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Price Risk Management Alternatives for Farmers in the Absence of Forward Contracts with Grain Merchants

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Grain producers have historically made much less use of futures and forward contract markets than grain merchandisers and other middlemen in the grain marketing channel. When grain prices are close to government support levels, producers are well protected from price decreases and they have little need to manage risk through forward pricing. Also, producers must make many long–term investments in land and machinery, which coupled with yield risk, has made forward pricing somewhat less effective in protecting producers against the risks they face. However, as grain prices rise government supports have also become less effective in protecting producers against price decreases. Moreover, increased use of crop insurance allows producers to be able to pay nonperformance penalties associated with cash forward contracts in the event of a crop failure. Thus, producer demand for forward contracts has skyrocketed in recent years.

Most producers prefer forward contracts to futures contracts because they then avoid basis risk as well as the cash required for margin calls. Producers who forward contract receive a few cents less per bushel than they would by hedging (Brorsen, Coombs and Anderson, 1995; Shi, Irwin, Good and Hagedorn, 2004). Elevators have been willing to offer this service because it assures them a supply of grain. At the same time when farmers have a greater demand for cash forward contracts, grain merchants and elevator operators now have limited capacity to offer these contracts. The extra costs associated with margin accounts and extra working capital have been reflected in lower forward basis bids for corn, soybeans, and wheat in many Midwest and Corn Belt states. In Oklahoma, for example, elevators lowered their wheat forward basis bids about 30 cents/bushel rather than discontinue offering forward contracts. Many grain buyers began to restrict their offerings of cash forward contracts in March 2008 instead. Some elevators simply quit offering forward contracts. In other instances, buyers quit offering cash forward contracts beyond the current crop year. Some buyers are only offering cash forward contracts for grain to be delivered within 60 days.

The question then is what do producers do now? This article first explains the problems faced by elevators and offers possible solutions to their problems that would let them again offer competitive forward contract bids. Then, we review producers' alternatives to forward contracts for price risk management.

Elevators and Forward Contracts

Goodwin and Schroeder (1994) found in a sample of Kansas producers that only 11% hedged any of their grain using futures. Schroeder, Parcell, Kastens and Dhuyvetter (1998) summarized several studies that consistently showed that more producers used forward contracts than used futures hedges. These studies showed that 42–74% of producers used forward contracts to price any of their grain. Merchants and elevator operators can offer producers cash forward contracts, agreeing to purchase grain at a later date, because they can offset their risk in the futures market. Essentially, by doing so, they have hedged the producer's price risk in the futures market on behalf of the producer. So, the merchant maintains the margin account on behalf of the producer. Further, the producer is generally offered a flat price contract without basis risk. Hedging in the futures market typically involves changes in basis (the difference between the cash price in a particular market and the futures market price) from the time the futures hedge is initiated until it is offset. Grain merchants incur the risk of trading these changes in basis with the intention of profiting from these moves.

Due to higher price levels and increased volatility of futures market prices, the exchanges have increased both daily price limits (the maximum move up or down allowed in a day) and margin requirements. For example, the Chicago Board of Trade corn and soybean futures market daily price limits were increased in March 2008 from $0.20/bu to $0.30/bu and $0.50/bu to $0.70/bu, respectively. Margin requirements have increased as well. A margin account is a performance bond posted by traders to guarantee their financial performance in the market. The margin requirement is roughly equal to the maximum loss a trader can incur in one day's trade. The margin account balance is updated daily to reflect the trader's actual gain or loss for that day's trade. If the position lost money, the trader, be it a hedger or speculator, has to deposit additional funds into the margin account. This demand for a deposit is referred to as a margin call.

Therein lies the challenge for most grain hedgers—whether farmers or grain merchants or elevator operators. These traders, known as commercials, have long (ownership or buy) positions in the cash market and hedge their risk in the futures market by taking an opposite position (a short or sell position). Therefore, if prices decline, they make money in the futures market to compensate for the lower price received in the cash market. If the futures price increases, the hedger with the short futures position still realizes the same hedged price because the losses in the futures market are offset by higher cash market prices. The challenge now for commercials is that the price increases have become sudden, large, and highly volatile at a time when producers are forward contracting a higher percentage of total production. As a result, the amount of money needed to margin their positions has increased substantially. This leads to higher working capital needs and greater interest expenses being incurred. A typical grain elevator in Nebraska, for example, could be faced with a $3–5 million margin call *each day* when the futures market makes limit moves higher. Their credit lines for hedging have increased substantially as a result, so their interest costs have similarly grown.

It is possible to design a derivative such that elevators can hedge against the costs created by extremely high margin calls. Such options are not currently traded on futures exchanges, but they are offered in over–the–counter markets. It remains to be seen whether the industry will purchase many such options. But, the point is that markets can respond to protect elevators against the increased risk of large margin calls.

In addition to the increased capital requirements created by margin calls, elevators now face increased basis risk. The biggest source of basis risk has been the lack of convergence between cash and futures or more precisely as Roberts (2008) argues, the inconsistent convergence of cash and futures. In addition, there has been structural change in basis relationships, which makes historical basis values less useful in predicting future basis levels. For example, in Iowa basis relationships have shifted so that cash prices are highest near the concentration of ethanol plants rather than near the river as in the past. Increased transportation costs have also changed basis levels.

The inconsistent convergence of basis is likely to be a short–run problem because futures exchanges tend to take immediate action when they identify problems. Futures exchanges have already taken some action. The Kansas City Board of Trade has increased the number of delivery points. Storage costs at delivery points have been increased for the Chicago grain contracts. Exchanges may have already acted to take care of the problems of basis convergence.

Another alternative is for elevators to offset their forward contract with producers by contracting with a grain buyer like a livestock feeder or ethanol processor. In some respects, though, this is a return to the type of contracting that originally prompted the development of the futures market in the first place. Futures markets have been successful because they typically have lower transaction costs and they assure performance of the contract.

Some elevators are writing forward contracts which allow the elevator to "pass–on" margin costs, transportation, and other cost increases to the producer. The result is a quoted basis that may, under specific circumstances, be adjusted downward.

What Are Farmers' Alternatives for Risk Management*?*

Although not all cash grain buyers have abandoned or limited their use of cash forward contracts to originate grain, the potential loss of this important risk management tool should prompt farmers to evaluate other risk management strategies. Several traditional risk management tools are available that can provide price protection.

Hedging grain sales directly in the futures market is the primary alternative to forward contracting. Because hedging with futures may lead to higher net prices than forward contracting (Brorsen, Coombs and Anderson, 1995), one possibility is that producers might actually be better off by using futures in the first place. Although producers would still have basis risk, they may find that basis risk does not create too large of a problem, depending upon their location.

Capital requirements created by margin calls, however, can be a major drawback for many producers. At $1,500 per contract for the initial margin requirement, establishing a

position in the corn futures market requires $0.30/bu. For soybeans, the initial margin requirement is $3,250 per contract or $0.65/bu. While initial margins are essentially a performance bond rather than a payment, there is an opportunity cost associated with committing that capital to the margin account. For a producer hedging new crop corn or soybean sales on April 1 and holding the futures positions until October 1, interest expenses amount to slightly more than $0.01/bu for corn and nearly $0.03/bu for soybeans at an 8.5% interest rate. For a farmer growing 1,000 acres each of corn and soybeans with yields of 160 and 50 bushels per acre who decides to hedge 50% of the production using futures, the initial margin requirements for the corn and soybean futures trades would be $24,000 and $16,250, respectively. The interest costs to fund these margin requirements would total $1,023 and $693, respectively. Thus, the total committed money for this producer hedging half of expected production would total nearly $42,000.

Capital needs to fund the margin account would increase further if the futures position(s) lost money and margin calls resulted. For the short hedger, this would occur when the market price increased. So, in situations similar to those seen recently, additional funds must be added to the margin account dollar–for–dollar with market price increases. As a result, farmers could quickly exhaust their lines of credit. As one Oklahoma producer recently remarked when asked why he did not use futures markets, "I used futures once a few years ago, but the market went against me and I had to sell one of my farms just to meet my margin calls."

Farmers can enter into a basis contract with a grain merchant in addition to hedging in the futures market to provide both the price level and basis protection that a cash forward contract offers. While the risk protection of the futures hedge and basis contract combined is equivalent to the cash forward contract, the availability of basis contracts may be limited, similar to forward contracts. Recent transportation cost increases are changing how elevators offer basis contracts. The historically weak basis bids currently being offered by grain merchants suggest that producers would be better off to accept the basis risk themselves.

Options on futures positions are another viable hedging strategy, although, like futures hedging, they do not protect against basis moves. Farmers can purchase put options to establish the right, but not the obligation, to sell a futures contract at a specified strike price. For example, a producer might buy a $6/bu December corn put in the spring during planting to hedge a new crop sale. In the event that the futures price is below $6/bu at harvest time when the cash sale is made, the put option will let the hedger recover the difference between the lower futures price and $6/bu. However, if prices are higher than $6/bu at harvest, the value of the option will be near zero and not used. In many respects, purchasing an option is similar to an insurance policy.

Option premiums are determined by a number of factors, including the length of time before expiration and the volatility of the underlying futures contract. Premiums for options bought further in advance of their expiration will be higher because there is more time for the futures price to move in an unfavorable way and for the option to gain value or become "in–the–money." This large cash outlay can be a drawback for farmers when contracting a long way into the future, which is especially important when they are also contracting and paying for inputs. Additionally, options are thinly traded in deferred months, so even being able to purchase options several months or years in advance of a sale may not be possible without significantly moving the market. No research is available on the liquidity costs in options markets, but we expect that options markets are more expensive than futures markets for an equivalent amount of price protection.

Option premiums become more expensive when the volatility of the underlying futures contract increases because there is a higher probability that the option will expire in–the–money. Since grain futures market prices have become increasingly variable in recent years, option premiums have increased.

Producers can reduce the net premium cost of purchasing a put option to hedge a future cash sale by making sales of other options through either a fence or spread trade. A fence, for example, establishes a price ceiling as well as a price floor, but the ceiling price can be at a higher level than the maximum price created through a futures hedge or cash forward contract. Selling a call option (which gives the buyer the right, but not the obligation, to buy the underlying futures contract at the call strike price) with a higher strike price than the purchased put option creates this price ceiling in exchange for the premium received. Thus, a price fence, or window, between the two strike prices is created. The put gains value at prices below the put strike price and, therefore, creates a price floor, while the call option loses value for the seller at price levels above the call strike price, thus creating a price ceiling. One problem with the fence strategy is that it leaves producers exposed to possible margin calls if prices rise. Another drawback is increased costs from having two option trades instead of one.

Similarly, a vertical put spread can be created by purchasing a put option and selling another put option with a lower strike price. Collecting the premium on the put option sold reduces the net premium cost of the hedge; however, it also removes the down-

side price protection at levels below the strike price of the put option sold. While a multitude of other option trades can be made to provide price risk protection, most are so complex that many farmers are not comfortable using them and it is not clear that they offer much advantage over the simple purchase of an out–of–the–money put option.

Direct contracting with a downstream end–user is another alternative. Several cash market participants also need to hedge against the *opposite* risk that grain farmers have. Such downstream contracting, which bypasses grain merchants that are not offering forward contracts, has both advantages and disadvantages. These downstream end–users, such as livestock feeders and ethanol plants, are concerned about price increases and may be more willing than ever to forward contract and lock in their input prices. The disadvantage, however, is that transaction costs may be higher for both parties because they have to identify a willing second party, negotiate contract details, and likely seek legal counsel in constructing the contract. Additionally, these downstream end–users may not be protected by bonds, and therefore pose additional risks to sellers.

Another alternative for farmers is to obtain revenue protection that would simultaneously cover both price and yield risk. Premiums for crop revenue insurance are subsidized by 38–67% and therefore may be increasingly attractive as option premiums become more expensive. Crop revenue insurance does not, however, protect against basis risk and has limitations on how much price levels can change from year to year. While it must be purchased before planting, it does not require a cash payment until after harvest. The recently enacted 2008 farm bill offers another type of revenue protection called Average Crop Revenue Election Program (ACRE). ACRE provides indemnities to producers in states that have revenue shortfalls (determined by a 5–year state olympic average yield and national marketing year average price) who also have revenue shortfalls, after crop insurance, on their own farms. Producer risk management decisions will likely change as the details of the ACRE program and disaster payments provided in the 2008 farm bill become known.

Summary

Due to significantly higher and more volatile prices in recent years as well as the working capital required to manage risk associated with offering cash forward contracts, some grain merchants have restricted or eliminated these contracts, thereby limiting a risk management strategy at a time when farmers need it most. Grain farmers still have alternatives for price risk management, including futures and options hedges and downstream forward contracting. Each, however, has some disadvantages relative to forward contracting grain with merchants or elevator operators. For some farmers, these disadvantages will be surmountable and relatively easily overcome.

Farmers with larger operations, more working capital, and more familiarity with the futures market will likely find futures and option hedging to be a reasonable alternative to cash forward contracting. Other farmers, without knowledge of the alternatives or comfort in using them may elect not to use any risk management tools and remain completely exposed to price risk. That is possibly the biggest concern of all.

For More Information

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