17 Week 7a. Short sales, “overpricing,” liquidity, downward-sloping demand

Some big picture points

1. Issue: do “demand curves for stocks slope down?” For example, do short restrictions (laws, regulations as in Lamont, or IPO no-flipping rules, lockup, etc.) prop up stock prices? Does predictable December tax-loss selling drive prices down? Do roses cost more on Valentine’s day?

   (a) Old days: “Of course!”
   (b) Efficient markets: “Not at all. Arbitrageurs come in and set prices right.”
   (c) EM: There should be no such thing as “demand for shares”. Price equals present value of the company’s dividends, period.
   (d) Now “Maybe a little bit, in special circumstances.”
   (e) I.e., If you show up at 3 AM with a truckload of tomatoes, do you get full price?
      i. A: No
      ii. If you show up every night at 3 AM, you should.
      iii. Bill Gates announces sales of MS stock, with no price impact. –
   (f) The “downward sloping demand” can come from
      i. Limited risk-bearing ability of a small number of traders. (But why are traders limited?) “Segmented markets”
      ii. Asymmetric information: are you selling just to rebalance, or do you know something?
      iii. More deeply, when selling do you look like you know something? This logic is subtle however. We do not expect a simple static demand curve. “price pressure” will depend a lot on how much people think you know, how much you’ve advertised and marketed your desire to sell/buy ahead of time, and so forth. bookbuilding and other marketing activities of IPOs, for example, are ways of getting a bunch of tomato buyers to show up so there will not be much price impact.

2. Are “prices efficient”?

\[
\frac{P}{D} = \frac{1}{r - g}
\]

\[
25 = \frac{1}{0.04}
\]

\[
50 = \frac{1}{0.02}
\]

Small differences in return can add up to large differences in price if they last a long time. Thus, a large price deviation may not imply much of an “arbitrage opportunity” if it can last a long time, and if there is even a small (1%/year) cost to maintaining a long term short position. It’s especially hard to maintain a long term short position. If you think a stock is overpriced, but may take years to correct, there’s not much you can do about it.
Example. Two prices for the same security. The Gordon Growth formula (which assumes constant P/D, r, g forever) is

\[ \frac{D}{P} = r - g \]
\[ r = \frac{D}{P} + g \]

Return comes from dividend yield and dividend growth. If a price is 10% too big, then \( \frac{D}{P} \) is \( \frac{D}{P} \times 10\% \) too small. But \( \frac{D}{P} \) is a small number. If \( \frac{D}{P} = 4\% \) (big), then 10\% too big price means only 0.4\% too small return. 0.4\% is much larger than the transactions costs to put on a short position. Even a 10\% price error is only 40 bp of return error on an annual basis. This is too small to long-short.

So is a 10\% price error “irrational?” Is a 40bp return error “irrational?!”

“Arbitrage” strategies are really “convergence trades”, bets that the price discrepancy will soon revert. They are risky because prices might widen temporarily. Even a pure arbitrage can be risky! See the HSBC example below.

The short market is geared to short run speculative trades, not to long run short positions.

3. More background: Several other studies found small cases in which “two ways to get the same thing” have (slightly) different prices. Royal Dutch/Shell (trade on different exchanges); Closed-end funds. In each case there is a friction stopping you from arbitrage.

4. Short problems

(a) Must locate shares to borrow
(b) Borrow, sell
(c) Must post collateral – no zero cost investment! A long-short “zero cost” portfolio does not exist in practice; you need capital
(d) You receive interest on collateral, but not full interest. Retail investors don’t even get the interest. So, to short $100 of stock, you need cash, and you lose the interest on that cash. When it’s “Hard to short” stocks, you pay them for the privilege of shorting.
(e) Each day, you must adjust collateral. If stocks rise, you need to post more cash.
(f) The contract is one day. Lender may request shares back. If you can’t borrow again, you must buy, closing out the position.
(g) Most stocks can be shorted. Occasionally, there are just no shares around to borrow. This is especially true for hot IPOs.

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With P/D constant returns must come from divided yields and dividend growth.
Two good descriptions of short sales details


2. The market for securities lending

In a typical securities lending transaction, a would-be shorter, such as a hedge fund, would request a “locate” from its broker. The broker might locate the stock in its own inventory, or in the accounts of those of its customers permitting the use of their securities for lending. Failing this, the broker could turn to a custodian bank, or to another potential lender. Natural lenders include institutional investors such as insurance companies, index funds, and pension funds, who tend to have large and long-duration buy-and-hold investments. Brokers may even have exclusive contracts with institutional investors for access to portfolios of securities for lending purposes, as in a recent major exclusive lending deal between Credit Suisse First Boston (CSFB) and California Public Employees’ Retirement System (CalPERS). The broker’s search for lendable securities might be conducted using an electronic locate system, or by email, fax, or telephone. On May 22, 2001, ten large financial institutions announced the formation of Equilend, an automatic multi-broker lending facility. (Notably, CSFB was not one of the ten initial participating firms.)

A Financial Times reporter outlining the proposed role of Equilend described traditional methods for brokering shorts as “labor-intensive, because the appropriate shares or securities can take time to locate.”

When encountering stocks that are, using the common industry term, “hard to locate,” brokers sometimes cannot “circle” the quantity of lendable shares requested. Brokers may offer “partial fills.” Occasionally, a significant amount of time may pass before the necessary stock can be located. (Unfortunately, we do not have data concerning the distribution of time delays for locating lendable stocks.) Factors said to be related to the degree of difficulty of locating lendable shares include the capitalization of the issue, the float (the quantity of shares available for trade), whether the stock is included in an index, the stock’s liquidity, the degree of concentration of ownership, and the presence of special activity, such as IPOs, mergers, spinoffs, or acquisitions.

Once a security is located, the broker may execute a “pay-for-hold” transaction, compensating the lender for holding the securities until the borrower executes a short sale. This transaction is sometimes called “pre-borrowing.” Trades in the stock itself are normally executed in the US within three days of the trade. Normally, sell orders that are short sales are marked “short” for special attention, because they may be executed only on an “uptick,” an SEC regulation. [Note:

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14On November 3, 2000, CSFB offered the following press release. “Credit Suisse First Boston (CSFB), in the largest deal of its type, announced today that it has been selected by the California Public Employees’ Retirement System (CalPERS) to be an exclusive securities lending principal borrower for CalPERS’ passively managed Wilshire 2500 and small-cap stock portfolios totaling more than $57 billion in equity assets. In this arrangement, CalPERS has given CSFB the exclusive right to borrow the assets held in each of the portfolios for a guaranteed fee. ‘The combination of CalPERS and CSFB in this securities lending relationship will give the System’s members superior value for their assets while allowing CSFB to continue expanding its Equity Finance franchise,’ said Bob Sloan, Managing Director of the global Equity Finance Group at CSFB. ‘This places CSFB in a position to further our franchise in the prime brokerage and alternative capital arena,’ he continued. ‘We are very pleased CalPERS has selected CSFB.’ eSecLending provided the platform for distributing bidding parameters and guidelines to participating broker/dealers and disseminating bidding results to CalPERS for execution. eSecLending, LLC, (www.eseclending.com), is a new firm offering a web-based auction system for securities lending. The new process is designed to meet the needs of large pension funds, mutual funds and other major investors including online custodians. Burlington, Vt-based eSecLending serves as the primary developer of the web platform and software, and is responsible for staffing and managing the auction process.” (Source: www.csfb.com) The term “portfolio valuation” has apparently been used by brokers for the valuation of such exclusive lending rights. We are not aware of the fee in the CalPERS-CSFB deal.
The uptick rule is no longer in place -JC

The actual securities-lending transaction, given a locate, can be accomplished on a same-day basis. If conducted through a broker, the broker would typically act as the borrower from the outside lender, and as the lender to the outside borrower. Cash collateral, normally 102% of the market value of the borrowed shares for domestic securities (105% for international securities), is passed from the borrower to the lender in exchange for the shares. The lender “rebates” interest on the collateral at an agreed overnight rate. An overnight rebate rate of \( r \) implies a daily interest payment of \( r/360 \) times the amount of cash collateral. The interest payments may accrue on a daily basis, for month-end settlement. The rebate offered by the broker to its outside borrower would normally be lower than the rebate received by the broker from its outside lender. The extent to which the rebate is below a market rate (such as the federal funds rate in the United States) represents a benefit to the lender over other sources of funding. Occasionally, other securities are used as collateral, rather than cash, in which case an outright lending fee is charged. Only 1% of the security loans by a custodian bank appearing in the database analyzed by Geczy et al. (2001) were of this type.

Under SEC Regulation T, shorting retail customers of brokers must, in addition to the cash collateral, post 50% of the market value of the stock in additional collateral, although this additional collateral may be posted in Treasury Bills.\(^\text{15}\) Shorting retail customers typically do not receive interest on their cash collateral or lending fees because their shares are normally held in street name. Street-name shares are part of the broker’s “fungible mass” of shares held at the Depository Trust Corporation. When shares from this fungible mass are lent by the broker, there is nothing that ties the identity of the shares lent to a particular owner, as explained by Apfel et al. (2001).

In this paper we focus (implicitly) on institutional investors. One of the purposes of the paper is to model and present-value the stream of low-rebate benefits to owners of lendable shares. Our results do not attempt to capture the effect of retail owners that are not sufficiently large or sophisticated to enjoy the benefits of lending fees.

Lending agreements are normally on an open or continuing basis, renewed each day with an adjustment of the cash collateral according to changes in the market price of the stock and at a newly negotiated rebate rate. The lender may opt out of a continuing lending arrangement by issuing a recall notice, in which case the borrower must return the stock. A typical method for the short-seller to return the stock would be to borrow it from another lender. Alternatively, the borrower’s broker could issue its own recall notice to another borrower. In some cases, called “short squeezes,” the borrower (or its broker) is unable to locate lendable shares and is “bought in,” that is, must buy the stock outright.\(^\text{16}\) If the borrower fails to deliver the security in standard settlement time, the lender itself may buy it, using the cash collateral. The borrower remains responsible for any additional costs to the lender in conducting the buy-in. With a buy-in, the short sale is effectively interrupted. Institutional investors are viewed as preferred lenders, as they tend to hold stock positions over long periods of time, and are relatively unlikely to recall the stock. An unrelated broker would normally be a less desirable lender, because of uncertain motives for maintaining a position in the stock over time.

\(^\text{15}\)Maintenance margin is 30%, or $5 per share, whichever is greater. Investors may short a stock that they already own, a practice called “shorting against the box,” for example in order to create the effective reduction in equity exposure associated with a direct sale, but avoid immediate recognition of capital gains for tax purposes. The additional margin required when shorting against the box is only 5%, according to Brent et al. (1990).

\(^\text{16}\)A broker might, as a service to a highly valued customer, buy the stock on its own account in order to lend it to the customer.
During a lending agreement, ownership title (including voting rights and rights to any distributions, including dividends and shares) passes to the borrower.\textsuperscript{17} Cash-in-lieu-of-dividend payments are made by the borrower to the lender. In addition to borrowing for the purpose of profiting from a price decline or to obtain securities to deliver under a prior lending agreement, stocks may also be borrowed in order to hedge an investment (such as an equity derivative or a convertible bond), to gain access to voting rights, or to be the owner of record for dividends, which can be useful for certain accounting or tax reasons, or for dividend discount reinvestment plan purchases, the benefits of which are documented by Scholes and Wolfson (1989).

Shares are lent to obtain the cash collateral as a source of financing, to profit from the associated low rebates, or to meet the terms of an exclusive lending agreement, in return for which the lender receives a guaranteed fee, as in the CSFB–CalPERS deal.


The primary task of this paper is to describe the market empirically. Eighteen months of data (April 2000 through September 2001) from a large financial institution provide detailed information on loan supply, variation in fees, and the incidence and nature of lender recall. Key findings include:

- The aggregate market is easy to borrow: the value-weighted cost to borrow the sample loan portfolio is 25 basis points per annum and only 7% of loan supply (by value) is borrowed.
- Most stocks can be borrowed. While at most 16% (1,267 of 7,879) of the stocks found in the monthly Center for Research in Security Prices (CRSP) file are potentially impossible to short, these stocks account for less than 1% of the market by value (1,093 of these are in the bottom size decile and 719 are under $5).
- About 10% of stocks (813) are never shorted despite being available to borrow. These tend to be small, highly illiquid stocks that in aggregate account for less than 1% of U.S. market value.
- The holdings of institutional investors who lend are even more biased towards large, liquid stocks than the holdings of institutional investors in general. This reflects higher loan market participation by passive indexers.
- Ninety-one percent of the stocks lent out in the sample cost less than 1% per annum to borrow. These “general collateral” stocks have a value-weighted mean fee of 17 basis points. S&P 500 constituents, provided in excess supply by indexing lenders, are almost always general collateral.
- Only 9% of stocks (about 206 stocks per day) have loan fees above 1% per annum. These “specials” (stocks with high lending fees) have a mean fee of 4.3% per annum.
- Fewer than 1% of stocks (roughly seven per month) on loan become extremely special, demanding negative rebate rates (i.e., loan fees in excess of the risk-free rate). Krispy Kreme Doughnuts and Palm Inc. are examples of such stocks, exhibiting loan fees as high as 50% and 35%, respectively.

\textsuperscript{17}In Japan, given the Japanese tax treatment of dividends, it is common for the lender to recall the stock prior to dividends, in order to be recognized as the holder of record.
• The probability of being special decreases with size and institutional ownership.

• Several proxies for disagreement among investors (high turnover, high dispersion in analyst forecasts, increased message board activity, and low cash flows) seem to predict specialness.

• Recall is rare. In an average sample month, 2% (61) of the stocks on loan are recalled.

• Having been recalled, the mean (median) time before the short can be reestablished with the lender is 23 (nine) trading days.

• Days on which recalled borrowers might be forced to cover shorts are marked by extraordinary trading volume (more than twice the recalled stock’s overall sample mean) and intraday volatility.

• Returns earned during periods of involuntary or forced short covering in this sample are lower than average; this is evidence against widespread squeezes during this period in that short sellers can buy back shares at falling prices.
17.1 Lamont and Thaler questions

1. How are there two ways to buy Palm stock at different prices? What are the two prices?
2. Do L&T claim to have found an exploitable arbitrage opportunity?
3. If there is no way to make money, how can we say markets are inefficient?
4. Why are prices wrong in the first place? (p. 231)
5. What’s the difference between a carve-out and a spinoff?
6. Looking at Figure 1-4, and 3 in particular, do negative stubs seem to quickly converge? Does news seem to affect the stub, or is L&T’s contention of “woefully uninformed” traders confirmed by prices that do not react to news?
7. How is “real world” shorting different from our frictionless textbook? What are the extra costs and risks? (p.248 and my notes; p. 256 ff). Just mention 3-4 main issues)
8. Why would a short constraint lead to overpricing?
9. Would it ever make sense to buy a stock that you know is overpriced, and there is no chance that the price will rise further (no “greater fool”)?
10. Was there a lot of shorting in the “overpriced” subsidiaries? Was there more or less than in the parents? Did the sub shorting increase or decrease over time?
11. What do you learn from Fig. 5, 6?
12. Why don’t you and I lend shares to shorts when fees are high? Why doesn’t 3Com make a fortune doing this – it has 95% of Palm right there!
13. If we can’t short, let’s buy November (data of spinoff) puts, or create a synthetic short position in options markets. Will this work and if not why not?
14. How do turnover and institutional ownership of Palm compare to that of 3Com? What conclusions do L&T draw from these facts?
15. What happened to 3Com price during this episode? What conclusions to L&T draw?

17.2 Cochrane Questions

1. According to Cochrane, how are money and bonds like 3Com/Palm?
2. How does the monetary/convenience yield view say overpricing is associated with
   (a) turnover
   (b) supply
   (c) short sales constraints
   (d) “specialness” of the security (Palm, money); presence of substitutes
3. Is turnover associated with “overpricing” for 3Com/Palm? (show evidence)
4. How much does a typical Palm investor lose by holding Palm, not 3Com? Is this “a lot” or “not much”?

5. What’s the point of Figure 5?

6. Wait, monetary theory says you are willing to put up with low returns on money because there is no substitute. If you want to bet on Palm, why not buy 3Com or use options instead? (Point to evidence here in Table 1, Figure 7.)

7. Let’s look at the evidence that this “money” story might apply more broadly.
   (a) What’s the point of Figure 8 and Figure 9
   (b) What’s the point of Figure 11
   (c) As we look across all stocks, are prices high (ME/BE) where volume is high?

8. What big puzzle does Cochrane leave unanswered?

9. Big bottom line “bubbles” only come with “trading frenzies”. Most models of bubbles ignore this fact. Money makes sense of it.

10. Application: Don’t buy Palm for long run, as you don’t hold money for long run investing! Buy options, 3com instead. “provide liquidity” if you can.

17.3 Brandt and Kavajecz Questions

1. How do B&K measure “orderflow”? You see a trade; how do you know if it’s a “buy” or a “sell”? (“The market went up on a wave of buying” is a classic fallacy – for every buy, someone sold!)

2. What is the “price discovery” view of the correlation between orders and price changes? (hint: 2624)

3. Table IV: Central table. What does the number -0.72 in the top left corner of table IV mean? (This is a question about units – if x moves by what, what happens to y)

4. Is the regression in Table IV a forecasting regression or does it document a contemporaneous correlation?

5. There is a pattern in the coefficients of Table IV – which orderflows are most important for explaining each kind of yield change?

6. Is the orderflow effect stronger or weaker on days with big macro announcements? Why do we care?

7. How well would you do forecasting yield changes with one “order flow in all maturities” variable, rather than separate order flows?

8. What is the “inventory premium” view of the correlation between orders and price changes? (hint: 2640)

9. (The most important question) Overall, what three pieces of evidence lead Brandt to a “price discovery” view of the impact of order flow on prices, rather than the simpler view that “selling pressure does reduce prices after all” or there is an “inventory premium”. (Hint: Tables IV VI and VII matter here as well as Brandt’s discussion.)
17.4 Hasbrouk and Saar Questions

17.5 Krilenko Kyle Samadi Tazun Questions

I don’t have questions yet, but we will be reading and discussing these papers.