

20 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 exammple, are ways of getting a bunch of tomato buyers to show up so there will not be much price impact.
2. Are “prices efficient”?

$$\begin{aligned}\frac{P}{D} &= \frac{1}{r - g} \\ 25 &= \frac{1}{0.04} \\ 50 &= \frac{1}{0.02}\end{aligned}$$

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.

- (a) Example. Two prices for the same security¹⁰. The Gordon Growth formula (which assumes constant P/D, r, g forever) is

$$\begin{aligned} D/P &= r - g \\ r &= D/P + g \end{aligned}$$

Return comes from dividend yield and dividend growth. If a price is 10% too big, then D/P is $D/P \times 10\%$ too small. But D/P is a small number. If $D/P = 4\%$ (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.*

- (b) So is a 10% price error “irrational?” Is a 40bp return error “irrational?!”
- (c) *“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.*
- (d) 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.

¹⁰We did this before with continuous time, but here’s a simple version in discrete time

$$\begin{aligned} R &= \frac{P_{t+1} + D_{t+1}}{P_t} = \frac{(P_{t+1}/D_{t+1} + 1) D_{t+1}}{P_t/D_t} \frac{D_{t+1}}{D_t} \\ R &= \frac{(P/D + 1)}{P/D} (1 + \Delta D) = (1 + D/P) (1 + \Delta D) \\ R - 1 &\approx D/P + \Delta D \end{aligned}$$

With P/D constant returns must come from divided yields and dividend growth.

Two good descriptions of short sales details

From Duffie Garleanu and Petersen, “Securities Lending, Shorting and Pricing” *Journal of Financial Economics* 66 (2002)

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)¹¹ 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.” (May 22, 2001, p. 28.)

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:

¹¹On 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.’y 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.esecending.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.¹² 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.¹³ 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.

¹²Maintenance 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).

¹³A 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.¹⁴ 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.

From G. D’Avolio “The market for borrowing stock” *Journal of Financial Economics* 66 (2002) 271–306 273

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.

¹⁴In 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.

20.1 Lamont and Thaler q&a

1. p. 228. pp2. “Law of one price” is the most basic arbitrage restriction. LOOP is
 - (a) The same thing can’t sell for two different prices
 - (b) An asset must sell for the same as its replicating portfolio. If $A = B + C$, then $\text{price}(A) = \text{price}(B) + \text{price}(C)$.
Example: Black-Scholes stock, bond, option
 - (c) Small violations are commonplace. Bid/Ask spread is two prices for the same thing. But so far small. This paper: perhaps LOOP violations can be really big sometimes? (If you can’t short)
 - (d) Explain Loop vs. arbitrage vs. profits vs. efficiency.
2. How are there two ways to buy Palm stock at different prices? What are the two prices?
A:
 - (a) p. 230. March 2, 2000 3com did an equity carve-out – 5% of palm sold in IPO, 3Com keeps 95%. 3Com shareholders to receive the rest of Palm in 6 months
 - (b) Day before: 3Com = \$104.13. Day after: Palm at \$95.06, meaning 3Com should be at least \$145. Instead 3Com falls to \$81.81, for a -\$63 Stub!
 - (c) This mispricing was widely noted yet persisted for months.
3. Do L&T claim to have found an exploitable arbitrage opportunity?
A: p. 231, middle Short costs explain why arbitrage didn’t eliminate the mispricing.
4. If there is no way to make money, how can we say markets are inefficient?
A: Remember “inefficiency” = “prices don’t reveal information” NOT “you can make money”.
5. *But why are prices wrong in the first place?*
A: Their opinions 231 : “irrational. woefully uninformed, endowed with strange preferences.” But they could be anything that causes a downward sloping demand curve for specific stocks (despite the presence of cheaper and nearly identical substitutes). My paper: liquidity, convenience yield delivers such a demand curve.
JC: Morons is a poor theory. Maybe an “explanation” (like “the market went up on profit-taking”) but not a “theory” with much predictive content. What if prices are too low next time? These events are common, look for a theory!
6. What’s the difference between a carve-out and a spinoff?
A: p.232.The difference between a carve-out (raises money) and a spinoff (gift of shares). Note in the IPO process a concern about getting sufficient “demand for shares”.
7. (p.233, Table 2. “stub value” of parent and how it’s constructed. *Big point: A negative stub is their definition of ‘law of one price’ violation.* Note a negative stub is possible even though negative stock price is not possible – embedded lawsuits that will be paid by sub profits. But that’s not likely here. . p. 235 Sample is negative stubs.) Though not negative stub, similar events happened in the internet era. Example, GM and Hughes.

8. 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?

A: 237 Stubs take a remarkably long time to converge. They do respond to news – distribution announcement or IRS approval. JC notes this means somebody is paying attention, and the "marginal investor" still counts and is reading the newspaper.. p.242, "market forces act to mitigate the mispricing, but slowly." (As shorts are more and more able to enter.)

9. 242 on. Notes on Risk and return.

(a) Is a short Palm / long 3Com position riskfree at a monthly horizon?

A: No. It can go against you in the short run, becoming even more "overpriced." See p. 246, there is a substantial standard deviation of return. Table 4 CAPM. Yes, alpha. The stubs can go down before they go up.

JC note: 10 year bond is riskfree at 10 year horizon, but has lots of risk at a monthly horizon. Every price drop means expected return rises. It's a mistake to evaluate bond risk at monthly horizon! Spread trades are the same – when they lose money they are better deals. (If you can hold them to maturity!) The risks are being closed out, or if you have a horizon shorter than the end point.

Small digression on spread trades: A good deal can become a great deal. Alas you lose money along the way. Many famous blow ups come in this circumstance: financed by short term debt that runs; investors that pull out at the bottom; or margin calls (Corzine).

(a) 245. CAPM evaluation Though it may be risk free in the end, there is substantial risk over 1 month, etc. horizon. The spread can get worse before it gets better (and does).

(b) Still, though the arbitrage is not pure, the huge difference in price for (Palm) and (Palm + 3com) is weird. The big question: can small limits to arbitrage add up to huge difference in price? A: seems like yes, at least here.

10. Are the L&T cases pure violations of the Law of One Price – is 100 3Com really exactly the same as 150 palm plus more 3com? If not, what can go wrong buying 3Com to get Palm?

A: No. 246, 247 bottom, "the principal idiosyncratic risk is the possibility that the distribution will not take place, and consistent with this idea, when the distribution date is announced the stub values sometimes go from negative to positive. This pattern is consistent with arbitrageurs who are reluctant to take on substantial idiosyncratic risk." Parent may cancel the spinoff. IRS may disapprove. Third party may takeover the parent and cancel the spinoff. (More later in other papers). 3Com can borrow, using palm as collateral, and waste the money. Like the closed end fund puzzle.

11. Are these issues – the nonzero risks of arbitrage (beyond short costs) a problem for L+T's main point?

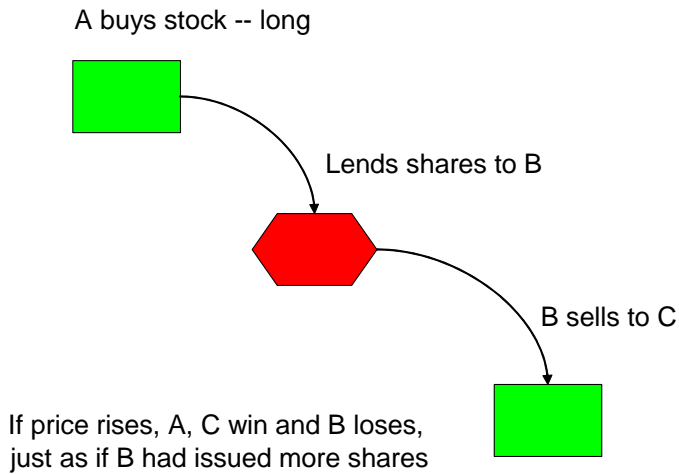
A: not really. Yes, it's not a pure LOOP violation, but price of Palm is surely "too high", not the expected present value of dividends.

12. How is "real world" shorting different from our frictionless textbook? What are the extra costs and risks?

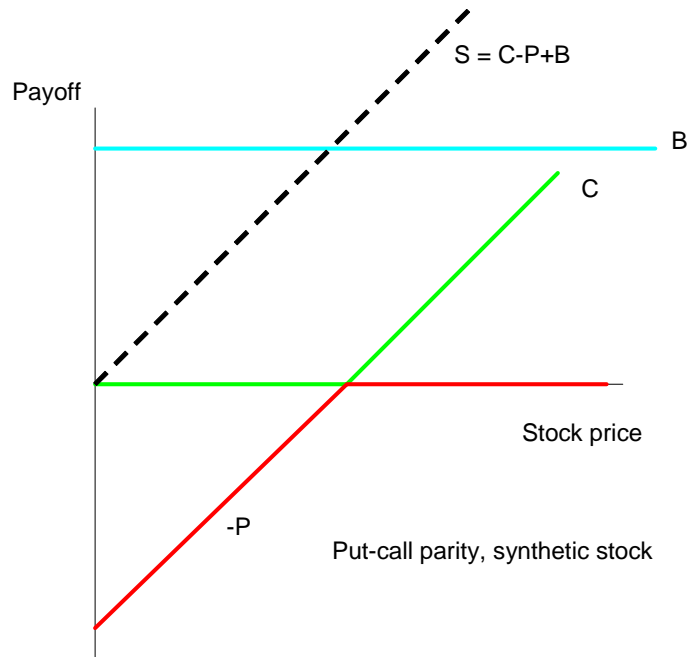
A: p.248 ff description of shorting process and my notes; p. 256 ff problems in shorting

- (a) Must borrow shares, typically from institutional investors.
 - (b) Must post collateral – no “short x, buy y, no money out of pocket” This is why long-short funds need your money!
 - (c) Interest rate rebate may be negative – you pay for the privilege of borrowing–or there may be none to borrow at any price.
 - (d) Then p. 256, bottom, lender has the right to call the loan at any time, forcing you to sell at a loss; you may have to post more collateral if the price rises, and rebate may increase.
256ff:
 - (e) Cost of finding a lender – Lending just after IPO is frowned on – supply of lendable shares is low. .
 - (f) May need to post more collateral if Palm goes up
 - (g) Palm lender might recall the loan, forced to close out the position
 - (h) Cost of shorting may be high, and may increase at any time (daily loans)
 - (i) *You cannot use short proceeds to buy stock – long/short is not a zero investment strategy in the real world.*
13. Why would a short constraint lead to overpricing?
249. The Miller theory that only optimists express their views. It’s not so easy though – why don’t optimists know this, and become less optimistic? It’s a little better than morons, but static.
14. 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”)?
- A: p.249. It may be rational to buy an overpriced stock, if you can earn money from lending it out equal to its expected price decline. Still this does not answer why price is high in the first place. Someone has to buy overpriced shares! 250 “someone has to own the shares...not all owners can lend their shares.”
15. 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?
- A: Short facts
- (a) Table 5 *huge* amount of shorting is in fact going on. The trouble is, there are not many shares outstanding.
 - (b) It builds up over time. (compare 1st, second month).
 - (c) Who in the heck are the 2.6% *short 3Com*???. Answer (a guess) AQR. If you have a quantitative strategy that is short all tech stocks, you might not notice and arbitrage between two of them.
16. What do you learn from Fig. 5, 6?
- A: Sort of seems like a “demand for shares” is at work - more shorting creates more supply, price discrepancy goes away. Note “demand for shares” should not exist in a frictionless market.

- (a) 252. How shorting generates extra “supply of shares.” (This is just like the way that banks “create money” from reserves.) This is how we get more than 100% shorted.



- (b) Fig 5,6: As shorts rise, “supply of shares” increases, price declines!252 “One might interpret this pattern as roughly tracing out the demand curve for the overpriced subsidiary. As the supply of shares grows via short sales, ... the price falls..”
17. 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!
- A: p.252 why few lent for short despite high fees. “dysfunctional nature of the shorting market.” You and I can’t lend for fees. 3Com can’t. Note 3com moved up the spinoff – the best it can do to supply more shares.
- Now many more institutions have short lending programs.
18. 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?
- A: Option market.
- (a) If you can’t short the stock, short calls/buy puts!
- (b) Put call parity, “synthetic stock” reminder.



- (c) Table 6 256: synthetic short at \$39.12 is much less than actual stock price at \$55.12. So much for arbitrageur shorting in the options market!
- (d) Call price is less than put price!
- (e) But why don't people who want to buy palm buy synthetic palm at \$39.12 rather than the real thing at \$55.12? Like buying 3Com instead, that's the puzzle! (Like "buy the cheaper generic" – a bit we can excuse but this much?) (note though: writing puts is hard) 257.
- (f) Table 6. Nov at the money puts are more expensive than at the money calls! Reflects a lot of put demand, but can't write more puts and hedge the position, because you can't short stock.
- (g) 260, middle: Back to the central point: *why is anyone buying Palm?* You can buy 3Com cheaper, you can buy synthetic palm cheaper.
19. How do turnover and institutional ownership of Palm compare to that of 3Com? What conclusions do L&T draw from these facts?
- A: Table 8., conclusions p. 262 Huge palm turnover, 37.8% per day much less for 3Com. (Smaller denominator though; *dollar* volume is not so different)
- JC: *So nobody is in fact being a Moron and holding Palm for 6 months rather than buying 3com. And why do woefully uninformed morons change their minds so quickly?* They admit, (261) on the "greater fool" theory. They see the slight differences in institutional ownership as indication of "morons."
20. p. 261 palm is "more liquid" because more turnover? Let's not mix supply and demand! Turnover can be a very low cost to trading with the usual demand for trading, or a huge demand for trading despite high cost.

21. 261 and 262 outlines of another theory, holding stocks for only a few days in the hope it goes higher.
22. What happened to 3Com price during this episode? What conclusions to L&T draw?

A: 264, Table 9 263. Amazing fact that parents *decline* as sub explodes, even though they hold 95% of sub stock! This is a real challenge for frictionless pricing! They just say “mystifying” (p. 264) – it’s central in my explanation!

23. Notes: Issuance/buy back is another response. The stock price is set by supply *and* demand!

20.1.1 L&T summary

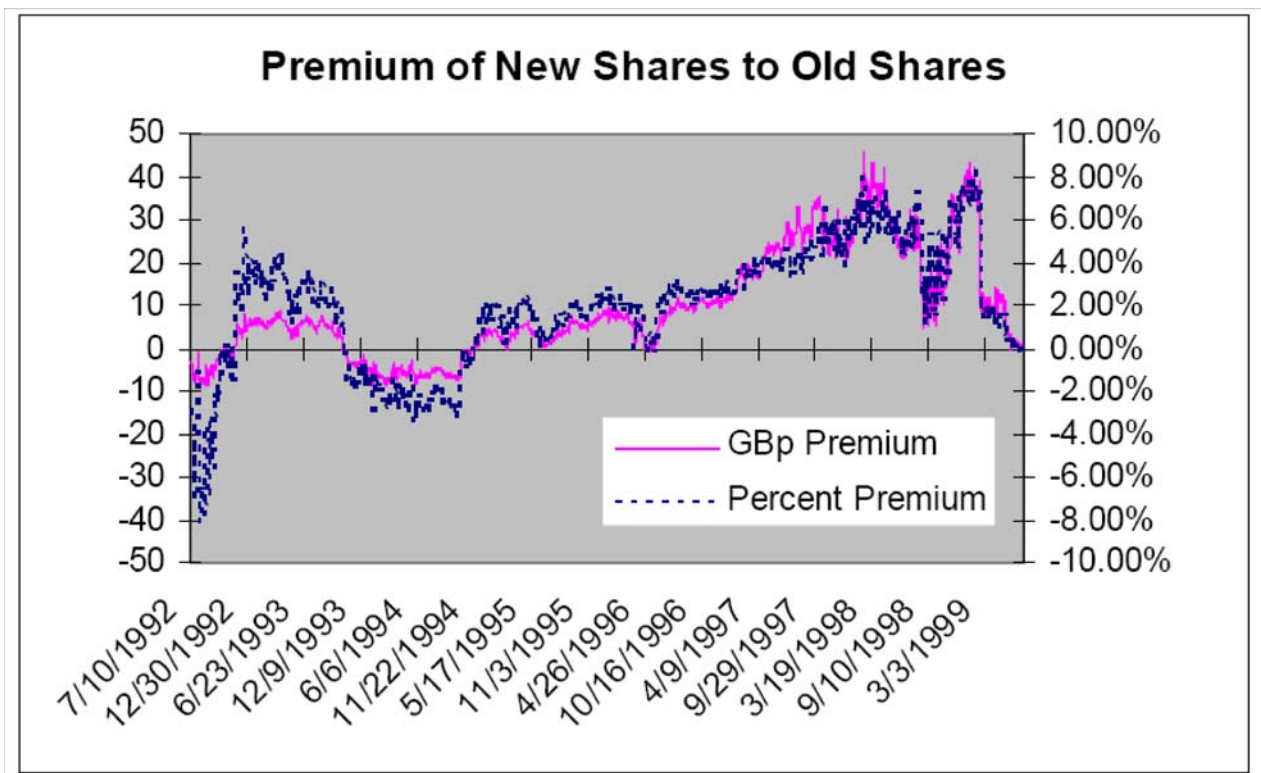
Big points:

1. 3Com/Palm story. Example: Domino’s sells a large Pizza for \$9, but a special with large pizza, coke and breadsticks for \$8.50. Let’s short the pizza, long the special and dine on cokes and breadsticks for free. Oh rats, you can’t sell pizzas back to Dominos. Oh well. But who are the “uninformed investors” who buy Pizza for \$9?
2. Facts:
 - (a) Palm (\$95) costs a lot more than buying 3com ($\$81.81/1.5 = \54.54) and waiting until November.
 - (b) The time pattern of stub values in Fig 1-4. Lasts a long time, slowly converges. Yet it is influenced by important news events – distribution announcement or IRS approval.
 - (c) Very few shares outstanding – 5%.
 - (d) There is a huge and increasing amount of short activity (Table 5), peaking at 141%
 - (e) The price disparity declines as short sales warm up, Figure 5,6.
 - (f) Option markets show put-call parity violations. “Synthetic Palm” is much cheaper than “real Palm” Table 6
 - (g) Huge turnover – 19% per day Palm, 4.5% 3 com. (But 5% Palm outstanding!) 38% per day on average. Palm has a *higher* bid/ask spread (0.09 / .14). → “Demand” for trading, not “Supply” of liquidity. (Table 8)
 - (h) 3com Fell 104 to 81 as Palm explodes (38 to 95), even though 3 com holds 95% of Palm (Table 9)
3. We do see “arbitrage,” even big ones, when forces (short limits) keep (many) arbitrageurs from entering. This is an instance in which prices pretty clearly were quite different from *frictionless* fundamental values.
4. Limits to arbitrage is interesting, and tempting to get distracted from the big question: *why is the price wrong in the first place?*
 - (a) Lamont: “Morons.”

- (b) Other explanations? A “discount rate?” Is there some reason people are willing to hold Palm *shares* (vs. equivalent claims to the same dividend stream, 3 com shares or synthetic long in options markets) despite lower expected returns
 - (c) *Theories??* Mentioned in the paper: Miller optimists, a more dynamic Harrison/Kreps.
5. JC interpretation: the interesting thing here is not the “rationality” or not of investors. It’s the insight into market frictions and liquidity.

20.1.2 L&T, short sales comments

- 1. Related puzzles. Royal Dutch/Shell. Closed-end funds. HSBC A/B shares. These were even traded on the same exchange! (Phil Maymin)



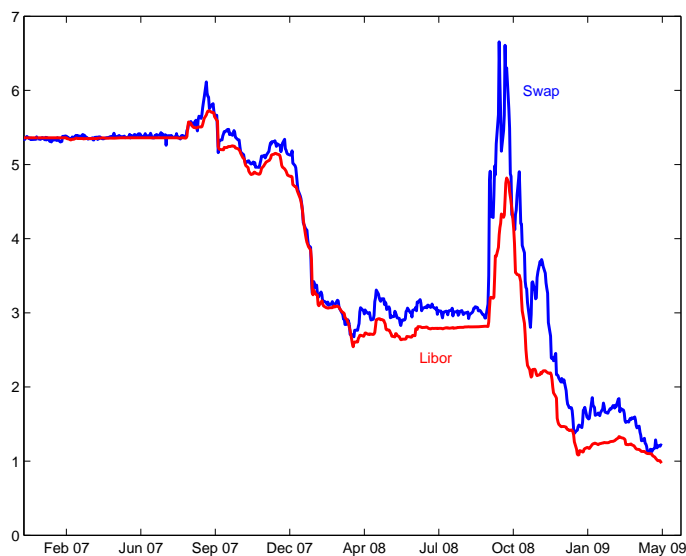
But a 10% price error that lasts forever can be a very small *return*. $r - g = D/P$ so $D/P = 0.03$ means $D/(1.10 * P) = 0.033 =$ an extra 30 bp *per year*. Arbitrage that!

- 2. *Discount rates* covers many more arbitrage opportunities that showed up in the crisis
 - Citigroup CDS vs. Citigroup bonds (CDS + treasury = bond)



Source: Fontana (2010)

- Covered interest parity. Libor = buy euros, invest in euro rate, sell euros forward



3 Month rates. Source: Baba and Packer (2009).

- In each case to unwind the arbitrage, you had to borrow dollars – a short constraint. But who was buying the “overpriced” security?
3. Lamont has done much more work on short sales constraints – see the optional papers. A star: “Go down fighting” forms portfolios of companies that are having public fights with short sellers and doing things to stop them (raising short costs deliberately)

Table IV
 Calendar time portfolio returns for one-year horizon returns

Monthly returns in percent for the twelve months following an event, calculated using calendar time portfolios. Portfolios are equal weighted except for last row, which is value weighted. Market adjusted returns are returns minus the return on the CRSP value weighted index. Characteristic adjusted are returns minus the returns on a value weighted portfolio of all CRSP firms in the same size, market-book, and one year momentum quintile. Four-factor alpha is the intercept from a regression of returns in excess of t-bills on the three factors of Fama and French (1993), size, value, and market, plus a fourth price momentum factor similar to Carhart (1997). "N months" is the number of calendar months available for market adjusted returns (the number may be lower for the other columns). T-statistics in parentheses.

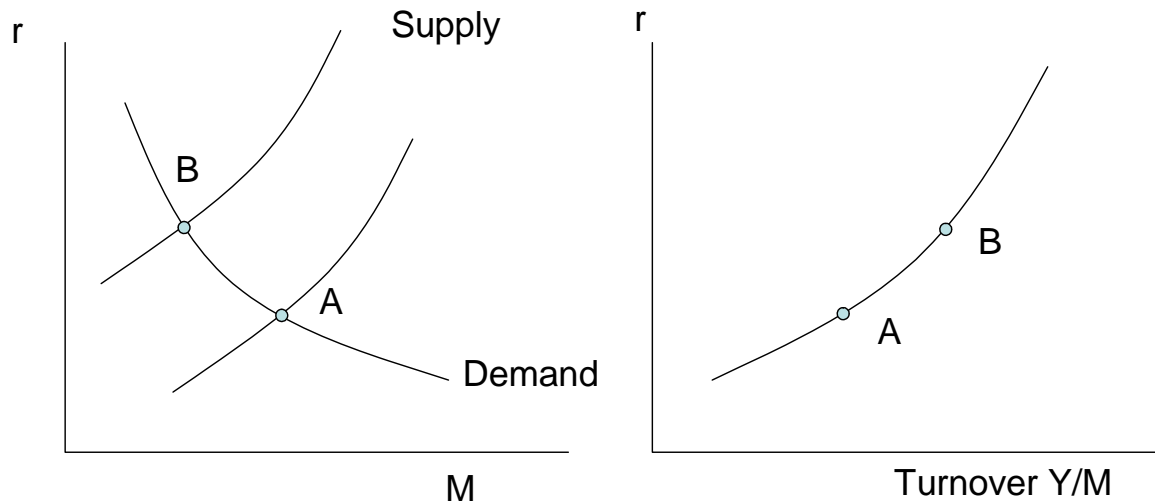
Description	N months	Market adjusted	Characteristic adjusted	Four-factor α
Claims conspiracy	166	-3.33 (2.22)	-2.77 (2.05)	-2.06 (1.32)
Alleges lies	229	-2.06 (2.22)	-1.09 (1.32)	-1.76 (1.79)
Considering options	125	-5.46 (3.37)	-4.66 (3.05)	-4.90 (2.91)
All belligerent	251	-2.26 (2.66)	-1.36 (1.85)	-1.94 (2.31)
Requests investigation	220	-2.67 (2.94)	-2.04 (2.47)	-2.11 (2.17)
Lawsuit	179	-3.07 (2.06)	-1.95 (1.39)	-2.93 (1.88)
All legal	241	-2.82 (3.32)	-1.91 (2.48)	-2.55 (2.89)
Exchange switch	53	0.58 (0.27)	1.32 (0.70)	-0.83 (0.33)
Urge not lend	132	-4.52 (3.07)	-4.55 (3.18)	-4.00 (2.48)
Friendly owners	51	-4.69 (1.82)	-3.15 (1.25)	-6.95 (2.19)
Other technical	58	-8.81 (2.45)	-7.26 (1.99)	-9.93 (2.42)
All technical	180	-2.79 (2.36)	-1.97 (1.87)	-2.90 (2.33)
All events	257	-2.85 (4.32)	-1.88 (3.41)	-2.40 (3.81)
All events, value weighted	257	-1.31 (1.81)	-1.23 (1.72)	-1.95 (3.22)

20.2 Cochrane questions and answers

1. *Big point:* Palm - 3com looks a lot like money or “convenience yield” in commodities “liquidity premiums” in bonds. If so, we don’t need “moron” investors to explain “overpricing.” Markets *exist* to trade, based on information, a fact our theory ignores so far; this makes trading central. But it does mean that liquidity can be a large, varying, and so-far unaccounted for, part of stock prices.
2. p. 2 note a big common component in palm/3com – the “stub” in LT is the difference between these two lines. Note the 3 com drop when it no longer includes a right to Palm. There is lots of “rationality” in here too! The market apparently knows how to “subtract!”
3. According to Cochrane, how are money and bonds like 3Com/Palm ?
A:
 - (a) p. 4 Both are claims to \$1 in 6 months/both are claims to Palm in 6 months, one is “overpriced”
4. 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

A: Mispricing comes with

- (a) Higher turnover of money. Nobody is in fact a moron. You hold money for at most a few weeks. And more mispricing = higher interest rates = more turnover. When interest rates are high, you take out less, go to the bank more often. The interest cost is a small part of doing business.
 - (b) Restricted supply of money. When the Fed supplies less, interest rates go up, and like part a.
 - (c) Binding short sales constraints. You can’t print money. Banks can’t expand checking accounts without reserves.
 - (d) Money is special. It is required for transactions. If credit cards, foreign currency, other substitutes arise, mispricing is lower for a given money supply.
5. A reminder: On the left is a conventional money supply and demand graph. As money supply tightens, we move along the money demand curve, so interest rates (mispricing) rises with lower supply. The way we demand less money is by going to the bank more often, i.e. higher turnover, seen in the right graph. So, less supply = higher rate = more turnover. (Not shown) a rightward shift in money demand would also raise turnover (one way to get more money demand is to go to the bank more often) and also raise rates.



6. The monetary view (unlike the morons view) is *testable*. It makes specific predictions about what should accompany overpricing. Point of the paper: *All four predictions are true of Palm/3Com too.*

7. How does the presentation of data in Figure 1 differ from Lamont and Thaler’s stub diagrams?

A: I graph the level of both prices. You see the strong common movement, much like the “arbitrages” in the financial crisis. This makes it clear that the problem is a steady overpricing in the level of one security vs. another, much like money and bonds, rather than 3 com and palm just going their own ways willy nilly. Most of the *variance* of prices is common. Also note the sharp drop in 3 com prices when the distribution happens. Apparently, the market *can* add and subtract.

8. Is turnover associated with “overpricing” for 3Com/Palm?

A: p. 5 (ms) Turnover is *huge*. See L&T, or Figure 2. 19% per day of Palm in first 20 days post ipo. 38% average *daily* turnover in all their cases (T8). 4.5% 3Com; 2% is typical. (Much of this reflects tiny denominator – small “float”). Figure 4: Volume is higher when price is higher. Figure 2. Notice the huge drop when 3com issues the remaining shares. There seems to be a demand for *dollar* not *proportional* volume. When there are only a few shares outstanding, that is a much larger *turnover*.

9. How much does a typical Palm investor lose by holding Palm, not 3Com? Is this “a lot” or “not much”?

A: p. 6 At 1-5 day horizon, even this huge price error is only 0.2% loss per day. This is not “moronic” to a day trader. It’s less than bid/ask spread; much less than typical weekly variation (Fig 3). p. 6: “Overpricing” means 2/10 percent per day drag; this is tiny compared to 7% σ of daily returns or 1% typical round-trip cost. *A day trader really doesn’t care about even the huge Palm/3Com price difference.* As you really don’t care about lost interest from \$40 in wallet. Figure 3: .2-1% loss is trivial in the one - five day return distribution. (This is admittedly the “greater fool” theory – why do people want to trade so much? I don’t know!)

10. p.7 Short constraints, like money

11. What's the point of Figure 5?
- A: 8, Fig. 5 As massive shorting of small number of available shares increases supply, price goes down. Just like banks meeting money supply by creating checking accounts. This is the same as L&T's figure, with a different interpretation.
12. 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.)
- A p. 10. Poor substitutes. (Crucial). *If you want to day trade you must hold Palm shares.* This is vital for a money-like explanation. If you can day-trade in 3com or the options market, there is nothing special about Palm shares. We need a special demand for *Palm* shares, not even these closest of substitutes.
- (a) Palm and 3com do move together – Figure 1.
 - (b) But surprisingly little at the hourly, 1, 5 day horizon. (This is especially surprising since the entire value of 3com is Palm). Evidence:
 - i. Table 1, a) R^2 of only 0.5 – 0.6.
 - ii. b) $\sigma(\varepsilon)$ is the tracking error of buying 3com to bet on palm; it is half or more of the standard deviation of Palm.
 - iii. 11, bottom “At short horizons, Palm prices and 3Com prices are delinked.”
 - iv. Figure 7. Intraday evidence. Buying 3com is a *really* bad way of betting on Palm.
13. Figure 6: Addresses the concern that there really is a 3 com negative stub, that the difference between Palm and 3Com price really does reflect changes in “real” 3com value, which *can* be negative. If the stub is the “real” value of 3 com, why does the character of the 3 com return change so drastically after the spinoff?
14. To Cochrane, the fact that 3Com *fell* is explained. How? What do Lamont and Thaler say about it?
- A: p. 13 Why did 3com fall? All the day-trade action betting on the future of Palm moves over to Palm stock. L&T are silent. (“mystifying”)
15. Summary, Table 2. All the ways 3Com/Palm is “like” money and stocks.
16. What evidence does Cochrane give that this “money” story might apply more broadly?
- (a) The bubble was very concentrated, Figure 8; p. 17. Why should irrational enthusiasm apply only to a narrow category of stocks?
 - (b) Volume was high where price was high, Figure 9,10. Fig 8, 9,10 *are the stars in the volume/price correlation.*
 - (c) The same thing happened in 1929, Figure 11, for the market as a whole!
 - (d) Price and volume are associated across stocks. Table 3
 - (e) Ofek, Richardson: The bubble burst more generally as lockups expired, share supply increased.
 - (f) Theory comparison p. 22: Only money accounts for everything, in particular the association of price with turnover.

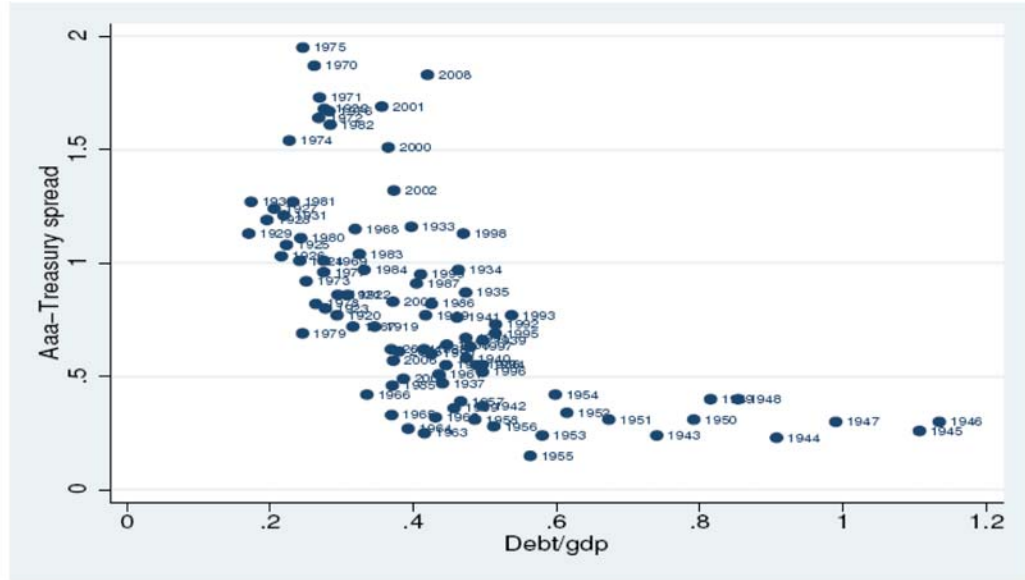
17. Comments:

- (a) Big bottom line “*bubbles*” only come with “*trading frenzies*.” Most models of bubbles ignore this fact. Money makes sense of it
- (b) An interesting possibility: The bubble was “rational,” caused by a low discount rate. If so “liquidity demands” and “downward sloping demand curves” are a *lot* more important than we think. Large demand for information trading drives the time-varying expected return.
- (c) This is a big change in how we view things. Traditionally, asset pricing thought that macro events – in a theory with zero trading – explain the big movements in prices. Then you tack on a few basis points for liquidity etc. If this view is right, the liquidity features are as big or bigger than macro features.
Put another way, we have long thought that *prices caused trading* or were at least independent of trading. Maybe *trading activity affects prices!*
- (d) The big Puzzle: Who are all these day traders? How can we all rationally think we know more than the other person? Volume is a big puzzle. *Why does the NYSE exist at all?*
- (e) This is just a big version of something we’ve known about for years, where the “more liquid” of a pair has a higher price. It’s just a lot bigger. *Why do people care about “liquidity” at all rather than buy and hold?* Examples
 - i. on the run vs. off the run spreads,
 - ii. benchmark bond spreads
 - iii. stock vs future spreads
 - iv. dually traded stock spreads
- (f) Practical advice. Don’t buy Palm for long run, as you don’t hold money for long run investing! Buy options, 3com instead. Don’t buy “liquidity” if you’re not going to use it! “provide liquidity” if you can.

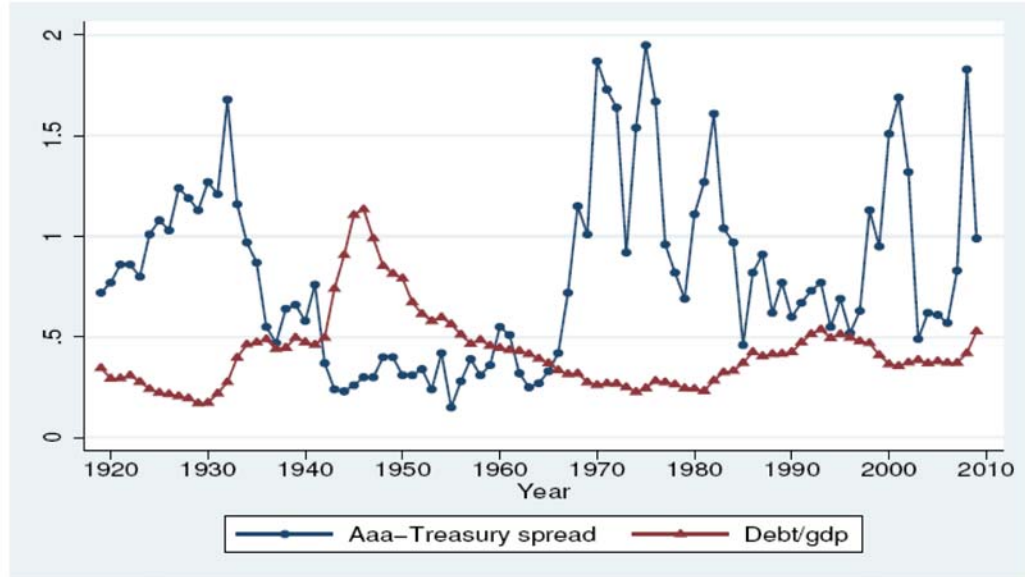
18. Many more “transactions premiums” or “money like” premiums are cropping up. A recent example, by Annette Vissing-Jorgenson and Arvind Krishnamurthy

Figure 1: Corporate Bond Spread and Government Debt

A. Scatter plot



B. Time series plot

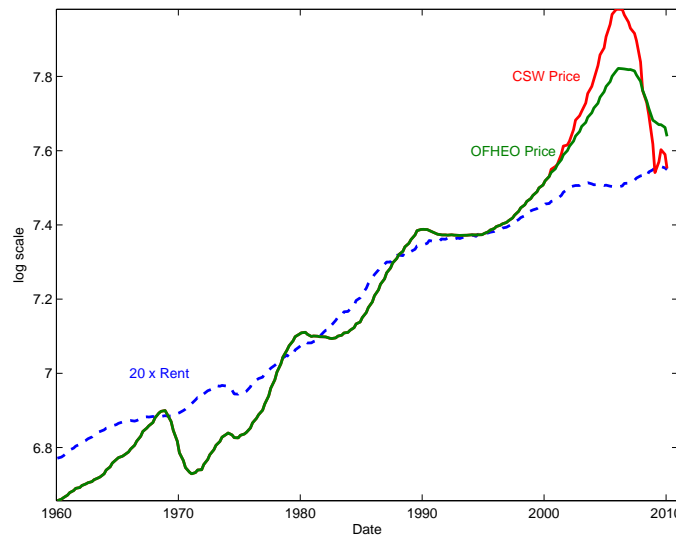
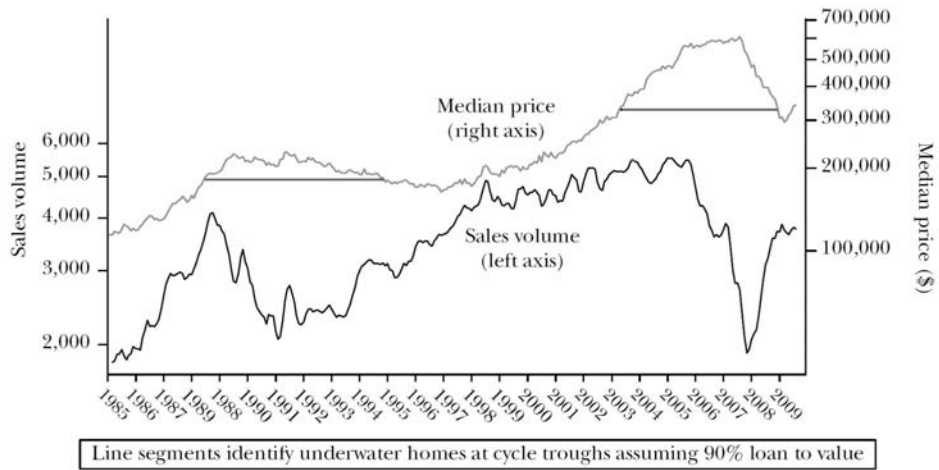


Source: Krishnamurthy and Vissing-Jorgenson

19. House “bubbles” are also “trading frenzies.” From Ed leamer:

Figure 2

Los Angeles Housing Market: Median Home Price and Sales Volume



House prices and rents. Data from
<http://www.lincolinst.edu/subcenters/land-values/rent-price-ratio.asp>

20. In many other markets the “liquid” version has a higher price. For example, the “on the run” bonds have higher prices than exactly the same ‘off the run” bonds. They also have much more volume and lower bid/ask spreads.
21. One practical implication: don’t buy securities that have lots of liquidity/trading overpricing if you’re not interested in the liquidity!