Short interest and aggregate stock returns ☆

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ABSTRACT

We show that short interest is arguably *the* strongest known predictor of aggregate stock returns. It outperforms a host of popular return predictors both in and out of sample, with annual R^2 statistics of 12.89% and 13.24%, respectively. In addition, short interest can generate utility gains of over 300 basis points per annum for a mean-variance investor. A vector autoregression decomposition shows that the economic source of short interest's predictive power stems predominantly from a cash flow channel. Overall, our evidence indicates that short sellers are informed traders who are able to anticipate future aggregate cash flows and associated market returns.

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1. Introduction

The equity market risk premium impacts many fundamental areas of finance, from portfolio theory to capital budgeting. Accordingly, a voluminous literature attempts to predict changes in future aggregate excess stock returns.[3] In this paper, we show that short interest, aggregated across securities, is arguably *the* strongest predictor of the equity risk premium identified to date. Short interest outperforms a host of popular return predictors from the literature in both in-sample and out-of-sample tests. Short interest also generates substantial utility gains and Sharpe ratios that exceed those provided by popular predictors. Furthermore, we provide evidence that the ability of short interest to predict future market returns stems predominantly from a cash flow channel. Taken together, our results suggest that short sellers are informed traders who are able to anticipate changes in future aggregate cash flows and associated changes in future market returns.

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[3] See Pástor and Stambaugh (2009), Henkel, Martin, and Nardari (2011), and Pettenuzzo, Timmermann, and Valkanov (2014) for recent examples. Rapach and Zhou (2013) provide a survey of the literature.
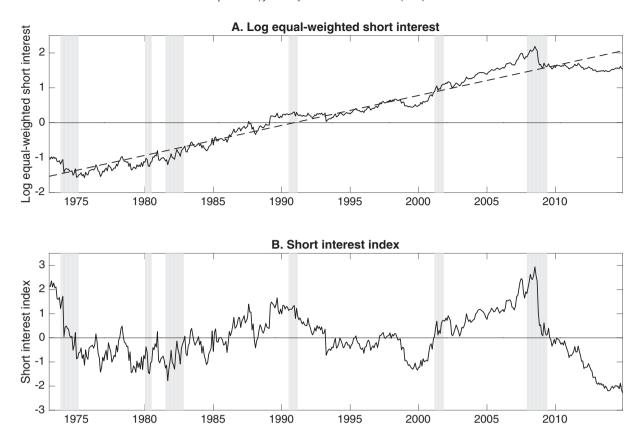
A. Log equal-weighted short interest

B. Short interest index

Fig. 1. Aggregate short interest, 1973:01–2014:12. The solid line in Panel A delineates the log of the equal-weighted mean across all firms of the number of shares held short in a given firm (from Compustat) normalized by each firm's shares outstanding; the dashed line is the linear trend for the series. Panel B delineates the deviation in the solid line from the dashed line in Panel A, where the deviation has been standardized to have a standard deviation of one. Vertical bars depict recessions as dated by the National Bureau of Economic Research (NBER).

We begin by constructing a long monthly time series of aggregate short interest spanning 1973 to 2014. Each month, using data recently made available by Compustat, we calculate the log of the equal-weighted mean of short interest (as a percentage of shares outstanding) across all publicly listed stocks on U.S. exchanges. The resulting series constitutes a measure of total short selling in the economy. The short interest series, which is plotted in Panel A of Fig. 1, displays a strong upward trend over our sample period. Much of the upward trend is likely due to the continued development of the equity lending market, which has made it easier to short sell over time, as well as the increase in the number of hedge funds in existence, which has led to an increase in the amount of capital devoted to short arbitrage. Indeed, we find significant evidence of a linear trend using robust statistical tests; this trend obscures the true information content in aggregate short interest. We thus detrend the short interest series to capture the variation in short interest that is due to changes in the beliefs of short sellers, and not simply secular changes in equity lending conditions and/or the amount of capital devoted to short arbitrage. We standardize the detrended series to create a short interest index (SII, hereafter), which can be viewed as a measure of market pessimism based on short interest data.

If short interest does contain information about future market returns, we would expect higher values of SII to predict lower future returns. We find that it does. In-sample tests show that a one-standard-deviation increase in SII corresponds to a six to seven percentage point decrease in the future annualized market excess return. SII produces predictive regression R^2 statistics of 1.24% at the monthly horizon and 12.89% at the annual horizon. We also compare the predictive power of SII to that of 14 popular predictor variables from Goyal and Welch (2008). SII substantially outperforms all of the popular predictors at quarterly, semi-annual, and annual horizons and performs as well as or better than all of the predictors at the monthly horizon.

Goyal and Welch (2008) show that, despite significant evidence of in-sample predictive ability, popular predictor variables fail to predict the equity risk premium based on *out-of-sample* tests. Consequently, we also examine the out-of-sample predictive ability of SII.[4] We find positive out-of-sample R^2 statistics (Campbell and Thompson, 2008) of 1.94%, 6.54%, 11.70%, and 13.24% at horizons

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[4] We are careful to use only information available at the time of forecast formation when we calculate detrended aggregate short interest for our out-of-sample tests, so that our forecasts do not have a "look-ahead" bias.