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The costs and benefits of long-short investing: A perspective on the market efficiency literature[☆]

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ABSTRACT

We highlight key assumptions implicit in the models used by academics conducting research on market efficiency. Most notably, many academics assume that investors can borrow unlimited amounts and construct long-short portfolios at zero cost. We relax these assumptions and examine the attractiveness of long-short strategies as stand-alone investments and as a part of a diversified portfolio. Our analysis illustrates that the key benefit of long-short investing is adding diversification to a portfolio beyond what the market provides. We show that as stand-alone investments, nontrivial risk remains in the "hedge" strategies and that the returns generally do not beat the market in a head-to-head contest. Our findings raise questions about the degree of inefficiency in anomaly studies because plausible measures of costs generally offset strategy returns. The ability to achieve greater diversification may be, but is not necessarily, due to market inefficiency. We also highlight the key role of the generally ignored but critically important short interest rebate and show that absent this rebate, the long-short strategies we examine generally yield insignificant returns.

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1. Introduction

The empirical literature investigating market efficiency over the past few decades has identified hundreds of fundamental variables that are related to future returns (see Green, Hand, & Zhang, 2013). The impact on the literature and practice has been profound spurring the continued discovery of new "anomalies" as well as research explaining why these anomalies may continue to exist even in efficient markets. Notably, the literature has long known that transaction costs reduce returns to trading strategies (Ball, Kothari, & Shanken, 1995; Keim & Madhavan, 1998; Schultz, 1983; Stoll & Whaley, 1983) and more recent research has shown that transaction costs reduce or eliminate evidence of inefficiency (Asquith, Pathak, & Ritter, 2005; Hanna & Ready, 2005; Korajczyk & Sadka, 2004; Lesmond, Schill, & Zhou, 2004; Ng, Rusticus, & Verdi, 2008; Richardson, Tuna, & Wysocki, 2010).

We add another perspective to the literature by identifying and considering the importance of the implicit assumptions frequently made by academic researchers in this area, and exploring how inefficiency might be exploited. These assumptions

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[☆] Data availability: The data used in this study are publicly available from the sources listed.

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are made for analytical convenience and are similar to those made in the Capital Asset Pricing Model *CAPM* (Litner, 1965; Sharpe, 1964). For example, under *CAPM* it is assumed investors can borrow unlimited amounts at the risk-free rate. Researchers in the market efficiency literature take this one step further and assume investors can borrow unlimited amounts at zero cost to implement their strategies (zero-cost strategies). The mechanism for a zero-cost strategy is that when securities in the short portfolio are sold short, the proceeds are available to the investor and used to fund the long portfolio. While theoretically convenient, this is unrealistic and prohibited by regulation T. Understanding these assumptions is critical when interpreting empirical studies and their implications for market efficiency and information processing by investors.

Empirical models used by researchers assume a very specific trading implementation: a long position is taken in firms that are expected to have higher than average returns (e.g., firms with low accruals) and a short position is taken in firms expected to have lower than average returns (e.g., firms with high accruals). The return to this strategy, the "hedge" return, is the most common measure of market inefficiency. The academic literature typically focuses on the magnitude and statistical significance of the hedge return. Our paper extends the analysis by examining downside risk (drawdown), Sharpe and information ratios, and our paper also combines accounting-based anomaly strategies with each other and with the market to determine the most efficient portfolio and to assess the diversification benefits of long-short investing.

In the first part of the paper, we explore the implementation of a new long-short fund that is not diversified to discuss the costs and benefits of long-short investing as well as long-only investing. In the second part of the paper, we consider combinations of long-short strategies, long-only strategies, and the market to show how diversifying across multiple strategies affects performance. We compare estimates of trading strategy profitability under zero-cost assumptions and after assessing an opportunity cost. If one accepts zero-cost assumptions, then there is no need to assess an opportunity cost of capital. Our motivation to relax zero-cost assumptions and consider a cost of capital is the recognition that short sellers are prohibited from using short sale proceeds by Regulation T. Assuming that institutions will lend shares in stocks and allow the proceeds to fund risky strategies without collateral or compensation is highly unrealistic.

To illustrate the costs of long-short investing, we conduct analysis with five representative anomalies. We first show that under zero-cost assumptions, the anomalies generally have significant returns. Relaxing zero-cost assumptions, we show that long-short hedge returns are generally not preferable to a simple investment in a market index if a single choice were to be made.[1] Next, we show that the returns to the short portfolio are generally positive, counter to what the traditional short sale would predict, reducing both raw trading strategy returns and volatility. In addition, despite the reduced volatility of long-short strategies, nontrivial risk remains, leading to instances of extremely poor intra-year performance, or drawdown. To illustrate the diversification benefits of long-short investing, we conduct analysis which combines long-short strategies with the market and show that significant efficiency gains can be achieved, leading to higher Sharpe ratios as a result of reduced volatility.

Another benefit of long-short investing is the generally ignored but critically important short interest rebate. In a zero-cost setting, rebates are completely irrelevant because short sale proceeds are assumed to fund the long position rather than being invested in low-risk securities that generate a rebate. We demonstrate that without rebates, none of the long-short strategies we evaluate statistically beats even the risk-free rate as a benchmark (as will be seen in Table 3, Panel D), or generates a Sharpe ratio that beats the market (as will be seen in Table 4, Panel A).

Our findings raise questions about the interpretation of market inefficiency in some anomaly studies. Our findings suggest plausible measures of long-short strategy costs offset their returns. They do generate benefits through greater diversification, which may arise in efficient or inefficient markets. The greater diversification achieved by combining long-short strategies with the market may indicate that the commonly used proxy for the market portfolio, the value-weighted portfolio of common stocks, is a poor or incomplete proxy.

Our results demonstrate the difficulty in beating the market. The potential of abnormal performance, attributable to reduced risk as opposed to higher returns, comes from employing complex mixing strategies. Because we find that stand-alone long-short strategies do not beat the market, our analysis also helps to partially explain why it has been so difficult for professionally managed funds to consistently demonstrate "superior" returns.

In practice, inefficiency may be exploited without forming a "hedge" portfolio. For example, investment managers may follow a long-only strategy, buying underpriced stocks, avoiding overpriced stocks, or selling overpriced stocks already held. Inefficiency could disappear as sophisticated and unsophisticated investors observe and mimic actions of other investors (Chewning, Coller, & Tuttle, 2004). The tendency of investment managers to focus on avoiding losses could contribute to reducing overpricing (Willman, Fenton-O'Creevy, Nicholson, & Soane, 2002), even without short selling. Also, investors may use options to exploit overpricing or underpricing without actually taking a long or short position in a stock.

A large investing industry attempts to exploit perceived mispricing. Academic research plays an important role in generating economic insights that may yield abnormal returns. Some funds actually implement long-short strategies in a manner consistent with what academics assume in empirical tests. As such, we explore issues unique to the implementation of long-short strategies and highlight some assumptions that are unrealistic. However, we do not claim to conduct analysis

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[1] The theoretical construct of the market portfolio is broad and includes assets outside of common stocks; when referring to the construct, we explicitly refer to the "market portfolio". We use an index as a proxy for the market return (the CRSP value-weighted market index); when referring to this proxy for the market portfolio, we refer to the market index (a market strategy is an investment in the index) or simply the market.

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