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Taming agricultural risks

by David B. Oppedahl, senior business economist

On November 19, 2013, the Federal Reserve Bank of Chicago held a conference to explore the key risks faced by agricultural producers and lenders, as well as the risk-management tools available to them, in today's volatile environment.

Materials presented at the conference are available at www.chicagofed.org/webpages/events/2013/agriculture_conference.cfm.

Experts from academia, policy institutions, banking, and the farming industry gathered at the conference to examine the chief risks facing the agricultural sector and the different approaches to managing them—in particular, those most relevant to farm operations in the Seventh Federal Reserve District.[1] Most conference participants agreed that in general, agricultural producers have strong balance sheets after several years of high incomes and they have adequate risk-management strategies to survive a downturn in farming. Yet, some speakers noted that certain segments of agriculture—especially beginning farmers and producers that expanded rapidly during the boom times—face more-challenging circumstances to manage in the years to come, particularly given the declines in field crop prices during 2013.

David B. Oppedahl, Federal Reserve Bank of Chicago, kicked off the conference by going over the major categories of agricultural risks. He showed several maps of crop insurance indemnities produced by the Risk Management Agency (RMA) of the U.S. Department of Agriculture (USDA) in order to discuss the weather-related risks across the country. These maps illustrated widely differing results from year to year, as negative effects from weather varied across the nation and triggered shifting patterns of payments for agricultural damages. The drought of 2012, which hit the Seventh District especially hard, resulted in the highest payments for crop damages ever under the RMA's programs, noted Oppedahl. In addition to weather-related risks, agricultural production faces disease and pest risks, he said. Other key categories of risks are price or market risk (e.g., fluctuations in input costs and output prices), financial risk (e.g., shifts in interest rates and credit access), institutional risk (involving government policies), and human risk (including farmer health and labor issues).

Insuring against farm risks

Eldon F. Gould, owner-operator of a family farm, gave the keynote address, sharing his experiences not only as a lifelong grain and livestock producer but also as a former administrator of the RMA. Gould described the substantial growth in the RMA's liabilities due to the high commodity prices of the past few years and the fairly recent expansion of its coverage to include additional counties and crops. Agricultural producers rely on the RMA's insurance programs, as well as the knowledge of its county agents, to protect themselves against potential losses. Cultivating solid relationships is vital to the mission of the RMA because doing so not only fosters teamwork but also encourages transparency, both within the agency and between county agents and farmers, said Gould. Moreover, he argued that new technologies can assist in achieving even greater transparency (and reducing

fraudulent insurance claims)—e.g., properly calibrated monitors on tractors can now allow for accurate and timely dissemination of field data. In closing, Gould advocated for agricultural producers to be better heard on other issues that affect farm enterprises—such as changing consumer trends and perceptions of quality (e.g., in regard to genetically modified foods and livestock management practices).

Thomas P. Zacharias, National Crop Insurance Services (NCIS), discussed the state of the crop insurance industry and its role in managing farm risks. He laid out the collaborative relationship between insurance providers, which are members of NCIS, and the RMA in making subsidized federal crop insurance available to farmers. As Zacharias explained, the private insurance companies must sell policies to all eligible farmers in states where they operate, and they must also collect premiums, adjust policies, bear underwriting risk, pay all claims, and train staff to sell and service policies; meanwhile, the RMA vets private insurers, sets premium rates, subsidizes premiums, makes payments for private companies' service delivery costs, and sets underwriting standards. The private companies and the RMA share in the gains or losses from underwriting the insurance policies; inform producers about the details of policies; and develop new insurance products. These activities are delineated in standard reinsurance agreements between the USDA and insurance companies.[2] In terms of insured liabilities as a share of production value, 55% of the crop total was covered on average in 2011–12; while presenting the disaggregated numbers, Zacharias noted that grains and oil crops had even higher coverage levels, with 79% and 66% of their production values being insured, respectively. In 2012, 73% of the insurance policies sold were revenue protection policies (which account for both production losses due to natural causes and price declines) and 18% were yield protection policies (which account for only production losses), with the remainder covering groups (such as entire counties) or other risks (such as for aquaculture). There has been growth in insured liabilities in recent years, but only two years (2002 and 2012) since 1994 have resulted in indemnities far exceeding premiums, said Zacharias. For 2012, 80% of the indemnities were related to the drought; the $13.3 billion in funding by taxpayers for crop insurance in 2012 was the largest ever for the RMA's programs, as the big losses triggered further federal subsidies (in addition to the regular administration cost and premium subsidies). The debate over how much public funding should be provided for crop insurance continues, yet the crop insurance industry continues to provide reliable tools for agricultural risk management.

All participants in the agricultural sector need to identify, analyze, and mitigate (or accept) the attendant risks in order to prosper in a volatile era.

Contracting to manage farm risks

James MacDonald, Economic Research Service of the USDA, discussed the agricultural industry's wide use of contracts for product sales and input purchases. The agreements for product sales typically occur between agricultural producers and contractors (usually companies, such as food processors and grocery store chains) that specify the conditions of marketing and/or producing farm products. Contracts offer today's farmers an effective risk-management tool, largely because they specify the quality requirements of the commodity, the price per unit, and the quantity before it is harvested (or slaughtered) or even before production commences. The two major types of sales contracts—marketing and production contracts—differ in terms of the timing of when they are made (before or after production starts), control over production decisions, and ownership of the commodity during production. Marketing contracts allow for the management of price risk before harvest by setting formulas for pricing and designating outlets, all while the farmer maintains production decisions and ownership of the output. MacDonald noted that the shares of corn, soybeans, and wheat marketed under contract had grown to above 20% of their respective values of production in 2011. USDA data also showed that in 2011, corn, soybean, and wheat farms that used marketing contracts tended to be larger. In contrast to marketing contracts, production contracts are reached before production begins under set compensation formulas, with the contractor providing some inputs and owning the commodity from the outset of production. Thus, production contracts shift significant portions of the price, production, and marketing risks to the contractor. These advantages to farmers under production contracts have led to gains in efficiency among pork and poultry producers, according to MacDonald. However, he warned of a major risk introduced by production contracts that particularly affects livestock producers: Producers typically invest heavily in livestock housing to meet their contractors' needs, but filling that housing depends critically on the contractors' commitment to maintaining the relationships. In conclusion, MacDonald said that over time agricultural production has shifted toward large enterprises, which exploit economies of scale; to manage their risks, lower their costs, and gain strategic flexibility, large farms have contracted out certain inputs (e.g., by using temporary labor and leasing equipment).

Price risk and financial exchanges

Financial exchanges provide additional tools for managing price risk, explained David Lehman, CME Group. He broke down price risk into two components: futures[3] price risk and basis risk. Basis risk equals a cash price to physically own a commodity minus its futures price, leaving a difference owing to storage, transportation, and handling costs, as well as product quality issues and local market conditions. Participants in agricultural markets can manage the

uncertainty of cash transactions through tools in financial markets—e.g., futures and options.[4] These types of contracts make price information more transparent and pass price signals between different markets, aiding the price discovery process (the dynamic process of buyers and sellers arriving at a transaction price for a given quality and quantity of a commodity at a given time and place). Price risk management depends on the divergent roles of market participants: hedgers (who have positions in cash markets for agricultural commodities) and speculators (who do not have positions in such cash markets). Hedgers want to manage price risk, since it is unavoidable, while speculators seek out price risk, since it may represent an arbitrage opportunity. Hence, price risk can shift from hedgers, including agricultural producers, to speculators via financial markets. Product innovations offer new ways to manage risks related to the timing of transactions (some by the week), spreads between the prices of commodities, and even the weather.

Scott Irwin, University of Illinois at Urbana–Champaign, further explained the role of financial exchanges and commented on structural changes in agricultural futures markets. These structural changes include the switch to electronic trading that enabled high-frequency trading, the expansion of market access through technological innovations, and the rise in passive (buy-and-hold) investors, who seek risk diversification through investment exposure to a basket of agricultural commodities. These developments have increased trading volumes in agricultural financial markets, but Irwin contended that such changes did not cause spikes in agricultural prices. Furthermore, Irwin said his research suggests that agricultural price bubbles have been infrequent, small, and short-lived. Moreover, the price discovery process in financial markets may have improved in quality after these structural changes, according to Irwin.

Financial risks in a downturn

Michael Boehlje, Purdue University, warned that there could be some lean years ahead for the U.S. agricultural sector. After several years of high profits for the sector, net farm income could decline significantly from its current level by 2015, he said. Indeed, 2013 profits were already falling for producers that didn't price their crop sales early. World income growth is a key generator of demand for agricultural products; this demand is critical for maintaining U.S. farm incomes, but may falter. The slowing growth in export demand for U.S. farm products and in biofuel production, combined with expansions of international crop output, bodes poorly for domestic farm profitability in the near term. In Boehlje's view, there is the potential for a soft landing rather than a collapse in the U.S. farm sector. He said that the critical issues for agriculture finance are low debt repayment capacity and liquidity (the degree to which an asset can be easily converted to cash). Stress testing showed that a large percentage of small farms will need to adjust their cash flow on account of these factors. Also, farmers who own a low percentage of their acreage, such as beginning farmers, will need to make similar adjustments. Some geographic areas may have an overrepresentation of these at-risk farmers, so those areas may experience decreases in farmland values, along with other negative effects. Boehlje argued that agricultural land is priced above its fundamentals, so farmers destroy working capital by purchasing land with cash, thereby locking in high production costs and possibly creating liquidity problems. In addition, farm operations could have operating risk from farmland leases at terms that are priced too high and/or set too long.

Implications for agricultural lending

Given that agriculture's boom seems to have ended, agricultural lenders should prepare for farm operations to return to close to their long-run averages for farm income and financial stress, according to a panel of experts on agricultural lending. Moreover, the panel agreed that risk mitigation strategies undergird sound agricultural lending. The key concern for Curt Covington, Bank of the West, was liquidity, which acts as the first and foremost line of defense in a downturn. Farmers built up strong assets and liquidity positions during the boom, but face market conditions that could quickly erode these strengths. Increasing productivity remains the most effective method by which farmers can cover the gap between prices paid for their products and their input costs; if this gap is not covered, they will have trouble servicing their debts, thus putting lenders at risk. An additional risk for lenders is funding a capital project, such as a new greenhouse, for which there's no guarantee that the agricultural producer will get orders for its output upon the project's completion. Even so, farmers' investments in land, buildings, machinery, and equipment may be sold off if orders for their goods do fall short. Covington discussed other factors that may be adjusted to make up for gaps between prices for outputs and costs for inputs. He stated that farmers' level of lifestyle spending (which may affect their business operations) could require adjustment. Covenants on lifestyle spending should be set when lending; plus, lenders must see financial statements for verification. Management succession is another factor that bears close watching by lenders as more farm operators grow older; if loans are going

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to farming operations led by farmers on the verge of retirement (or those with health issues), lenders must ensure that these farmers have plans in place for competent successors who will deliver comparable levels of output.

Gary J. Ash, 1st Farm Credit Services, focused on several key risks for agricultural lenders as they support a sector facing lower returns and seek to determine the repayment capacity of borrowers. Efforts to understand collateral risks underlie an extensive appraisal program at 1st Farm Credit Services. Changes in the values of benchmark farms get linked to all loans as part of monitoring financial performance. Lending against farmland also involves balancing the percentage of the purchase price borrowed versus the length of the loan, he explained. Turning to current agricultural lending conditions, Ash contended that even with a large amount of cash used to fund farmland purchases in recent years, farmers are maintaining adequate liquidity. That said, Ash argued that some agricultural lenders may have their loans too concentrated in certain subsectors; e.g., Illinois farm lenders face concentration risk because so many of their loans have been made to corn and soybean farm operators. Concentration risk can be managed through loan participation (collaboration among lenders to share a loan), portfolio stress testing, crop insurance coverage, and conservative underwriting.

Managing underwriting risk is another challenge for farm lenders in the current environment. Because there are multiple underwriting standards, potential loans may fall outside one standard but could still be justified according to another. Granular ratings for probability of loan default require updated data to ensure compliance with underwriting standards. Ash also mentioned the use of internal audits with three levels of validation to monitor credits. Given the expected decreases in farm income and potential increases in interest rates, Ash said that farm real estate values could decline 15% to 30% by 2016, making it all the more important for farm lenders to stay focused on risk management.

Jeffrey A. Jensen, Federal Reserve Bank of Chicago, pointed to the basic principles of sound risk management for farm lending laid out in a 2011 Supervision and Regulation Letter (SR 11-14) from the Board of Governors of the Federal Reserve System.[5] He emphasized that capital planning is vital; a lender's core capital should cover negative events. The elements of a lender's portfolio analysis should include commodity price movements, current farm production costs, farmland values, and global market issues. Underwriting standards need to be updated with appropriate benchmarks, reliable collateral valuations, and realistic loan-term structures. Setting appropriate repayment standards should involve much analysis, including assessments of the cash flow and working capital of borrowers and stress testing. Stated values of capital assets should be verified by lenders. Finally, even the documentation of farm visits can play an important role in judging the characteristics of borrowers, Jensen noted.

Conclusion

Risks abound in agriculture. All types of agricultural risk require producers and lenders to implement various risk-management techniques. Some agricultural risks may be more difficult to manage than others, and some farmers may be at higher risk than others. Yet, all participants in the agricultural sector need to identify, analyze, and mitigate (or accept) the attendant risks in order to prosper in a volatile era.

[1] The Seventh Federal Reserve District comprises all of Iowa and most of Illinois, Indiana, Michigan, and Wisconsin.

[2] Under these agreements, the USDA provides insurance against the financial risk posed by claims on crop insurance policies sold by private insurers. For details, see www.rma.usda.gov/pubs/ra/.

[3] A futures contract is a contract that obligates the buyer to buy an asset (or the seller to sell it) at a predetermined future date and price.

[4] An option is a contract giving its owner the right, but not the obligation, to buy or sell a particular asset at a specified price on or before a specified date.

[5] See www.federalreserve.gov/bankinforeg/srletters/sr1114.htm.