**Estimating Margins for FAPRI Baseline Strategies**

***Emily Scully, Melvin Brees[[1]](#footnote-1)***

When selling crops using the futures market, producers and lenders must be aware of the margin implications when initializing a hedge sale. Margin can be defined as the amount of money that a producer will need to provide or finance to maintain hedge positions in the futures market. The margin represents “good faith” money or insurance to cover any losses that the hedge transaction might incur. While this money is given up front, it expected that the hedge will result in an overall gain, and thus the margin money, along with hedging gains, will be returned to the producer’s margin account. The money returned could then be withdrawn to repay the market loan principal or used to offset price losses in the cash market. The margin can also be left in place to margin additional hedge sales. In cases where the opposite is true, the margin acts as insurance that the producer will cover and pay for any losses incurred in the futures market. There are two margins to consider when calculating the total margin requirement: initial margin and maintenance margin. The initial margin is a set amount of money required to make a sale. The initial margin can change based on price action and volatility over time and is set by the futures exchange. The maintenance margin will vary depending upon price movement against the hedger’s position and margin calls will require producers to deposit additional funds into their futures brokerage account as the market goes against them to cover their loss potential (in the case of hedge sales as prices go up). To find the maintenance margins on historic positions, one would calculate the difference between the maximum price between the date of the hedge sale and the date the hedge position is offset.

The following example illustrates determining the amount of margin funds that were necessary to cover a hedge sale for one of the pricing strategies using FAPRI ranges as price objectives. See: ***Using FAPRI Baselines and Ranges for Corn and Soybean Pricing Strategies,*** *by* ***Melvin Brees, Abner Womack, Emily Scully, Daniel Jaegers[[2]](#endnote-1).*** The same calculation methods can be used to calculate other futures hedging strategies or estimate potential margin funding needed.

To make a futures hedge sale, the producer must have a futures account with a brokerage firm with at least an amount of funds deposited to cover the initial margin requirements and broker fees for the hedge position to be established. In most cases, they will want somewhat more funds deposited to cover small fluctuations in futures prices at the time a position is taken. They must also be prepared to deposit more funds (margin call) into their futures account if prices move against their position and these requirements will require quick responses (wire transfers or digital transfer of funds) if the futures position is to be maintained.

Figure 1. Graphical Example of Margin for a Sale Made January 23rd, 2008

Chart, line chart

Description automatically generated

Figure 1 is a graphical representation of how margin is calculated for a single hedge sale. In this case, a 10,000-bushel futures hedge (two futures contracts) sale of corn was made on January 23, 2008 at $4.84 per bushel using December 2008 futures contracts to hedge harvest time (Sep-Oct) delivery. At the time of the hedge sale, a producer would have been required to provide $0.1 per/bushel in initial margin (from CME Group website). As time went on, the price began to increase. Each time the price increased, the producer was required to contribute additional margin to the margin account to match the difference between the current price and hedged price, otherwise known as margin calls. Each time the price decreased, margin would have been returned to the producer’s account. For example, on March 11th the price rose to $5.86. A producer would have been required to provide a minimum of $1.02 per bushel in the futures account to cover potential losses from the increased prices. However, by March 20th the price had fallen to $5.21 per bushel meaning the required margin decreased by $0.37 per bushel and the extra margin funds would be credited back to the producer’s account. Following these rules, one can see that at any time during that contract period, the maximum margin a producer would have needed in their account at one time due to margin calls was $3.04 per bushel. (What was the futures price when this occurred?) When the initial margin is accounted for, this means that the maximum total margin would be $3.23/ per bushel. It should be noted that, like in the March example, when prices decline the additional margin gets credited back to the producer’s account. Thus, when the crop was harvested and sold in the cash market followed by offsetting the hedge, the producer could withdraw funds from his futures account—the gains from the futures sale when added to the cash price results in a net price equal to the futures hedge sale price in March (plus basis—usually a minus).

In certain hedging situations, the margin requirements can get quite high, so it is important for producers and lenders to understand futures hedging and potential margin requirements before making such decisions. A major question to consider when establishing a hedge position is how much financing a producer might need to margin a futures account. To look for solutions to this question, the nine years (2008-09 to 2017-18) of sales made for the base marketing models using FAPRI ranges for single marketing year and multi-year selling strategies. Next the margins which would have been required were calculated. Total production was also assumed to be 100,000 bushels per year with ten sales of 10,000 bushels each. The results can be seen in the appendix in either a per-bushel (tables 1 and 2) or per-contract (tables 3 and 4) average for four of our base strategies (Trailing Stop and Price Objective) developed in ***Using FAPRI Baselines and Ranges for Corn and Soybean Pricing Strategies***. In summary, based on the strategy performance for the given marketing years, a corn producer could estimate the need for an average of about $1.15 per bushel or $5,650 per contract in margins. If multi-year sales are utilized for corn sales, the margin would increase to $1.85 per bushel or $9,230 per contract. A similar summary can be found for soybeans. For single-year sales, the average margin would be about $2.12 per bushel or $10,580 per contract. Again, margins would increase for multi-year sales to about $2.60 per bushel or $12,950 per contract.

Appendix

Table 1. Corn: Average Margin Per Bushel Per Year

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Crop Year | PO[[3]](#footnote-2) | POMY[[4]](#footnote-3) | TS[[5]](#footnote-4) | TSMY[[6]](#footnote-5) |
| 2008-09 | $2.54 | $2.54 | $2.56 | $2.56 |
| 2009-10 | $0.77 | $2.79 | $0.77 | $2.79 |
| 2010-11 | $1.03 | $2.75 | $1.42 | $2.75 |
| 2011-12 | $1.62 | $1.62 | $1.76 | $1.76 |
| 2012-13 | $2.45 | $2.45 | $2.34 | $2.34 |
| 2013-14 | $0.43 | $1.76 | $0.43 | $1.76 |
| 2014-15 | $0.78 | $2.17 | $0.71 | $2.17 |
| 2015-16 | $0.27 | $0.27 | $0.22 | $0.22 |
| 2016-17 | $0.35 | $0.35 | $0.29 | $0.29 |
| 9-year Average | $1.14 | $1.85 | $1.17 | $1.85 |
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Table 2. Soybeans: Average Margin Per Bushel Per Year

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Crop Year | PO2 | POMY3 | TS4 | TSMY5 |
| 2008-09 | $3.29 | $3.29 | $3.44 | $3.09 |
| 2009-10 | $1.37 | $2.82 | $1.39 | $2.82 |
| 2010-11 | $2.71 | $2.35 | $2.88 | $2.47 |
| 2011-12 | $1.89 | $1.89 | $2.14 | $2.14 |
| 2012-13 | $4.62 | $4.26 | $3.95 | $3.95 |
| 2013-14 | $2.10 | $2.84 | $2.47 | $2.88 |
| 2014-15 | $1.20 | $3.48 | $0.91 | $4.80 |
| 2015-16 | $0.64 | $0.64 | $0.87 | $0.87 |
| 2016-17 | $1.28 | $1.28 | $0.99 | $0.99 |
| 9-year Average | $2.12 | $2.54 | $2.11 | $2.67 |
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Table 3. Corn: Average Margin Per Contract Per Year

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Crop Year | PO2 | POMY3 | TS4 | TSMY5 |
| 2008-09 | $12,683.33 | $12,683.33 | $12,783.33 | $12,783.33 |
| 2009-10 | $3,850.00 | $13,950.00 | $3,833.33 | $13,950.00 |
| 2010-11 | $5,166.67 | $13,725.00 | $7,120.00 | $13,725.00 |
| 2011-12 | $8,120.00 | $8,120.00 | $8,790.00 | $8,790.00 |
| 2012-13 | $12,250.00 | $12,250.00 | $7,010.00 | $11,683.33 |
| 2013-14 | $2,150.00 | $8,775.00 | $2,166.67 | $8,775.00 |
| 2014-15 | $3,885.00 | $10,841.67 | $5,941.67 | $10,841.67 |
| 2015-16 | $1,250.00 | $1,250.00 | $1,475.00 | $983.33 |
| 2016-17 | $1,646.88 | $1,646.88 | $1,433.33 | $1,433.33 |
| 9-year Average | $5,666.88 | $9,249.10 | $5,617.04 | $9,218.33 |
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Table 4. Soybeans: Average Margin Per Contract Per Year

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Crop Year | PO2 | POMY3 | TS4 | TSMY5 |
| 2008-09 | $16,450.00 | $16,450.00 | $17,180.00 | $15,458.33 |
| 2009-10 | $6,850.00 | $14,100.00 | $6,933.33 | $14,100.00 |
| 2010-11 | $13,558.33 | $11,772.22 | $14,400.00 | $12,358.33 |
| 2011-12 | $9,428.57 | $9,428.57 | $10,690.00 | $10,690.00 |
| 2012-13 | $23,090.00 | $21,275.00 | $19,737.50 | $19,737.50 |
| 2013-14 | $10,480.00 | $14,181.25 | $12,360.00 | $14,381.25 |
| 2014-15 | $6,016.67 | $17,410.00 | $4,566.67 | $24,000.00 |
| 2015-16 | $3,008.77 | $3,008.77 | $4,341.67 | $3,256.25 |
| 2016-17 | $6,400.00 | $6,400.00 | $4,937.50 | $4,937.50 |
| 9-year Average | $10,586.93 | $12,669.54 | $10,571.85 | $13,213.24 |
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1. Emily Scully, MU Student Researcher; Melvin Brees, Retired MU Agriculture Economist [↑](#footnote-ref-1)
2. Melvin Brees, Retired MU Agriculture Economist; Abner Womack, Retired MU Economist and former FAPRI Director, Emily Scully and Daniel Jaegers, MU Student Researchers [↑](#endnote-ref-1)
3. Price Objective [↑](#footnote-ref-2)
4. Price Objective with Multi-Year Sales [↑](#footnote-ref-3)
5. Trailing Stop [↑](#footnote-ref-4)
6. Trailing Stop with Multi-Year Sales [↑](#footnote-ref-5)