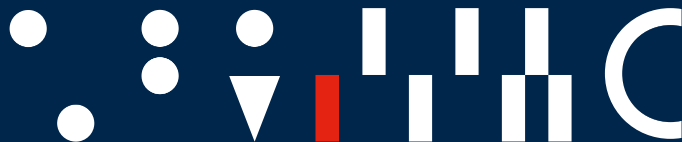

Optiver

Insights

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Market Structure

Two types of liquidity: The Mississippi River and market makers in agricultural derivatives

The United States Department of Agriculture (USDA), trading exchanges and other agricultural-related publications have published several articles recently regarding the Mississippi River's water levels.[1] In this paper, we join them in highlighting the tremendous importance of the Mississippi to the US economy, as well as exploring the relationship between its water levels and agricultural derivatives markets.

While many farmers may not directly trade futures, these markets play a critical role in influencing cash prices and mitigating price volatility in the broader agricultural economy. Few events have illustrated this relationship as clearly as the ongoing crisis in the Mississippi River. Since 2021, persistent droughts have pushed water levels in the river to record lows, threatening a supply chain that carries over 60% of US grain exports.[2] With barge transportation disrupted, local grain prices have fallen, squeezing farmers who rely on these routes.

Yet even as water levels have dropped, futures markets have provided stability to growers and the overall agricultural complex by addressing price risk. This paper examines how futures markets, and the market-making firms that keep them efficient, have functioned as a buffer in one of the most significant agricultural disruptions in recent years.

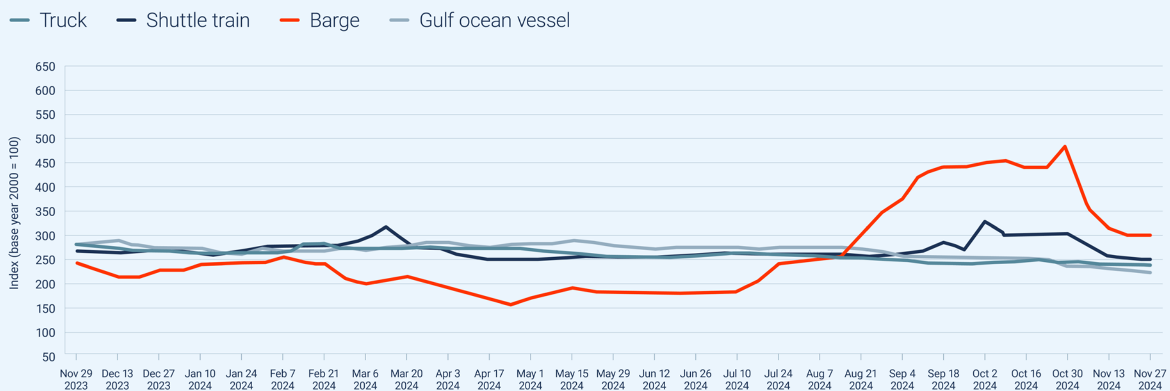
Background

The Mississippi River touches 32 U.S. states and two Canadian provinces as it winds its way between the Rocky and Appalachian mountain ranges. During the harvest season of 2024, the Mississippi experienced low water levels for the third year in a row. Barges, the most common method for transporting agricultural commodities, were forced to operate at reduced capacity, leading to both higher per-unit shipping costs and delays on delivery. As a result of this disruption, grain elevators lowered the cash price they could offer to farmers and/or increased the sale price of these goods to purchasers further down the processing chain.

[1] See e.g., Rippey, Brad. "Low Water Concerns for Mississippi River Tributaries." U.S. Department of Agriculture, 16 Oct. 2024, www.usda.gov; and CME Group. "Low River Levels Are Creating Higher Costs for Farmers." CME Group, 2024, www.cmegroup.com.

[2] Kate Grumke, Low Mississippi River levels are again making it more expensive to transport crops in the Midwest, Harvest Public Media, WXPR, September 20, 2024

Grain transportation cost indicators
(as of week ending 11/27/24)



Source: USDA, Agricultural Marketing Service.

In addition to lower cash prices at the elevators and delayed sales due to transportation bottlenecks, farmers also faced uncertainty in planting decisions, as local profitability became harder to predict.

The role of futures

Futures markets address these challenges by providing a pricing benchmark, enabling hedging, reducing long term volatility and signaling pricing adjustments for future harvest seasons. These markets provide a degree of certainty for producers regarding future planting decisions for a number of agricultural products such as corn, wheat and soybeans.

Futures pricing reflects a broader market consensus, unaffected by regional transportation issues. In this way, it serves as a reliable benchmark, ensuring farmers understand the “fair value” of their commodities. If futures prices for soybeans remain at $13.50 per bushel, farmers can compare this with the $12.80 per bushel offered at their local elevator to understand their price risk.

Grain elevators, which buy crops from farmers, use futures to hedge their own risk. This allows them to continue buying from farmers even when local transportation conditions make selling grain downstream more difficult. An elevator can sell futures contracts for soy at $13.50 to offset the risk of falling cash prices due to local disruptions.

Futures markets also help stabilize prices by encouraging hedging and arbitrage, preventing cash prices from becoming overly volatile even in the face of regional or global disruptions. For instance, Optiver argued for the importance of dynamic price limits in the CME Wheat market during the war in Ukraine. Our argument was that allowing price limits to adjust dynamically in periods of volatility allows the market to stay open, facilitating more complete risk management and better pricing.

Following Optiver's advocacy, the CME and CFTC worked together to implement dynamic price limits on CME's Wheat contracts on May 1, 2023.[3]

Because futures prices incorporate global factors, such as expected demand, weather patterns and input costs, they can guide farmers' planting decisions for the following crop year. If soy futures remain strong for the following season despite increased local costs relating to the low water level in the Mississippi, for instance, farmers may still consider planting soy, knowing broader market conditions will remain favorable. These farmers can use futures to offset their local price risk.

The role of market makers in futures markets

Within futures markets, market making firms play a vital role to ensure liquidity and efficiency. This benefits all market participants, including farmers who can access a transparent pricing benchmark for their crops, whether they participate in futures trading or not.

Market makers continuously quote buy (bid) and sell (ask) prices for futures and options contracts. This ensures that any market participant can quickly and easily buy or sell contracts without waiting for a counterparty. The presence of a market maker reduces the likelihood of price slippage (where trades are executed at unfavorable prices due to lack of liquidity).

Further, competition between market makers to offer the most competitive prices results in smaller spreads between the bid and the ask. This reduces the cost of trading futures contracts for all participants.

By actively trading and quoting prices, market makers help aggregate information about supply, demand and expectations, improving the accuracy of futures prices as a reflection of market conditions. This process is often described as "price discovery" and is one of the critical benefits futures markets provide to the economy as a whole.

Finally, market makers absorb some of the flow of market orders, smoothing out price movements even during periods of high uncertainty or stress. The presence of market making firms contributes to the overall diversity of participants in trading which helps lead to robust market conditions during volatile periods.

Farmers, market makers and international participants

While farmers may never engage directly with market makers, they benefit from the presence of these firms. The liquidity provided by market makers ensures that farmers and grain elevators can hedge their price risks efficiently. The farmer locking in a price for soybeans using futures (say, to offset the price risks inherent in the trend of falling Mississippi water levels) benefits from the market maker's willingness to buy or sell the contract.

These prices, which have been shaped partly by market makers, serve as a robust benchmark against which farmers can make informed decisions about planting, harvesting and selling their crops. The ease with which a farmer's direct customers (grain elevators, processors and other agribusinesses) can enter and exit futures positions also depends on market making firms, allowing these businesses to offer stable competitive local cash prices to farmers. International

[3] *See* Sammann, Derek. "Rising Risks: Managing Volatility in Global Commodity Derivatives Markets." *CME Group*, 9 Mar. 2023, https://www.cmegroup.com/media-room/speeches-and-comment-letters/2023/cme-group-sammann-testimony-house-ag-hearing-03-09-2023.pdf.

buyers of US crops can also use futures prices as an accurate and reliable source when structuring purchasing deals.

Finally, during extended disruptions like those caused by low water levels in the Mississippi, market makers remain present in the market, continuing to help stabilize prices when volatility might otherwise harm farmers. If unusually high shipping rates were to continue for an extended period, this could lead to additional problems, such as threatening the status of these markets as a benchmark for international participants. One possible consequence is that international participants could seek other agricultural benchmarks for pricing, leading to fragmentation of liquidity in US derivatives markets.

Conclusion

As part of the backbone of futures markets, market makers help support liquidity, price stability and efficiency. Even if farmers don't interact with them directly, the presence of market makers strengthens the overall agricultural pricing ecosystem, helping farmers manage risks and achieve better financial outcomes. It's a liquidity that farmers can rely on, even when they can't rely on the liquidity of the "Mighty Mississippi."

About Optiver

Optiver is a global market maker founded in Amsterdam, with offices in London, Chicago, Austin, New York, Sydney, Shanghai, Hong Kong, Singapore, Taipei and Mumbai. Established in 1986, today we are a leading liquidity provider, with close to 2,000 employees in offices around the world, united in our commitment to improve the market through competitive pricing, execution and risk management. By providing liquidity on multiple exchanges across the world in various financial instruments we participate in the safeguarding of healthy and efficient markets. We provide liquidity to financial markets using our own capital, at our own risk, trading a wide range of products: listed derivatives, cash equities, ETFs, bonds and foreign currencies.