Stock Duration, Analysts Recommendations, and Misvaluation

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Abstract

This paper empirically studies how the interaction between short-term investors and analyst recommendations is related to a speculative component in stock prices. Using a new measure of the holding duration of institutional investors (called Stock Duration), we document that frequently traded stocks with optimistic (pessimistic) analyst recommendations have large negative (positive) future alphas that follow large positive (negative) past outperformance. Using Russell 2000 index reconstitutions to capture exogenous changes in institutional ownership, Stock Duration and analyst coverage, we conclude that strong analyst recommendations serve as a coordination mechanism among short-term, likely speculative, traders, causing significant misvaluations and subsequent price reversals.

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1. Introduction

If some speculative investors are overly optimistic and their trading affects stock prices (see, e.g., Diether, Malloy and Scherbina, 2002; Lamont and Thaler, 2003; Ofek and Richardson, 2003; Chen, Hong and Stein, 2002), what role do analyst recommendations play in the collective price impact of speculative trading? On the one hand, analyst recommendations may help to disseminate information, allowing overly optimistic investors to update their information, and thereby mitigate speculator optimism. Theoretically, short-term overreaction may occur if investor beliefs are disperse and shorting is costly (Harrison and Kreps, 1978; Scheinkman and Xiong, 2003), such that analyst recommendations could reduce the dispersion in beliefs and thereby lower overreaction. Consistent with this argument, Andrade, Bian and Burch (2013) find that stocks in China with greater analyst coverage were less susceptible to the 2007 Chinese stock market bubble. More generally, a large literature has documented that analyst recommendations can improve how markets incorporate information. Brennan, Jegadeesh and Swaminathan (1993), for example, show that stocks with wider analyst coverage adjust faster to new information.

On the other hand, the literature considering analysts and the effects of short-term investors on stock prices suggests that analysts may be biased themselves and could thus exacerbate, rather than mitigate, investor biases. DeBondt and Thaler (1990), for example, find that security analysts making relatively extreme earnings-per-share forecasts seem to overreact, possibly due to their own overconfidence. Importantly, Ertimur, Muslu, and Zhang (2011) find that stocks with 'strong buy' recommendations underperform in the future, consistent with analyst over-optimism. Shiller (2002, 2003) describes how speculative bubbles may arise through feedback loops that are fed by analysts, where past price increases affect expectations about continuing future price increases. Such expectations could lead to an increase in demand from speculative investors, whose collective additional buying could have a price impact and help sustain the positive price momentum, leading to temporary overvaluation. The theory of Hong, Scheinkman, and Xiong (2008) proposes

an alternative model that provides a similar prediction to explain stock market overreaction, but without recourse to investor overreaction and analyst bias. Their model suggests that some analysts are rationally inflating their forecasts to signal that they are well-informed, but naïve investors mistakenly take their forecasts at face value and thereby overreact, causing misvaluation.

In this paper, we empirically test whether analyst recommendations mitigate or aggravate the price impact of speculative trading. We document robust evidence that frequently traded stocks that receive optimistic (pessimistic) analyst recommendations have large negative (positive) future alphas that follow large positive (negative) past outperformance. While this is consistent with Ertimur, Muslu, and Zhang (2011), we find that these price reversals *only* occur for stocks with both frequent trading and extreme analyst recommendations; they hence neither occur in frequently traded stocks where analyst recommendations are not extreme nor in stocks with extreme recommendations and few short-term traders. Accordingly, extreme (optimistic or pessimistic) analyst recommendations seem to provide a coordination mechanism that allows speculative investors to coordinate their trading, leading to substantial temporary mispricing. We find no evidence that extreme analyst recommendations themselves attract speculative investors, though our results do suggest that analysts with strong recommendations may be overreacting and be too slow in subsequently updating (i.e., moderating) their views. We thus conclude that strong analyst recommendations aggravate the price impact of speculative trading, while we find no evidence that the number or the dispersion of recommendations help to mitigate such price impact.

Our main proxy for the presence of speculative trading – investors who are assumed to trade frequently – is a new measure of the holding durations of institutional investors called Stock Duration, which was introduced in Cremers and Pareek (2014). Stock Duration is calculated as the weighted-average length of time that institutional investors have held a stock in their portfolios, based on quarterly 13F holding reports and weighted by the dollar amount invested across all institutions currently holding a stock. Stocks with

decreasing holding durations experience the arrival of many new and possibly speculative investors. Stock Duration has the advantage that it allows any given institutional investor to be short-term in some stocks and long-term in others; for example because investments are made by different portfolio managers with heterogeneous horizons and trading motives.[1] Our proxy for extreme analyst recommendations is based on the top and bottom quintile of the consensus or mean analyst recommendation from the IBES database. Both extremes in analyst recommendations and extremes in Stock Duration (either very short or very long) are mean reverting, but not in ways that are related.

Economically, our results are remarkably strong. For our basic results, we independently double sort each quarter stocks with analyst coverage into quintiles based on their Stock Duration and their mean analyst recommendation, and calculate subsequent holding returns for the next 12 months. The value-weighted portfolio of stocks with short (first quintile) Stock Duration and most optimistic (first quintile) analyst recommendations has an annualized 5-factor alpha of -7.7% (t-stat of 3.00), while the portfolio with short (fifth quintile) Stock Duration and most pessimistic (fifth quintile) analyst recommendations has a 5-factor alpha of 6.5% per year (t-stat of 2.34). As a result, the corresponding long-short portfolio buying stocks in the latter and selling stocks in the former has an annualized 5-factor alpha of 14.2% (t-stat of 3.62).[2] Analogous results using the 3-factor models are similar (the long-short value-weighted portfolio has an alpha of 12.4% per year, t-stat of 3.19), as are results for equally-weighted portfolios (the long-short portfolio has an annualized 5-factor alpha

[1] Accounting for this is important as one can only observe institutional holdings at an aggregate institution level if one uses 13F filings. The main limitation of Stock Duration is that the quarter-end holdings that are used to compute it ignore roundtrip trades within the quarter. Our results are generally robust to using share turnover instead of Stock Duration. Share turnover captures all trading activity, but in recent years is strongly impacted by high frequency trading.

[2] Consistent with Ertimur, Muslu, and Zhang (2011), stocks with 'strong buy' recommendations subsequently underperform stocks with the most pessimistic average analyst recommendations. In unconditional (single) sorts, the equal-weighted long-short portfolio that buys (sells) stocks with the most (least) optimistic analyst recommendations has a 5-factor alpha of 3.98% per year (t-stat of 2.72), and the analogous value-weighted long-short portfolio has a 5-factor alpha of 2.26% per year (t-stat of 1.15). These alphas only obtain for stocks with short Stock Duration.

of 10.8%, t-stat of 4.40).[3] As stocks with the most (least) optimistic average analyst recommendations have very large positive (negative) lagged market-adjusted returns, these results indicate large price reversals.

We then show that these price reversals are strongly related to limited arbitrage (see, e.g., Duffie, 2010).[4] On the long side, stocks with the most pessimistic analyst recommendations and short Stock Duration have much larger positive abnormal returns if their idiosyncratic volatilities and thus limits to arbitrage (see Pontiff, 1996) are high. On the short side, we find that more short-sales constrained stocks with the most optimistic analyst recommendations and short Stock Duration have substantially larger negative abnormal returns.

Empirically, we do not find any correlation between having extreme analyst recommendations and either more speculative investors or more frequent trading. This suggests that extreme analyst recommendations are not directly attracting short-term traders, but rather that, among stocks with many short-term traders, extreme analyst recommendations serve as a coordination mechanism. This is similar to the interpretation of the results in a closely related paper by Balakrishnan, Schrand, and Vashishtha (2014), who find much stronger 'bubble continuation' among stocks with strong and concentrated analyst buy recommendations in the 2000 technology bubble.

[3] Consistent with the slow mean reversion of both extreme analyst recommendations and extreme Stock Duration, we show that lagging the information upon portfolio constructions of both signals by up to four quarters hardly diminishes the future alphas of the constructed portfolios. Using share turnover as a robustness check, we find that the long-short portfolio that buys stocks with the most pessimistic (fifth quintile) analyst recommendations and sells stocks with the most optimistic (first quintile) analyst recommendations has an annualized 5-factor of 11.4% (t-stat of 3.37) when equally-weighting, and of 9.9% (t-stat of 2.45) if we use value-weighted portfolios.

[4] In his presidential address, Duffie (2010) considers how impediments to institutional trading may allow extended periods of asset price distortions. Limits to arbitrage may give rise to temporary mispricing with subsequent price reversals that occur only slowly over time. Duffie (2010) mentions several specific examples of the long-standing price impact of supply and demand shocks in the presence of slow moving arbitrage capital, such as trading around index reconstitution (e.g., Shleifer, 1986; Chen, Noronha, and Singhal, 2004; Greenwood, 2005; and Petajisto, 2011), trading around large supply shocks induced by extreme mutual fund flows (e.g., Coval and Stafford, 2007; Edmans, Goldstein, and Jiang, 2012), and trading around temporary market dislocations due to the slow moving withdrawal of arbitrage capital in, for example, the convertible bond market (e.g., Mitchell, Pedersen, and Pulvino, 2007).

The symmetry in price reversals helps ruling out an explanation of abnormal performance based on information trading. If short-term investors would generally be well-informed, then in that case we expect asymmetric results, i.e., that the short-term traders only hold stocks with positive (rather than negative) future alpha. However, for value-weighted portfolios the negative alpha (of the portfolio with stocks with the most optimistic mean analyst recommendations and short Stock Duration) is quite similar to the positive alpha (of the portfolio with stocks with the most pessimistic mean analyst recommendations and short Stock Duration). As a result, on average short-term investors do not appear well-informed, but neither do they on average hold stocks that subsequently underperform.

In order to further test our interpretation that our results are caused by short-term investor overreaction due to their coordinating through extreme analyst recommendations, we consider the annual events where the Russell 2000 index is reconstituted, which cause exogenous changes in both analyst coverage and institutional ownership (and, as a result, in Stock Duration as well).[5] Specifically, we focus on stocks newly added to the Russell 2000 'from below', i.e., stocks that were previously not included in the Russell 1000 but whose strong recent positive abnormal performance and increase in market value lead to Russell 2000 inclusion.

In particular, we show that stocks with *low* Stock Duration experience major changes at the time of the index reconstitution. First, institutional ownership in these stocks sharply increases from a pre-inclusion average of 20% to over 40% institutional ownership soon after inclusion in the Russell 2000. Second, both their Stock Duration and analyst coverage triple (Stock Duration jumps from about 1.2 quarter before to about four quarters afterwards; the average number of analysts increases from about one analyst before to over three

[5] Russell index reconstitutions are events that do not provide new information to the market (e.g., because they are quite predictable, as they are based on market capitalizations at the end of each June), but are accompanied with significant buying and selling, respectively, by funds tracking the index (Lynch and Mendenhall, 1997; Chang, Hong, and Liskovich, 2014). We focus on the Russell 2000, where the price impact of its reconstitutions is particularly significant (Petajisto, 2011; Cremers, Petajisto, and Zitzewitz, 2012).

afterwards). There are no correspondingly large changes for stocks added to the Russell 2000 from below that at that time have long Stock Duration. As a result, the large increases in institutional ownership, Stock Duration, and analyst coverage constitute an important and (arguably) largely exogenous shock to these stocks, which should diminish the role of the short-term speculators.

Our main result of price reversals for stocks with short Stock Duration and extreme analyst recommendations continue to hold when we only consider stocks that are added to the Russell 2000 from below. However, conditioning on stocks added to the Russell 2000 from below means conditioning on stocks that have recently performed well, even for stocks with the least optimistic analyst recommendations. This could explain why we only find overvaluation (i.e., large negative alphas for stocks with strongly optimistic recommendations and short Stock Duration) but no undervaluation (i.e., no significantly positive alphas for stocks with the least optimistic recommendations and short Stock Duration). Stocks with strongly optimistic analyst recommendations and short Stock Duration thus appear to be significantly overvalued at the time when they are added to the Russell 2000 from below. After addition to the index, the overvaluation slowly reverses over the subsequent two years, probably as the role of speculative, short-term investors in these stocks is much reduced as a result of the major increase in institutional ownership and analyst coverage.[6] As these latter changes are likely exogenous to firm events and information, we thus conclude that short-term speculation can significantly contribute to misvaluation, especially for stocks that are hard to arbitrage and lack significant analyst coverage.

A study closely related to ours is Brown, Wei, and Wermers (2014), who document that revisions of analyst recommendations induce herding by career-concerned fund managers. Consistent with our results, they find that the mutual fund herding leads to an overreaction in stock prices with subsequent price reversals.

[6] These price reversals thus appear over considerably longer horizons than considered in the literature. E.g., Boehmer and Kelley (2009) find that short-term trading is associated with increased price efficiency, but only consider periods of up to three months.

A complimentary hypothesis is considered by Cella, Ellul, and Giannetti (2013), who show that selling pressure of stocks held by short-term institutional investors is amplifying market-wide negative shocks. They document that such selling pressure leads to temporary *under*valuation, which they explain by the demand of liquidity at times when arbitrage capital is scarce. While they focus on particular periods of market turmoil with systematic negative shocks, our paper does not condition on "abnormal" times, considers misvaluation rather than only undervaluation and focuses on the role of analyst recommendations. Another closely related paper is Coval and Stafford (2007), who report that extreme mutual fund flows can create temporary price distortions. We show that Stock Duration is not simply picking up the effect of institutional price pressure from extreme mutual fund flows, but rather constitutes an additional factor that extends to less extreme situations and other institutional investors.

Our paper is also related to Sias, Starks, and Titman (2006), who consider the relation between stock returns and changes in ownership to interpret the strong contemporaneous positive association between quarterly changes in aggregate institutional ownership and returns (see, e.g., Nofsinger and Sias, 1999; Wermers, 1999). As they argue, "the demand for shares from one group of investors must be offset by the supply of shares from another group of investors. Hence, if we believe that aggregate institutional buying causes returns to increase, we are implicitly assuming that selling by non-institutional investors does not have a countervailing effect." However, they find no subsequent price reversals after institutional turnover–consistent with our unconditional results – and conclude that the positive correlation is due to information rather than any price impact. The main innovation of our paper that explains our different results is that we distinguish among institutional investors those who are generally short-term (and thus may be less patient and more likely to demand liquidity), versus other institutions who are more long-term oriented. Moreover, our paper integrates the interaction of short-term investors with extreme analyst recommendations who can serve as a coordination devise for speculative investors.

Our paper is structured as follows. Section 2 provides the data and summary statistics. Section 3 reports portfolio results and Fama-MacBeth regressions for the full sample and Section 4 focuses on Russell 2000 inclusions. Section 5 concludes.

2. Data and Summary Statistics

2.1 Data and Summary Statistics

We use institutional investor holdings data from the Thomson Financial CDA/Spectrum database of SEC 13F filings to create our Stock Duration measure. All institutional investors with more than US$ 100m of securities under management are required to report their holdings to the SEC on form 13F. Holdings are reported quarterly and all common stock positions greater than 10,000 shares or US$ 200k must be disclosed. Stock returns are from CRSP and accounting data is from COMPUSTAT. We obtain the most recent consensus analyst recommendations at the end of each quarter from the IBES database. We use the 'mean analyst recommendation' variable as our measure of the consensus analyst recommendation. We focus on US common stocks from December 1993 to December 2013 because IBES stock recommendations are not available before November 1993. We eliminate stocks without analyst recommendations, stocks with missing market capitalization and book value of equity information, and stocks with prices below US$ 1. Further, we require stocks to be present in CRSP for at least two years before they are included in the sample to ensure that IPO-related anomalies do not affect our results. To eliminate a sample bias, we further require institutional investors to be present for two years before being included. We do this as new institutions have short past holding durations for stocks in their portfolios by construction.

Our resulting main sample consists of 47% of all common stocks included in CRSP (on average 2374 stocks per year) and on average covers 73.5% of the total CRSP market capitalization.

2.2 Methodology: Calculating Stock Duration

Using the methodology introduced in Cremers and Pareek (2014), we calculate the holding duration of each stock for every institutional investor by calculating a weighted-measure of buys and sells by an institutional investor, weighted by the duration for which the stock was held. For each stock in a given institution's portfolio, the holding duration measure is calculated by looking back over the full time period since that particular stock has been held continuously in the portfolio. Intuitively, our variable measures how long a US$ 1 investment in a stock has on average been in an institution's portfolio at a particular point in time.

The calculation of the duration for stock *i* that is included in the institutional portfolio *j* at time *T-1*, for all stocks *i* = 1 … I and all institutional investors *j* = 1 … J, is given by:

$$Duration_{i,j,T-1} = d_{i,j,T-1} = \sum_{t=T-W}^{T-1} \left(\frac{(T-t-1)\alpha_{i,j,t}}{H_{i,j} + B_{i,j}} \right) + \frac{(W-1)H_{i,j}}{H_{i,j} + B_{i,j}} \qquad (1)$$

where

$B_{i,j}$ = total percentage of shares of stock *i* bought by institution *j* between *t = T-W* and *t = T-1* (*t, T* are in quarters).

$H_{i,j}$ = percentage of total shares outstanding of stock *i* held by institution *j* at time *t = T-W*.

$\alpha_{i,j,t}$ = percentage of total shares outstanding of stock *i* bought or sold by institution *j* between time *t-1* and *t*, where $\alpha_{i,j,t} > 0$ for buys and <0 for sells.

We choose *W* = 20 quarters, as very few stocks are held continuously for longer than five years. If stock *i* is not included in institutional portfolio *j* at time *T-1*, then $Duration_{i,j,T-1} = 0$. Our measure takes into account tax selling and other temporary adjustments in portfolios because intermediate sells are cancelled by immediate buybacks, with only a small effect on the duration of current holdings. The limitation of our measure is that any round-trip trades within a quarter are ignored, as we only observe institutional holdings at the end of each quarter. Next, we compute Stock Duration at the individual stock level by averaging

institutional stock level $Duration_{i,j,T-1}$ over all institutions currently holding the stock, using as weights each institution's total current holdings in the stock.

2.3 Summary Statistics

Table 1, Panel A provides summary statistics across the sample. Our Stock Duration measure has a mean (median) of 1.39 (1.37) years across the sample. On average, a stock has a mean recommendation of 2.2 and is covered by 7.2 analysts. A recommendation of 1 corresponds to 'strong buy' and a recommendation of 5 corresponds to a 'sell' recommendation. Therefore, on average analysts are more likely to issue optimistic than pessimistic recommendations. Table 1, Panel B reports the rank correlations between Stock Duration, mean analyst recommendation, and other stock characteristics. The rank correlation between Stock Duration and Mean Analyst Recommendation is only 16%, showing that analyst recommendations are mostly unrelated to the presence of short-term investors.

We employ share turnover as an alternative measure of institutional investor horizon. As expected, Stock Duration and share turnover are negatively correlated with a correlation of -41%. Other variables have low correlations with Stock Duration, except idiosyncratic volatility which has a moderately high correlation of -36% with Stock Duration.

In Table 1, Panel C, we present summary statistics for a sub-sample of stocks newly included in the Russell 2000 index. We include these summary statistics for the twelve month period after their addition to the index. We only include stocks that are added to the index 'from below', i.e., stocks that were not part of Russell 1000 index of large stocks before, but whose relative increase in market capitalization warranted inclusion in the Russell 2000. On average 112 stocks in our sample are added to the Russell 2000 index each year. Table, Panel C shows that these newly included stocks tend to have on average significantly lower Stock Duration (1.03 years) and higher daily share turnover (0.8%) compared to stocks in the full sample. As expected, newly included stocks are also smaller and covered by fewer analysts.

3. Stock Duration, Analysts, and Misvaluation: Portfolio Sorts and Fama-MacBeth Regressions

3.1 Results from Portfolio Sorts: Stock Duration and Analyst Recommendations

We consider how the presence of short-term investors is related to temporary price distortions. We proceeds in three steps, each step considering an additional aspect of the three components that make up the future return predictability: (i) a proxy for short-term trading (Stock Duration or share turnover); (ii) Mean Analyst Recommendation; (iii) and a proxy for limits to arbitrage. Therefore, in the first step, we sort portfolios based only on Stock Duration, in the second step we double sort stocks on both Stock Duration and Mean Analyst Recommendation, and finally, in the third step, we consider triple sorts on Stock Duration, Mean Analyst Recommendation, and one of three proxies for limits to arbitrage. As proxies for limits to arbitrage, we use idiosyncratic volatility, the short-interest ratio, and ownership by Dimensional Fund Advisors, one of the major stock-lenders for shorting small stocks.

The results from portfolio sorts conditional on only Stock Duration are reported in Table 2, Panel A. We sort the sample into quintiles based on Stock Duration at the end of each quarter, calculating returns for the next four quarters and updating the portfolio every quarter. Our portfolio sorts are intended to capture any reversal of longer-term mispricing (i.e., over the next four quarters). We account for overlapping portfolios by following the methodology in Jegadeesh and Titman (1993), such that stocks ranked in each of the last four quarters form one-fourth of the portfolio. Returns from each of the four sub-portfolios are equally weighted to calculate the monthly portfolio returns. We report monthly equally-weighted and value-weighted returns for the CAPM, 3-factor, and 5-factor models. We further report the 5-factor loadings for each of the five quintile portfolios as well as the long-short portfolio that buys stocks with long Stock Durations (top quintile) and sells stocks with short Stock Durations (bottom quintile).

Table 2, Panel A shows that there is evidence for a positive relation between Stock Duration and future stock returns, which provides initial support for the hypothesis that stocks held by more short-term investors

are more likely to be misvalued. For example, as shown in the second and third columns of Table 2, Panel A, a long-short equal-weighted portfolio with long positions in stocks in the highest Stock Duration quintile and short positions in stocks in the lowest Stock Duration quintile earns a 3-factor alpha of (12*0.34%=) 4.1% per year (t-stat of 2.62) and a 5-factor alpha of (12*0.32%=) 2.88% per year (t-stat of 1.96). The economic magnitude of the 5-factor alpha is similar for value weighted portfolios with a long-short return of 0.24% per month but the difference is not significant with a t-stat of 1.26. The negative HML factor loading for short-duration stocks suggests that they are more likely to be growth stocks.

Constituting our second step, we next consider whether analyst recommendations mitigate or aggravate any price impact of speculative trading by short-term investors. In particular, we test the joint importance of Stock Duration and consensus analyst recommendations for stock return predictability. If stocks held by the short-term investors are more likely to be misvalued and extreme analyst recommendations provide a coordination mechanism that allows speculative investors to coordinate their trading, then the above return reversal/predictability should be stronger *conditional* on the direction of analyst recommendations. We examine this prediction by independently double sorting stocks into quintiles based on Stock Duration at the end of each quarter, and based on the consensus analyst recommendation.

Figure 1 plots average values of Mean Analyst Recommendation (in Figure 1A) and Stock Duration (in Figure 1B) of the stocks in the four 'extreme' portfolios of the 5x5 sort, from eight quarters before to twelve quarters after portfolio construction. The figures show that both Mean Analyst Recommendation and Stock Duration are strongly mean reverting over a similar period of about two years. Importantly, there is no significant difference between the average Stock Duration across the two extreme Mean Analyst Recommendation quintiles, and there is also no significant difference between the average Mean Analyst Recommendation across the two extreme Stock Duration quintiles. This suggests that investors do not

substantially change their holding durations depending on analyst recommendations, nor do analysts seem to condition their recommendations based on holding durations.

Looking at return predictability, we report in Table 2, Panel B equal-weighted and value-weighted monthly alphas using the 5-factor model. The first row in the panel reports the alphas for portfolios conditional on only Mean Analyst Recommendation. On average, stocks with pessimistic recommendations earn a higher return relative to stocks with optimistic analyst recommendations, but the difference is statistically significant only for equal-weighted portfolios (with an annualized 5-factor alpha of 3.98% and a t-stat of 2.72; consistent with Ertimur, Muslu, and Zhang, 2011), but is insignificant for value weighted 5-factor alpha (5-factor alpha of 2.26% per year with a t-stat of 1.15).

For the independent double sorts on Stock Duration and Mean Analyst Recommendation, we find that stocks with the most optimistic consensus recommendations (quintile 1) have negative future alphas – and thus appear overvalued – *only* when held by short-term investors. To the contrary, stocks with similarly optimistic mean recommendations (quintile 1) have insignificant or even positive future alphas if these stocks are held by more long-term investors. For example, in Table 2, Panel B the value-weighted 5-factor alpha for stocks in the low or most optimistic mean recommendation quintile and the low Stock Duration quintile equals -7.73% per year (t-stat of 3.00), whereas the 5-factor alpha for stocks in the low mean recommendation group and the high Stock Duration group is positive (2.22% per year), with a t-stat of 0.97. The difference of 9.95% alpha per year between the two Stock Duration groups is highly significant (t-stat of 2.89). This difference in returns remains statistically significant for Fama-French 3-factor alphas (9.24% yearly, t-stat of 2.74) as shown in Appendix A-2, Panel A.

Similarly, stocks with short Stock Duration are also more likely to overreact to pessimistic recommendations. In particular, the portfolio with stocks with short Stock Duration (quintile 1) and the most pessimistic average analyst recommendations (quintile 5) has a future value-weighted 5-factor alpha of 6.45%

per year (t-stat of 2.34), while the value-weighted portfolio with long Stock Duration stocks (quintile 5) and similarly pessimistic analyst recommendations (quintile 5) has an alpha of 1.98% per year that is statistically insignificant (t-stat of 1.21). The difference in annualized alphas of 4.47% is statistically insignificant though, with a t-stat of 1.34.

In Table 2, Panel C, we find that the return predictability conditional on Stock Duration and Mean Analyst Recommendation is remarkably persistent over next four quarters. For example, if we postpone portfolio construction by one quarter (i.e., use the Stock Duration and Mean Analyst Recommendation three months prior to portfolio construction), the long-short portfolio that buys (sells) stocks with the most pessimistic (optimistic) analyst recommendations among stocks with the shortest Stock Duration generates an annualized 5-factor alpha of 14.64% (t-stat of 2.74). Lagging by two, three, or four quarters, respectively, gives annualized 5-factor alphas of 13.17% (t-stat of 2.33), 16.51% (t-stat of 2.22) and 12.76% (t-stat of 2.37), respectively.

To complement this analysis, Figure 2A provides cumulative abnormal returns of the four 'extreme' portfolios in the 5x5 independent double sort in event time. Unsurprisingly, stocks with the most optimistic (pessimistic) consensus analyst forecasts previously had large positive (negative) abnormal performance. For stocks with long Stock Duration, there is no price reversal of this past abnormal performance, but for stocks with short Stock Duration, the figure shows strong price reversals consistent with the abnormal returns discussed above. In Figure 2B, we plot cumulative abnormal returns of two different long-short portfolios based on Stock Duration and Mean Analyst Recommendation in calendar time. For both long and short Stock Duration quintiles, we construct long-short portfolios that are long in stocks with the most pessimistic analyst recommendations (fifth quintile of Mean Analyst Recommendation) and short in stocks with the most optimistic recommendations (first quintile). The figure shows that one dollar invested in the long-short

portfolio with long Stock Duration very significantly outperforms stocks with short Stock Duration over the period 1993 to 2013.

As a robustness check for our Stock Duration measure, in Appendix A-2, Panel B we consider average daily share turnover during the previous 12 months as an alternative proxy for the presence of speculative traders. The unconditional portfolio sorts based on share turnover show no evidence that turnover by itself is related to future abnormal performance. Independent double sorts of stocks into share turnover and mean analyst recommendation quintiles generally confirm the previous results that stocks with the most optimistic analyst recommendations subsequently underperform stocks with the most pessimistic analyst recommendations, which effects is stronger the higher the turnover. However, the abnormal returns only suggest undervaluation of stocks with the most pessimistic analyst recommendations and high turnover, as the alphas of stocks with the most optimistic analyst recommendations and high turnover tend to be low (if not negative) but not statistically insignificant.

3.2 Results from Portfolio Sorts: Role of Limits to Arbitrage

In the previous section, we find evidence of strong price reversals for stocks with short holding durations and extreme analyst recommendations, suggestive of temporary distortions in stock prices. If so, it is important to uncover what frictions prevent arbitrageurs from trading these away, or to show evidence of limits to arbitrage as in Shleifer and Vishny (1990). We consider three stock characteristics that the previous literature has identified as associated with greater limitations to arbitrage: (i) higher short-interest ratio; (ii) lower ownership by a major stock lender for small market capitalization stocks, namely Dimensional Fund Advisor (DFA); and (iii) high idiosyncratic volatility. The first two characteristics relate to stocks that are more likely to be subject to short-sales constraints (e.g., Asquith, Pathak, and Ritter, 2005; Nagel, 2005), and the third more generally to stocks that are more difficult to trade, implying also greater limits to arbitrage (e.g., Shleifer and Vishny, 1997). Short-interest ratio captures the shorting demand: the higher the demand, the

more expensive shorting is likely to be. Ownership by DFA, a major lender of small cap stocks, captures the supply of shares available for shorting. The lower the ownership by DFA, the more expensive shorting is likely to be, particularly for small cap stocks.

We hence form 5x5x2 independent triple sorts on Stock Duration, mean analyst recommendation, and proxies for arbitrage costs, with the results reported in Table 3. We use the short-interest ratio (in Panel A), the percentage of shares outstanding owned by DFA (in Panel B), and idiosyncratic volatility (in Panel C) as proxies for arbitrage costs. For all three panels, we report the monthly value-weighted 5-factor alphas.

Table 3 shows that the patterns documented in Table 2, Panel B, namely that stocks with extreme mean analyst recommendations exhibit significant price reversals only if held by short-term investors, are driven by the subset of stocks with high arbitrage costs. For example, we find in Table 3, Panel A that the value-weighted annualized 5-factor alpha for stocks with optimistic mean recommendations that are also held by short-term investors equal -9.98% (t-stat of 3.50) if the short-interest ratio is high. However, the analogous 5-factor alpha is not statistically nor economically significant if the short-interest ratio is low (-2.08% per year, t-stat of 0.71). The difference in these alphas of -7.91% per year is also significant with a t-stat of 2.39. Shorting costs as proxied by the short-interest ratio do not seem to matter if stocks are held by investor with long-term durations. Consistent with limited arbitrage and the short-interest ratio being a proxy for shorting cost, conditioning on the short-interest ratio matters mostly on the short-side or for negative return predictability.

We find similar results when we use the percentage ownership by Dimensional Fund Advisors (DFA) as an alternative proxy for shorting cost. For example, in Table 3, Panel B, the value-weighted 5-factor alpha for stocks with optimistic recommendations that are held by short-term investors equals -8.26% per year (t-stat of 2.84) if DFA ownership is low. The 5-factor alpha is not statistically nor economically significant if DFA ownership is high (-2.42% per year, t-stat of 1.16). The difference in alpha of 5.83% per year is also significant with a t-stat of 1.98.

Finally, Table 3, Panel C presents the results conditional on idiosyncratic risk. We find that the return predictability is stronger for high idiosyncratic risk stocks, and especially so on the long-side or positive abnormal returns compared to the previous two proxies of arbitrage costs. For example, we find that the value-weighted annualized 5-factor alpha for stocks with the most pessimistic mean analyst recommendations that are also held by short-term investors equals 9.31% (t-stat of 2.67) if idiosyncratic risk is high. However, the 5-factor alpha is neither statistically nor economically significant if idiosyncratic volatility is low (1.76% per year, t-stat of 0.64). These results imply that idiosyncratic risk doesn't seem to capture shorting costs in our sample, but is rather a more general proxy for arbitrage risk.

3.3 Results from Fama-MacBeth Regressions

As an additional test, we use the Fama-MacBeth (1973) methodology and estimate predictive cross-sectional regressions of next one-year raw returns on Stock Duration and Mean Analyst Recommendation while controlling for other stock characteristics. These results are presented in Table 4.

We find Fama-MacBeth regression estimates that are generally consistent with the previously documented portfolio results. For example, the coefficient of Stock Duration is positive and highly significant in most of the specifications. In column 1, the value of the Stock Duration coefficient is 3.1%, with a t-stat of 3.47. This confirms the results in Table 2, Panel A that stocks with low holding duration earn a lower return compared to stocks that are held for longer duration. In column 2, we replace the continuous Stock Duration measure with dummy variables corresponding to top and bottom Stock Duration quintiles. The coefficient corresponding to the short (or bottom) Stock Duration quintile is negative and highly significant with a t-stat of 4.04, whereas the coefficient corresponding to longest Stock Duration quintile is positive but insignificant with a t-stat of 1.16. This confirms that among stocks with short Stock Duration, the overvaluation effect is stronger compared to the undervaluation effect, which is consistent with the presence of short-sales constraints.

Looking at the interplay of holding durations and analyst recommendations, in column 3 we find that the coefficient of the interaction between Stock Duration and Mean Analyst Recommendation is positive and highly statistically significant (t-stat of 3.39). This confirms that return predictability based on Stock Duration is stronger for stocks with extreme mean analyst recommendations as shown earlier in Table 2, Panel B. In column 4, we find that returns conditional on Mean Analyst Recommendation are significant only for short Stock Duration stocks. Column 5 also includes interaction terms between analyst dispersion and the number of analyst recommendation with Stock Duration. The coefficient of the interaction between mean analyst recommendation and Stock Duration becomes even stronger once these other interactions are added, whereas these additional interactions terms themselves have insignificant coefficients. Finally, in column 6 we include average daily stock turnover as an alternative proxy for trading frequency. We find that the coefficient corresponding to the interaction term between mean analyst recommendation and turnover is positive and highly significant, which is consistent with the portfolio results in Appendix A-2, Panel B.

4. Exploiting Exogenous Variation: Evidence from Russell 2000 Inclusions

4.1 Results from Portfolio Sorts

To corroborate our interpretation that the documented return predictability is *caused* by short-term investor overreaction due to their coordination through extreme analyst recommendations, we exploit the annual Russell 2000 index reconstitutions as exogenous changes in both analyst coverage and institutional ownership (and, as a result, in Stock Duration). We focus on stocks newly added to the Russell 2000 'from below', i.e., stocks that were previously not included in the Russell 1000 but whose strong recent positive abnormal performance and increase in market value lead to Russell 2000 inclusion.

Endogeneity concerns arise because some unobservable variables (e.g., information or news) could affect misvaluation, the decision by short-term investors to invest in certain stocks (which would give rise to a selection effect), but also analyst recommendations. In other words, short-term investors and analysts may be

simply bystanders rather than directly involved with causing any of the misvaluation and price reversals that we documented. To mitigate this concern and to corroborate that the documented predictability is indeed driven by the reversal of speculator-driven misvaluation, we consider index reconstitutions that arguably generate exogenous changes in Stock Duration. We focus on Russell 2000 inclusions 'from below' as these are events that do not provide new information to the market. In fact, membership in the Russell 2000 is quite predictable, as it is based only on a firm's market capitalization rank on May 31 each year: firms whose market capitalization ranks between 1,000 and 3,001 are included in the Russell 2000 index.[7] Whether stocks are just above or below these cutoffs is likely to be random (e.g., Chang, Hong, and Liskovich, 2014). Stocks added to the Russell 2000 'from below' enter our sample at the end of June when they are first included. We keep the stocks added from below in our sample for four quarters (i.e., from the second quarter of a given calendar year when the stock is added to first quarter of the next calendar year).

Figure 3 shows that, in general, extremes in the consensus analyst recommendations and Stock Durations are similarly mean reverting in the Russell 2000 subsample as for the full sample. There is one exception though, namely that stocks that have long Stock Duration at the time they are added to the Russell 2000 exhibit no subsequent mean reversion in their Stock Duration. This suggests that these stocks are significantly less impacted by index inclusion than stocks with low Stock Duration.

We verify this in Figure 4, showing that Russell 2000 reconstitutions 'from below' generate substantial changes in institutional ownership and analyst coverage for stocks with short Stock Duration (first quintile, see Figure 4A) at the time of reconstitution, but not for stocks with long Stock Duration (fifth quintile, see Figure 4B). In particular, firms with low Stock Duration experience a sharp increase in institutional ownership from a pre-inclusion average of 20% to over 40% soon after inclusion. Moreover, the number of analysts covering these stocks triples (the average number of analysts from about 1 analyst before to over 3 afterwards). There

[7] See http://www.russell.com/indexes/americas/indexes/.

are no correspondingly large changes for stocks added to the Russell 2000 from below that, at that time, have long Stock Duration. As a result, the large increases in institutional ownership, Stock Duration and analyst coverage constitute an important and (arguably) largely exogenous shock for stocks that have largely short-term institutional ownership, which diminishes the role of these short-term speculators in these stocks after index inclusion.

Our main result of price reversals for stocks with short Stock Duration and extreme analyst recommendations in Table 2 continue to hold when we only consider stocks that are added to the Russell 2000 from below, as shown in Table 5. We find strong evidence for a positive relation between Stock Duration and future stock returns, supporting the hypothesis that the stocks held by short-term investors are more likely to be overvalued at the time of Russell 2000 inclusion. For example, as shown in the second and third columns of Table 5, Panel A, a long-short equal-weighted portfolio with long positions in stocks in the highest Stock Duration quintile and short positions in stocks in the lowest Stock Duration quintile earns a 3-factor alpha of (12*1.12%=) 13.44% per year (t-stat of 4.02) and a 5-factor alpha of (12*1.02%=) 12.24% per year (t-stat of 3.63). The magnitude and significance of the abnormal returns is similar for value weighted portfolios, for example, the long-short 5 factor alpha is highly significant 1.01% per month with a t-stat of 3.29. The only factor loading which is very different between the short duration and long duration stocks is the HML loading, showing that short-duration stocks are more likely to be growth firms whereas long-duration stocks on average are value stocks.

Results are similar if we use 3-factor alphas in Appendix A-3, Panel A. In Appendix A-3, Panel B, we consider for robustness average daily turnover as an alternative measure of trading frequency and fin results that are similar. Most notably, we find that stocks with high turnover strongly underperform the stocks with low performance after Russell 2000 inclusion. For example, as shown in the last column of Table 5, Panel B, a long-short value-weighted portfolio with long positions in stocks in the lowest turnover quintile and short

positions in stocks in the highest turnover quintile earns a 5-factor alpha of (12*0.78%=) 9.41% per year (t-stat of 2.14).

We next consider whether analyst recommendations mitigate or aggravate any price impact of speculative trading by short-term investors before Russell 2000 inclusions. In particular, we test the joint importance of Stock Duration and consensus analyst recommendations for stock return predictability. We examine this by independently double sorting stocks into 3x3 tercile portfolios based on Stock Duration and the consensus analyst recommendation. We report equal-weighted and value-weighted monthly alphas using the 5-factor model in Table 5, Panel B.

Similar to results in full sample, we find that the return reversal for Stock Duration is stronger conditional on extreme analyst recommendations, which seem to exacerbate the misvaluation due to presence of short-term investors. For example, in Table 5, Panel B the value-weighted 5-factor alpha for stocks in the most optimistic Mean Analyst Recommendation tercile and the lowest Stock Duration group equals -9.89% per year (t-stat of 2.67), whereas the 5-factor alpha for stocks with similarly optimistic mean Analyst Recommendations but long Stock Duration is positive (0.84% per year), with a t-stat of 0.25. The difference of 10.69% alpha per year between the two Stock Duration groups is highly significant (t-stat of 2.47).

Stocks added to the Russell 2000 from below generally performed relatively well in the past one year. This may explain why short-term investors are less likely to overreact to pessimistic recommendations in our Russell 2000 inclusion subsample, compared to the results in the full sample. For example, the portfolio with stocks with short Stock Duration (tercile 1) and the most pessimistic mean analyst recommendations (tercile 3) has an insignificant future value-weighted 5-factor alpha of 2.24% per year (t-stat of 0.39), while the value-weighted portfolio with long Stock Duration stocks (tercile 3) and similarly pessimistic analyst recommendations (tercile 3) has an alpha of -0.82% per year that is also statistically insignificant (t-stat of 0.29). The difference in annualized alphas of 3.06% is also statistically insignificant, with a t-stat of 0.49.

4.2 Fama-MacBeth Regressions

We again verify the robustness of our results using the Fama-MacBeth (1973) methodology and estimate predictive cross-sectional regressions of next one-year raw returns on Stock Duration and mean analyst recommendation, controlling for other stock characteristics. Results are presented in Table 6. In columns 1 to 4, we estimate regressions over full sample and include a dummy variable if a stock has been added to Russell 2000 from below (the 'Russell 2000 inclusion dummy') in the current quarter or in any of the previous 3 quarters. We also include the interaction between the Russell 2000 inclusion dummy and Stock Duration or other stock characteristics.

In column 1, we include Stock Duration and its interaction with the Russell 2000 inclusion dummy. The coefficient on the interaction equals 3.7% and is highly significant with a t-stat of 3.15. The coefficient on log Stock Duration is 1.2% with a t-stat of 2.16. Therefore, the coefficient on Stock Duration is approximately four-times larger (0.012+0.037=0.049) conditional on recent Russell 2000 inclusion from below, which shows that return reversals due to Stock Duration reversals are even stronger after Russell 2000 inclusions from below. This is consistent with the hypothesis that these events provide an exogenous shock to the institutional investor base, leading to less speculative, more long term investors holding the stock and diminishing the role of the more speculative short-term institutions.

In column 2, we find similar results conditional on share turnover. The coefficient on the interaction term between turnover and the Russell 2000 inclusion dummy is negative and highly significant with a t-stat of 3.79. Therefore, return reversals conditional on high turnover are stronger for stocks recently included in the Russell 2000 index. In columns 3 and 4, we find that return reversals conditional on overvaluation are in general stronger for stocks included in the Russell 2000 index. In column 3 we find that return reversals for high idiosyncratic risk stocks is limited to the stocks recently added to the Russell 2000 index, and similarly that return reversals for high market-to-book ratio stocks is stronger in the year after Russell 2000 inclusion.

In columns 5 to 7, we focus only on the Russell 2000 subsample and show results analogous to the portfolios results reported in Table 5. The regression estimates in columns 5 to 7 are generally consistent with the portfolio results reported above. For example, in column 5, the coefficient of Stock Duration is 4.3%, which is significant at the 10% level with a t-stat of 1.69. This confirms the result in Table 5 that stocks with short Stock Duration earn a lower return post Russell 2000 inclusion compared to stocks that are held for longer durations. In column 6, the coefficient of the interaction between Stock Duration and Mean Analyst Recommendation is negative and highly statistically significant (t-stat of 2.09). This confirms that return predictability based on Stock Duration is stronger for stocks with optimistic consensus analyst recommendations as shown earlier in Table 5, Panel B. Finally, when we include in column 7 share turnover as an alternative proxy for trading frequency, we find that the coefficient corresponding to the interaction term between the consensus analyst recommendation and turnover is positive as predicted, but we note that it is insignificant with a t-stat of only 1.00.

4.3 Results for Stocks around the Market Cap Cutoff

In our previous results, we find a sharp reversal of returns for stocks recently added to the Russell 2000 index from below (and especially if these stocks have very positive consensus analyst recommendations). One possible concern with examining the stocks recently added to the Russell 2000 index from below is that these stocks are generally very different compared to rest of the stocks in our sample. For example, as shown in Table 1 newly included stocks are much smaller in size (median market cap of $221 million versus $482 million for the full sample) and they have much higher return over past one year (median return of 75.9% vs 7.7% for the full sample). To address this concern, in Table 7 we compare the returns of the 100 smallest stocks included in Russell 2000 from below that just made the cutoff, with those 100 largest stocks that just missed the cutoff and thus were not added to the Russell 2000 from below. Around the cutoff, the inclusion of stocks is likely to be most random, while market capitalization and past returns are similar for both groups of stocks.

Results for the sample of the smallest 100 stocks added to the index are in Table 7, Panel A, while the results for our comparison sample consisting of the largest 100 stocks just below the market cap cutoff that missed the inclusion are presented in Table 7, Panel B. We find that past abnormal returns (Qtr t-3 to t) for both types of stocks are positive and highly significant. However, the comparison variable of most relevance for our analysis is the future return predictability conditional on Stock Duration. If the price reversal is driven by overly optimistic short-term investors becoming less important as more long-term institutional investors buy the stocks after index inclusion, then we should expect the return reversals to be stronger for stocks that were included. On the other hand, return reversals should be weaker for stocks that just missed the inclusion to the index.

The results in Table 7 confirm this prediction. For example, in Table 7, Panel A we find that short-duration stocks earn a negative value-weighted 5-factor alpha of -13.32% in the year after Russell 2000 inclusion, which is highly significant with a t-stat of 2.50. Short-duration stocks that just missed the Russell 2000 cutoff did not experience such strong return reversals, earning an insignificant 5-factor alpha of only 0.84 per year with a t-stat of 0.18. This provides additional evidence supporting the idea that stocks owned by short-term investors are more likely to be misvalued, where the misvaluation declines as their importance diminishes.

5. Conclusion

In this paper, we document novel evidence that the presence of short-term investors, when combined with extreme consensus analyst recommendations, is strongly associated with future price reversals. Stocks held by short-term institutional investors with the most optimistic (pessimistic) consensus analyst recommendations generally have large positive (negative) past abnormal stock returns, but these are followed by large negative (positive) subsequent abnormal stock returns. This finding is consistent with and expands the results of Ertimur, Muslu, and Zhang (2011). We further show that our economically large abnormal returns are

driven by stocks that are harder to arbitrage, such as stocks with higher short-interest ratios and higher idiosyncratic volatility. Our main interpretation of these results is that the extreme analyst recommendations serve as a coordination device for the short-term traders, assisting herding among speculators and exacerbating their collective price effect. This interpretation is also consistent with both Shiller (2002, 2003) and the theory of Hong, Scheinkman, and Xiong (2008).

Our main identification to corroborate that short-term traders indeed *cause* the documented misvaluation is obtained from stocks added 'from below' to the Russell 2000 index. This identification strategy has the advantage that it allows us to rule out other explanations, for example that short-term traders are trading on the misvaluation or that the documented price reversals are driven by news events that attract short-term investors (or other selection effects). Stocks added to the Russell 2000 have generally performed very well in the past year, such that their significant increase in market capitalization now newly qualifies them for inclusion in this popular small cap benchmark. If such newly included stocks have short Stock Duration, i.e., have institutional owners who are generally short-term, we find that the index inclusion causes substantial changes to analyst coverage, institutional ownership, and Stock Duration. As argued by, for example, Chang, Hong, and Liskovich (2014), these changes are arguably mostly exogenous to the firm and cause a much diminished role of the short-term speculators.

We find that stocks with strongly optimistic analyst recommendations and short Stock Duration appear to be significantly overvalued at the time when they are added to the Russell 2000 from below. After their index inclusion, the overvaluation fairly slowly reverses over the subsequent two years, as the importance of the short-term investors in these stocks declines due to substantial increases in institutional ownership and greater analyst coverage. Our results are remarkably large. For example, the value-weighted 5-factor alpha for stocks with the most optimistic Mean Analyst Recommendations and the lowest Stock Duration equals -9.89% per year (t-stat of 2.67), whereas the 5-factor alpha for stocks with similarly optimistic Mean Analyst

Recommendations but long Stock Duration is positive (0.84% per year), with a t-statistic of 0.25. Our study thus suggests that extreme analyst recommendations allow short-term traders to cause significant misvaluation, rather than serving to mitigate speculator optimism and their price impact.

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Table 1: Summary Statistics

This table provides summary statistics of the variables used in the empirical analysis. The sample consists of US common stocks from December 1993 to December 2013. We eliminate stocks without analyst recommendations, stocks with missing market capitalization or book value of equity data, and stocks with prices below US$ 1. Panel A reports summary statistics across the full sample and Panel B reports Spearman rank correlations. Panel C reports summary statistics only for stocks that are included to the Russell 2000 from below. Variables are defined in Appendix A-1.

Panel A: Full Sample

	Mean	STD	p25	Median	p75
Stock Duration (years)	1.39	0.59	0.98	1.37	1.77
Share Turnover (%)	0.7	0.8	0.3	0.5	0.9
Mean Analyst Recommendation	2.2	0.6	1.9	2.2	2.7
Market Cap ($ million)	3780	15760	158	482	1829
MB Ratio	5.3	60.0	1.4	2.1	3.7
Past 12 Months Return (%)	18.0	66.7	-15.3	7.7	34.8
Institutional Ownership (%)	54.4	24.2	35.9	57.2	74.2
DFA Ownership (%)	1.97	2.30	0.09	1.10	2.95
Analyst Coverage	7.2	6.5	2.4	5.0	10.0
Idiosyncratic Volatility (%)	2.7	1.6	1.6	2.3	3.3
Short Ratio	0.03	0.04	0.01	0.02	0.04

Panel B: Rank Correlations

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	Stock Duration	1.00								
(2)	Share Turnover	-0.41	1.00							
(3)	Mean Analyst Recommendation	0.16	-0.09	1.00						
(4)	Idiosyncratic Volatility (%)	-0.36	0.27	-0.07	1.00					
(5)	Analyst Coverage	0.02	0.42	0.04	-0.32	1.00				
(6)	Market Cap	0.18	0.26	0.01	-0.55	0.78	1.00			
(7)	MB Ratio	-0.12	0.26	-0.28	-0.05	0.28	0.40	1.00		
(8)	Past 12 Months Return (%)	-0.04	0.00	-0.20	-0.16	0.03	0.22	0.40	1.00	
(9)	Institutional Ownership (%)	0.04	0.43	-0.10	-0.23	0.52	0.53	0.17	0.10	1.00

Panel C: Russell 2000 Inclusion Sample

	Mean	STD	p25	Median	p75
Stock Duration (years)	1.03	0.57	0.60	0.97	1.38
Share Turnover (%)	0.8	0.9	0.3	0.6	1.0
Mean Analyst Recommendation	1.9	0.7	1.4	1.8	2.3
Market Cap ($ million)	270	153	182	221	303
MB Ratio	12.8	74.9	2.0	3.4	6.5
Past 12 Months Return (%)	111.2	129.1	35.5	75.9	146.5
Institutional Ownership (%)	47.1	21.0	31.3	46.8	62.8
Analyst Coverage	3.2	2.1	1.7	2.7	4.2
Idiosyncratic Volatility (%)	3.3	1.6	2.3	3.1	3.9
Short Ratio	0.03	0.04	0.01	0.02	0.03

Table 2: Return Predictability: Portfolio Results

Panel A presents monthly equal-weighted and value-weighted CAPM alphas, 3-factor Fama-French alphas, and 5-factor alphas for portfolio strategies from unconditional sorts based on Stock Duration. Panels B reports alphas for independent double sorts based on Stock Duration and the Mean Analyst Recommendation. At the beginning of each quarter, stocks are first divided into five groups based on Stock Duration. In Panels B they are then independently divided into five groups based on Mean Analyst Recommendation. We then report returns for these 25 portfolios which are calculated over next four quarters. In Panel C we investigate results once we lag the portfolio construction by one, two, three, and four quarters. To account for overlapping portfolios, we follow the methodology in Jegadeesh and Titman (1993) such that stocks ranked in each of the last four quarters form one-fourth of each portfolio. All the reported returns are in monthly percentages. The sample consists of US common stocks from December 1993 to December 2013. We eliminate stocks without analyst recommendations, stocks with missing market capitalization or book value of equity data, and stocks with prices below US$ 1. 5% significance levels are denoted in bold and *t*-statistics are reported in parentheses.

Panel A: Sorts on Stock Duration

	Equal-Weighted Returns			Value-Weighted Returns			Value-Weighted Returns FF 5-Factor Loadings				
Stock Duration	CAPM Alpha	FF 3 Factor Alpha	FF 5 Factor Alpha	CAPM Alpha	FF 3 Factor Alpha	FF 5 Factor Alpha	MKTRF	**HML**	SMB	UMD	PS Liquidity
1	0.18	0.07	**0.24**	-0.11	-0.06	-0.06	**1.23**	**-0.26**	**0.45**	0.02	-0.03
	(0.76)	(0.48)	**(2.11)**	(-0.52)	(-0.41)	(-0.37)	**(32.33)**	**(-5.04)**	**(9.22)**	(0.63)	(-0.82)
2	0.36	0.18	**0.33**	-0.02	-0.03	-0.04	**1.15**	**-0.11**	**0.45**	**-0.04**	**0.07**
	(1.77)	(1.49)	**(3.57)**	(-0.13)	(-0.31)	(-0.40)	**(43.74)**	**(-2.91)**	**(13.15)**	**(-2.01)**	**(2.55)**
3	**0.53**	**0.32**	**0.41**	**0.30**	**0.24**	**0.19**	**1.07**	**0.11**	**0.19**	0.00	**0.08**
	(3.17)	**(3.44)**	**(5.58)**	**(3.09)**	**(2.75)**	**(2.18)**	**(51.52)**	**(3.92)**	**(7.17)**	(0.04)	**(3.79)**
4	**0.55**	**0.33**	**0.39**	**0.21**	**0.17**	0.13	**1.01**	**0.14**	-0.02	0.01	**0.05**
	(3.69)	**(4.10)**	**(5.78)**	**(2.71)**	**(2.31)**	(1.75)	**(58.24)**	**(5.74)**	(-0.85)	(0.89)	**(2.80)**
5	**0.63**	**0.41**	**0.48**	**0.14**	**0.15**	**0.18**	**0.90**	0.03	**-0.25**	0.01	**-0.06**
	(4.24)	**(5.03)**	**(6.47)**	**(1.58)**	**(2.37)**	**(2.84)**	**(58.74)**	(1.19)	**(-12.82)**	(0.60)	**(-3.66)**
5-1	**0.46**	**0.34**	**0.24**	0.24	0.22	0.24	**-0.32**	**0.29**	**-0.70**	-0.01	-0.03
	(2.40)	**(2.62)**	**(1.96)**	(0.92)	(1.16)	(1.26)	**(-7.10)**	**(4.59)**	**(-11.96)**	(-0.32)	(-0.55)

Panel B: Double Sorts on Stock Duration and Mean Analyst Recommendation

	Equal-Weighted FF 5-Factor Alpha						Value-Weighted FF 5-Factor Alpha					
	Mean Analyst Recommendation						Mean Analyst Recommendation					
Stock Duration	1 (Buy)	2	3	4	5 (Sell)	5-1	1(Buy)	2	3	4	5 (Sell)	5-1
Uncond.	**0.20**	**0.27**	**0.40**	**0.47**	**0.53**	**0.33**	-0.01	**0.17**	**0.20**	**0.20**	**0.18**	0.19
	(2.01)	**(3.11)**	**(5.36)**	**(6.34)**	**(4.83)**	**(2.72)**	(-0.05)	**(2.53)**	**(2.69)**	**(2.64)**	**(2.00)**	(1.15)
1	-0.10	0.05	**0.39**	**0.59**	**0.80**	**0.90**	**-0.64**	-0.17	**0.50**	0.34	**0.54**	**1.18**
	(-0.70)	(0.32)	**(2.88)**	**(3.73)**	**(3.88)**	**(4.40)**	**(-3.00)**	(-0.83)	**(2.06)**	(1.73)	**(2.34)**	**(3.62)**
2	0.16	**0.30**	**0.41**	**0.42**	**0.45**	0.30	-0.19	-0.01	0.11	0.13	0.19	0.38
	(1.20)	**(2.86)**	**(3.83)**	**(3.33)**	**(2.59)**	(1.46)	(-1.02)	(-0.04)	(0.72)	(0.87)	(1.21)	(1.54)
3	0.22	**0.29**	**0.45**	**0.49**	**0.59**	**0.37**	0.11	0.15	0.25	**0.26**	**0.34**	0.23
	(1.88)	**(2.64)**	**(5.12)**	**(5.08)**	**(4.68)**	**(2.38)**	(0.58)	(1.25)	(1.89)	**(2.32)**	**(2.38)**	(1.03)
4	**0.50**	**0.33**	**0.34**	**0.42**	**0.36**	-0.14	-0.04	0.23	0.10	0.19	0.21	0.24
	(5.01)	**(3.16)**	**(4.29)**	**(4.80)**	**(3.29)**	(-1.03)	(-0.19)	(1.83)	(1.21)	(1.95)	(1.73)	(1.13)
5	**0.53**	**0.39**	**0.40**	**0.43**	**0.53**	0.00	0.19	0.21	0.21	0.23	0.16	-0.02
	(4.68)	**(3.95)**	**(4.30)**	**(4.85)**	**(4.36)**	(0.01)	(0.97)	(1.80)	(1.79)	(1.95)	(1.21)	(-0.08)
5-1	**0.63**	**0.35**	**0.01**	-0.16	-0.26	**-0.90**	**0.83**	0.38	-0.28	-0.12	-0.37	**-1.20**
	(4.56)	**(2.06)**	(0.08)	(-0.90)	(-1.28)	**(-4.07)**	**(2.89)**	(1.56)	(-1.05)	(-0.50)	(-1.34)	**(-3.06)**

Table 2 (continued)

Panel C: Double Sorts on Stock Duration and Mean Analyst Recommendation: Lagged Portfolio Construction

	Qtr+1			**Qtr+2**			**Qtr+3**			**Qtr+4**		
	Value-Weighted FF 5-Factor Alpha			Value-Weighted FF 5-Factor Alpha			Value-Weighted FF 5-Factor Alpha			Value-Weighted FF 5-Factor Alpha		
	Mean Analyst Recommendation			Mean Analyst Recommendation			Mean Analyst Recommendation			Mean Analyst Recommendation		
Stock Duration	1 (Buy)	5 (Sell)	5-1	1 (Buy)	5 (Sell)	5-1	1 (Buy)	5 (Sell)	5-1	1 (Buy)	5 (Sell)	5-1
1	**-0.75**	0.47	**1.22**	**-0.62**	0.48	**1.10**	**-0.75**	**0.63**	**1.38**	-0.49	0.57	**1.06**
	(-3.05)	(1.46)	**(2.99)**	**(-2.33)**	(1.69)	**(2.64)**	**(-3.01)**	**(1.97)**	**(3.37)**	(-1.84)	(1.87)	**(2.47)**
5	0.38	0.23	-0.14	0.08	-0.02	-0.09	-0.05	0.26	0.31	0.37	0.18	-0.19
	(1.59)	(1.31)	(-0.81)	(0.32)	(-0.09)	(-0.30)	(-0.20)	(1.57)	(1.04)	(1.40)	(1.17)	(-0.61)
5-1	**1.13**	-0.24	**-1.36**	**0.69**	-0.50	**-1.19**	**0.70**	-0.37	**-1.06**	**0.86**	-0.40	**-1.25**
	(3.29)	(-0.62)	**(-2.74)**	**(2.04)**	(-1.43)	**(-2.33)**	**(2.05)**	(-0.99)	**(-2.22)**	**(2.17)**	(-1.18)	**(-2.37)**

Table 3: Return Predictability: Portfolio Results for Stocks with High versus Low Limits to Arbitrage

This table presents monthly value-weighted 5-factor alphas for portfolio strategies based on 5x5x2 independent triple sorts on Stock Duration, Mean Analyst Recommendation, and proxies for limits to arbitrage. We report the portfolios separately for stocks with a low or high short ratio (Panel A), low or high ownership by DFA (Panel B), and low or high idiosyncratic volatility (Panel C). At the beginning of each quarter, stocks are first divided into five groups based on Stock Duration. They are then independently divided into five groups based on Mean Analyst Recommendation. We then report returns for these 25 portfolios which are calculated over next four quarters. We report results for the top and bottom Stock Duration groups only. To account for overlapping portfolios, we follow the methodology in Jegadeesh and Titman (1993) such that stocks ranked in each of the last four quarters form one-fourth of each portfolio. Returns are in monthly percentages. The sample consists of US common stocks from December 1993 to December 2013.

Panel A: Short Interest

	Short Ratio=Low						Short Ratio=High						
	Mean Analyst Recommendation						Mean Analyst Recommendation						
Stock Duration	1 (Buy)	2	3	4	5 (Sell)	5-1	1 (Buy)	2	3	4	5 (Sell)	5-1	
1	-0.17	0.31	0.09	0.40	0.41	0.58	**-0.83**	-0.01	0.26	0.04	0.33	**1.17**	0.58
	(-0.71)	(1.58)	(0.35)	(1.66)	(1.42)	(1.61)	**(-3.50)**	(-0.06)	(1.03)	(0.17)	(1.20)	**(3.46)**	(1.22)
5	**0.42**	0.12	0.26	0.25	0.24	-0.18	0.31	0.21	0.02	0.14	0.08	-0.23	-0.05
	(2.17)	(1.10)	(1.77)	(1.60)	(1.40)	(-0.72)	(1.06)	(1.04)	(0.15)	(0.92)	(0.50)	(-0.73)	(-0.14)
5-1	**0.59**	-0.19	0.17	-0.15	-0.17	-0.76	**1.15**	0.22	-0.23	0.10	-0.25	**-1.40**	-0.64
	(1.98)	(-0.87)	(0.58)	(-0.51)	(-0.52)	(-1.79)	**(3.38)**	(0.78)	(-0.85)	(0.39)	(-0.81)	**(-3.29)**	(-1.13)

Panel B: DFA Ownership

	DFA Ownership=Low						DFA Ownership=High						
	Mean Analyst Recommendation						Mean Analyst Recommendation						
Stock Duration	1 (Buy)	2	3	4	5 (Sell)	5-1	1 (Buy)	2	3	4	5 (Sell)	5-1	
1	**-0.69**	-0.14	**0.60**	0.34	**0.73**	**1.42**	-0.20	-0.09	-0.03	**0.43**	0.24	0.45	**-0.98**
	(-2.84)	(-0.65)	**(2.22)**	(1.53)	**(2.54)**	**(3.62)**	(-1.17)	(-0.43)	(-0.13)	**(2.22)**	(1.21)	(1.68)	**(-2.30)**
5	0.18	0.21	0.21	0.23	0.17	-0.01	0.47	0.16	0.18	0.17	0.29	-0.18	-0.17
	(0.91)	(1.78)	(1.77)	(1.94)	(1.15)	(-0.04)	(3.52)	(1.00)	(1.43)	(1.23)	(2.13)	(-1.11)	(-0.56)
5-1	**0.87**	0.35	-0.38	-0.11	-0.57	**-1.43**	**0.68**	0.25	0.20	-0.26	0.05	**-0.63**	0.80
	(2.75)	(1.37)	(-1.31)	(-0.44)	(-1.67)	**(-3.16)**	**(3.39)**	(0.95)	(0.82)	(-1.04)	(0.20)	**(-2.15)**	(1.55)

Panel C: Idiosyncratic Volatility

	Idiosyncratic Volatility=Low						Idiosyncratic Volatility=High						
	Mean Analyst Recommendation						Mean Analyst Recommendation						
Stock Duration	1 (Buy)	2	3	4	5 (Sell)	5-1	1 (Buy)	2	3	4	5 (Sell)	5-1	High-Low
1	-0.45	-0.07	0.26	0.01	0.15	0.59	**-0.53**	-0.33	0.23	0.49	**0.78**	**1.30**	0.71
	(-1.66)	(-0.40)	(1.38)	(0.06)	(0.64)	(1.80)	**(-2.53)**	(-1.37)	(0.80)	(1.91)	**(2.67)**	**(3.57)**	(1.73)
5	0.21	0.20	**0.25**	0.19	0.16	-0.05	0.40	0.36	0.46	0.30	0.39	-0.01	0.04
	(1.09)	(1.67)	**(2.05)**	(1.57)	(1.15)	(-0.20)	(1.86)	(1.10)	(1.68)	(1.06)	(1.75)	(-0.04)	(0.11)
5-1	**0.66**	0.27	-0.01	0.18	0.01	-0.64	**0.92**	0.69	0.24	-0.20	-0.39	**-1.31**	-0.67
	(2.00)	(1.20)	(-0.04)	(0.72)	(0.05)	(-1.61)	**(3.56)**	(1.72)	(0.61)	(-0.59)	(-1.10)	**(-3.20)**	(-1.22)

Table 4: Return Predictability: Fama-MacBeth Regressions

This table provides quarterly Fama-MacBeth predictive regressions linking next-twelve-months stock returns and Stock Duration. We further include interactions of Stock Duration with Mean Analyst Recommendation. Variables are defined in Appendix A-1. Newey-West (1987) adjusted *t*-statistics, calculated based on two lags, are reported in parentheses. The sample consists of US common stocks from December 1993 to December 2013. We eliminate stocks without analyst recommendations, stocks with missing market capitalization or book value of equity data, and stocks with prices below US$ 1. 5% significance levels are denoted in bold and *t*-statistics are reported in parentheses.

	Dependent Variable: 12 Months Return					
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.467	**0.525**	0.367	**0.550**	0.448	0.034
	(1.86)	**(2.03)**	(1.53)	**(2.10)**	(1.73)	(0.13)
Log(Stock Duration)	**0.031**		**0.097**		**0.115**	**0.030**
	(3.47)		**(3.67)**		**(3.74)**	**(3.08)**
Stock Duration Low		**-0.036**		**-0.139**		
		(-4.04)		**(-3.94)**		
Stock Duration High		0.009		0.017		
		(1.16)		(0.88)		
Mean Analyst Recommendation * Log(Stock Duration)			**-0.031**		**-0.049**	
			(-3.12)		**(-3.50)**	
Log(Analyst Forecast Dispersion) * Log(Stock Duration)					-0.002	
					(-0.50)	
Log(Analyst Coverage) * Log(Stock Duration)					0.008	
					(0.94)	
Mean Analyst Recommendation * Stock Duration Low				**0.050**		
				(3.39)		
Mean Analyst Recommendation * Stock Duration High				-0.003		
				(-0.33)		
Mean Analyst Recommendation * Log(Share Turnover)						**0.038**
						(4.59)
Analyst Forecast Dispersion * Log(Share Turnover)						0.005
						(1.35)
Log(Analyst Coverage) * Log(Share Turnover)						0.004
						(0.78)
Mean Analyst Recommendation	0.010	0.010	**0.059**	0.000	0.016	**0.207**
	(1.67)	(1.64)	**(3.15)**	(0.03)	(1.58)	**(4.47)**
Log(Analyst Coverage)	0.007	0.007	0.006	0.006	0.010	0.036
	(1.11)	(1.10)	(1.04)	(1.07)	(1.48)	(1.40)
Log(Analyst Forecast Dispersion)	0.007	0.007	0.006	0.006	0.006	0.032
	(1.11)	(1.10)	(1.04)	(1.07)	(0.83)	(1.43)
Log(Market Cap)	-0.011	-0.011	-0.011	-0.011	-0.011	-0.010
	(-1.89)	(-1.87)	(-1.91)	(-1.92)	(-1.58)	(-1.58)
Log(MB Ratio)	-0.012	-0.012	-0.011	-0.011	-0.013	-0.012
	(-1.20)	(-1.16)	(-1.11)	(-1.09)	(-1.28)	(-1.19)
Past 12 Months Return	-0.010	-0.010	-0.008	-0.009	-0.008	-0.007
	(-0.47)	(-0.50)	(-0.40)	(-0.44)	(-0.36)	(-0.34)
Log(Share Turnover)	0.014	0.014	0.014	0.015	0.012	**-0.066**
	(0.84)	(0.83)	(0.86)	(0.87)	(0.76)	**(-2.45)**
Log(Institutional Ownership)	-0.013	-0.014	-0.014	-0.014	-0.017	-0.016
	(-0.99)	(-1.15)	(-1.02)	(-1.16)	(-1.12)	(-1.05)
Log(Idiosyncratic Volatility)	0.035	0.035	0.034	0.033	0.020	0.022
	(1.13)	(1.12)	(1.10)	(1.08)	(0.83)	(0.86)
Average R-square (%)	6.1	6.1	6.2	6.3	7.7	7.9
Number of Quarters	76	76	76	76	76	76

Table 5: Return Predictability: Portfolio Results for Russell 2000 Inclusion Stocks

Panel A presents for stocks added to the Russell 2000 from below monthly equal-weighted and value-weighted CAPM alphas, 3-factor Fama-French alphas, and 5-factor alphas for portfolio strategies from unconditional sorts based on Stock Duration. Panels B reports alphas for independent double sorts based on Stock Duration and the Mean Analyst Recommendation. At the beginning of each quarter, stocks are first divided into three groups based on Stock Duration. They are then independently divided into three groups based on Mean Analyst Recommendation. We then report returns for these 9 portfolios which are calculated over next four quarters. To account for overlapping portfolios, we follow the methodology in Jegadeesh and Titman (1993) such that stocks ranked in each of the last four quarters form one-fourth of each portfolio. All the reported returns are in monthly percentages. The sample consists of US common stocks that are included to the Russell 2000 from below from December 1993 to December 2013. We eliminate stocks without analyst recommendations, stocks with missing market capitalization or book value of equity data, and stocks with prices below US$ 1. 5% significance levels are denoted in bold and *t*-statistics are reported in parentheses.

Panel A: Sorts on Stock Duration for Russell 2000 Inclusion Stocks

	Sample: Russell 2000 inclusion from below year (t)										
	Equal-Weighted Returns			Value-Weighted Returns			Value-Weighted Returns FF 5-Factor Loadings				
Stock Duration	CAPM Alpha	FF 3 Factor Alpha	FF 5 Factor Alpha	CAPM Alpha	FF 3 Factor Alpha	FF 5 Factor Alpha	MKTRF	HML	SMB	UMD	PS Liquidity
1	**-1.08**	**-1.06**	**-0.91**	**-1.06**	**-1.00**	**-0.98**	**1.22**	**-0.50**	**1.04**	-0.02	-0.01
	(-2.90)	**(-4.05)**	**(-3.60)**	**(-2.83)**	**(-4.00)**	**(-3.80)**	**(20.04)**	**(-5.99)**	**(13.30)**	(-0.47)	(-0.23)
2	-0.48	**-0.53**	**-0.39**	-0.43	**-0.44**	-0.38	**1.15**	**-0.31**	**1.06**	0.02	**-0.13**
	(-1.62)	**(-2.62)**	**(-1.97)**	(-1.25)	**(-1.96)**	(-1.64)	**(21.26)**	**(-4.19)**	**(15.23)**	(0.39)	**(-2.27)**
3	-0.02	-0.18	-0.06	-0.28	-0.36	-0.40	**1.07**	-0.07	**0.98**	**0.09**	-0.04
	(-0.08)	(-0.89)	(-0.31)	(-0.92)	(-1.70)	(-1.87)	**(21.15)**	(-1.02)	**(15.03)**	**(2.14)**	(-0.78)
4	0.07	-0.12	0.01	0.10	-0.07	-0.01	**0.99**	**0.16**	**1.03**	0.01	**-0.10**
	(0.24)	(-0.68)	(0.07)	(0.34)	(-0.34)	(-0.06)	**(20.71)**	**(2.43)**	**(16.87)**	(0.31)	**(-2.07)**
5	0.27	0.06	0.11	0.27	0.07	0.04	**0.94**	**0.34**	**0.81**	0.00	0.06
	(1.01)	(0.27)	(0.55)	(1.04)	(0.37)	(0.17)	**(19.14)**	**(5.08)**	**(12.82)**	(0.12)	(1.11)
5-1	**1.34**	**1.12**	**1.02**	**1.33**	**1.08**	**1.01**	**-0.28**	**0.85**	**-0.23**	0.03	0.07
	(4.09)	**(4.02)**	**(3.63)**	**(3.74)**	**(3.58)**	**(3.29)**	**(-3.81)**	**(8.43)**	**(-2.45)**	(0.47)	(0.94)

Panel B: Double Sorts on Stock Duration and Mean Analyst Recommendation for Russell 2000 Inclusion Stocks

	Equal-Weighted FF 5-Factor Alpha					Value-Weighted FF 5-Factor Alpha				
		Mean Analyst Recommendation					Mean Analyst Recommendation			
Stock Duration	Uncond.	1 (Buy)	2	3 (Sell)	3-1	Uncond.	1(Buy)	2	3(Sell)	3-1
Uncond.		-0.34	-0.06	0.00	0.33		**-0.48**	**-0.41**	-0.13	0.34
		(-1.74)	(-0.33)	(-0.03)	(1.51)		**(-2.24)**	**(-2.00)**	(-0.59)	(1.20)
1	**-0.55**	**-0.82**	**-0.58**	0.18	**1.00**	**-0.68**	**-0.82**	**-0.70**	0.19	1.01
	(-2.79)	**(-2.87)**	**(-2.23)**	(0.53)	**(2.47)**	**(-3.06)**	**(-2.67)**	**(-2.25)**	(0.39)	(1.85)
2	0.03	-0.30	0.42	-0.02	0.28	-0.27	-0.44	0.06	-0.35	0.09
	(0.14)	(-1.02)	(1.68)	(-0.06)	(0.75)	(-1.30)	(-1.45)	(0.21)	(-1.24)	(0.24)
3	0.08	0.12	0.02	0.11	0.00	-0.05	0.07	-0.20	-0.08	-0.14
	(0.45)	(0.43)	(0.08)	(0.50)	(-0.01)	(-0.29)	(0.25)	(-0.74)	(-0.29)	(-0.39)
3-1	**0.62**	**0.94**	0.60	-0.07	**-1.01**	**0.63**	**0.89**	0.50	-0.26	-1.16
	(2.80)	**(2.77)**	(1.76)	(-0.19)	**(-2.10)**	**(2.36)**	**(2.47)**	(1.28)	(-0.49)	(-1.84)

Table 6: Return Predictability: Fama-MacBeth Regressions for Russell 2000 Inclusion Stocks

This table provides for stocks added to the Russell 2000 from below quarterly Fama-MacBeth predictive regressions linking next-twelve-months stock returns and Stock Duration. We further include interactions of Stock Duration with Mean Analyst Recommendation. Variables are defined in Appendix A-1. Newey-West (1987) adjusted *t*-statistics, calculated based on two lags, are reported in parentheses. The sample consists of US common stocks that are included to the Russell 2000 from below from December 1993 to December 2013. We eliminate stocks without analyst recommendations, stocks with missing market capitalization or book value of equity data, and stocks with prices below US$ 1. 5% significance levels are denoted in bold and *t*-statistics are reported in parentheses.

	Dependent Variable: 12 Months Return						
	Full Sample				R2000 Inclusion Sample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	0.153	0.163	0.160	0.154	0.349	0.308	0.231
	(0.88)	(0.93)	(0.91)	(0.88)	(0.78)	(0.68)	(0.59)
Log(Stock Duration)	**0.012**	**0.014**	**0.014**	**0.014**	0.043	**0.133**	
	(2.16)	**(2.35)**	**(2.38)**	**(2.34)**	(1.69)	**(2.47)**	
Mean Analyst Recommendation					0.003	**0.071**	0.092
					(0.24)	**(2.23)**	(0.92)
Mean Analyst Recommendation * Log(Stock Duration)						**-0.047**	
						(-2.09)	
Mean Analyst Recommendation * Log(Share Turnover)							0.018
							(1.00)
R2000 Inclusion	**-0.111**	**-0.291**	**-0.342**	**-0.035**			
	(-5.20)	**(-4.40)**	**(-5.55)**	**(-2.45)**			
R2000 Inclusion * Stock Duration	**0.037**						
	(3.15)						
R2000 Inclusion * Share Turnover		**-0.042**					
		(-3.79)					
R2000 Inclusion * Idiosyncratic Risk			**-0.079**				
			(-4.94)				
R2000 Inclusion * MB Ratio				**-0.028**			
				(-2.01)			
Log(Market Cap)	-0.006	-0.006	-0.006	**-0.006**	-0.031	-0.038	-0.043
	(-1.59)	(-1.69)	(-1.54)	(-1.66)	(-1.05)	(-1.24)	(-1.46)
Log(MB Ratio)	**-0.018**	**-0.018**	**-0.018**	-0.017	0.003	0.005	0.002
	(-2.04)	**(-2.05)**	**(-2.05)**	(-1.88)	(0.14)	(0.30)	(0.13)
Past 12 Months Return	0.029	0.029	0.029	0.029	0.011	0.016	0.010
	(1.72)	(1.76)	(1.74)	(1.73)	(0.47)	(0.67)	(0.43)
Log(Share Turnover)	-0.006	-0.004	-0.005	-0.006	-0.010	-0.010	-0.057
	(-0.53)	(-0.37)	(-0.52)	(-0.53)	(-0.48)	(-0.47)	(-1.45)
Log(Institutional Ownership)	**0.016**	**0.016**	**0.016**	**0.016**	-0.005	-0.006	0.007
	(2.20)	**(2.21)**	**(2.20)**	**(2.20)**	(-0.23)	(-0.31)	(0.30)
Log(Idiosyncratic Volatility)	0.012	0.011	0.015	0.012	-0.005	-0.002	-0.014
	(0.58)	(0.56)	(0.72)	(0.59)	(-0.13)	(-0.07)	(-0.39)
Average R-square (%)	6.1	6.1	6.1	6.2	13.6	14.6	13.4
Number of Quarters	111	111	111	111	76	76	76

Table 7: Comparison of Stocks Around the Russell 2000 Cut-Off

Panel A presents results for 100 smallest stocks added to the Russell 2000 from below. Panel B reports the corresponding results for 100 largest stocks just below the market cap cutoff for Russell 2000 inclusion from below and hence missed the inclusion. Monthly equal-weighted and value-weighted 5-factor alphas for portfolio strategies from unconditional sorts based on Stock Duration are presented. 5% significance levels are denoted in bold and *t*-statistics are reported in parentheses.

Panel A: Stocks Included to Russell 2000

	Qtr t-3,t		Qtr(t+2,t+5)	
	Bottom 100 Included			
	Equal-Weighted	Value-Weighted	Equal Weighted	Value-Weighted
Stock Duration	FF 5 Factor Alpha	FF 5 Factor Alpha	FF 5 Factor Alpha	FF5 Factor Alpha
1	**6.45**	**3.72**	-0.83	**-1.11**
	(10.42)	**(6.74)**	(-1.92)	**(-2.50)**
2	**4.54**	**2.82**	0.01	-0.23
	(12.17)	**(8.69)**	(0.04)	(-0.65)
3	**4.06**	**2.31**	-0.35	-0.63
	(10.36)	**(6.51)**	(-0.95)	(-1.66)
4	**3.76**	**2.35**	-0.38	-0.47
	(9.75)	**(7.07)**	(-0.93)	(-1.12)
5	**3.45**	**2.14**	0.15	0.13
	(7.79)	**(5.72)**	(0.46)	(0.40)
5-1	**-3.00**	**-1.58**	0.97	**1.24**
	(-4.31)	**(-2.61)**	(1.63)	**(2.09)**

Panel B: Stocks Not Included to Russell 2000

	Qtr t-3,t		Qtr(t+2,t+5)	
	Top 100 Not Included			
	Equal-Weighted	Value-Weighted	Equal-Weighted	Value-Weighted
Stock Duration	FF 5 Factor Alpha	FF 5 Factor Alpha	FF 5 Factor Alpha	FF5 Factor Alpha
1	**3.37**	**1.09**	0.06	0.07
	(6.98)	**(2.74)**	(0.20)	(0.18)
2	**1.90**	0.12	0.19	0.33
	(5.31)	(0.34)	(0.60)	(1.03)
3	**1.48**	-0.25	0.63	0.32
	(3.65)	(-0.68)	(1.64)	(0.93)
4	**1.24**	-0.26	0.01	0.12
	(3.39)	(-0.80)	(0.05)	(0.38)
5	**1.15**	-0.15	0.49	0.31
	(3.36)	(-0.51)	(1.63)	(1.10)
5-1	**-2.23**	**-1.24**	0.43	0.24
	(-3.90)	**(-2.58)**	(1.02)	(0.56)

Figure 1: Changes in Analyst Recommendations and Stock Duration

The figure shows for the full sample average values of Mean Analyst Recommendation (Figure 1A) and Stock Duration (Figure 1B) for stocks in four portfolios from eight quarters before to twelve quarters after portfolio construction. The portfolios are based on annual independent 5x5 sorts of all stocks in our sample into Stock Duration and Mean Analyst Recommendation quintiles. The reported four portfolios include stocks in the interaction of the first ('Short') and fifth ('Long') Stock Duration quintiles and the first ('Buy') and fifth ('Sell') Mean Analyst Recommendation quintiles.

Figure 1A: Mean Analyst Recommendations around Portfolio Construction

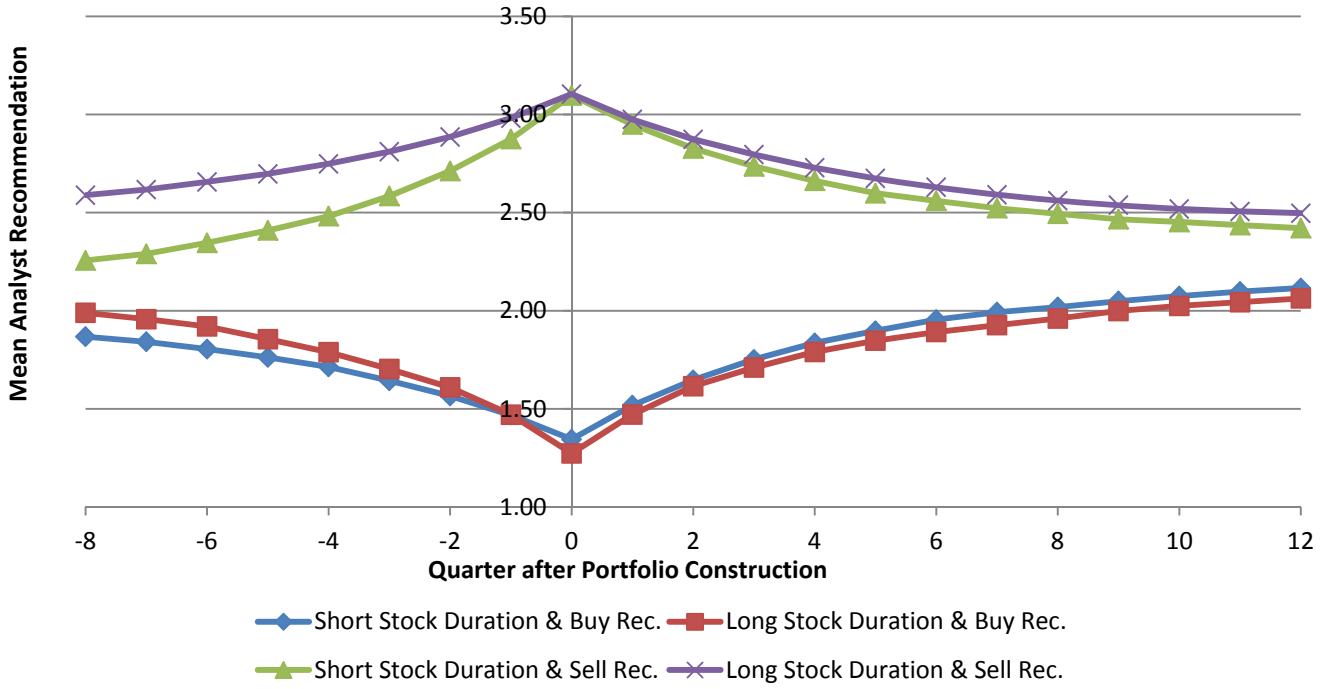


Figure 1B: Stock Duration around Portfolio Construction

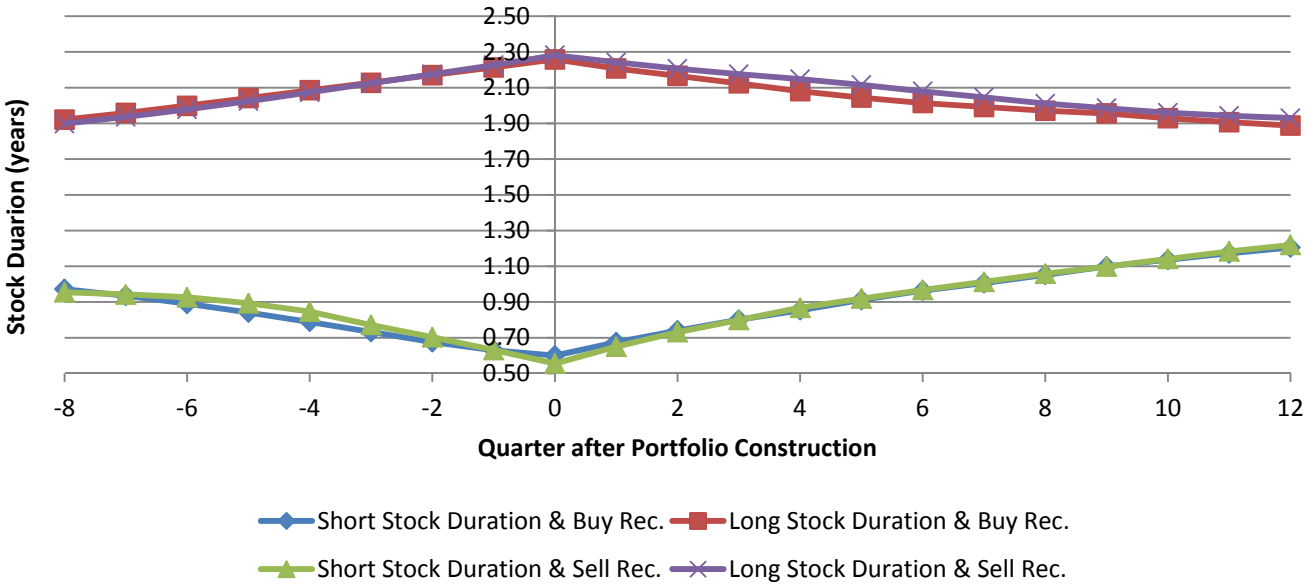


Figure 2: Abnormal Returns of Stock Duration: Mean Analyst Recommendation Quintile Portfolios

The figure shows for the full sample the cumulative abnormal returns based on the 5-factor model. Figure 2A reports these returns in event time (i.e., before and after portfolio construction) from eight quarters before to twelve quarters after portfolio construction. We report returns of stocks in four portfolios based on annual independent 5x5 sorts into Stock Duration and Mean Analyst Recommendation quintiles. The returns are shown for the four portfolios with stocks in the interaction of the first ('Short') and fifth ('Long') Stock Duration quintiles and the first ('Buy') and fifth ('Sell') Mean Analyst Recommendation quintiles. Figure 2B reports returns in calendar time for the long-short portfolio that buys (sells) stocks in the fifth or 'Sell' (first or 'Buy') Mean Analyst Recommendation quintile conditional on stocks being in the first ('Short') Stock Duration quintile. We also report returns for the long-short portfolio that buys (sells) stocks in the fifth or 'Sell' (first or 'Buy') Mean Analyst Recommendation quintile conditional on stocks being in the fifth ('Long') Stock Duration quintile.

Figure 2A: Cumulative Abnormal Returns in Event Time

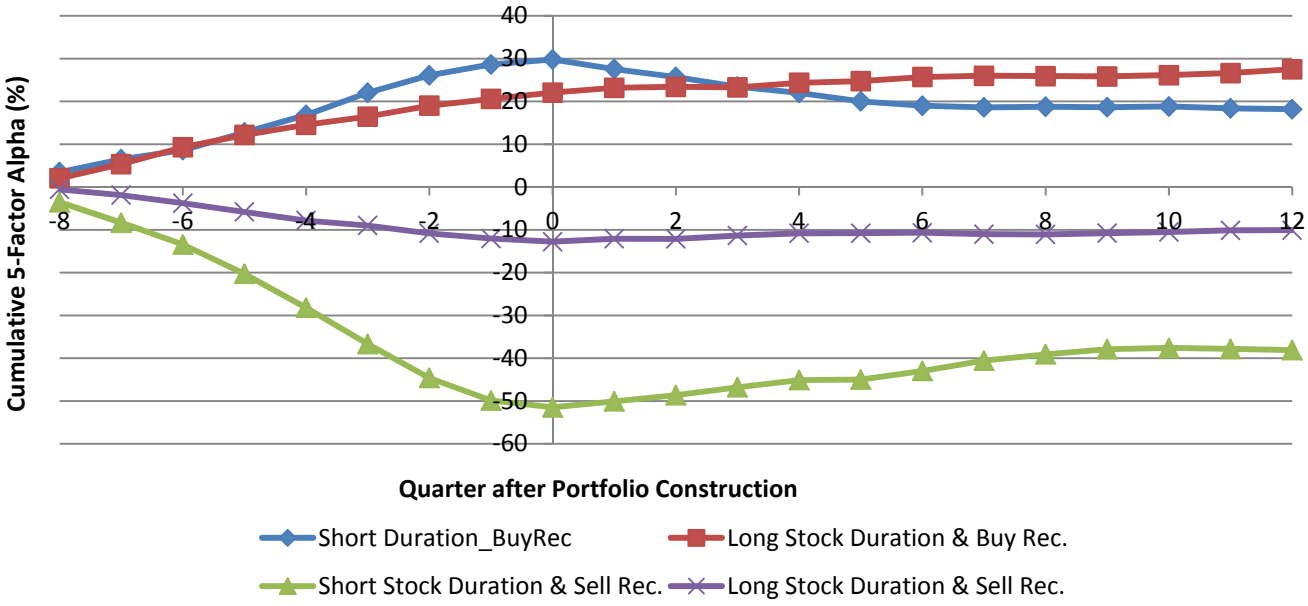


Figure 2B: Cumulative Abnormal Returns in Calendar Time

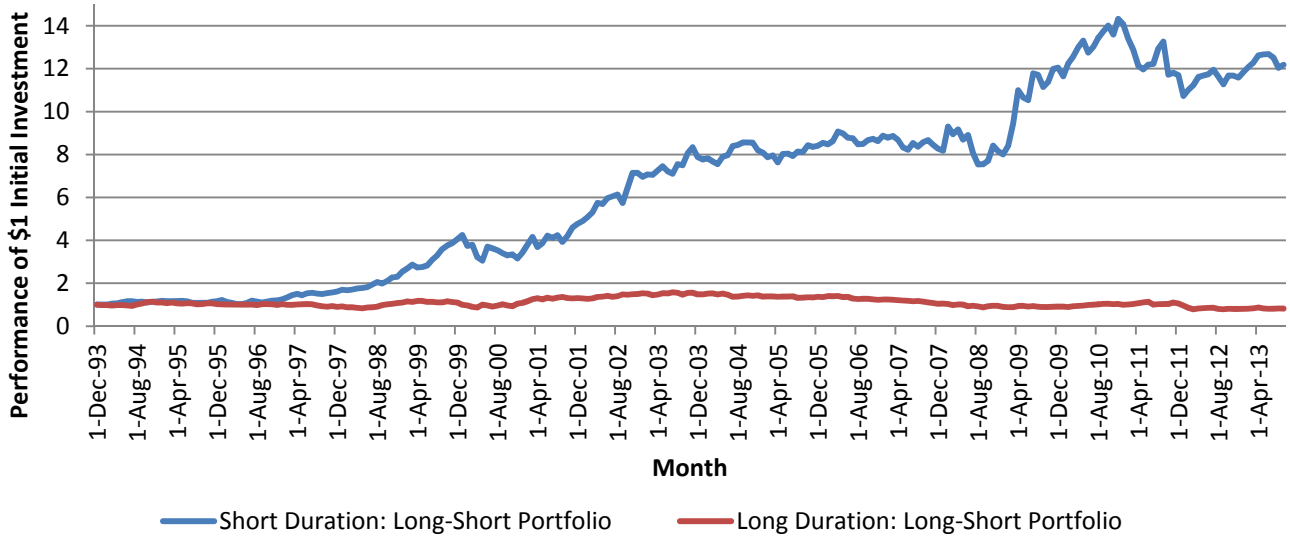


Figure 3: Changes in Analyst Recommendations and Stock Duration around Russell 2000 Inclusion

The figure shows for the sample of firms that are added to the Russell 2000 'from below' average values of Mean Analyst Recommendation (Figure 3A) and Stock Duration (Figure 3B) for stocks in four portfolios from eight quarters before to twelve quarters after portfolio construction. The portfolios are based on annual independent 3x3 sorts of all stocks in our sample into Stock Duration and Mean Analyst Recommendation quintiles. The reported four portfolios include stocks in the interaction of the first ('Short') and third ('Long') Stock Duration tercile and the first ('Buy') and third ('Sell') Mean Analyst Recommendation tercile.

Figure 3A: Mean Analyst Recommendations around Portfolio Construction

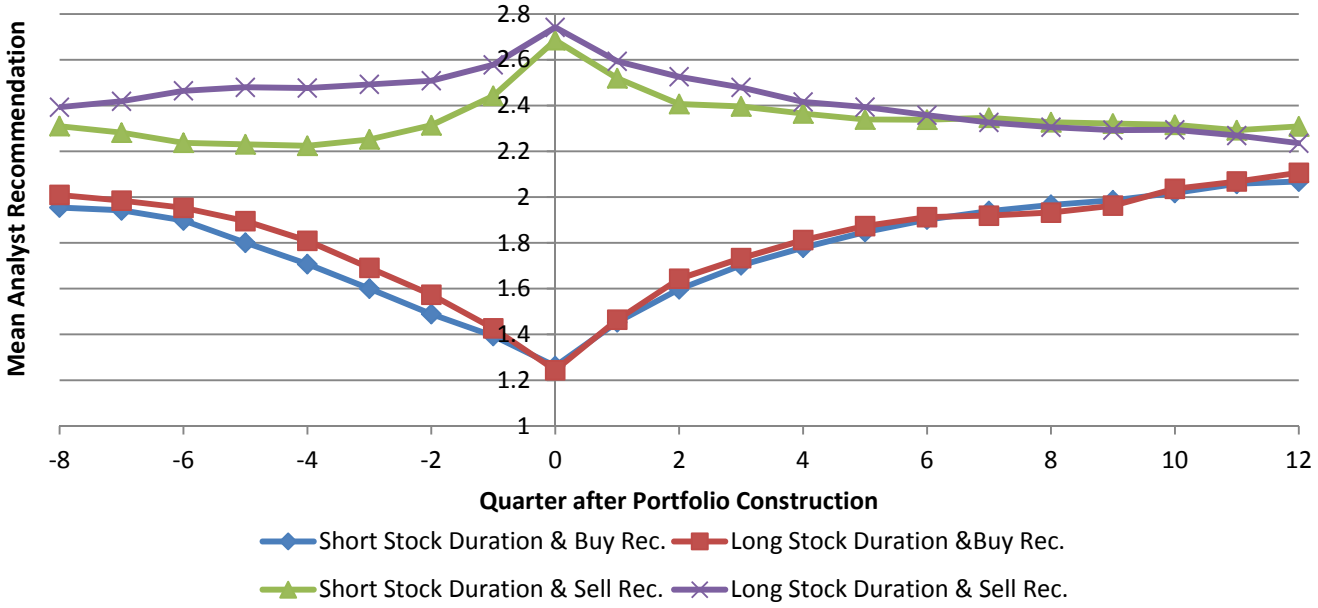


Figure 3B: Stock Duration around Portfolio Construction

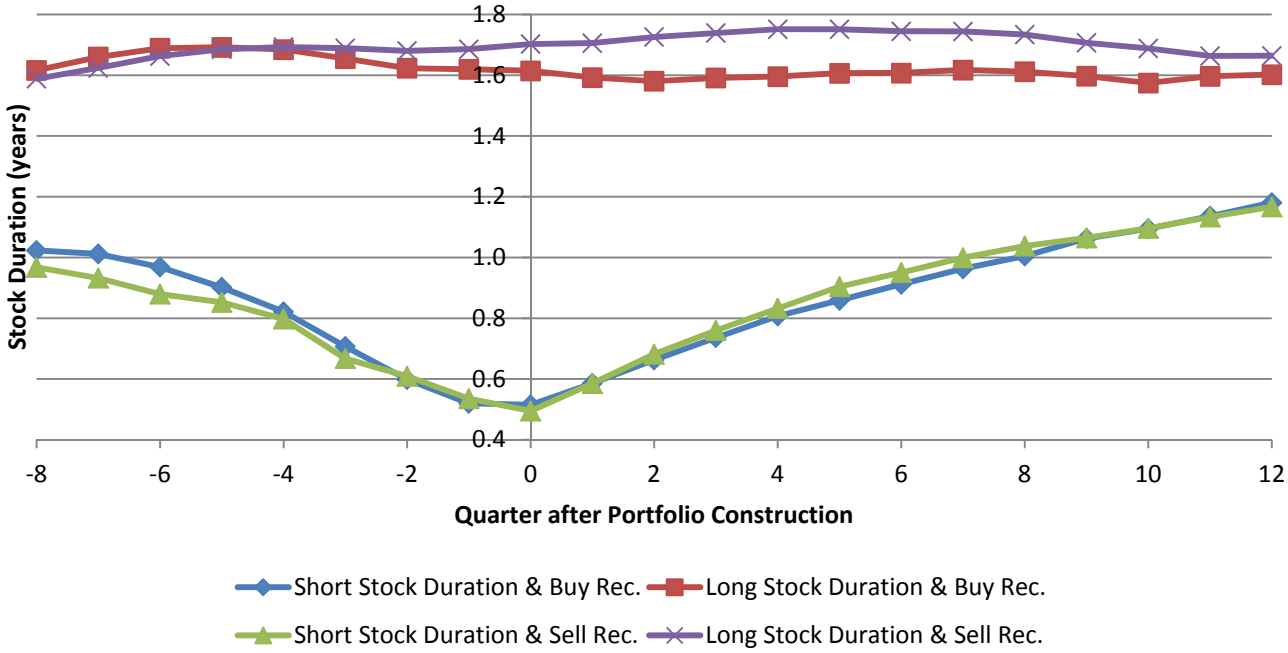


Figure 4: Changes in Analyst Coverage and Institutional Ownership around Russell 2000 Inclusion

The figure shows for the sample of firms that are added to the Russell 2000 'from below' average values of Stock Duration, Analyst Coverage, and Institutional Ownership from eight quarters before to eight quarters after stocks are added to the Russell 2000. Figure 4A only considers stocks in the first ('Short') Stock Duration tercile, while Figure 4B only considers stocks in the third ('Long') Stock Duration tercile. For each sample of stocks, we plot the average values of Stock Duration in quarters and report those on the middle axis. We also report Analyst Coverage on the middle axis. Institutional Ownership is reported on the right axis.

Figure 4A: Stocks in the First Quintile (Short) of Stock Duration

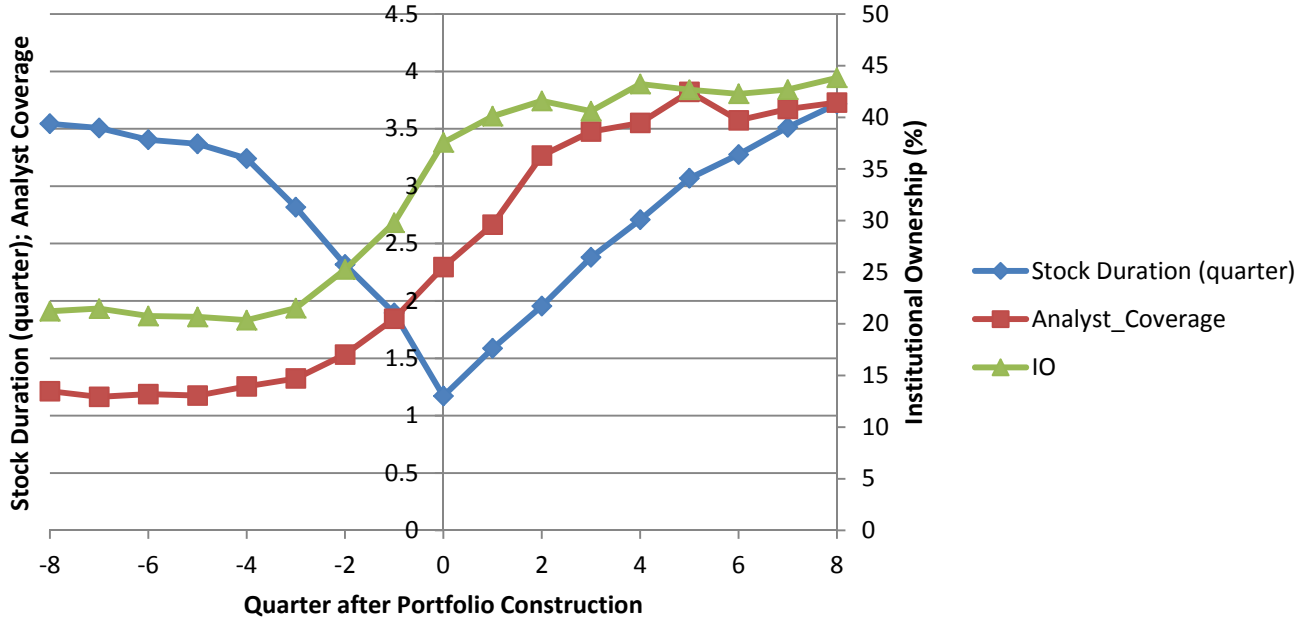


Figure 4B: Stocks in the Fifth Quintile (Long) of Stock Duration

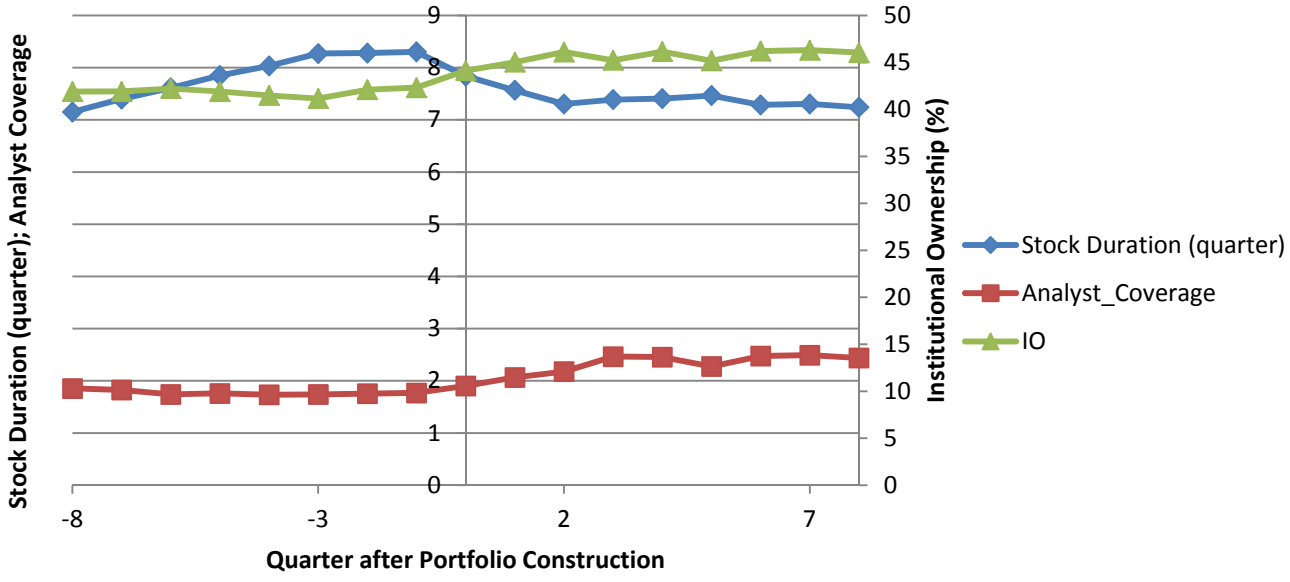


Figure 5: Abnormal Returns of Stock Duration: Recommendation Quintile Portfolios around Russell 2000 Inclusion

The figure shows for the sample of firms that are added to the Russell 2000 'from below' the cumulative abnormal returns based on the 5-factor model. Figure 5A reports these returns in event time (i.e., before and after portfolio construction) from eight quarters before to twelve quarters after portfolio construction. We report returns of stocks in four portfolios based on annual independent 3x3 sorts into Stock Duration and Mean Analyst Recommendation terciles. The returns are shown for the four portfolios with stocks in the interaction of the first ('Short') and third ('Long') Stock Duration terciles and the first ('Buy') and third ('Sell') Mean Analyst Recommendation quintiles. Figure 5B reports returns in calendar time for the long-short portfolio that buys (sells) stocks in the third or 'Sell' (first or 'Buy') Mean Analyst Recommendation quintile conditional on stocks being in the first ('Short') Stock Duration tercile. We also report returns for the long-short portfolio that buys (sells) stocks in the third or 'Sell' (first or 'Buy') Mean Analyst Recommendation tercile conditional on stocks being in the third ('Long') Stock Duration tercile.

Figure 5A: Cumulative Abnormal Returns in Event Time

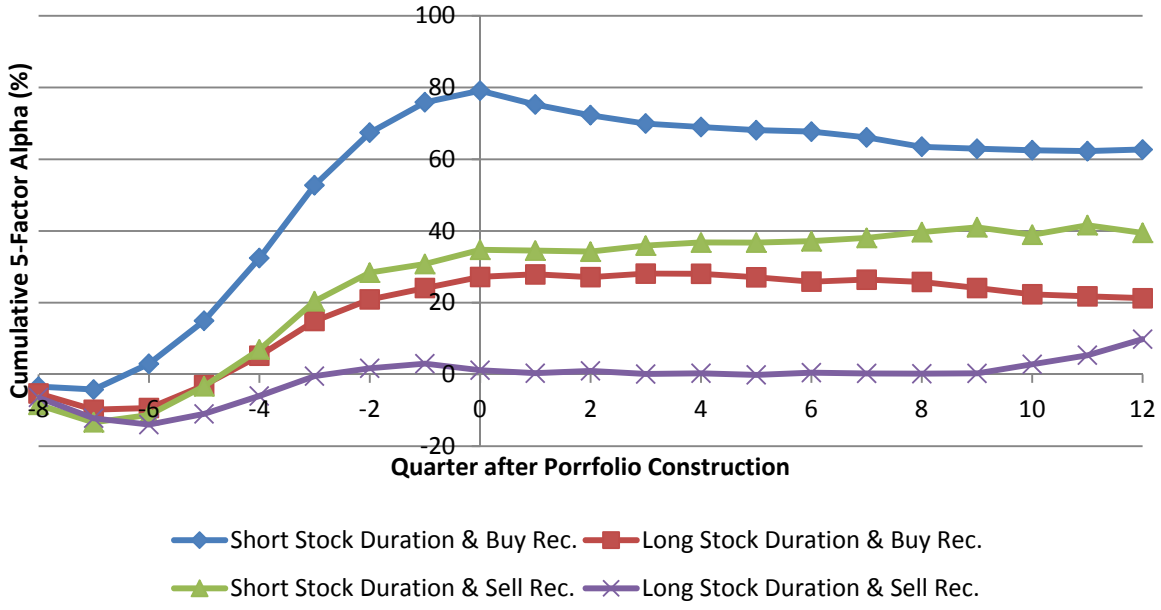
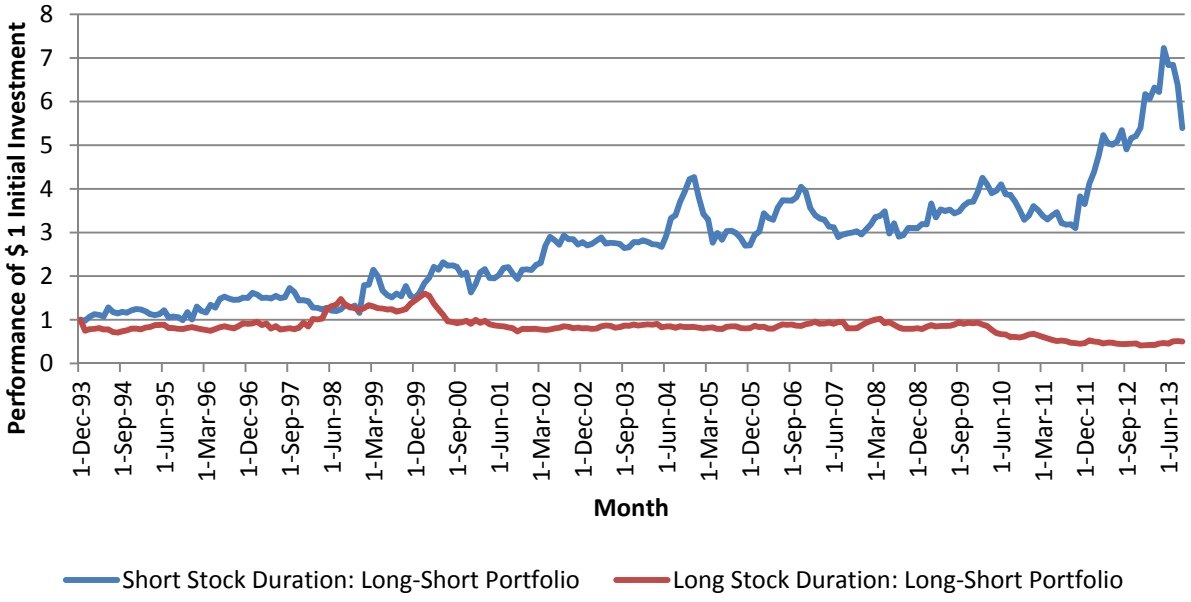


Figure 5B: Cumulative Abnormal Returns in Calendar Time



Appendix A-1: Definitions of Variables

This table provides definitions of the variables used in the empirical analysis.

Variable	Definition
Stock Duration	This variable is defined as the weighted average duration a stock has been in the portfolios of institutional investors. This variable is calculated as the holding duration of ownership of each stock for every institutional investor by calculating a weighted-measure of buys and sells by an institutional investor, weighted by the duration for which the stock was held. For each stock in a given fund manager's portfolio, the holding duration measure is thus calculated by looking back over the full the time period since that particular stock has been held continuously in that fund's portfolio. The calculation of the duration for stock i that is included in the institutional portfolio j at time T-1, for all stocks i = 1 … I and all institutional investors j = 1 … J, is given by: $$Duration_{i,j,T-1} = d_{i,j,T-1} = \sum_{t=T-W}^{T-1} \left(\frac{(T-t-1)\alpha_{i,j,t}}{H_{i,j} + B_{i,j}} \right) + \frac{(W-1)H_{i,j}}{H_{i,j} + B_{i,j}}$$ where Bi,j = total percentage of shares of stock i bought by institution j between t = T-W and t = T-1; t,T are in quarters; Hi,j = percentage of total shares outstanding of stock i held by institution j at time t = T-W; αi,j,t = percentage of total shares outstanding of stock i bought or sold by institution j between time t-1 and t, where αi,j,t > 0 for buys and <0 for sells. We choose W = 20 quarters, as very few stock positions are held continuously for longer than 5 years. If stock i is not included in institutional portfolio j at time T-1, then Durationi,j,T-1 = 0. Next, we compute at the individual stock-level our "Stock Duration" proxy by averaging the institutional-stock level Duration¬i,j,T-1 over all institutions currently holding the stock, using as weights the total current holdings in the stock of each institution.
Mean Analyst Recommendation	Mean (consensus) analyst recommendation according to the IBES database. Analyst recommendations are coded on a scale from 1 to 5. A recommendation of 1 corresponds to a 'strong buy' and a recommendation of 5 corresponds to a 'strong sell' recommendation.
Analyst Coverage	Number of analysts covering a stock according to the IBES database.
Share Turnover	Daily number of a firm's shares that are traded divided by the number of shares outstanding.
Institutional Ownership	Percentage ownership of institutional investors.
DFA Ownership	Percentage ownership by ownership Dimensional Fund Advisor (DFA), which is a major stock lender for small market capitalization stocks.
MB Ratio	Market value of equity over the book value of equity.
Market Cap	Market capitalization of the equity of a firm (in million).
Analyst Forecast Dispersion	Ratio of the standard deviation of analysts' next fiscal year earnings forecast divided by the mean forecast.
Short Ratio	Short-interest ratio of a stock.
Idiosyncratic Volatility	Residual that is obtained from a 3-factor Fama and French model of stock returns. It is estimated using daily returns over the quarter before the fiscal year end.
R2000 Inclusion	Dummy variable that takes the value 1 if a stock is included to the Russell 2000 from below. Such a stock was previously not included in the Russell 1000 but the strong recent positive abnormal performance and increase in market value lead to Russell 2000 inclusion.
Return 12 Months	Twelve-months raw stock return.
Past 12 Months Return	Past-twelve-months raw stock return.

Appendix A-2: Portfolio Sorts: Robustness Tests

Panel A reports monthly equal-weighted and value-weighted 3-factor Fama-French alphas for independent double sorts based on Stock Duration and the Mean Analyst Recommendation. At the beginning of each quarter, stocks are first divided into five groups based on Stock Duration. They are then independently divided into five groups based on a Mean Analyst Recommendation. We then report returns for these 25 portfolios which are calculated over next four quarters. Panel B reports monthly equal-weighted and value-weighted 5-factor Fama-French alphas for independent double sorts based on Share Turnover and the Mean Analyst Recommendation. At the beginning of each quarter, stocks are first divided into five groups based on Share Turnover. They are then independently divided into five groups based on a Mean Analyst Recommendation. To account for overlapping portfolios, we follow the methodology in Jegadeesh and Titman (1993) such that stocks ranked in each of the last four quarters form one-fourth of each portfolio. All the reported returns are in monthly percentages. The sample consists of US common stocks from December 1993 to December 2013. We eliminate stocks without analyst recommendations, stocks with missing market capitalization or book value of equity data, and stocks with prices below US$ 1. 5% significance levels are denoted in bold and *t*-statistics are reported in parentheses.

Panel A: Double Sorts on Stock Duration and Mean Analyst Recommendation: 3-Factor Alphas

	Equal-Weighted FF 3-Factor Alpha						Value-Weighted FF 3-Factor Alpha					
	Mean Analyst Recommendation						Mean Analyst Recommendation					
Stock Duration	1 (Buy)	2	3	4	5 (Sell)	5-1	1(Buy)	2	3	4	5 (Sell)	5-1
Uncond.	0.12	**0.20**	**0.32**	**0.32**	**0.37**	**0.25**	0.02	**0.20**	**0.21**	0.14	0.06	0.03
	(1.08)	**(1.97)**	**(3.38)**	**(3.02)**	**(2.83)**	**(2.05)**	(0.20)	**(2.95)**	**(2.90)**	(1.81)	(0.59)	(0.20)
1	-0.25	-0.13	0.25	0.35	**0.60**	**0.85**	**-0.61**	-0.18	**0.51**	0.27	0.42	**1.04**
	(-1.56)	(-0.75)	(1.59)	(1.74)	**(2.69)**	**(4.26)**	**(-2.93)**	(-0.93)	**(2.15)**	(1.35)	(1.84)	**(3.19)**
2	0.07	0.19	**0.28**	0.22	0.22	0.15	-0.18	0.00	0.13	0.13	0.14	0.31
	(0.51)	(1.55)	**(2.13)**	(1.33)	(1.08)	(0.72)	(-0.98)	(0.00)	(0.84)	(0.83)	(0.87)	(1.29)
3	0.16	**0.27**	**0.38**	**0.38**	**0.39**	0.23	0.23	**0.26**	**0.29**	**0.26**	0.23	0.01
	(1.35)	**(2.35)**	**(3.69)**	**(3.17)**	**(2.59)**	(1.43)	(1.23)	**(2.07)**	**(2.15)**	**(2.25)**	(1.63)	(0.04)
4	**0.47**	**0.33**	**0.31**	**0.31**	0.22	-0.25	0.09	**0.29**	0.15	0.18	0.13	0.04
	(4.74)	**(3.02)**	**(3.48)**	**(3.04)**	(1.80)	(-1.86)	(0.50)	**(2.28)**	(1.72)	(1.80)	(1.06)	(0.16)
5	**0.51**	**0.37**	**0.34**	**0.32**	**0.41**	-0.10	0.16	0.22	0.19	0.13	0.00	-0.16
	(4.45)	**(3.72)**	**(3.46)**	**(3.25)**	**(3.23)**	(-0.69)	(0.83)	(1.89)	(1.60)	(1.06)	(0.01)	(-0.63)
5-1	**0.76**	**0.50**	0.09	-0.03	-0.19	**-0.95**	**0.77**	0.40	-0.32	-0.14	-0.42	**-1.19**
	(5.25)	**(2.82)**	(0.56)	(-0.16)	(-0.91)	**(-4.40)**	**(2.74)**	(1.69)	(-1.22)	(-0.63)	(-1.54)	**(-3.11)**

Panel B: Double Sorts on Share Turnover and Mean Analyst Recommendation

	Value-Weighted FF 5-Factor Alpha							Value-Weighted FF 5-Factor Alpha						
		Mean Analyst Recommendation							Mean Analyst Recommendation					
Share Turnover	Uncond.	1 (Buy)	2	3	4	5 (Sell)	5-1	Uncond.	1(Buy)	2	3	4	5 (Sell)	5-1
1	**0.48**	**0.52**	**0.49**	**0.54**	**0.37**	**0.49**	**-0.03**	**0.32**	**0.48**	**0.44**	0.33	0.24	0.00	**-0.47**
	(4.42)	**(3.85)**	**(3.46)**	**(3.93)**	**(2.84)**	**(3.85)**	**(-0.20)**	**(2.11)**	**(3.09)**	**(2.21)**	(1.63)	(1.44)	(0.03)	**(-2.53)**
2	**0.39**	**0.31**	**0.35**	**0.42**	**0.38**	**0.42**	**0.11**	0.18	0.01	0.11	**0.31**	0.22	0.23	0.23
	(4.73)	**(2.55)**	**(2.83)**	**(4.67)**	**(3.74)**	**(3.44)**	**(0.71)**	(1.85)	(0.03)	(0.95)	**(2.55)**	(1.78)	(1.71)	(1.10)
3	**0.39**	**0.27**	**0.30**	**0.40**	**0.43**	**0.55**	**0.28**	0.13	0.14	0.12	0.15	0.19	0.14	0.00
	(5.34)	**(2.33)**	**(2.75)**	**(4.56)**	**(4.86)**	**(3.93)**	**(1.65)**	(1.90)	(0.83)	(1.16)	(1.55)	(1.73)	(1.09)	(0.01)
4	**0.32**	0.09	0.18	**0.40**	**0.42**	**0.54**	**0.45**	0.07	-0.38	0.14	0.14	0.16	0.04	0.42
	(3.66)	(0.71)	(1.63)	**(3.98)**	**(3.84)**	**(2.98)**	**(2.24)**	(0.63)	(-1.92)	(0.81)	(0.98)	(1.21)	(0.20)	(1.48)
5	**0.29**	-0.16	0.09	**0.37**	**0.73**	**0.79**	**0.95**	0.32	0.06	0.24	0.37	**0.50**	**0.89**	**0.83**
	(2.02)	(-0.88)	(0.58)	**(2.08)**	**(3.97)**	**(2.79)**	**(3.37)**	(1.61)	(0.23)	(1.00)	(1.61)	**(2.27)**	**(3.17)**	**(2.45)**
5-1	-0.19	**-0.68**	-0.40	-0.17	0.36	0.30	**0.97**	0.00	-0.42	-0.20	0.05	0.26	**0.88**	**1.30**
	(-1.64)	**(-3.68)**	(-1.86)	(-0.70)	(1.40)	(0.99)	**(3.23)**	(0.00)	(-1.35)	(-0.61)	(0.13)	(0.86)	**(2.58)**	**(3.53)**

Appendix A-3: Portfolio Sorts: Robustness Tests for Russell 2000 Inclusion Stocks

Panel A reports for Russell 2000 inclusion stocks monthly equal-weighted and value-weighted 3-factor Fama-French alphas for independent double sorts based on Stock Duration and the Mean Analyst Recommendation. At the beginning of each quarter, stocks are first divided into three groups based on Stock Duration. They are then independently divided into three groups based on a Mean Analyst Recommendation. We then report returns for these 9 portfolios which are calculated over next four quarters. Panel B reports monthly equal-weighted and value-weighted 5-factor Fama-French alphas for independent double sorts based on Share Turnover and the Mean Analyst Recommendation. At the beginning of each quarter, stocks are first divided into three groups based on Share Turnover. They are then independently divided into three groups based on a Mean Analyst Recommendation. To account for overlapping portfolios, we follow the methodology in Jegadeesh and Titman (1993) such that stocks ranked in each of the last four quarters form one-fourth of each portfolio. All the reported returns are in monthly percentages. The sample consists of US common stocks included to the Russell 2000 from below from December 1993 to December 2013. We eliminate stocks without analyst recommendations, stocks with missing market capitalization or book value of equity data, and stocks with prices below US$ 1. 5% significance levels are denoted in bold and *t*-statistics are reported in parentheses.

Panel A: Double Sorts on Stock Duration and Mean Analyst Recommendation: 3-Factor Alphas for Russell 2000 Inclusion Stocks

	Equal-Weighted FF 3-Factor Alpha					Value-Weighted FF 3-Factor Alpha				
		Mean Analyst Recommendation					Mean Analyst Recommendation			
Stock Duration	Uncond.	1 (Buy)	2	3 (Sell)	3-1	Uncond.	1(Buy)	2	3(Sell)	3-1
Uncond.		**-0.42**	-0.12	-0.15	0.27		**-0.48**	-0.36	-0.14	0.34
		(-2.19)	(-0.70)	(-0.78)	(1.27)		**(-2.30)**	(-1.76)	(-0.64)	(1.21)
1	**-0.68**	**-0.96**	**-0.60**	-0.06	**0.90**	**-0.69**	**-0.89**	**-0.64**	0.05	0.95
	(-3.36)	**(-3.34)**	**(-2.32)**	(-0.18)	**(2.25)**	**(-3.17)**	**(-2.95)**	**(-2.09)**	(0.11)	(1.77)
2	-0.07	-0.30	0.30	-0.15	0.15	-0.24	-0.38	0.07	-0.33	0.05
	(-0.36)	(-1.04)	(1.22)	(-0.56)	(0.39)	(-1.14)	(-1.25)	(0.26)	(-1.20)	(0.12)
3	0.02	0.06	-0.01	0.00	-0.06	0.00	0.08	-0.16	-0.07	-0.15
	(0.13)	(0.23)	(-0.02)	(0.02)	(-0.18)	(-0.03)	(0.33)	(-0.61)	(-0.26)	(-0.43)
3-1	**0.70**	**1.02**	0.60	0.07	**-0.95**	**0.68**	**0.98**	0.48	-0.12	-1.10
	(3.20)	**(3.07)**	(1.79)	(0.19)	**(-2.03)**	**(2.63)**	**(2.76)**	(1.25)	(-0.23)	(-1.79)

Panel B: Double Sorts on Share Turnover and Mean Analyst Recommendation for Russell 2000 Inclusion Stocks

	Equal Weighted FF 5-Factor Alpha				Value Weighted FF 5-Factor Alpha			
	Mean Analyst Recommendation				Mean Analyst Recommendation			
Share Turnover	1 (Buy)	2	3 (Sell)	3-1	1(Buy)	2	3(Sell)	3-1
1	-0.12	-0.03	0.03	0.14	-0.09	-0.23	-0.25	-0.16
	(-0.43)	(-0.11)	(0.12)	(0.52)	(-0.38)	(-0.96)	(-1.09)	(-0.63)
2	-0.09	0.02	0.01	0.09	-0.24	-0.09	-0.03	0.21
	(-0.32)	(0.07)	(0.03)	(0.27)	(-0.84)	(-0.32)	(-0.08)	(0.52)
3	**-0.69**	-0.35	-0.15	0.54	**-0.77**	**-0.70**	-0.13	0.64
	(-2.22)	(-1.23)	(-0.41)	(1.18)	**(-2.23)**	**(-2.14)**	(-0.26)	(1.00)
3-1	-0.58	-0.32	-0.18	0.40	-0.68	-0.47	0.12	0.80
	(-1.40)	(-0.79)	(-0.43)	(0.77)	(-1.63)	(-1.13)	(0.22)	(1.18)