Financial Trading

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Lecture 7
Traders, Prices and Market Efficiency

Agenda and objectives of the lecture

- Agenda
  1. Informed traders and their various styles.
  2. Competition, profit and market efficiency.
- Objectives
  1. Be able to explain how informed traders make prices informative.
  2. Be able to explain why prices cannot be completely informative.

Motivation: Informed traders must understand why they expect to profit from trading. Liquidity suppliers must understand how informed traders hurt them. Since we use prices to make allocation decisions, we need to know how information gets into prices.

Relevant article

Article 7-A: The Pandemic Turned My Parents Into Day Traders

THE WALL STREET JOURNAL.

MARKETS | PERSONAL FINANCE

The Pandemic Turned My Parents Into Day Traders

A Wall Street Journal reporter watches with unease as her normally frugal mother and father turn into raging stock-market bulls, chasing quick profits in Tesla and Zoom

By Stephanie Yang
Oct. 23, 2020 5:29 pm ET

In the past few months, my parents have become obsessed with Zoom. Not for its software, which facilitates our family's biweekly video calls, but for its stock, whose wild ride has at times made them thousands of

Terminology

- Market value: price at which we trade.
- Fundamental value: price at which we could trade if everyone had same info and therefore agreed on value: expected present value of all future benefits and costs associated with holding the security (DCF value).
- Fundamental values are not observed.
- A price reflects a piece of information if that information cannot be used to forecast future price changes. If so, the information is said to be in the price.
- Information that is already in the price is stale information.

Trader types

- Informed traders
- Noise traders (uninformed traders)
- Inside traders
- Market makers

Informed traders

- They trade when price differs from their estimates of fundamental underlying value.
- They buy when price is below fundamental value and sell otherwise.
- Their trades' price-impacts move price toward their estimates of fundamental value.

- Profit motivates informed traders, not a desire to make prices more informative.
- Informed traders need liquidity to profit.

Styles of informed trading

- Value-motivated traders estimate fundamental values.
- News traders estimate changes in fundamental values.

- Technical traders try to identify price patterns that are inconsistent with prices that reflect fundamental values.
- Arbitrageurs estimate relative differences in fundamental values.

Value-motivated traders

- Value-motivated traders use economic models to estimate security values.
  - Forecast cash flows,
  - Estimate discount rates,
  - Value the security and take a position based on their valuation.
- Value-motivated traders must be very disciplined about their assumptions.

Information-flow traders

- News traders (or information-flow traders) follow news carefully.
- They trade on events that they expect to change prices.
- News traders must act quickly.

Early peek advantage? Efficient price discovery with tiered information disclosure☆

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ABSTRACT

From 2007 to June 2013, a small group of fee-paying, high-speed traders receive the Michigan Index of Consumer Sentiment two seconds before its broader release. Within this early peek window, we find highly concentrated trading and a fast price discovery of less than 200 milliseconds. Outside this narrow window, general investors trade at fully adjusted prices. We further establish a causal relationship between the early peek mechanism and the fast price discovery by isolating the impact of the early peek arrangement along two dimensions. In cross section, we use other news releases without the early peek (as controls); in time series, we use the sudden suspension of the early peek arrangement in July 2013 (as the treatment). Our difference-in-difference tests directly connect the early peek arrangement to more efficient price discovery — it results in faster price discovery, lower volatility, and faster resolution of uncertainty. These results show that contrary to the common perception, tiered information release may help to reduce, rather than enhance, the informational advantage of faster traders and improve the efficiency of the price discovery process in financial markets.

Pseudo-informed traders

- Pseudo-informed traders are news traders who trade on stale information.
- Trading on stale information is the most common mistake novice traders make.
- To be a good news trader, you must know whether your information is already in the price.

The New York Times

United Airlines shares fall on false report of bankruptcy

By Micheline Maynard

Sept. 9, 2008

ANN ARBOR, Michigan — How jittery are investors about airline stocks these days? Just ask United Airlines.

An erroneous report that flashed across trading screens Monday

Pseudo-informed trading: An example

- The price of Shell is presently \$90. The price will be \$100 if Shell finds oil and \$80 if not.
- Well-informed traders believe Shell will find oil. They buy and push prices to \$100.
- Shell finds oil.

- When news of the find becomes public, the information is already in the price.
- If pseudo-informed traders buy on the stale information, they may push prices up to \$110.
- Value-motivated traders will sell and prices will fall back towards \$100.
- The pseudo-informed traders generally will lose.

Technical traders

- Informationally efficient prices should not have forecastable changes.
- Technical traders try to forecast prices from past prices and other market data.
- Their trading removes predictable price patterns.
- Technical traders profit when other traders make mistakes.
- They scavenge for the tidbits that other traders leave on the table.

- Since people learn from their mistakes, technical trading strategies rarely produce consistent profits over long time periods.

Arbitrageurs

- Arbitrageurs use fundamental and technical models to estimate relative differences in fundamental values.
- They trade when the relation between two (or more) prices differs from the relation predicted by their models.
- The effect of their trading is to remove these differences.

Noise traders

Uninformed traders who are also known as noise traders or liquidity traders:

- Individual investor are generally presumed to be noise traders
- Trade for personal liquidity reasons
- On average lose to informed traders
- Usually trade with market orders
- Effectively pay sell-side traders for
  - Liquidity (immediacy),
  - Efficiency (prices that reflect fundamentals).

Noise traders (cont.)

Recent research on noise traders is interesting.

- Individual investors trade in the same direction. They herd.
- When lots of individuals buy a stock, it underperforms the market for the next year .
- When they sell, it outperforms.
- Institutions have opposite pattern.
- Noise traders may be moving the market.
- They may also be providing liquidity to institutions - buying when prices fall.

Insiders

- Insiders typically are informed traders
- Insider trades based on "material information" about the value of a security that is not publicly available are illegal – investigated by the SEC.
- Corporate officers are required to disclose their trades within 2 business days.
- Firms tell employees when they can trade.

Market makers

- Market makers supply liquidity – trade with limit orders and keep limit order book full.
- Try to earn the bid-ask spread.
- Becoming increasingly automated – high frequency traders try to make markets.
- Very competitive game – probably make zero economic profits in the long run.

Trader types: An example

- There are two types of grocery shoppers.
  1. Some clip coupons, look at adds, compare prices across stores, save money on the bill.
  2. Others just grab what they need off the shelf and pay no attention to the price.

- The "noise shoppers" are losing on average to the "informed shoppers," but they do not care.
- The informed keep the market maker (the store) from charging high prices.

Public information vs. private information

- Public information
  - Anything broadly known or disseminated.
  - Fundamental: directly related to company cash flows (accounting statements).
  - Market (technical): security price history, trades and bid-ask quotes.
- Private information
  - All non-public information known to at least one person.
  - Illegal "insider" information.
  - Insights gained through superior or more timely analysis.

How does the market set prices?

- The demand and the supply of a security determines the price of that security (Check Lecture #3).
- What does determine the supply and demand for the security?
  - Liquidity motive.
  - Profit motive.
- Liquidity-motivated trading is not generally information driven.
- Profit-motivated trading is generally information driven.
- Generally, investors form beliefs about securities' values largely on the basis of public "common knowledge" information.

How does the market set prices? (cont.)

- This information set is extremely broad, ranging from public fundamental information of obvious relevance (such as the firm's financial statements) to more diffuse information that might affect investors' sentiment (such as a political development in a distant country).

- Arrival of new information changes the information available to investors and hence their assessment of securities' values.
- Prices generally adjust to reflect changes in this information, and trades are often a part of the adjustment process.
- Note that all security price changes cannot be be attributed to value-relevant information.
- As an example, Hirshleifer and Shumway (2003) note:
  - "Sunshine is strongly significantly correlated with stock returns."
  - This finding is difficult to reconcile with fully rational price setting.

Efficient market hypothesis (EMH)

- Security prices reflect price-relevant information fully and immediately.
- What kind of information?
  - Past prices, trading volume, etc. (Weak form of EMH)
  - Public information announced (Semi-strong form of EMH)
  - Private information of managers (Strong form of EMH)
- If a piece of information fully reflected in the price, you cannot make excess trading profits based on the information (you cannot beat the market).

Efficient market hypothesis (EMH) (cont.)

- Arrival of new information changes the information available to investors and hence their assessment of securities' values.
- The economic force driving market efficiency is competition among investors to accurately assess and interpret the information available them.
- The process of arriving at the new price, involving a complex interplay of bids, asks, and trades, is called price discovery.
- The term "discovery" emphasizes that the outcome is unknown.

The dynamics of price adjustment to new public information: Scheduled public announcements

- Typical adjustment around a scheduled news announcement:
  - If we buy before the announcement, we have extra risk as the news might cause a large price change.
  - Market making is riskier for dealers and designated market maker (like a specialist) would prefer not to post bids and offers.
  - The bid ask spread widens.
  - Depth (sizes, # of shares at the NBBO) declines.
  - Trading volume tends to decline.

The dynamics of price adjustment to new public information: Scheduled public announcements (cont.)

- Generally, trades do occur following a news announcement.
- The incoming order flow generally tend to be one sided, in the direction of the announcement surprise.

- Trading volume is often high. Why?
  - Traders might disagree about the importance of the information.
  - Traders who took established a position with the intent of betting on the impact of the announcement will unwind.
  - Any kind of an announcement brings the stock to people's attention.

The dynamics of price adjustment to new public information: Scheduled public announcements (cont.)

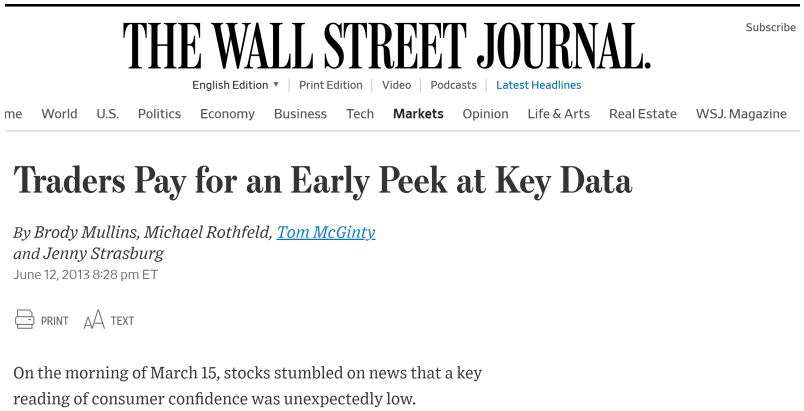
- Because major announcements often induce volatility, they are generally scheduled outside of regular trading hours (before the official market open or after the close).
- If a company decides that an announcement must be made during regular trading hours, the company will usually notify the listing exchange. If the news is major, the listing exchange will halt trading immediately prior to the announcement. Uniform pricing rule determines the price after the halt.

The dynamics of price adjustment to new public information

- Suppose a stock is trading at \$10, and there is a major news announcement: shares are worth \$1 more.
- Anybody who has heard the news will lift any offer below \$11.
- This process could occur without any trading.
- Initial quotes of \$9.90 bid, offered at \$10.10, are cancelled and replaced by: \$10.90 bid, offered at \$11.10.
- Generally trading often accompanies the adjustment.

Relevant article

Article 7-B: Traders Pay for an Early Peek at Key Data



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Traders Pay for an Early Peek at Key Data

By Brody Mullins, Michael Rothfeld, Tom McGinty and Jenny Strasburg

June 12, 2013 8:28 pm ET

PRINT TEXT

On the morning of March 15, stocks stumbled on news that a key reading of consumer confidence was unexpectedly low.

- The Michigan Consumer Sentiment Index is a survey number compiled and published by the University of Michigan.
- Prior to June, 2013
  - Reuters paid UM $1.1 Million per year for distribution rights.
  - "Official" public release time was 9:55:00 Eastern
  - But by paying a $5,000 monthly fee subscribers could get the release at 9:54:58.
  - For two seconds, the numbers were private information.
  - Was this legal? Was this fair?

The dynamics of price adjustment to new private information

- The public-information version of the efficient market hypothesis usually strikes people as a reasonable first approximation.
- The market forces causing prices to reflect public information are just powerful ones. But how about private information?
- The SEC states: "Illegal insider trading refers generally to buying or selling a security, in breach of a fiduciary duty or other relationship of trust and confidence, while in possession of material, nonpublic information about the security."

The dynamics of price adjustment to new private information (cont.)

- To the extent that the law is followed, we would not expect prices to reflect illegal private information.
- Full compliance with the law is not, however, something that can be simply assumed by other traders in the market.
- We have many instances of violations, and presumably many instances of violations that were not detected.
- If only one person knows something, how can it be reflected in the security price?
- The simplest answer is that anyone who possesses such information has a strong incentive to trade until the public price hits their private estimate of value.

The dynamics of price adjustment to new private information: An example

- ABC stock is offered at \$51.
- Only Joe knows that there will a takeover bid for ABC at \$60.
- Joe lifts ABC's offers, buying until the offer reaches \$60.
- Note: This is illegal in the United States.
- Other traders see that ABC is offered at \$60.
- They do not know why (until the takeover bid is announced).
- The bid is made public, Joe sells his stock.
- Joe's private information is already reflected in the price.

The dynamics of price adjustment to new private information: An example (cont.)

Some necessary conditions for Joe to make profit

- Trading
  - The market must be open and liquid.
  - Joe must be able to trade on the information.
- Revelation
  - The private information must be made public before Joe can close out his position at a profit.
- A buy and hold investor with favorable private information can patiently sit back and make profit."
- A buy and sell trader needs a market, needs to trade, and needs the information to be revealed.

The dynamics of price adjustment to new private information: An example (cont.)

Problems with this story:

- Before the takeover bid is announced, there is no new fundamental public information.
- Once Joe lifts the offers at \$51, why don't sellers continue to offer at \$51?
- If someone is willing to pay above the \$51 ("public information") value, why don't short sellers step in?
- How can the offer ever reach \$60 before the revelation of the takeover bid?

The dynamics of price adjustment to new private information

- Private information may not be reflected in the price but it can have profound effects on prices.
- The dealer always loses to informed traders.
- The dealer's expected losses to informed traders depend on
  - How many there are, how much they trade, their rate of arrival.
  - The strength of their information.

The dynamics of price adjustment to new private information

- Private information causes a spread between the bid and ask prices. In particular, it increases bid-ask spread.
- To stay in business, the dealer's profits from the noise traders must exceed the losses to informed traders.
- To maintain a given level of profitability, when informed traders grow more numerous or obtain better information, the dealer must offset the increased losses by increasing profits from the noise traders.
- The dealer raises the bid-ask spread.
- To avoid losses market makers expend effort to identify their counterparties or distinguish between informed and uninformed orders.

Impediments to market efficiency

- Information is costly to accumulate and process.
  - Some investors have superior acquisition or processing ability.
- Trading costs.
  - Some investors have lower trading costs.
- Psychological/cognitive biases.
  - Some investors are better at recognizing and countering them.

Questions for class discussion

- Why retail order flow is more desirable to a market maker relative to institutions/ institutional orders?

- James is an accountant working for a client, the ABC corporation. At a meeting to discuss the upcoming annual report, James learns that ABC will shortly be making takeover bid for XYZ. The accountant buys XYZ stock. In his insider trading trial, the defense presents expert evidence establishing that the impact of James' orders on the price of XYZ's stock was exactly the same as the impact of all other orders in XYZ. The defense claims that if James had in fact been trading on inside information, the impact of his trades would have been larger. Could the evidence be correct? And, if so, is the defense claim correct?

Questions for class discussion (cont.)

- ... The defense claims that if James had in fact been trading on inside information, the impact of his trades would have been larger. Could the evidence be correct? And, if so, is the defense claim correct?

- The evidence could well be correct: Orders move security prices due to the markets' beliefs in the likelihood of insider trading- not the actuality. All orders move prices in the same way because the market cannot tell who is informed and who is not.

- The construction the defense puts on this claim, however, is false. Just because the market could not tell, at the time of his trades, whether or not James had information, it does not rule out the possibility that he actually did.