management services. The current system does not take true advantage of what the private sector can do best—innovate. The changes could be put in motion with an adjustment process that would ease the transition out of heavy government subsidies. The gains for society and the agricultural sector could be significant.

Readings

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