





Short sales, institutional investors and the cross-section of stock returns



[Stefan Nagel](#)  

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<https://doi.org/10.1016/j.jfineco.2004.08.008> 

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Abstract

Short-sale constraints are most likely to bind among stocks with low institutional ownership. Because of institutional constraints, most professional investors simply never sell short and hence cannot trade against overpricing of stocks they do not own. Furthermore, stock loan supply tends to be sparse and short selling more expensive when institutional ownership is low. Using institutional ownership as a proxy, I find that short-sale constraints help explain cross-sectional stock return anomalies. Specifically, holding size fixed, the under-performance of stocks with high market-to-book, analyst forecast dispersion, turnover, or volatility is most pronounced among stocks with low institutional ownership. Ownership by passive investors with large stock lending programs partly mitigates this under-performance, indicating some impact of stock loan supply. Prices of stocks with low institutional ownership also underreact to bad cash-flow news and overreact to good cash-flow news, consistent with the idea that short-sale constraints hold negative opinions off the market for these stocks.

Introduction

That stock returns are predictable in the cross-section is well established. A variety of firm characteristics (the book-to-market equity ratio, for example) contain information about a firm's future stock returns (see the survey in Campbell, 2000). What causes this return predictability is less clear. On the one hand, predictability could reflect variation in rational expected returns across firms. On the other hand, it could be the result of mispricing, with overpriced firms earning predictably low future returns and underpriced firms earning predictably high returns. A central element of any mispricing story has to be an explanation as to why these abnormal returns are not arbitrated away. In other words, for mispricing to persist in the presence of sophisticated professional investors, some limits to arbitrage must exist (Shleifer and Vishny, 1997). In this paper, I investigate whether short-sale constraints might play this role. In the presence of short-sale constraints, stocks can become overpriced if some investors are too optimistic (Miller, 1977). If so,

return predictability should be most pronounced among short-sale constrained stocks. To the extent that we can identify cross-sectional variation in the tightness of short-sale constraints across stocks, this conjecture constitutes a testable hypothesis.

Short-sale constraints can arise in two ways. First, for institutional and cultural reasons, a general lack of short selling seems to exist in the stock market. I summarize these impediments under indirect short-sale constraints. With indirect short-sale constraints, price efficiency could depend on the actions of the existing shareholders of a stock. Sophisticated investors would sell if a stock gets overpriced. But if the existing owners are not sufficiently sophisticated, the stock could become overpriced, as outside investors cannot sell it without going short. In contrast, if a stock gets underpriced, sophisticated outside investors can always exert buying pressure. Because institutional investors are likely to be more sophisticated than the typical individual investor, indirect short-sale constraints are more likely to affect stocks that are owned mainly by individuals. Second, short selling can be costly. Short sellers must borrow shares from an investor willing to lend. If loan supply is sparse, the short seller may have to pay a significant fee. I refer to this situation as direct short-sale constraints. D'Avolio (2002) shows that the main suppliers of stock loans are institutional investors. Correspondingly, he finds that the degree of institutional ownership explains much of the variation in loan supply across stocks and that stocks with low institutional ownership are more expensive to borrow. Hence, both direct and indirect short-sale constraints are most likely to affect stocks with low institutional ownership.

This makes it feasible to test the short-sale constraints story for cross-sectional return predictability. One immediate implication, and my first hypothesis, is that predictability should be most pronounced among stocks with low institutional ownership. In particular, going down from high to low institutional ownership, sorts on variables that forecast returns should produce an increasing spread in future returns, but mainly so on the short side. Put differently, because short-sale constraints allow only overpricing to persist, but not underpricing, institutional ownership should make a difference when the predictor variable indicates that future returns are low, but not when returns are forecast to be high.

To develop clean tests of this hypothesis, one must address the fact that the degree of institutional ownership is strongly correlated with firm size. Size could proxy for frictions and impediments to arbitrage other than the specific short-sales mechanism that I focus on. Therefore, in portfolio-based tests, I use residual institutional ownership as a sorting variable, which is the percentage of shares held by institutions, adjusted for size in a cross-sectional regression. I also exclude small stocks below the 20th NYSE/Amex size percentile. As cross-sectional predictors, I use the market-to-book ratio, as, for example, in Fama and French (1992); analyst forecast dispersion from Diether et al. (2002); trading volume as in Brennan et al. (1998) and Datar et al. (1998), measured as turnover; and firm-level volatility, as in Ang et al. (2004). Previous studies show that high values of these variables predict low returns and that the effects are distinct from each other.

My findings support the short-sale constraints hypothesis. Holding size fixed, the strength of these return predictability effects increases sharply with lower institutional ownership. For example, within the lowest residual institutional ownership (RI) quintile, high market-to-book (growth) stocks underperform low market-to-book (value) stocks by a stunning 1.47% per month over the sample period 1980–2003. For comparison, in the highest RI quintile, the value premium is only 0.47%. Consistent with the short-sale constraints story, this variation in the value premium across RI quintiles is driven entirely by growth stocks; their average raw returns vary from a dismal -0.01% to 1.06% going from low to high RI. The most striking finding, however, is that the same patterns appear for the other three predictors, too. The underperformance of stocks with high analyst forecast dispersion, high turnover, or high volatility is most pronounced among stocks with low RI, while the returns of stocks with low values of these predictor

variables do not vary much with RI. As a result, sorts on these predictors produce a large spread in returns in the low RI quintile (between 0.97% and 1.31% per month), but only a small spread in the high RI quintile (between 0.43% and 0.49%). These results do not seem to be explainable by differential exposure to risk factors. Patterns in abnormal returns relative to the CAPM or the Fama–French three-factor model are similar.

While these results broadly support the short-sale constraints story, they do not reveal whether both direct and indirect short-sale constraints matter. In an effort to disentangle the two channels, I test whether return predictability effects are weaker for stocks held by investors who are large and active lenders of stocks. For these stocks, indirect short-sale constraints could still be binding, but direct short-sale constraints should be relaxed. I find that the under-performance of stocks with high market-to-book, analyst forecast dispersion, volatility, or turnover is mitigated when they are held by the Vanguard 500 (V500) index fund or by Dimensional Fund Advisors (DFA), two of the largest passive investors and major suppliers of stock loans in large- and small-cap stocks, respectively. Stocks held by the V500 fund tend to have higher overall institutional ownership, making the interpretation ambiguous, but DFA stocks do not. This shows that ownership by a large stock lender, and hence the direct short-sale constraints channel, determines to some extent whether cross-sectional return predictability effects can be arbitrated away.

Because institutional and stock lender ownership is a proxy for unobservable short-sale constraints, it is hard to completely rule out alternative explanations. It seems unlikely that institutional ownership is simply proxying for stock-picking skills of institutions (without the short-sales constraints element) because institutional ownership affects predictability only on the short side, and ownership by a passive investor (DFA) also reduces predictability. In addition, the short-sale constraints theory makes specific predictions about the way in which mispricing should arise and persist that are distinct from other explanations. In particular, because short-sale constraints hold negative opinions off the market, prices of stocks with low institutional ownership should underreact to bad news and overreact to good news about future cash flows. I provide empirical support for this conjecture. Sorting stocks on cash-flow news estimated from a vector autoregression (VAR) as in Vuolteenaho (2002) and Cohen et al. (2002), I find that low RI stocks with bad cash-flow news experience a continuation of their bad performance, whereas those with good cash-flow news experience reversals. This striking asymmetry in the reaction to cash-flow news points to a lack of selling pressure from arbitrageurs, in line with the short-sale constraints explanation.

The findings in this paper tie in well with other recent work showing that constraints on short-selling can lead to an optimism-bias in prices (Chen et al., 2002; Diether et al., 2002; Jones and Lamont, 2002; Lamont, 2004; Ofek et al., 2004; Reed, 2003). I contribute to this literature by providing evidence that short-sale constraints offer an explanation for the persistence of major cross-sectional return anomalies. The paper also connects to other work that examines cross-sectional return predictability conditional on some firm characteristics. Ali et al. (2003), for example, show that market-to-book effects are stronger when arbitrage risk is higher and investor sophistication is lower along various dimensions, where institutional ownership is one of their measures. In a contemporaneous paper, Phalippou (2004) also finds that market-to-book predicts returns most strongly among low institutional ownership stocks. My findings show that the Ali, Hwang, and Trombley results hold up when size is controlled for (i.e., they are not driven by the fact documented in Loughran (1997) and Griffin and Lemmon (2002) that the market-to-book effect is stronger among small stocks) and, most important, that the same pattern appears for several other cross-sectional anomalies, too. Moreover, I show that stocks with low institutional ownership misreact to news about future cash flows in a way consistent with the short-sale constraints explanation.

The remainder of the paper is organized as follows. Section 2 discusses the theory of short-sale constraints and develops the hypotheses. Section 3 describes the data and methodology. Section 4 examines how the degree of cross-sectional return predictability varies with institutional ownership. Section 5 examines ownership by large stock lenders. Section 6 investigates the reaction to cash-flow news. Finally, Section 7 concludes.

Section snippets

Theory and hypotheses

Short-sale constraints can prevent pessimistic opinions from being expressed in prices. Hence, when investor opinions about the value of an asset differ (i.e., they agree to disagree, for example because they are overconfident) optimistic investors will end up holding overpriced assets, with pessimists sitting on the sidelines (Miller, 1977).¹...

Data and methodology

Data on stock returns are from the Center for Research in Security Prices (CRSP) Monthly Stocks File for NYSE, Amex, and Nasdaq stocks. I eliminate closed-end funds, real estate investment trusts (REIT), American Depository Receipts (ADR), foreign companies, primes, and scores. To correct returns for delisting bias, I use the adjustment proposed in Shumway (1997) when the delisting return is missing on CRSP. Small-cap stocks below the 20th NYSE/Amex size percentile (i.e., the bottom 20 percent) ...

Institutional ownership and the cross-section of stock returns

This section presents tests of Hypothesis 1, which predicts that cross-sectional pricing anomalies should be concentrated among stocks with low institutional ownership. The first set of tests examines each effect individually, using portfolio sorts on residual institutional ownership, intersected with independent sorts on M/B, ADISP, TURN, and VOL. I then proceed with cross-sectional regressions to examine the interplay of these different return predictors....

Ownership by large stock lenders

In an effort to distinguish the effects of direct and indirect short-sale constraints, this section turns to tests of Hypothesis 2. More precisely, the objective is to check whether direct short-sale constraints, driven by scarce supply of lendable shares, matter at all. To check this, I examine holdings of two of the largest stock lenders in large- and small-cap stocks, respectively. For stocks held by large stock lenders, loan supply should be abundant in most instances. First, from the...

Asymmetric reaction to cash-flow news

As a final test of the short-sale constraints story, I investigate Hypothesis 3, which predicts that stock prices of firms with low institutional ownership should react asymmetrically to news about future cash flows (they should underreact to bad cash-flow news and overreact to good cash-flow news) because short-sale

constraints hold negative opinions off the market. One might be tempted to investigate this hypothesis by looking for variation in return momentum and reversals across stocks. Yet, ...

Summary and conclusions

The evidence presented in this paper suggests that short-sale constraints play an important role in the cross-section of stock returns. I argue that short-sale constraints, both indirect institutional constraints and direct short-selling costs, should mainly affect stocks with low institutional ownership. Consistent with these arguments, I find that the forecasting power of several cross-sectional return predictors is most pronounced when institutional ownership is low. Specifically, holding...

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- ★ I would like to thank Viral Acharya, Nick Barberis, Markus Brunnermeier, Andrea Buraschi, Kent Daniel, Elroy Dimson, John Doukas, James Dow, Eugene Fama, Robin Greenwood, Denis Gromb, Andrew Jackson, Tim Johnson, Owen Lamont, Tim Loughran, Ludovic Phalippou, Garrett Quigley, Sergey Sanzhar, Henri Servaes, Raman Uppal, Tuomo Vuolteenaho, an anonymous referee, and workshop participants at London Business School for useful comments. Part of this research was undertaken while I was a doctoral student at London Business School. I gratefully acknowledge financial support from the Economic and Social Research Council (ESRC), the Lloyd's Tercentenary Foundation, and the Kaplanis Fellowship. Data on analysts' forecasts were provided by I/B/E/S Inc. under a program to encourage academic research.

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