

Lamont, Owen A.

**Article**

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# Short Sale Constraints and Overpricing

Owen A. Lamont\*

Short sale constraints — including various costs and risks of shorting, as well as legal and institutional restrictions — can allow stocks to be overpriced. If these impediments prevent investors from shorting certain stocks, then these stocks can be overpriced and thus have low future returns until the overpricing is corrected. By identifying stocks with particularly high short sale constraints, one identifies stocks with particularly low future returns.

Consider a stock whose fundamental value is \$100 (that is, \$100 would be the share price in a frictionless world). If it costs \$1 to short the stock, then arbitrageurs cannot prevent the stock from rising to \$101. If the \$1 is a holding cost that must be paid every day that the short position is held, then selling the stock short becomes a gamble that the stock will fall by at least \$1 a day. In such a market, a stock could be very overpriced, yet if there is no way for arbitrageurs to earn excess returns, the market is still in some sense efficient. If frictions are large, “efficient” prices may be far from frictionless prices.

## Short Sale Constraints

To be able to sell a stock short, one must borrow it, and because borrowing shares is not done in a centralized market, finding shares sometimes can be difficult or impossible. In order to borrow shares, an investor needs to find an owner willing to lend them. These lenders receive a fee in the form of interest payments generated by the

short-sale proceeds, minus any interest rebate that the lenders return to the borrowers. This rebate acts as a price that equilibrates supply and demand in the securities lending market. In extreme cases, the rebate can be negative, meaning investors who sell short have to make a daily payment to the lender for the right to borrow the stock (instead of receiving a daily payment from the lender as interest payments on the short sale proceeds). This rebate only partially equilibrates supply and demand, because the securities lending market is not a centralized market with a market-clearing price.

Once a short seller has initiated a position by borrowing stock, the borrowed stock may be recalled at any time by the lender. If the short seller is unable to find another lender, he is forced to close his position. This possibility leads to recall risk, one of many risks that short sellers face.

Generally, it is easy and cheap to borrow most large cap stocks, but it can be difficult to borrow stocks that are small, have low institutional ownership, or are in high demand for borrowing. In addition to the problems in the stock lending market, there are a variety of other short sale constraints. U.S. equity markets are not set up to make shorting easy. Regulations and procedures administered by the SEC, the Federal Reserve, the various stock exchanges, underwriters, and individual brokerage firms can mechanically impede short selling. Legal and institutional constraints inhibit or prevent investors from selling short (most mutual funds are long only). We have many institutions set up to encourage individuals to buy stocks, but few institutions set up to encourage them to short. In addition to regulations, short sellers also face hostility from society at large. Policymakers and the general public seem to have an instinctive reaction that short selling is morally wrong.

Short sellers face periodic waves of harassment from governments and society, usually in times of crisis or following major price declines, as short sellers are blamed.

## The Overpricing Hypothesis

Short sale constraints can prevent negative information or opinions from being expressed in stock prices, as in Miller (1977).<sup>1</sup> Although constraints are necessary in order for mispricing to occur, they are not sufficient. Constraints can explain why a rational investor fails to short the overpriced security, but not why anyone buys the overpriced security. To explain that, one needs investors who are willing to buy overpriced stocks. Thus two things, trading costs and some investors with downward sloping demand curves, are necessary for substantial mispricing. This willingness to hold overpriced stocks can be interpreted either as reflecting irrational optimism by some investors, or rational speculative behavior reflecting differences of opinion. In the rational model of Harrison and Kreps (1978), differences of opinion, together with short sale constraints, create a “speculative premium” in which stock prices are higher than even the most optimistic investor’s assessment of their value.<sup>2</sup> Short sale constraints generate a pattern of overpriced stock leading to subsequent low returns.

## Short Selling in the 1920s

Charles M. Jones and I study a direct measure of shorting costs, coming from the securities lending market.<sup>3</sup> Stocks that are expensive to short should have low subsequent returns. We use a unique dataset that details shorting costs for New York Stock Exchange (NYSE) stocks from 1926

\* Lamont is an NBER Research Associate in the Programs on Monetary Economics, Corporate Finance, Asset Pricing, and Economic Fluctuations and Growth. He is also a Professor of Finance at Yale School of Management. His profile appears later in this issue.

to 1933. In this period, the cost of shorting certain NYSE stocks was set in a centralized stock loan market on the floor of the NYSE.

From this public record, we collected eight years of data on an average of 90 actively traded stocks per month. New stocks periodically appear in our database when shorting demand cannot be met by normal channels; when stocks begin trading in the centralized borrowing market, they usually have high shorting costs. Thus, appearance in our database conveys important information about shorting demand. In our sample, a few of the stocks were astronomically expensive to borrow, with negative rebates and shorting costs of more than 50 percent per year.

Our results show that stocks that are expensive to short or which enter our database have low subsequent returns, consistent with the hypothesis that they are overpriced. This return predictability shows that shorting costs keep arbitrageurs from forcing down the prices of overvalued stocks. The magnitude of the effect is huge, reflecting the fact that this is a very special sample of extremely overpriced stocks that have extremely low returns. Stocks entering our sample have (in the year following their first appearance) average returns that are 1 percent to 2 percent per month lower than other stocks of similar size. So over the next year they under perform by about 12-24 percent in total.

## Go Down Fighting

Yet another form of short sale constraints that I study are those deliberately engineered to hurt the short sellers.<sup>4</sup> Firms (either management or shareholders) can take a variety of actions to impede short selling of their stock. Firms take legal and regulatory actions to hurt short sellers, including accusing them of illegal activities, suing them, hiring private investigators to probe them, and requesting that the authorities investigate their activities. Firms take technical actions to make shorting the stock difficult, such as splits or distributions specifically designed to disrupt short selling. Management can coordinate with shareholders to withdraw shares from

the stock lending market, thus preventing short selling.

I look at long-term returns for a sample from 1977 to 2002 for 266 firms who threaten, take action against, or accuse short sellers of illegal activity or false statements. The sample uses publicly observable actions from news reports and firm press releases. It turns out that sample firms have very low returns in the year subsequent to taking anti-shorting action. Abnormal returns are approximately -2 percent per month in the subsequent year, and continue to be negative in subsequent years. Thus the evidence is consistent with the idea that short sale constraints allow very substantial overpricing, and that this overpricing gets corrected only slowly over many months.

## 3com/Palm

A third example of clear overpricing comes from 3Com/Palm, which I studied with Richard H. Thaler.<sup>5</sup> In this case, the driving force is not fraud but rather overoptimistic investors. Again, having some investors overoptimistic is not a problem, as long as there are more rational investors who can correct their mistakes by short selling. But add overoptimistic investors and short sale constraints together, and the result is overpricing.

On March 2, 2000, 3Com (a profitable company selling computer network systems and services) sold a fraction of its stake in Palm (which makes hand-held computers) to the general public via an initial public offering (IPO) for Palm. In this transaction, called an equity carve-out, 3Com retained ownership of 95 percent of the shares. 3Com announced that, pending an expected IRS approval, it would eventually spin off its remaining shares of Palm to 3Com's shareholders before the end of the year. 3Com shareholders would receive about 1.5 shares of Palm for every share of 3Com that they owned.

This event put in play two ways in which an investor could buy Palm. The investor could buy (say) 150 shares of Palm directly, or he could buy 100 shares of 3Com, thereby acquiring a claim to 150 shares of Palm plus a portion of 3Com's other assets.

Since the price of 3Com's shares can never be less than zero (equity values are never negative), the price of 3Com should have been at least 1.5 times the price of Palm.

After the first day of trading, Palm closed at \$95.06 a share, implying that the price of 3Com should have been at least \$145 (using the precise ratio of 1.525). Instead, 3Com fell to \$81.81. The "stub value" of 3Com (the implied value of 3Com's non-Palm assets and businesses) was minus \$63. In other words, the stock market was saying that the value of 3Com's non-Palm business was minus 22 billion dollars.

This example is puzzling because there is a clear exit strategy. This spin-off was expected to take place in less than a year, and a favorable IRS ruling was highly likely. Thus, in order to profit from the mispricing, an arbitrageur would need only to buy one share of 3Com, short 1.5 shares of Palm, and wait six months or so. In essence, the arbitrageur would be buying a security worth at worst worth zero for -\$63, and would not need to wait very long to realize the profits. If one had been able to costlessly short Palm and buy 3Com, one could have made very substantial returns. This mispricing was possible because shorting Palm during this period was either difficult and expensive, or (for many investors) just impossible.

## Short Sale Constraints More Generally

Each one of these three examples has unique characteristics, and it is conceivable that any one result reflects chance or an unusual sample period. But taken together, the evidence shows that in extreme cases where short sellers want to short a stock but find it difficult to do so, overpricing can be very large.

Can short sale constraints explain the amazing gyrations of stock prices in recent years? Prices seemed absurdly high in the period 1999-2000, especially for technology-related stocks. The Palm example shows that for some specific stocks, short sale constraints relating to mechanical problems in stock lending are surely the answer. More generally though, diffi-

culty in borrowing stock cannot be the whole story. One can always easily short NASDAQ or the S&P using futures or exchange-traded funds.

So if short sale constraints do play a wider role, it is not because of the stock lending difficulties, but because of more generic short sale constraints. Jeremy C. Stein and I look at short selling of NASDAQ stocks during this period, and find that short selling actually decreased as NASDAQ rose.<sup>6</sup> Thus, for whatever reason, the amount of short selling was not enough to drive prices down to rational valuations.

For most large cap stocks it is not difficult to sell short. Thus one cannot conclude from the evidence that short sale constraints are pervasive phenomena in stock pricing. What we do know

is that for most stocks, very little short selling occurs (relative to other trading activity) and most investors never go short. Thus something is constraining short selling, perhaps lack of knowledge about shorting, institutional constraints, risk, or cultural issues. Generalizing from the narrow (but dramatic) evidence discussed here, one can speculate that these more general short sale constraints also affect stock prices.

<sup>1</sup> E. M. Miller, "Risk, Uncertainty, and Divergence of Opinion," *Journal of Finance*, (September 1977), pp. 1151-68.

<sup>2</sup> J. M. Harrison and D.M. Kreps, "Speculative Investor Behavior in a Stock Market with Heterogeneous Expectations," *Quarterly Journal of Economics*, (May 1978), pp. 323-36.

<sup>3</sup> C. M. Jones and O. A. Lamont, "Short Sale Constraints and Stock Returns," *NBER Working Paper No. 8494*, October 2001, and *Journal of Financial Economics*, (November 2002), pp. 207-39.

<sup>4</sup> O. A. Lamont, "Go Down Fighting: Short Sellers vs. Firms," *NBER Working Paper No. 10659*, July 2004.

<sup>5</sup> O. A. Lamont and R. H. Thaler, "Can the Market Add and Subtract? Mispricing in Tech Stock Carve-outs," *NBER Working Paper No. 8302*, May 2001, and *Journal of Political Economy*, (April 2003), pp. 227-68.

<sup>6</sup> O. A. Lamont and J. C. Stein, "Aggregate Short Interest and Market Valuations" *NBER Working Paper No. 10218*, January 2004, and *American Economic Review*, May 2004.

## Historical Perspectives on Racial Economic Differences: A Summary of Recent Research

Robert A. Margo\*

Few public policy debates in the United States are as contentious or as long lasting as those arising from racial economic differences. Historical perspective is essential to these debates because history casts a long shadow — what happened in the past, even the distant past, can affect economic behavior today — and because race is central to so much of the political, social, and economic history of the United States. Race, as the Nobel Prize-winning economist Gunnar Myrdal put it, is the "American dilemma."

Much of the research that I have conducted while associated with the

NBER has focused on racial economic differences. For example, my book *Race and Schooling in the South, 1880-1950: An Economic History* is an extended analysis of the economics of segregated schools in the South prior to the Supreme Court's famous decision in *Brown v. Board of Education* whose 50-year anniversary is celebrated this year.<sup>1</sup> In this summary I briefly discuss my recent work on racial differences, most of which has been conducted jointly with NBER Research Associate William J. Collins, my colleague at Vanderbilt University.

### Racial Differences in Schooling

In the United States today black children lag behind their white counterparts in most dimensions of schooling. These gaps have been attributed

variously to racial differences in the quality of schooling, family background, neighborhood and other environmental factors, and to cultural biases in testing procedures. Economically, the schooling gaps matter because the American labor market rewards schooling, and these rewards have grown larger over time.

Collins and I<sup>2</sup> attempt to provide some historical perspective on contemporary racial differences in schooling. Our work draws heavily on recently available public use samples of various federal censuses, as well as on other public documents. We interpret the evidence in an "analytic narrative" that is based conceptually on a simple model of optimal investment in schooling. The narrative has three principal themes. First, in all the dimensions that the data address, the long-term pattern is one of substantial racial convergence. Second, conver-

\* Margo is a Research Associate in the NBER's Programs on Labor Studies and Development of the American Economy. He is also a professor of economics and history at Vanderbilt University. His profile appears later in this issue.