# Stock markets, and secondary markets, more generally
# 266: Financial Markets and Institutions

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▶ **Review**

- We've discussed
  - What equities are and broad facts about how equity indices behave
  - Models of equity valuation
- Today we turn to the guts of how secondary markets actually work

▶ **Note:**

- We are also using equities to introduce lots of ideas that apply equally well to markets for all kinds of financial instruments and assets—bonds, options, other derivatives, houses, baseball cards, etc.

▶ **Secondary markets**

- A secondary market is where folks go to buy or sell financial instruments already in the hands of the public.
- Well-functioning secondary markets are essential if you want any class of securities to be attractive to a broad range of potential holders

  stocks, bonds, bitcoin, etc.

- This lecture starts with big think issues about secondary markets, in general, and then turns to the nitty gritty of equity markets.

▶ **The essence**

- A broad range of folks will never buy and hold a security unless they are confident they could sell it if they needed to.

- Put another way, when you buy the instrument if you have to worry whether you could unload it if needed, you'll demand extra compensation for holding it

  The market price will be lower; yield will be higher.

▶ **Definition: liquid market**

- A market for a security is liquid if there is usually a broadly accepted 'fair market price' and holders of the asset can reliably buy or sell the security at something close to this fair market price on short notice and at low transactions cost.

▶ **Liquidity: It's a matter of degree . . .**

- How clear is it what the fair price is? How reliably can I get the fair price? How much better price might I get if I waited an hour or a day? How low is the transactions cost?
- The market for your house: very illiquid.

  High transactions costs, not clear what the fair value is, and it may take quite a while to find someone willing to pay the fair price.

- The market for U.S. government Treasury bills: extremely liquid

  Market price is stable and bills can be traded on very short notice at low transactions cost

- Market for IBM shares: liquid, but less liquid than market for Treasury bills

  for example, there are regular moments of heightened uncertainty when you will get a worse price for your IBM shares than the fair market value.

▶ **Liquidity premium**

- All else equal, the higher the liquidity of the secondary market, the higher the price the asset will sell for.
- Assets that are highly liquid carry a 'liquidity premium'
- Put another way: assets with lower liquidity have to offer a yield premium in order to get folks to hold them

  Remember prices and yields move in opposite directions: higher price→ lower yield.

▶ **Liquidity involves deep puzzles**

- Economists have trouble even precisely defining what we mean by liquidity.
- Existing theories do a poor job of accounting for the empirical behavior of liquidity premia.
- Throughout the course, when we give equations for asset prices, we'll often just stick a term '$+\ell$' at the end and say, 'plus a liquidity premium that we don't understand very well.'

- **But pretty much everyone agrees that the liquidity, like all other deep issues in financial markets, is rooted in asymmetric information problems.**

- **Basic information problems**

  - In some markets, buyers and sellers of some item form a small community and are well-known to each other

    Say, diamond dealers in New York, or very high-end art dealers.

  - But this is rare. If the asset is widely held through society, potential buyers and sellers will be dispersed and have no relationship with each other.
  - Further, neither party may be expert at determining the fair value for the item.
  - The deserderatum in secondary market design is to facilitate 'arms' length' trades between buyers and sellers who don't know each other and who are not valuation experts.

- **A scenario illustrating the problem**

  - I really need to sell this Elvis painting. I think it's pretty valuable, but I really need to sell it.
  - I'll offer a low price, say $50.
  - Buyer: Wow, great picture, and a great price. But wait. Why such a low price? Maybe he knows something I don't? I better only offer $30.
  - Seller: That's nuts, its worth at least $70.
  - Buyer: And I suppose you also have bridge you could sell me. Take it or leave is $30.

- **Adverse selection**

  - The problem just described is a version of adverse selection, also known as the 'market for lemons' problem.
  - Made famous by George Akerlof, who got the Nobel prize for analyzing the issue.

    (aka, Janet Yellen's husband)

- **Many problems, standard solutions**

  - Markets where 'fair value' may be hazy and buyers and sellers don't know each other are subject to lots of problems of this variety.
  - Under these conditions, there is an immense range of private sector and governmental institutions that pop up to facilitate the functioning of the secondary market.

- **(Imperfect) fixes**

- 1. Experts who provide information about fair value

  house value appraisers, Ratings agencies for bonds, valuation consultants for antiques, your local auto mechanic, portfolio managers for stocks

- But how can I know who is an 'expert'?

  Bonding and certifying groups or licensing of experts also pop up.

- 2. Folks who stand willing to buy and/or sell at any time

  pawn shops, collectors, pickers, market makers

▶ **Trading posts**

- 3. In the old days, widely-known physical market places were organized
- These became places where a high volume of buyers and sellers tended to congregate

  Organized flea markets, stock exchanges, gun shows, swap meets, Christy's auction house. go

  http://www.christies.com/

- Thus, if you wanted to buy or sell, you'd go there.
- The idea is that if a reasonably large group of buyers and sellers have one spot where they tend to congregate, a 'fair price' is likely to emerge for standard competitive reasons

▶ **The modern version**

- Buyers and sellers can now 'virtually' congregate without having to physically do so.

  ebay and a zillion other auction sites

- And many equivalent computerized markets for financial instruments

  NASDAQ was the first prominent example of a largely computerized financial market, now all stock markets have a very important electronic side.

▶ **But still...**

- Most of us have day jobs, and so even if we know that there is a flea market or stock market we could go to in order to sell/buy our item, we don't have the time or specific knowledge to do so.
- Solution: agents crop up who, for a fee, will conduct the transaction in the market.

  stock brokers, ebay valet, real estate agents (buyer's and seller's agents) go

  http://sellforme.ebay.com/

▶ **But, of course,**

- We then have to ponder why we should trust these agents.
- Thoroughly checking them out may be a costly as simply mastering the process of making the transaction personally.
- Thus, we get private or public accreditation, licensing, bonding, fraud laws, ...

▶ **Secondary markets never flourish without an elaborate web of such institutions**

▶ **Do these institutions solve asymmetric information?**

▶ **No.**

- These 'fixes' form a confusing web of partial solutions.
- The fixes are very imperfect, which is part of the reason financial capital doesn't flow efficiently from those with savings to those with good ideas.
- In the U.S. and U.K., the solutions work pretty well. The euro area is getting quite good.
- Most other countries in the world, these institutions are much less reliable and financial markets are less vibrant.

▶ **A very deep, important, and simple fact**

- There is only one real *solution* to asymmetric information:

  The original parties to the trade learn all the information so that they both know everything relevant to the trade

- But learning is really hard and really costly

  Check your tuition bill, and ponder the pain of finals week.

▶ **The essence of secondary market institutions**

- Market institutions need to raise the likelihood buyers and sellers can reliably and cheaply get a fair price without the buyers and sellers ever having to go through the pain and expense of becoming fully informed.
- You should be realizing: ultimately, this must require an element of faith by buyers and sellers

  Thus, confidence and reputation will be important.

- Hmmm. That sounds precarious...

  When/if that faith/confidence falters, markets break down and *liquidity premia* sky rocket.

▶ **Institutions 'popping up'**

- Above, we said that these institutions pop up, making it sound as if this happens almost magically and quickly.
- In reality, 'pop up' was a slow process beginning centuries ago
- The process accelerated greatly in the U.K. in mid-1800s, and has been continuing ever since.

▶ **We are constantly evolving a ways to get broad participation in financial markets in order to allow an efficient flow of capital.**

▶ **Other stuff that 'pops up'**

- Every time a new institution pops up, you must also expect scammers to pop up and exploit its weaknesses.

  clever scammers will proliferate

- If they shatter the faith in market institutions, the flow of finance will be much less efficient than it otherwise might be.

▶ **Ultimate backbone**

- Ultimately laws and government form the backbone of this system
- SEC,CFTC,ETC.

  (that last one is a pun). And

▶ **End of big think, on to particulars**

▶ **Liquid markets and liquidity providers**

- Above all else, a liquid market requires that at most times there are a large number of potential buyers and sellers willing to trade near whatever happens to be the fair price.
- Businesses pop up that are known as 'liquidity providers' or 'market makers'
- But how do these businesses make money?

▶ **Liquidity providers and the 'fair price'**

- In practice, the fair price is two prices, a bid price and and ask price.
- Bid: the price at which you can sell shares to the market
- Ask: the price for which you can buy shares from the market.

▶ **Bid and ask**

- Bid is always less than the ask

- The spread between is the bid-ask spread.
- The 'liquidity providers' buy at the bid price and sell at the ask price

  and earn the spread
- And they may also earn some fees for participating in the market

  e.g., payments from the exchange if this is a market with an organized exchange.
- Note, the bid-ask spread is one component of transactions costs

  If I buy and immediately have to sell, how much money will I lose.

▶ **Mechanics of Buying and selling**

▶ **. . .**

- So let's take it as given that there is some physical or virtual location where a bunch of liquidity providers gather.
- We still need a process for arm's length buyers and sellers to interact with the liquidity providers

▶ **Buying/selling shares**

▶ **Step 1: Folks buy and sell shares by placing order with a broker.**

▶ **Placing an order**

- See the reading

  trading basics go

  http://www.sec.gov/investor/alerts/trading101basics.pdf

- Sad reality: When you place an order with your broker, you can be specific about the quantity transacted or the price, but not both.

▶ **Standard orders**

- Market order: Buy 5 shares at whatever price you can get

  I know I'll get 5 shares, but I'm not sure what price I'll pay
- Limit order: Buy 5 shares, but pay no more than $7.50 per share.

  I know the most I'll pay, but I'll either get 5 or 0 shares, not sure which.
- Stop order: if the market price falls below $7.50, sell my 5 shares for whatever you can get

  That is, place a market sell order if the price falls below the threshold.

- Here you are not sure if you'll sell; and if you do, you don't know what price you'll sell for

  Once the price passes $7.50, it may move (much) further before your broker can sell.

▶ **There are other orders, but for this class**

- I want you to know the buy and sell versions of market, limit, and stop orders.
- See the reading provided.

▶ **Who cares?**

- When buying and/or selling a stock that is widely traded most of the details about buying and selling don't matter much.
- You'll probably get a fair price

  (that is, if you are scammed, it won't be by much)

▶ **But, see the flash crash.**

- Flash crash: prices dropped precipitously for a few minutes then recovered
- If you had a stop order in place to sell your shares, you could have gotten a very bad price for shares that really didn't change value much over a half hour.

▶ **Aside:: a note about the flash crash**

- Many of the worst trades—the craziest sale prices— in the flash crash were cancelled ex post

  trades that more than 60 percent below what seemed to be the fair price were 'broken'

- Organized markets have rules, but also much discretion, regarding when to break (cancel) trades that seem 'unfair' in some sense.
- They have these rules to build confidence that folks participating in the market won't get screwed very much or very often

▶ **Step 2: Broker gets trade executed.**

▶ **Step 2: Broker gets trade executed**

- Broker can take several routes here

  See the reading on trade execution go

  http://www.sec.gov/investor/pubs/tradexec.htm

▶ **Obligation to get a good deal**

- Broker has obligation to get you the best price

  ... highest if you are selling; lowest if you are buying.

- But there may be lots of centers of trading for a given security.
- Q: With all these different routes for execution, how would you (or your broker) know if you are getting the best price?

  A: You don't, and neither does your broker

- But once again, institutional arrangements can raise the likelihood you'll get something close to a fair price most of the time.

▶ **NBBO: a partial fix**

- Remember: we want folks to be confident that there is a 'fair price' and that they are getting something close to that.
- SEC requires collecting and reporting of a National Best Bid and Offer (NBBO) across various trading entities
- Brokers required to provide you a price at least as good as the NBBO
- Alternative trading systems (ATSs) are not registered exchanges but are generally required to get you something generally as good as the NBBO

▶ **Very complicated, but ...**

- The goal here is to convince the broad public that a 'fair price' is established and that when they trade, they'll get something close to that.
- Given all the different trading venues and the speed of trading, the NBBO is a very imperfect fix.

  Investopedia does a nice job outlining the basic issues go

  https://www.investopedia.com/terms/n/nbbo.asp

▶ **Let's go a bit deeper into the weeds**

▶ **Some details on where trades get executed**

▶ **1. Route trade to a 'registered exchange'**

- e.g., NYSE, NASDAQ

  full list at (you don't need to know these): go

  http://www.sec.gov/divisions/marketreg/mrexchanges.shtml

▶ **2. Internalization**

- Execute the trade within the broker's firm by matching incoming buys and sells.

  Allows the firm to capture the bid-ask spread

▶ **3. Alternatives**

- Route trades to certain market making firms.

  firms that offer the same price as that on the organized exchanges

- These firms pay to have orders routed their way
- Why pay to get trades?

  Several reasons, but basically incoming orders (this 'order flow') might give them a hint as to which way the market is moving and allow them to make money by trading for themselves

- ECNs: electronic communications networks
- ECNs match buyers and sellers but are not regulated as exchanges.

  thus, generally have fewer protections and less transparency

- One example in this category is dark pools.

▶ **Dark pools**

- Distinguished by the fact that there is very little transparency about the trades

  Its as if folks are trading in a 'dark' room so they don't really know who they are trading with and they don't know what unfilled orders available to be matched

▶ **Dark pools: Q. Why? A. Asymmetric info.**

▶ **Dark pools and large sales**

- Suppose you have an unexpected expense and need to sell a large block of stock.
- If you placed a really big sell order on a public market, execution of the trade would probably depress the price you'd get
- In part, the price fall is because folks suspect that you have negative news about the firm and are dumping it.

  Try as you might, you can't convince them that your motives have nothing to do with the value of the firm.

- Thus, on conventional markets, brokers split up big trades to minimize their impact.
- In a dark pool, a large sell order can be matched with, perhaps, a bunch of smaller buy orders

- The fact that there has been large sell order is never shown to the market

▶ **How do ATSs affect the 'fair price' on registered markets?**

▶ **ATSs/dark pools and price discovery**

- A key feature of market institutions is price discovery

  'finding' what folks generally accept to be the fair price.

- If there is a high volume of trades AND most go through organized exchanges, we might hope that that NBBO would be a good representation of 'fair.'
- If more and more of the trading volume shifts to ATSs, the quality of the price discovery on the registered exchanges may diminish
- And then folks won't want to trade on the exchanges, and the price discovery may get worse.
- For example, folks might start trying to systematically scam the NBBO

  E.g., figuring out when the NBBO bid is 'too high' and selling (or vice versa)

- Currently there is lots of concern about price discovery if trading becomes more fragmented.

▶ **Finally, scams: how can this system be exploited**

▶ **Finally, scams:**

- All of these systems may allow for a certain amount of scamming.

▶ **Problem set**

- Question on the next problem set asks you to explore a number of market scandals
- The point is that it is hard to put together a system that reliably delivers the 'fair' price
- And given that much asymmetric information remains, folks have a big incentive to manipulate the price to be a bit less fair.

▶ **A key issue very much unresolved: computerized, high frequency trading.**

▶ **Computerized/High frequency trading**

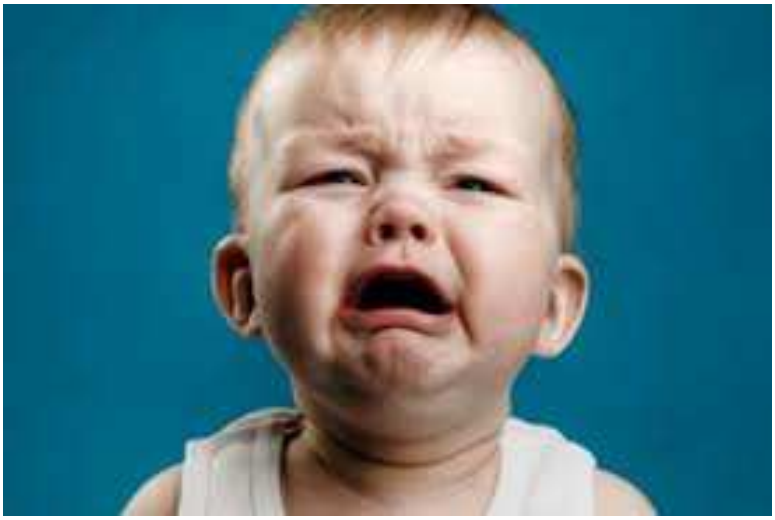
- Computerized trading is where a computer program reacts to market developments and buys and sells based on an computer algorithm.
- These programs can be used to manipulate markets in various ways that would not be possible for human traders

  e.g., placing and cancelling bids within span of a few milliseconds.

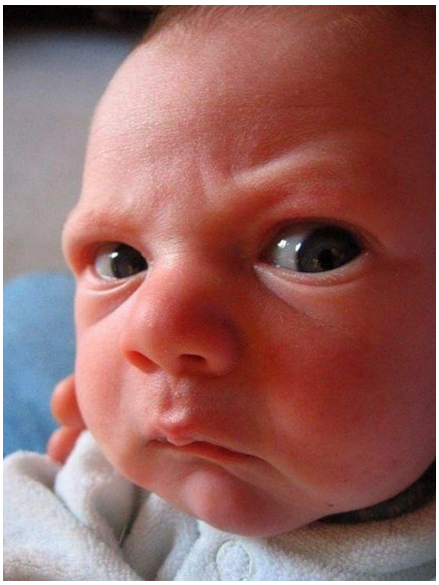
- Many questions about how to regulate this activity by exchanges or through governmental intervention

▶ **So how bad is it?**

▶ **Not this bad**



▶ **But maybe this bad**



▶ **More seriously. . .**

▶ **U.S. markets**

- Note that U.S. markets are generally viewed as among the best—most liquid, fairest—in the world
- This may be part of the reason that the markets are so large

  That is, why market finance is much more prominent than bank finance in the U.S.

- If so, it is because of the particulars of our financial market institutions.