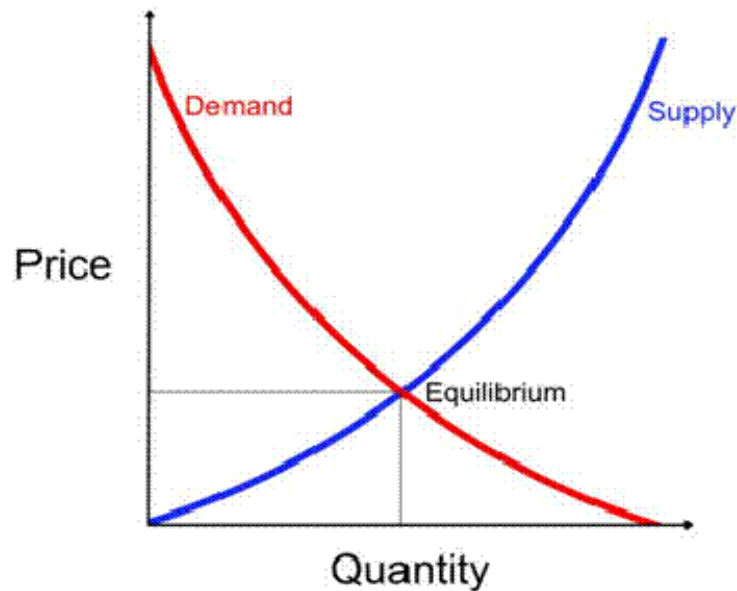


Price Discovery and Cash Markets

PRICE DISCOVERY

Price discovery is the process of finding out the value or price of a given asset or commodity. It is the central function of a marketplace. Simply put, price discovery happens when a buyer and a seller agree on a price and a transaction occurs.

UNDERSTANDING PRICE DISCOVERY



According to classical economics, price discovery is the process of finding where supply and demand curves intersect. This point of intersection is the price at which a transaction occurs.

While the term “**price discovery**” is relatively new, it is a practice that has existed for millennia. The ancient marketplace in the Middle East, Europe, the Indian subcontinent, and China have historically brought together large collections of buyers and sellers to trade and determine

price of goods. This process is still very relevant today.

In more modern times, price discovery for many of the primary commodities involved in international trade is undertaken by in the “pits” or “on the screen of derivative and futures markets like the Chicago Mercantile Exchange (CME), and other organized exchanges. Originally traders standing in trading “pits” on a trading floor, used verbal “open outcry “ along with hand signals, to signal their bids and offers in an effort to determine price and transact business for a given commodity. This process has further evolved into electronic trading platforms, with computers, a screen and a keyboard replacing the manual processes. The evolution of the process has, over time, increased trading volumes and liquidity.

PRICE DISCOVERY AS A PROCESS

The price discovery process and the facilitation of trade is the central function in any marketplace. The regulations governing the process associated with an organized market or exchange are central to its integrity.

The purpose of a marketplace is to bring potential buyers and sellers together in a public place where they can transact business. Each participant is likely have differing interests and reasons for participating in the market, as well as varying approaches.

In the 21st Century, a marketplace may be anything from a digital platform for electronically traded financials instruments, to a physical location where people gather, to a local auction house or farmer's market. By providing a venue or platform where traders can interact, individual buyers and sellers can agree to a consensus price and quantity to transact. As the number of transactions grows and the volume increases, price discovery becomes more efficient. If timely information (i.e. bids, offers, volumes, time of delivery, and transacted price, along with other relevant information) is made publicly available, the price discovery process is becomes increasingly transparent.

Price discovery is influenced by a wide variety of tangible and intangible factors, including:

- supply and demand (i.e. scarcity/abundance),
- transaction size and volume,

- transaction costs
- the underlying market structure and liquidity,
- information flow and availability,
- the overall economic environment,
- geopolitical issues,
- attitudes and appetites for risk on the part of the buyer and seller,
- market sentiment and buyer/seller psychology.

While there is no one formula that can successfully predict how all these factors and take all these factors into consideration, the result of their interaction is seen with each agreed price.

The formula is a dynamic process that constantly changes as new information becomes available to participants. To the extent relevant market information becomes inaccessible or insufficient, that specific market becomes less efficient.

MARKET NEWS AND INFORMATION



Market news and information has an impact on prices and business decisions across the supply chain

Market news and information play a critical role in price discovery. As new information (or even rumors) enters the market, prices can change. These price changes are a result of the reaction of market participants to the new information. In many cases, the news that changes market prices is not hard data, but simply information that changes expectations.

For example, the news that planting is delayed due to cold and wet conditions may push corn prices up, even though no one will know the size of the harvest until after harvest several months later.

Because of power and ability of information to move markets, market

participants have an insatiable thirst for timely news and information. Public and private market information services and systems are used by grain farmers, livestock producers, traders to gather, analyze and disseminate information about prices and other relevant information. As such, these services and systems play a key role not only in price discovery, but to the functioning of the entire supply chain.

As new information becomes available, it influences a market participant's assessment market value, and therefore the strategic decision of buying / selling price, as well as the volume they may be willing to trade. Market participants with the most current and highest quality information will have a comparative advantage and the ability to make better decisions. As "time is of the essence", they are able to act before others, gaining a first mover advantage.

"In the market, there is no reward for those arriving late, as the opportunities are fleeting as the price discovery process moves quickly upon the arrival of new information."

With the advancement communication technologies, news and information that drives market prices and business decisions is being delivered at a rapid pace and on an increasingly timely basis. With the development of the internet and the advancement of electronic commerce, the market has a robust capacity to react to new information through an efficient price discovery process. All participants throughout the market from producer to end user, and hedger to speculator, benefit from this process. It has leveled the field from small to large participants. As the access, timeliness, quality and volume of information has increased, the price discovery process has become increasingly efficient.

OECD countries have traditionally emphasized the importance of providing information to the agricultural sector. One of the world's best examples of this is the service provided by the United States Department of Agriculture (USDA). For over a century, USDA's continuous flow of free information and services to the entire supply chain has fostered transparency and confidence in the market.

In addition to local market information, merchandisers and traders are also likely to seek information on global supply and demand. The USDA and other government agencies in the United States and other countries regularly forecast worldwide supply and demand for a range of commodities. The private sector also produces copious, detailed information and analysis on the flow of grain across the globe. Market participants should keep in mind that the quality of analysis and the accuracy of forecasts can vary widely, even from reputable sources.

There is a wide variety of market information services or systems available to the public. Some important sources of market information include:

Private

- Internal Analysis & Research
- Proprietary Services & Research
- Electronic & Internet
- Word of Mouth

Government

- ABARE / ABS
- Stats Canada
- USDA
- ERS - Economic Research Service
- FAS - Foreign Agricultural Service
- AMS - Agricultural Marketing Service
- NASS - National Agricultural Statistics Service
- WAOB - World Agricultural Outlook Board

USDA Reports - Weekly

- Crop Condition Reports
- Planting Progress Report
- Crop Condition Report
- Harvest Progress Report
- Export Sales – FAS
- Export Inspections – AMS
- Grain Transportation Report – AMS

USDA Reports - Monthly

- WASDE – World Agriculture Supply & Demand Estimates
- US Crop Production – NASS
- World Agricultural Production – FAS
- Grains: World Markets and Trade – FAS
- Wheat Outlook – ERS
- Rice Outlook – ERS
- Feed Outlook – ERS
- Oilseeds: World Markets and Trade – FAS
- Oil Crops Outlook – ERS
- Cotton World Markets and Trade – FAS
- Cotton and Wool Outlook – ERS
- Livestock and Poultry World Markets and Trade – FAS
- Meat Price Spreads – ERS

- Dairy Monthly Tables – ERS
- Cattle on Feed – NASS
- Poultry Slaughter – NASS

USDA Reports - Quarterly

- Quarterly Stocks Report
- Flour Milling Products
- U.S. Bioenergy Statistics

MARKET TRANSPARENCY

Market transparency typically refers to the extent to which information about the bid prices, ask prices, and trading quantities for a specific stock is available. It also refers to the availability of other information that can affect prices. The opposite of a transparent market is an opaque market. The degree to which a market is free and efficient is determined by its transparency.

The internet has greatly improved price transparency. All types of market information and current prices are readily available through a few clicks on the computer. Large multi-national corporate traders, small proprietary business, and individual producers have equal, virtually instant access to pricing information on the major exchanges. The widespread use and relative affordability of mobile devices has further leveled the playing field. With readily available information, individuals can compare prices across different markets to help them make the best informed decisions.

Electronic trading has greatly improved the efficiency of markets, allowing traders to make more informed and faster decisions, and capture real-time pricing opportunities.

For example, the CME Group provides information on the bids and offers across each contract month for each particular commodity.

Importers looking to procure and purchase a range of products can go online and easily see where and when these products may be available, compare the price and quality between origins and with other products, and determine the best deal for their situation.

In standard economic theory, market participants all have perfect information, which creates complete price transparency. Markets with greater price transparency are considered to be "freer" markets with lower

information costs.

MARKET EFFICIENCY

Market efficiency refers to the degree to which market prices reflect all available, relevant information. If markets are efficient, then all information is already incorporated into prices, and so, there is no way to "beat" the market because there are no undervalued or overvalued assets available.

Market efficiency is the ability of markets to incorporate information that provides the maximum opportunity to buyers and sellers to effect transactions without increasing transaction costs.

There are three degrees of market efficiency:

- The Weak Form
- The Semi-Strong Form
- The Strong Form

The **Weak Form** of market efficiency is that past price movements are not useful for predicting future prices. If all available, relevant information is incorporated into current prices, then any information relevant information that can be gleaned from past prices is already incorporated into current prices. Therefore, future price changes can only be the result of new information becoming available.

Based on the Weak Form hypothesis, such investing strategies such as momentum or any technical analysis based rules used for trading or investing decisions should not be expected to persistently achieve above normal market returns. Within this form of the hypothesis there remains the possibility that excess returns might be possible using fundamental analysis.

The **Semi-Strong Form** of market efficiency assumes that market prices adjust quickly to absorb new public information, such that an investor cannot benefit over and above the market by trading on that new information.

This form implies that neither technical analysis nor fundamental analysis would be reliable strategies to achieve superior returns, because any information gained through fundamental analysis will already be available

and thus already incorporated into current prices. Only private information unavailable to the market at large will be useful to gain an advantage in trading, and only to those who possess the information before the rest of the market does.

The **Strong Form** of market efficiency says that market prices reflect all information both public and private and builds on incorporating both the weak form and the semi-strong form hypothesis.

Given the assumption that prices reflect all information (both public and private), no trader, including a corporate insider, would be able to profit above the average investor even if he were privy to new insider information.

Whether or not commodity markets are efficient, or to what degree, is a heated topic of debate among academics and practitioners.

MARKET VOLATILITY

Volatility is a statistical measure of how large an asset or commodity price moves around the mean price. In other words, it is a statistical measure of its change in price over time.

Volatility is often measured as either the standard deviation or variance between the change in price over time for that same asset or commodity. There are several ways to measure volatility, including beta coefficients, option pricing models, and standard deviations of returns. One way to measure an asset's volatility is to quantify the daily change in price (percent move on a daily basis).

In the commodity markets, volatility is often associated with big swings in prices in either direction. More volatile commodities are often considered to be riskier than less volatile commodities because the price is expected to be less predictable.

Volatility can also refer to the amount of uncertainty or risk related to the size of changes in an asset's price. This means that the price of the commodity can change unpredictably and dramatically over a short period of time. A lower volatility implies that a commodity's price does not fluctuate as dramatically and prices tend to be more constant.

Historical Volatility is based on historical prices and represents the

degree of variability in the price of a commodity. This number is expressed as a percentage. As such, volatility can be quantified on a daily, weekly, monthly, or annualized basis.

Implied Volatility refers to a metric that captures the market's view of the likelihood of changes in a given price. Traders can use implied volatility to project the likelihood of future price moves, and is employed in the pricing of options contracts.

Implied volatility is not the same as historical volatility (also known as realized volatility or statistical volatility), which measures past market changes and their actual results.

CASH MARKETS AND TRADE

To assist in procuring and purchasing agricultural inputs, grain importers need a mechanism that will assist them in securing supplies and discovering the market price for these commodities.

Generally speaking, prices of major agricultural commodities can be found in two separate, but related markets.

- Physical Cash Markets
- Derivative and Futures Markets

Initially, it is the physical cash market to which we usually look to discover the price of a commodity. These can be found across a large number of pricing points found throughout the network of established supply chains where buyers and sellers transact business and the commodity changes ownership.

The second are established commodity exchanges which facilitate the trade in derivatives such as futures, options and other related financial instruments. It is important to understand that these markets have a well defined and understood relationship to an underlying physical market.

The CME Group is a primary example of an established exchange for agricultural commodities and includes the Chicago Mercantile Exchange (CME), Chicago Board of Trade (CBOT), New York Mercantile Exchange (NYMEX) and Commodity Exchange Inc. (COMEX).

PHYSICAL CASH MARKETS

Generally speaking, “physical” or “cash” markets are where buyers and sellers exchange physical commodities for immediate / “spot” or forward delivery. This can be commonly found at country elevators, feed lots, processing facilities, and transloading terminals.

A physical cash market is a means by which importers secure a physical supply of grains and other agricultural commodities. The purchase or sale of the physical commodity in the cash market for delivery at a specified later date is the most common form of trade.

A “spot” market indicates the commodity is ready for immediate delivery or shipment, while a “forward” market indicates the commodity contracted of delivery or shipment at some point in the future. Both arrangements are entered into by means of a contract between the buyer and the seller.

A cash contract is distinguished from the other tools discussed in this chapter in that:

1. A cash forward contract involves a direct contractual relationship between two identified, specific parties. Such a contract establishes a seller’s obligation to deliver or ship, and a buyer's obligation to accept, the agreed amount of a commodity at an agreed time and place.
2. Each contract’s price and other relevant specifications, terms and conditions are determined by negotiation between the two parties, and without the assistance of an auction-style price discovery process.
3. The nature of a cash trade is that each transaction is unique to each deal and may vary to local customs of the trade. While terms and conditions of a proforma contract, or underlying trade rules, may be incorporated into the transaction, cash contracts are not standardized as to specifications, terms and conditions.
4. Cash contracts is not subject to the rules or regulations of an organized or regulated futures exchanges. That said, it is frequently the case, if overtly agreed to by both the buyer and the sell, the contract may be subject to trade rules, terms and conditions of a governing trade association. This terms and conditions may also extend into an agreed dispute resolution process and arbitration process. This is frequently done to expedite the dispute resolution process and avoid costly

litigation.

5. A cash contract cannot be automatically “cancelled” or “washed out”. However, in certain instances the buyer and the seller may be willing to negotiate an offsetting contract, that allows a washout to occur, but the individual nature of the trade does not allow this flexibility.

It is common practice that both buyers and seller in grains and other agricultural commodity markets to utilize both physical cash markets in tandem with related futures and options markets to develop a comprehensive procurement and purchasing strategies. These activities often extend into effective risk management consideration.

Depending on underlying market conditions, liquidity of trade, the governing rules of trade and the availability of quality trading partners, the cash grain trading markets may be used as risk management tools.

BROKERS

A grain broker is an independent individual, firm or electronic platform who acts as an intermediary between the buyer and seller. They facilitate trade in physical cash markets on behalf of the clients, assisting in negotiating terms under instructions from Buyers and Sellers, and charges them a commission for his services.

This type of an intermediary or broker can typically be found in grain markets that have reasonable volume and liquidity in locations around the world.

A person is not a Broker:

- who has possession and absolute control of goods supplied to him or her to sell and collect the price. (Therefore, a commission agent to whom a commodity is consigned for sale is not a Broker.)
- who only acts for one Principal to the exclusion of all others.

It is important to distinguish the difference between a Broker and an Agent. An Agent means a person who is not a Broker and who is authorized to act on behalf of a Principal and typically has constructive control of the goods.

A broker for physical cash grain should be delineated from an “**Introducing Broker**”. An “Introducing Broker (IB) is a broker in the

futures markets who has a direct relationship with a client, but delegates the work of the floor operation and trade execution to another futures merchant, typically a Futures Commission Merchant (FCM). The IB is usually affiliated with a FCM, either as an independent entity that is partnered with that merchant firm or as a direct subsidiary of that FCM. Activities of an IB are typically regulated by the affiliated exchange, as well as other regulatory agencies.

Chapter Author: Guy H. Allen
Senior Economist – International Grains Program
Kansas State University

Chapter Reviewer: Philip Shull
Senior Diplomat (Ret)
U.S. Department of Agriculture