Institutional Investors and Short-Term Return Reversals

Qianqiu Liu, Ghon Rhee, and Hong Vo*

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* All authors are at Department of Financial Economics and Institutions, Shidler College of Business, University of Hawaii at Manoa, 2404 Maile Way, Honolulu, Hawaii, 96822. Email: qianqiu@hawaii.edu (Liu); rheesg@hawaii.edu (Rhee); hongxv@hawaii.edu (Vo).

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Abstract

We examine the impact of firm size on return reversals using weekly returns from January 1980 to December 2013. We find that return reversals are greater for the largest size quintile than for the smallest size quintile in the first half of the sample period. However, the firm size effect on return reversals disappears in the second half sample. Return reversals are significantly stronger during the up market period than down market period for all stocks and the reversal difference between the largest and smallest size quintiles is also highly significant in the up market. We demonstrate that a high institutional demand, mainly from the small stakeholders, for large-firm stocks results in high demand for immediacy as well as strong return reversals for these stocks in the first half sample. After institutions shifted their preferences to stocks of smaller firms since the mid-1990s, return reversals for large-firm stocks became insignificantly different from small-size firms in the second half of the sample period.

I. Introduction

The short-term return reversal in the stock market has been a well established phenomena for more than 40 years and proven to be robust and of economic significance. Jegadeesh (1990), for example, documents profits of 2.49% per month over the period 1934-1987 from a reversal strategy that buys loser and sells winner decile portfolios based on stock returns in the prior month and holds them for the next month. Similarly, Lehmann (1990) finds that the short-term contrarian strategy based on weekly stock returns generates 1.79% per week and positive profits in around 90% of the holding weeks from 1962 to 1986.

Jegadeesh (1990) shows stronger return reversals for small-firm stocks with monthly returns. This finding has been confirmed with the most recent data in the literature, such as Huang, Liu, Rhee, and Zhang (2010), Da, Liu, and Schaumburg (2014), and Cheng, Hameed, Subrahmanyam, and Titman (2015). Contrary to the evidence from monthly returns, Lehmann (1990) reports larger weekly return reversals for large size stocks. This finding seems "counterintuitive" because large-firm stocks are very liquid, with low trading costs, and widely traded by institutions. However, it is consistent with the evidence recently documented in Gutierrez and Kelley (2008), where they find larger weekly return reversals for large stocks and stocks with high institutional ownership, high volatility, and high analyst coverage for the period from 1983 through 2003. The weekly returns of these stocks also have less momentum in the remaining of the year.

In this paper we extend the sample period from January 1980 to December 2013 and investigate the return reversal within different size groups using weekly returns. For comparison, we divide our sample into two equal-length subperiods. We find that return reversals are greater for large-firm stocks than for small-firm stocks in the first half of the sample, i.e., from January

1980 to December 1996. However, this difference disappears in the second half of the sample between January 1997 and December 2013. The difference in the intensity of return reversals is related to the market condition. We classify the markets as up and down markets depending on the market performance. When the market is up, we find that return reversals for large-firm stocks are much stronger than in down markets. The magnitude is also significantly greater than that of small-firm stocks in up markets. In contrast, the reversal difference is insignificant between the large and small size quintiles during the down period.

Our findings are robust when we exclude January and S&P 500 stocks from our sample. Although return reversals for large-firm stocks are greater than for small-firm stocks in the first half of the sample, they are short-lived. The reversal for large firms does not last for more than two weeks on average. On the contrary, the duration of reversal for small size stocks is much longer – it could persist for three weeks. This also explains why the return reversal is much weaker on the large-firm stocks at the monthly frequency since 1980s.

We demonstrate that the stock return patterns documented above is closely related with the changes in institutional ownership. Gompers and Metrick (2001) find that institutional investors nearly doubled their shares of the stock market from 1980 to 1996. This compositional shift increases the demand for the stocks of large firms and decreases demand for the stocks of small firms, which explains the disappearance of the small-company stock premium partially. Further analysis by Yan and Zhang (2009) indicates that the positive relation between institutional ownership and future stock returns is driven by short-term institutions, defined based on the portfolio turnover in the previous year. These short-term institutions are better informed and they trade actively to exploit their informational advantage.

Institutions have shifted their preferences toward smaller, riskier securities since 1990s (Bennett, Sias, and Starks, 2003). This is also confirmed in Blume and Keim (2011), where they find that institutions, especially hedge funds, have increased their holdings of small stocks and decreased their holdings of large stocks over the period of 1980 through 2008. Their evidence indicates that although institutional investors have rapidly increased their percentage holdings of stocks over time, they now underweight the largest stocks and overweight the smallest stocks relative to their market weights.

Using the relative weight of institutional holdings as the explanatory variable, we show that this difference in institutional holdings can explain the significant reversal difference between the large and small-size stocks in the first half of the sample period and the insignificance in the second half. We find that the high institutional demand of large-firm stocks is mainly from their small stakeholders, which own less than 1% of a firm's shares. According to Ali, Klasa, and Li (2008), these small stakeholders are less informed about the firm. Therefore, these high non-informational demands for immediacy may push the stock prices to depart from fundamentals, which will be followed by price reversals (Avramov, Chordia, and Goyal, 2006; Vayanos and Wang, 2012). Institutions shift their preferences to stocks of smaller firms since the mid-1990s. As the difference of the relative weight of institution holdings between the large and small size portfolios gets much smaller in the second subperiod, there is no significant difference of return reversals between them in the second half of the sample period.

The remainder of this study is organized as follows. In Section II we provide the details of the data sets used in our empirical analysis. Section III compares the return reversals between large-size stocks and small-size stocks from 1980 to 2013, and the two subperiods. We link these empirical findings to the institutional demand for large and small firm stocks in section IV. Section V presents our conclusions.

II. Data

Our data include NYSE, AMEX, and NASDAQ common stock daily returns from January 1980 to December 2013. We obtain daily returns data from the Center for Research in Security Prices (CRSP) and use the daily value-weighted index return from CRSP as the market return. Weekly returns are calculated by compounding the daily returns from Thursday this week to Wednesday next week. To mitigate the bias from the bid-ask spread, our portfolio formation period is based on the four-day returns between the previous Thursday to this Tuesday, as in Lehman (1990) and Avramov, Chordia, and Goyal (2006). We also exclude stocks with closing prices less than $5 at the end of the formation week. To avoid the extreme daily returns, we winsorize the bottom and top 1% of the daily returns for all CRSP stocks each trading day.

Our institutional holding data are from the Thomson Financial Institutional 13F Ownership database. According to a 1978 amendment to the Securities and Exchange Act of 1934, all institutions are required to report their holdings to the Securities and Exchange Commission (SEC) if they have greater than $100 million of securities under discretionary management. Holdings are reported quarterly on the SEC's form 13-F at the end of each March, June, September, and December back to 1980, where all common-stock positions greater than 10,000 shares or $200,000 must be disclosed. We use the quarterly reports of institutional holding data from the first quarter of 1980 to the final quarter of 2013.

Table I provides the summary statistics of institutional holdings over the sample period from 1980 to 2013, and the two half subsample periods, 1980 to 1996, and 1997 to 2013. Over the sample period from 1980 to 2013, institutions, which include banks, insurance companies, investment companies, independent investment advisors, and others, hold 37.87% of the outstanding shares of common stocks. On average, a stock is held by 81 institutions and the market share per institution owns is 1.16%. The institutional concentration, computed as the sum of squared market shares, is 22.83%.

The stock market has a rapid growth during these 34 years, with the average market capitalization of all stocks 5.1 times in the second half ($3,414 million) compared to the first half ($669 million). Consistent with the trend in Gompers and Metrick (2001) that essentially overlaps our first half of the sample period, both the number of institutions with equity holdings and the percent of market owned by all institutions continue to grow in the second half of the sample period. The average number of institutions holding a stock increases from 44 to 120; the percent of market owned by these institutions increases substantially from less than 26.40% to 50.20%. With these increases, the market share per institution owns drops from 1.44% to 0.89%, and the institutional concentration also drops from 29.54% to 15.62%.

Table I also shows the institution holdings for the size quintiles during the full sample period and two subsample periods. As in Gompers and Metrick (2001), institutions have the highest demand for the stocks of the largest companies and lowest demand for the stocks of the smallest companies, and the percentage holdings increase monotonically with the firm size within the full sample period and the first half from 1980 to 1996. At the same time, the ownership per institution and institutional concentration decreases monotonically as the firm size increases. Institutions continue to increase their percentage holdings of stocks since 1990s. In the first sample period, 48.98% of large stocks are owned by institutional investors, and the percentage of institutional holdings for large stocks increases to 66.94% in the second period. This represents a

17.96% increase. The change of the percentage holdings of small stocks is more remarkable: institutions own 16.98% of the small stocks from 1980 to 1996, and this percentage increases to 35.78% from 1997 to 2013. Compared with the first period, the percentage holdings more than doubled in the second half of the sample period. Although the average percentage of institution holdings of the largest firms is still higher than the smallest firms from 1997 to 2013, the middle three size quintiles of stocks have caught up with the largest stocks in terms of institution holdings. These findings are consistent with Bennett, Sias, and Starks (2003) and Blume and Keim (2011), which report that institutions have shifted their preferences toward smaller, riskier securities since 1990s.

III. Short-Term Return Reversals

The empirical regularity that individual stock returns exhibit negative serial correlation over a short horizon has been well known for a long time. Jegadeesh (1990) finds that the negative first-order correlation in monthly stock returns is highly significant, and he reports profits of about 2.49% per month from a contrarian strategy that buys loser stocks and sells winner stocks based on their formation month returns and holds them one month. Similarly, Lehmann (1990) finds that the short-term contrarian strategy based on a stock's one-week return generates 1.79% per week, and positive profits in 90% of the holding weeks. These findings are generally regarded as evidence of short-term return reversals of individual stocks.[2]

[2] In existing literature, there are different explanations for the source of short-term return reversals. Grossman and Miller (1988), Kaul and Nimalendran (1990), Conrad, Kaul and Nimalendran (1991) and Jegadeesh and Titman (1995a) argue that the return reversals are caused by market microstructure phenomena such as bid-ask spread or inventory effect. Lo and MacKinlay (1990) suggests that a size-dependent lead-lag market microstructure is an important source of contrarian profits. Jegadeesh and Titman (1995b) show that most of contrarian profits are due to stock price overreaction to firm-specific information instead of the lead-lag effect. Da, Liu, and Schaumburg (2014) find that the reversal profits from buying losers are attributable to liquidity shocks, while the profits from selling

However, there is some difference in the pattern of return reversals with these two data frequencies. Jegadeesh (1990) shows stronger return reversals for small-firm stocks with monthly returns, which are also confirmed in the more recent studies, such as Huang, Liu, Rhee, and Zhang (2010) and Da, Liu, and Schaumburg (2014). In contrast, Lehmann (1990) documents that the largest winners and losers experienced the largest subsequent reversals with the weekly returns from 1962 to 1986. This finding is consistent with the evidence in Gutierrez and Kelley (2008), where they find larger return reversals in the first holding week and less momentum in the remaining of the year for large stocks. The difference seems puzzling, but has not received enough attention in the literature. We now focus on this issue in our empirical analysis.

3.1. Return reversals within size quintiles

We examine the intensity of return reversals of weekly returns within different size portfolios from January 1980 to December 2013. Individual stocks are sorted into quintiles based on their market capitalizations at the end of the previous June, where NYSE breakpoints are adopted.

Following the methodology of Bennett, Sias, and Starks (2003) and Sias (2004), we standardize both the independent and dependent variables, and compute the average β from the weekly cross-sectional Fama and Macbeth (1973) regressions within each size-based quintile:[3]

winners are attributable to investor sentiment. Cheng, Hameed, Subrahmanyam, and Titman (2015) document that the withdrawal of liquidity by institutions leads to stronger reversals.

[3] We standardize all variables such that they have the mean value of zero and standard deviation of one within each size quintile per week. Therefore the intercept in Equation (1) is zero. The standardized regression coefficients are scale-free so that we can directly compare them across time. Our empirical results based on raw data are qualitatively similar.

$$r_{i.t} = \alpha_i + \beta_1 r_{i.t-1} + \beta_2 r_{i.t-2} + \beta_3 r_{i.t-3} + \beta_4 r_{i.t-4} + \varepsilon_{i.t} \quad (1)$$

As in Jegadeesh (1990) and Avramov, Chordia, and Goyal (2006), we measure the intensity of return reversal by the regression coefficients, β's. To avoid the bid-ask bias, we exclude Wednesday return in the previous week for β_1. Similar to Sias, Starks, and Titman (2006), we include four lags of returns (approximately one month) in the regression. We also report the average of the difference between the β's of stocks in the largest size quintile and that of smallest size quintile. The *t*-statistics are computed using Newey-West (1987) correction method.

Table II shows strong evidence of short-term return reversals from the previous week as β_1 is significant at the 1% level among all quintiles for the whole period between 1980 and 2013. The return reversal for large-firm stocks is -0.0432. It is the strongest as the magnitude is the largest among the size quintiles. The return reversal for small-firm stocks is -0.0252, which is much smaller in the magnitude: the difference in the return reversals between these two portfolios is -0.0181 and it is significant at the 1% level.

We divide the whole sample period into two equal-length subperiods: 1980-1996 and 1997-2013. In the first subperiod, the return reversals for small-firm and large-firm stocks from the previous week are -0.0240 and -0.0609, respectively. The difference in return reversals between the two groups is -0.0369 and the return reversal of the large-firm stocks is significantly stronger than that of the small stocks at the 1% level. The return reversal declines in the second period for all the size groups, except for the smallest size quintile. This indicates a more efficient stock market and is consistent with the current literature. The return reversal for small-firm stocks increases to -0.0263, while the return reversal for large-firm stocks declines to -0.0257. The return reversal for small-firm stocks is stronger than that of large-firm stocks in the second period from 1997 to 2013, although the difference does not show statistical significance. Therefore, larger return reversals for large-firm stocks in the whole period are mostly driven by the first period from 1980 to 1996. Figure 1 provides a time-series trend of the reversal difference between large and small stocks.

The rest of regression coefficients examine the impact of weekly returns in the previous 2-4 weeks to the holding week return within the size quintiles. The evidence indicates that return reversals are very short-lived, especially for the stocks of large firms. Although the coefficient is still negative in the second and third weeks for large stocks in the full sample and two subperiods, the intensity is much weaker compared to that in the first week, and none of them is statistically significant from zero after two weeks. We observe similar patterns in the other size quintiles: the return reversal disappears within the three middle size quintiles after three weeks in the first half sample period, and it is no longer significant just after one week in the second half of the sample. In contrast, return reversals for the small-firm stocks last longer. They are still significant at the 5% level in the third week after the portfolio formation in the first subperiod and in the second week in the second subperiod from 1997 to 2013.[4]

3.2. Robustness of weekly return reversals

Jegadeesh (1990) finds that the monthly return reversal is stronger in the month of January, especially for small-size stocks. As a robustness check, we examine the weekly return reversals after removing January from the sample in Table III. The results are quite close to those in Table

[4] The evidence in this table also explains why returns reversals of large-firm stocks are weaker than those of the small-firm stocks at the monthly level. Although return reversals for large-firm stocks are stronger than those of the small-firm stocks based on weekly returns, they are short-lived and mainly exist in the first two weeks after portfolio formation in the first half of the sample period. As the weekly return reversals for small-firm stocks last longer, monthly return reversals are larger for small-firm stocks.

II. In general, we find that the return reversal of the large stocks in the first week is significantly stronger than that of the small stocks at the 1% level in the first half of the sample; the return reversal for large stocks is still significant in the first week in the second period from 1997 to 2013, but the difference is no longer significant from the small stocks. As in Table II, larger return reversals for large stocks from the previous week in the full sample period are driven by the first half period from 1980 to 1996, even after January is excluded.

The evidence in Table III also shows that return reversals are very short-term. Jegadeesh (1990) shows that the monthly return reversal is especially strong for small sized firms in the month of January. After January is removed from the sample, the return reversals for small stocks disappear more quickly. They disappear after two weeks in the first half and only one week in the second period as the coefficients are no longer significant. Nonetheless, the results show that the differences in return reversals from weeks 2 to 4 are insignificant between the two size-sorted portfolios, same as in Table II.

Da and Schaumburg (2011) construct a contrarian strategy on S&P 500 stocks and show that the resulting profits are economically and statistically significant. As institutions, especially index funds, hold very large ratios of S&P 500 stocks, we examine the return reversal difference between large and small size quintiles when these stocks excluded from the sample. The results reported in Table IV are consistent with our earlier findings. In general, we document stronger return reversal of large stocks than that of small stocks in the first week. The difference is extremely significant in the first half of the sample, but weakens and becomes insignificant in the second period from 1997 to 2013. There is one different pattern though when S&P 500 stocks are removed from the sample. Unlike Table II, the return reversal of large stocks is stronger than that of small stocks in the second week after the portfolio formation and the difference is significant at the 1% level in the first half of the sample period from 1980 to 1996. For example, the coefficients of the second week return reversals for large-firm stocks are -0.0163, -0.0287, and -0.0040 in the full sample, and the two subperiods, respectively, while the corresponding numbers for small sized stocks are -0.0098, -0.0136, and -0.0060. However, return reversals are significant for small stocks in the third week in the full sample and first half of the sample period, but they disappear for large stocks in the third and fourth weeks in all the sample periods. This finding is again consistent with what we observe from Table II.

In sum, these robustness tests demonstrate that return reversals are very short-term, especially for large stocks. They are strongly significant in the first week, but disappear in about three weeks. The large stocks have stronger reversal than that of small stocks in the first week in the first half sample period, but the difference is insignificant in the more recent half of the sample period.

3.3. Return reversals in different market states

Cooper, Gutierrez, and Hameed (2004) examine momentum in different market states. They find that momentum profits are asymmetric in different market states. In this study, we also examine whether return reversals are asymmetric for small- and large-firm stocks in different market states.

In Table V, we compare return reversals of large- and small-firm stocks in up and down market states in the full sample and the two subperiods, 1980-1996 and 1997-2013. Similar as Cooper, Gutierrez, and Hameed (2004), we define market states according to the sign of the return on the value-weighted market return at the portfolio formation week: UP means that market return is nonnegative; DOWN means that market return is negative. We examine return reversals in the UP and DOWN markets for both large and small-firm stocks to see where return reversals come from and whether there are any differences in different states.

We run Fama-MacBeth (1973) cross-sectional regressions as in Equation (1) for the size quintiles in the UP and DOWN states. Panel A of Table V shows that in the first holding week return reversals for large-firm stocks in up markets are much stronger than those in down markets, while the reversals are similar for small stocks in both up and down markets. For example, during the sample period from 1980 to 2013, return reversals for large-firm stocks in the up markets are -0.0566, while in the down markets they are only -0.0247. This difference is highly significant at the 1% level. In fact, we find stronger reversals in up markets than in the down markets for all size quintile portfolios. The reversal difference between the up and down markets is the smallest for the smallest size quintile, and is still significant at the 5% level. We also note that the reversal difference between large and small firms only happens in the up markets since the difference is insignificant in the down markets. Similar patterns also exist in the two half sample periods; return reversals in the up markets are much stronger than in down markets, especially for large stocks. However, in the first sample period from 1980 to 1996, return reversals of large stocks are also significant higher than those of small stocks in the down markets, although the difference (-0.0210) is still much smaller when compared with the up market (-0.0476). Instead, the reversal intensity for small stocks is significantly stronger than for large stocks in the down markets in the second half of the sample period. The last two columns in Panel A compare the reversal difference in the up and down markets between these two half sample periods. They indicate that with the time the reversal is weaker for all size quintiles except for the smallest quintile, as the magnitudes of reversals in the four larger size quintiles are much smaller in the second half of the sample period between 1997 and 2013. Only the reversals for small stocks are similar in the two subperiods; their difference is insignificant in both up and down markets.

Following Cooper, Gutierrez, and Hameed (2004), we use the market return in the formation week as a continuous measure of market state to further examine the impact of market state on the first-week return reversal difference between large and small stocks. The regression results are shown in Panel B of Table V. The intercept is significantly negative in the full sample and the first half subperiod, and is insignificant in the second half subperiod. This is what we have observed in Table II. More interestingly, the coefficient on the lagged market return is significantly negative in all three sample periods. The negative loading increases the reversal difference if there is a bull market in the previous week, and decreases the difference in a bear market. Therefore we have found a much larger reversal difference in the up market in Panel A.

In sum, our results show stronger return reversals for large-firm stocks in the up markets than for small-firm stocks, especially in the first period. The difference in down markets is much smaller. The reversal in the second period is much weaker for all stock portfolios, except for the smallest size quintile, which reduces the reversal difference between the large and small stocks. These findings combined together indicate that the extremely strong reversal for large stocks in the up markets of the first period is a main root of the findings documented in the previous subsection, i.e., return reversals are larger for large-firm stocks than for small-firm stocks in the first subperiod, as well as in the whole period.

IV. Return Reversals and Institutional Investors

We have documented that return reversals are stronger for large-firm stocks than for small-firm stocks from 1980 to 1996. The difference is no longer significant from 1997 to 2013. In the meantime, we have also shown some changing institutional preferences for stocks over the time. Is there any relation between the institutional holdings and weekly return reversals? We investigate the issue in this section.

4.1 Correlation between changes in institutional ownership and stock returns

Gompers and Metrick (2001) show that there is strong evidence of a positive contemporaneous relation between quarterly changes in institutional ownership and returns in the same quarter. However, the relation between institutional holdings and the weekly returns is still unclear because institutional ownership data are unavailable at the weekly frequency. Following the methodology in Sias, Starks, and Titman (2006), we estimate the correlations between unobservable weekly changes in institutional ownership and observable lag, contemporaneous, and lead weekly returns in Table VI. The top row in Panel A shows that there is a significantly positive correlation between quarterly changes in institutional ownership and returns in the same quarter. This relation is primarily driven by the relation between weekly changes in institutional ownership and returns in the same week. In particular, the estimated weekly contemporaneous comovement accounts for 104% (131%) of the correlation between the change of the number of institutional investors (the percentage of institutional holdings) and stock returns in the same quarter. The results in Table VI also suggest that weekly changes in institutional ownership are inversely related to returns in the following week.[5] This correlation accounts for -33% or -43% of

[5] Our results are different from Griffin, Harris, and Topaloglu (2003), who study the daily and intradaily relation between stock returns and the trading of institutional and individual investors in NASDAQ 100 securities from May 2000 to February 2001. They find that institutions follow short-term past returns. However, the return difference between the high and low deciles of institutional imbalance is of the correct sign for a reversal, but it is insignificant.

the comovement between the quarterly changes of institutional ownership and stock returns, depending on the measure of the institutional ownership. All these numbers are statistically significant at the 5% level. We conduct the same analyses in the two subsample periods. We find the strong positive relation between the change of institutional ownership and stock return in the same week, and the negative relation between the change of institutional ownership and stock return one week later in both periods. Both of these relations are significant at the 1% level from 1980 to 1996. However, the negative relation is much weaker and insignificant in the most recent period from 1997 to 2013.

4.2 Relative weight of institutional holdings

In their sample from 1980 to 1996, Gompers and Metrick (2001) find that institutional investors nearly doubled their shares of the stock market, and this compositional shift increases the demand for the stocks of large firms and decreases demand for the stocks of small firms. They argue that the demand of institutional investors causes the disappearance of the size premium since 1980s. Yan and Zhang (2009) further show that the positive relation between institutional ownership and future stock returns is driven by short-term institutions, defined based on the portfolio turnover in the previous year. These short-term institutions are better informed and they trade actively to exploit their informational advantage.

As shown in Panel B of Table I, institutions continue to increase their percentage holdings of stocks since 1990s. In the first sample period, 48.98% of large stocks are owned by institutional investors, and the percentage of institutional holdings for large stocks increases to 66.94% in the second period. The percentage holdings of small stocks has increased from 16.98% to 35.78%. In the second sample period, the percentage of institutional holdings is 62.08%, 65.79%, and 68.64%, respectively among the three middle-sized quintiles of stocks, which is almost about the same as that of the largest stocks in terms of institution holdings.

Following Blume and Keim (2011), we calculate the relative weight of a stock as the difference between its weight in institutions relative to its market weight and use it to measure the institutional preference for a stock. Panel A of Table VII shows that large stocks are overweighed by institutions in the first sample period, but are underweighted in the second period. In the sample period from 1980 to 1996, the average relative weight for large stocks is 5.07%. It changes to be -1.30% in the second period from 1997 to 2013. In contrast, the average weight for small stocks changes from -2.58% to -0.64% during these two subperiods. The relative weights of the three middle-sized portfolios have all increased and they are all overweighed by institutions in the second half of the sample period. These findings are consistent with Bennett, Sias, and Starks (2003) and Blume and Keim (2011), which report that institutions have shifted their preferences toward smaller, riskier securities since 1990s.

Although institutional investors have rapidly increased their percentage holdings of stocks over time, they now underweight the largest stocks and overweight the smaller-sized stocks relative to their market weights. There are two possible reasons for the shift in institutional preferences: first, the demand shocks of the institutions have driven the valuations of large-firm stocks “too high” and therefore make them unattractive; second, the increased institutionalization of large firm stocks have resulted in fewer opportunities for institutional investors to exploit their informational advantages. In contrast, stocks of smaller firms provide more opportunities for institutions to take advantage of their private information.

Institutions are not the same informed. Ali, Klasa, and Li (2008) divide institutions into 3 groups based on their stakeholdings. Large, medium, small stakeholders are institutions which hold at least 5 percent, from one percent to below five percent, and below one percent of shares of a firm, respectively. They show that large stakeholders are dedicated investors. They are informed, but are not able to exploit their private information to trade around earnings announcements due to regulations. Medium stakeholders are likely to have significant private predisclosure information about the stock and are likely to trade on this information around earnings announcements. In contrast, small stakeholders have less incentive to pay for or collect costly private information and tend to be less informed.

Following the classification in Ali, Klasa, and Li (2008), we examine the relative weight of different stakeholders among the size quintiles. Panel B indicates that large stakeholders underweight the largest-sized stocks (-19.86%), but overweight the smallest-sized stocks (2.05%). Instead, medium stakeholders underweight the largest and smallest size quintiles, but overweight the three middle-sized stock portfolios in Panel C. Small stakeholders are very different. They are less informed, and have a large overweight on the largest size quintile in both periods, especially in the first half of the sample period (16.99%) from Panel D.

Figure 2 illustrates dynamics of institutional weights relative to market weights for size quintiles for all the institutional investors and three types of stake holders. It is clear to see the relative weight for large stocks have been declining, from around 10% in 1980 to -3% in 2013 for all institutions. The weight for small stocks has been increasing gradually over time, from around -3% to close to zero at the end of the sample period. Large stocks have been underweighted by large and medium stake holders all the time. In contrast, they are overweighed by small stake holders. The overweight is declining from around 21% in 1980 to 6% in 2013.

4.3 Time-series regressions

Although we have showed the negative relation between the changes in institutional ownership and stock returns in the following week, the source of this relation remains unclear. What kind of institutions and which trading lead to the negative relation? We aim to answer these questions in the following analyses.

Sias, Starks, and Titman (2006) show that institutional trading includes both temporary liquidity effects, which are reversed later and permanent effects, in which the share price will continue. The temporary effect of institutional trading comes from the demand for immediacy, while the permanent effect is associated with information.

Institutions that overweight some stocks may have higher demand for immediacy or because they have superior information. In the following, we run the time-series regressions and use the institutional relative weight to proxy the time-variation of institutional holdings. We aim to investigate whether the time-variation of reversal difference between large-firm stocks and small-firm stocks can be explained by the changing institutional holdings between these two size portfolios over time.

The first column in Panels A and B of Table VIII show that the reversal difference between the large and small size quintiles is no longer significant at the conventional statistical levels in the full sample and first half of sample period once we use the institutional relative weight as the explanatory variable. The coefficient on the relative weight difference of institutional holdings is significantly negative at the 1% level in these two sample periods. With a large overweight on large-sized stocks and underweight on small-sized stocks during these periods, institutional holdings lead to larger return reversals of the large firms. We further compare the large, medium, and small stakeholders in the last three columns. In the full sample period and first subperiod, only the coefficient on the small stakeholders is significantly negative at the 1% level, while none of the coefficients on large and medium stakeholders is significant at the conventional statistical levels. Ali, Klasa, and Li (2008) find that institutions with small stakes are uninformed. Therefore their overweight on large firms leads to the short-term return reversals. In contrast, only the coefficient on medium stakeholders is significantly positive at the 10% level in the second half of the sample period. These medium stakeholders are informed and more likely to trade based on information, therefore their trades will lead to price continuation rather than return reversal. Given the very small difference in the relative weight between the large and small size quintiles, we therefore find that the reversal difference is insignificant in the second subperiod. The coefficient on large stakeholders is insignificant in the full sample and two subsamples. Although large stakeholders are also informed, they underweight large firms and they would not use their private information to trade as they are dedicated investors.

In Table IX, we add the market return in the previous week as an additional explanatory variable in the time-serious regressions. The results in Panels A and B show that the coefficient on the lagged market return is significantly negative in all these regressions, which indicating a stronger reversal in the up market. We still find a significantly negative loading on the relative weight of small stakeholders in the full sample and first half of the sample period from 1980 to 1996. During these periods, many small stakeholders overweight large stocks and their liquidity demands cause larger return reversals of the large firms. As in Table VIII, the return reversal difference between large and small size quintiles is no longer significant once we control the relative weight difference of institutional holdings.

In summary, our analyses show that institution holdings, mainly from small stakeholders, contribute to short-term return reversals due to their demand for immediacy. A large number of small stakeholders overweight large stocks and underweight small stocks in the period from 1980 to 1996, when we document much stronger return reversals for large-firm stocks. There is a shift of preferences to hold smaller firms by institutions in the second period, which explains the insignificant reversal difference between the large and small size quintiles from 1997 to 2013.

V Conclusions

We examine return reversals in size quintiles with weekly returns from January 1980 to December 2013. The sample is divided into two equal-length subperiods. We find that return reversals are greater for large-firm stocks than for small-firm stocks in the first half of the sample, i.e., from January 1980 to December 1996. However, this difference disappears in the second half of the sample between January 1997 and December 2013. The difference in the intensity of return reversals is related to the market condition. We classify the markets as up and down markets depending on the market return in the previous week. When the market is up, we find that return reversals for large-firm stocks are significantly stronger than in down markets, and they are also much stronger than those of small stocks in up markets. In contrast, there is no significant difference between return reversals for large-firm stocks and small-firm stocks in down markets.

We argue that high institutional demand, especially from small stakeholders, for large-firm stocks may result in high demand for immediacy as well as return reversals for these stocks in the period 1980 though mid 1990s. Institutions shift their preferences to stocks of smaller firms since then. As the difference of the relative weight of institution holdings between the two size portfolios gets much smaller in the second subperiod, there is no significant difference of return reversals between the large and small-firm stocks since the mid-1990s.

Understanding the source of short-term return reversal and the role of institutional investors have important implications for empirical asset pricing tests, and more generally for market efficiency. Our work sheds new light and helps researchers better understand this anomaly and its relation with institutional ownership.

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Table I

Institutional Holdings - Summary Statistics

The table provides the data description about institutional holdings for each size-based quintile. The sample includes all common stocks listed in NYSE/AMEX/NASDAQ with the price at least $5 at the end of each quarter. Stocks are arranged into five groups based on their market values at the end of each quarter using NYSE breakpoints. The sorting is repeated at the end of each quarter. Mean is computed for each size quintile over the whole period and two subperiods by pooling all stock-quarter observations in the same quintile and period. Market cap is the market value of the stock. Institutional ownership is the ratio of shares held by institutions to total shares outstanding. Number of institutions is the average number of institutions that hold a stock. Inst. Ownership/Inst. is institutional ownership per institution. Institutional concentration is the Herfindahl index, computed as the sum of squared market shares. Panel A and B report the summary statistics for the whole period and two subperiods, respectively.

Panel A. The whole sample period (1980-2013)

	Market cap. (mil.)	Inst. Ownership (%)	Number of Institutions	Inst. Ownership/Inst. (%)	Inst. Concentration (%)
All	1,991	37.87	81	1.16	22.83
Small (S1)	108	25.49	22	1.66	34.11
S2	472	46.96	64	0.90	12.92
S3	1,053	52.52	101	0.63	9.38
S4	2,597	57.86	167	0.40	6.98
Large (S5)	18,812	58.79	387	0.20	4.65

Panel B. The subperiods

	1980-1996					1997-2013				
All	669	26.40	44	1.44	29.54	3,414	50.20	120	0.89	15.62
Small (S1)	52	16.98	11	1.99	42.63	174	35.78	36	1.29	23.81
S2	219	32.11	33	1.12	17.13	729	62.08	96	0.68	8.63
S3	512	38.67	59	0.76	11.71	1,571	65.79	141	0.50	7.15
S4	1,253	45.37	108	0.47	7.64	3,757	68.64	217	0.34	6.40
Large (S5)	6,380	48.98	252	0.23	4.65	29,143	66.94	498	0.17	4.66

Table II

Cross-sectional Regressions of Weekly Return Reversals

This table shows the average β from the weekly cross-sectional Fama-Macbeth (1973) regressions as follows:

$$r_{i.t} = \alpha_i + \beta_1 r_{i.t-1} + \beta_2 r_{i.t-2} + \beta_3 r_{i.t-3} + \beta_4 r_{i.t-4} + \varepsilon_{i.t}$$

where $r_{i,t}$, $r_{i,t-2}$, $r_{i,t-3}$, $r_{i,t-4}$ are weekly compound returns from this Thursday to next Wednesday while r_{t-1} is weekly compound returns from this Thursday to next Tuesday (skip 1 day).

The sample period is from January 1980 to December 2013. We include NYSE, AMEX, and NASDAQ stocks that have the price at the end of formation week at least $5. Stocks in the sample are arranged into quintiles based on their market value in the most recent June and NYSE size breakpoints. Regressions are run separately for all stocks in different size quintiles. To compare β across size quintiles with different number of stocks and over periods, we standardize both dependent and independent variables with zero mean and unit standardization for each size quintile following Bennett, Sias, and Starks (2003) and Sias (2004). Therefore the intercept is zero in the regression. The table shows the average standardized β for all size quintiles and the difference in the average standardized β between group 5 (large-size stocks) and group 1 (small-size stocks). DIFF is the difference between the second subperiod (1997-2013) and the first subperiod (1980-1996). The Newey-West t-statistics are given in parentheses below the average β. *, **, and *** denote the significance at 10%, 5%, and 1%, respectively.

	1980-2013				1980-1996				1997-2013			
	b1	b2	b3	b4	b1	b2	b3	b4	b1	b2	b3	b4
Small (S1)	-0.0252***	-0.0109***	-0.0028*	0.001	-0.0240***	-0.0158***	-0.0042**	0.0010	-0.0263***	-0.0061**	-0.0014	0.0010
	(-15.24)	(-6.46)	(-1.83)	(0.67)	(-11.66)	(-7.88)	(-2.37)	(0.56)	(-10.20)	(-2.30)	(-0.55)	(0.42)
S2	-0.0339***	-0.0144***	-0.0052***	-0.0008	-0.0472***	-0.0252***	-0.0060**	-0.0017	-0.0208***	-0.0037	-0.0044	0.0001
	(-14.68)	(-6.47)	(-2.58)	(-0.39)	(-17.79)	(-9.73)	(-2.33)	(-0.66)	(-6.10)	(-1.10)	(-1.43)	(0.03)
S3	-0.0382***	-0.0134***	-0.0039	-0.0018	-0.0584***	-0.0251***	-0.0093***	-0.0024	-0.0181***	-0.0019	0.0015	-0.0012
	(-14.03)	(-5.01)	(-1.57)	(-0.69)	(-18.77)	(-7.30)	(-2.88)	(-0.72)	(-4.91)	(-0.48)	(0.40)	(-0.30)
S4	-0.0372***	-0.013***	-0.0045*	0.0036	-0.0603***	-0.0233***	-0.0071**	0.0021	-0.0141***	-0.0026	-0.0019	0.0050
	(-11.34)	(-4.28)	(-1.67)	(1.20)	(-15.35)	(-6.29)	(-2.10)	(0.56)	(-3.24)	(-0.58)	(-0.45)	(1.08)
Large (S5)	-0.0432***	-0.0145***	-0.0017	0.0011	-0.0609***	-0.0204***	-0.0029	0.0007	-0.0257***	-0.0086*	-0.0005	0.0015
	(-13.17)	(-4.31)	(-0.54)	(0.34)	(-14.32)	(-4.62)	(-0.71)	(0.16)	(-5.73)	(-1.72)	(-0.10)	(0.31)
Large - Small	-0.0181***	-0.0036	0.0011	0.0001	-0.0369***	-0.0046	0.0014	-0.0003	0.0006	-0.0025	0.0009	0.0005
	(-5.69)	(-1.22)	(0.40)	(0.03)	(-8.61)	(-1.15)	(0.36)	(-0.08)	(0.14)	(-0.60)	(0.21)	(0.12)

Table III

Cross-sectional Regressions of Weekly Return Reversals (Exclude January)

This table shows the average β's from the weekly cross-sectional regressions as in Table II. The only difference is that we exclude January from our sample.

	1980-2013				1980-1996				1997-2013			
	b1	b2	b3	b4	b1	b2	b3	b4	b1	b2	b3	b4
Small (S1)	-0.0238***	-0.0084***	-0.0006	0.0023	-0.0232***	-0.0136***	-0.0018	0.0022	-0.0243***	-0.0032	0.0006	0.0023
	(-14.02)	(-4.96)	(-0.39)	(1.49)	(-10.59)	(-6.78)	(-1.05)	(1.23)	(-9.39)	(-1.20)	(0.26)	(0.95)
S2	-0.0332***	-0.012***	-0.0026	0.0013	-0.0467***	-0.0229***	-0.0033	0.0003	-0.0198***	-0.0011	-0.0019	0.0023
	(-13.74)	(-5.32)	(-1.25)	(0.65)	(-16.61)	(-8.80)	(-1.29)	(0.14)	(-5.61)	(-0.31)	(-0.57)	(0.72)
S3	-0.0375***	-0.0101***	-0.0014	-0.0005	-0.0577***	-0.0227***	-0.0074**	-0.0008	-0.0172***	0.0026	0.0046	-0.0003
	(-13.13)	(-3.75)	(-0.54)	(-0.20)	(-17.73)	(-6.71)	(-2.20)	(-0.23)	(-4.46)	(0.69)	(1.21)	(-0.07)
S4	-0.0357***	-0.0097***	-0.0023	0.0052*	-0.0589***	-0.0212***	-0.0056	0.0028	-0.0125***	0.0017	0.001	0.0075
	(-10.47)	(-3.17)	(-0.82)	(1.71)	(-14.42)	(-5.53)	(-1.61)	(0.77)	(-2.75)	(0.37)	(0.22)	(1.57)
Large (S5)	-0.0426***	-0.0124***	0.0007	0.0023	-0.0607***	-0.0188***	-0.0016	0.0014	-0.0244***	-0.0059	0.003	0.0033
	(-12.22)	(-3.61)	(0.22)	(0.69)	(-13.56)	(-4.12)	(-0.39)	(0.31)	(-5.13)	(-1.17)	(0.61)	(0.65)
Large - Small	-0.0188***	-0.0040	0.0013	0.0001	-0.0375***	-0.0052	0.0002	-0.0008	-0.0001	-0.0027	0.0024	0.0010
	(-5.61)	(-1.33)	(0.46)	(0.02)	(-8.35)	(-1.26)	(0.06)	(-0.20)	(-0.02)	(-0.63)	(0.55)	(0.22)

Table IV

Cross-sectional Regressions of Weekly Return Reversals (Exclude S&P 500 stocks)

This table shows the average β's from the weekly cross-sectional regressions as in Table II. The only difference is that we exclude S&P 500 stocks from our sample.

	1980-2013				1980-1996				1997-2013			
	b1	b2	b3	b4	b1	b2	b3	b4	b1	b2	b3	b4
Small (S1)	-0.0235***	-0.0098***	-0.0027*	0.0012	-0.0205***	-0.0136***	-0.0038**	0.0012	-0.0265***	-0.006**	-0.0015	0.0011
	(-14.10)	(-5.78)	(-1.72)	(0.77)	(-9.97)	(-6.69)	(-2.10)	(0.66)	(-10.20)	(-2.24)	(-0.60)	(0.47)
S2	-0.0344***	-0.0166***	-0.0061***	-0.0017	-0.0470***	-0.0271***	-0.0087***	-0.0025	-0.0217***	-0.0062*	-0.0035	-0.0010
	(-14.73)	(-7.43)	(-3.18)	(-0.90)	(-16.36)	(-9.84)	(-3.72)	(-1.00)	(-6.56)	(-1.89)	(-1.16)	(-0.34)
S3	-0.0340***	-0.0144***	-0.0032	0.0009	-0.0496***	-0.0260***	-0.0038	-0.0013	-0.0186***	-0.0029	-0.0027	0.0031
	(-13.04)	(-5.70)	(-1.36)	(0.40)	(-16.22)	(-8.48)	(-1.14)	(-0.43)	(-4.95)	(-0.77)	(-0.79)	(0.89)
S4	-0.0401***	-0.0164***	-0.0051*	-0.0021	-0.0594***	-0.0308***	-0.0099***	-0.0014	-0.0208***	-0.002	-0.0004	-0.0028
	(-14.12)	(-5.64)	(-1.94)	(-0.77)	(-17.25)	(-8.38)	(-2.87)	(-0.40)	(-5.46)	(-0.48)	(-0.09)	(-0.67)
Large (S5)	-0.0410***	-0.0163***	-0.0020	0.0013	-0.0600***	-0.0287***	-0.0051	-0.0012	-0.0221***	-0.0040	0.0011	0.0038
	(-12.26)	(-4.89)	(-0.70)	(0.41)	(-13.54)	(-6.84)	(-1.33)	(-0.28)	(-5.01)	(-0.80)	(0.25)	(0.81)
Large - Small	-0.0175***	-0.0065**	0.0006	0.0001	-0.0395***	-0.0151***	-0.0013	-0.0024	0.0044	0.0020	0.0026	0.0027
	(-5.48)	(-2.30)	(0.24)	(0.05)	(-9.63)	(-4.13)	(-0.37)	(-0.62)	(1.08)	(0.47)	(0.66)	(0.70)

Table V

Return Reversals in Different Market States

In Panel A, we apply the same methodology as in Table II for the up and down markets separately. If value weighted CRSP index of the formation week is greater than or equal to 0 (less than 0), market state is defined UP (DOWN). Panel A shows the average first week reversal (β_1) from the weekly cross-sectional regressions in Equation 1. In Panel B, we follow the methodology of Cooper, Gutierrez, and Hameed (2004) to run regressions of the reversal difference in β1 between largest and smallest size quintiles (from Table II) on the CRSP value-weighted returns in the previous week (and its squares). The Newey-West t-statistics are used in both tables and are given in parentheses below the average β1. *, **, and *** denote the significance at 10%, 5%, and 1%, respectively.

Panel A. Size Quintiles

	1980-2013			1980-1996			1997-2013			DIFF	
	UP	DOWN	DIFF	UP	DOWN	DIFF	UP	DOWN	DIFF	UP	DOWN
Small (S1)	-0.0279***	-0.0213***	-0.0066**	-0.0278***	-0.0185***	-0.0093**	-0.0281***	-0.0239***	-0.0041	-0.0003	-0.0055
	(-12.77)	(-8.42)	(-2.01)	(-9.78)	(-5.80)	(-2.33)	(-8.40)	(-6.16)	(-0.79)	(-0.08)	(-1.01)
S2	-0.0393***	-0.0265***	-0.0127***	-0.0496***	-0.0436***	-0.0059	-0.0285***	-0.0107*	-0.0179***	0.0210***	0.0330***
	(-14.08)	(-6.74)	(-2.84)	(-15.34)	(-9.79)	(-1.02)	(-6.70)	(-1.91)	(-2.67)	(4.20)	(4.50)
S3	-0.0465***	-0.0267***	-0.0198***	-0.0659***	-0.0475***	-0.0184***	-0.0263***	-0.0073	-0.0189**	0.0396***	0.0401***
	(-14.03)	(-6.16)	(-3.87)	(-20.55)	(-9.09)	(-2.78)	(-5.40)	(-1.30)	(-2.49)	(6.79)	(4.88)
S4	-0.0491***	-0.0206***	-0.0285***	-0.0691***	-0.0474***	-0.0217***	-0.0282***	0.0044	-0.0326***	0.0408***	0.0518***
	(-12.63)	(-3.91)	(-4.74)	(-16.22)	(-8.15)	(-2.83)	(-5.01)	(0.62)	(-3.64)	(5.95)	(5.40)
Large (S5)	-0.0566***	-0.0247***	-0.0319***	-0.0754***	-0.0395***	-0.0359***	-0.037***	-0.0109	-0.0261***	0.0384***	0.0286***
	(-13.61)	(-4.53)	(-4.95)	(-15.38)	(-5.48)	(-4.27)	(-6.23)	(-1.42)	(-2.70)	(5.09)	(2.76)
Large - Small	-0.0287***	-0.0034	-0.0253***	-0.0476***	-0.0210***	-0.0266***	-0.0089	0.0130**	-0.0219***	0.0387***	0.0341***
	(-7.09)	(-0.67)	(-4.35)	(-9.43)	(-3.02)	(-3.38)	(-1.64)	(1.99)	(-2.61)	(5.38)	(3.79)

Panel B. The lagged market return as a continuous measure of market states

	1980-2013		1980-1996		1997-2013	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0170***	-0.0165***	-0.0352***	-0.0348***	0.0012	0.0033
	(-5.56)	(-5.08)	(-8.38)	(-7.88)	(0.30)	(0.78)
LAGMKRET	-0.4578***	-0.4683***	-0.5589***	-0.5687***	-0.3638**	-0.3944**
	(-3.46)	(-3.51)	(-2.75)	(-2.78)	(-2.10)	(-2.28)
$LAGMKRET^2$		-1.0201		-0.9234		-3.0997
		(-0.46)		(-0.30)		(-1.11)

Table VI
Weekly Partitioning of Correlation between Quarterly Changes in Institutional Ownership and Stock Returns

This table reports the time-series average of the cross-sectional correlation between quarterly changes in the numbers of institutional investors or changes fraction of shares held by institutions and stock returns in the same quarter. We also generate the estimates of the contribution of the correlation between weekly changes of institutional holdings and contemporaneous, lead, and lag weekly stock returns following Sias, Starks, and Titman (2006). Panels A, B, and C report the results for the whole period, the first subperiod, and the second subperiod, respectively. The t-statistics are based on Newey and West (1987) standard errors.

Panel A. The whole period 1980-2013

	Estimates based on changes in numbers of institutional investors		Estimates based on changes in fraction of shares held by institutions	
	Fraction of Quarterly	Total	Fraction of Quarterly	Total
Quarterly Correlation		0.3019		0.1570
		(31.38)		(14.64)
4 weeks before	32%	0.0973	35%	0.0548
		(2.20)		(2.74)
3 weeks before	-4%	-0.0125	-10%	-0.0155
		(-0.33)		(-0.74)
2 weeks before	-8%	-0.0228	-14%	-0.0218
		(-0.65)		(-1.31)
1 week before	6%	0.0182	7%	0.0109
		(0.57)		(0.50)
Same week	104%	0.3140	131%	0.2052
		(6.84)		(6.84)
1 week after	-33%	-0.1007	-43%	-0.0673
		(-2.25)		(-2.44)
2 weeks after	30%	0.0910	6%	0.0091
		(1.76)		(0.30)
3 weeks after	-6%	-0.0173	11%	0.0167
		(-0.51)		(0.97)
4 weeks after	1%	0.0036	-6%	-0.0099
		(0.11)		(-0.43)

Panel B. The 1980-1996 period

	Estimates based on changes in numbers of institutional investors		Estimates based on changes in fraction of shares held by institutions	
	Fraction of Quarterly	Total	Fraction of Quarterly	Total
Quarterly Correlation		0.2845		0.1635
		(26.71)		(9.52)
4 weeks before	25%	0.0708	26%	0.0421
		(1.27)		(1.20)
3 weeks before	-15%	-0.0438	-9%	-0.0142
		(-0.88)		(-0.46)
2 weeks before	11%	0.0307	2%	0.0025
		(0.79)		(0.14)
1 week before	4%	0.0126	-9%	-0.0145
		(0.30)		(-0.45)
Same week	118%	0.3365	145%	0.2372
		(8.97)		(6.27)
1 week after	-51%	-0.1451	-78%	-0.1275
		(-2.89)		(-3.20)
2 weeks after	47%	0.1348	32%	0.0528
		(1.84)		(1.10)
3 weeks after	-24%	-0.0694	7%	0.0111
		(-1.35)		(0.43)
4 weeks after	-12%	-0.0350	-34%	-0.0558
		(-0.80)		(-1.80)

Panel C. The 1997-2013 period

	Estimates based on changes in numbers of institutional investors		Estimates based on changes in fraction of shares held by institutions	
	Fraction of Quarterly	Total	Fraction of Quarterly	Total
Quarterly Correlation		0.3203		0.1501
		(21.61)		(12.88)
4 weeks before	39%	0.1254	45%	0.0682
		(1.82)		(3.73)
3 weeks before	6%	0.0208	-11%	-0.0168
		(0.37)		(-0.61)
2 weeks before	-25%	-0.0797	-32%	-0.0476
		(-1.44)		(-1.80)
1 week before	8%	0.0241	25%	0.0380
		(0.51)		(1.30)
Same week	91%	0.2902	114%	0.1711
		(3.38)		(3.75)
1 week after	-17%	-0.0535	-2%	-0.0034
		(-0.73)		(-0.11)
2 weeks after	14%	0.0444	-25%	-0.0375
		(0.63)		(-1.15)
3 weeks after	12%	0.0381	15%	0.0226
		(1.02)		(1.02)
4 weeks after	14%	0.0446	26%	0.0388
		(0.99)		(1.31)

Table VII

Dynamics of Institutional Holdings for Size Quintiles

This table provides the dynamics of institutional holdings for size quintiles during our sample period from 1980 to 2013. We keep all NYSE/AMEX/NASDAQ common stocks with the price at least $5 at the end of each quarter. On the left of Panels, we report the percent of institution ownership for each size quintile over the total institutional holdings in terms of market capitalization in the full sample period and two subperiods. On the right of Panels, we report the institutional relative weight for each size quintile following Blume and Keim (2011), where the relative weight is defined as the difference between the market-capitalization-based ratio of each size quintile held by institutions over the total institutional holdings and its market weight. We follow Ali, Klasa, and Li (2008) to classify institutions into three groups based on their stakeholdings. Large, medium, and small stakeholders are institutions who hold at least five percent, from one percent to below five percent, and below one percent of shares of a stock, respectively. Panels A, B, C, and D report the results for all, large, medium, and small stake holders, respectively.

Panel A. All institutions

Institutional weight in each size quintile

	1980-2013	1980-1996	1997-2013	DIFF
Small	0.0203	0.0207	0.0200	-0.0007
Size2	0.0390	0.0395	0.0384	-0.0011
Size3	0.0682	0.0753	0.0611	-0.0142
Size4	0.1440	0.1616	0.1264	-0.0352
Large	0.7285	0.7030	0.7541	0.0511
Large - Small	0.7082	0.6823	0.7341	0.0518

Institutional relative weight in each size quintile

	1980-2013	1980-1996	1997-2013	DIFF
Small	-0.0161	-0.0258	-0.0064	0.0194
Size2	-0.0075	-0.0163	0.0014	0.0177
Size3	-0.0036	-0.0119	0.0046	0.0165
Size4	0.0084	0.0034	0.0133	0.0099
Large	0.0189	0.0507	-0.0130	-0.0637
Large - Small	0.0350	0.0765	-0.0066	-0.0831

Panel B. Large stakeholders

Institutional weight in each size quintile

	1980-2013	1980-1996	1997-2013	DIFF
Small	0.0569	0.0642	0.0497	-0.0145
Size2	0.0871	0.0976	0.0765	-0.0211
Size3	0.1280	0.1522	0.1038	-0.0484
Size4	0.2170	0.2280	0.206	-0.0220
Large	0.5110	0.4581	0.5640	0.1059
Large - Small	0.4541	0.3939	0.5143	0.1204

Institutional relative weight in each size quintile

	1980-2013	1980-1996	1997-2013	DIFF
Small	0.0205	0.0177	0.0233	0.0056
Size2	0.0406	0.0418	0.0395	-0.0023
Size3	0.0562	0.0650	0.0474	-0.0176
Size4	0.0813	0.0697	0.0929	0.0232
Large	-0.1986	-0.1942	-0.2030	-0.0088
Large - Small	-0.2191	-0.2119	-0.2263	-0.0144

Panel C. Medium stakeholders

Institutional weight in each size quintile	1980-2013	1980-1996	1997-2013	DIFF
Small	0.0248	0.0284	0.0213	-0.0071
Size2	0.0491	0.0553	0.0429	-0.0124
Size3	0.0843	0.1021	0.0665	-0.0356
Size4	0.1689	0.2091	0.1287	-0.0804
Large	0.6728	0.6051	0.7406	0.1355
Large - Small	0.6480	0.5767	0.7193	0.1426

Institutional overweight in each size quintile	1980-2013	1980-1996	1997-2013	DIFF
Small	-0.0116	-0.0181	-0.0051	0.0130
Size2	0.0027	-0.0005	0.0059	0.0064
Size3	0.0125	0.0149	0.0101	-0.0048
Size4	0.0333	0.0509	0.0157	-0.0352
Large	-0.0369	-0.0472	-0.0265	0.0207
Large - Small	-0.0253	-0.0291	-0.0214	0.0077

Panel D. Small stakeholders

Institutional weight in each size quintile	1980-2013	1980-1996	1997-2013	DIFF
Small	0.0072	0.0057	0.0086	0.0029
Size2	0.0186	0.016	0.0212	0.0052
Size3	0.0411	0.0407	0.0414	0.0007
Size4	0.1064	0.1154	0.0974	-0.0180
Large	0.8267	0.8221	0.8313	0.0092
Large - Small	0.8195	0.8164	0.8227	0.0063

Institutional overweight in each size quintile	1980-2013	1980-1996	1997-2013	DIFF
Small	-0.0293	-0.0408	-0.0178	0.0230
Size2	-0.0278	-0.0398	-0.0158	0.0240
Size3	-0.0307	-0.0465	-0.0150	0.0315
Size4	-0.0292	-0.0428	-0.0157	0.0271
Large	0.1171	0.1699	0.0643	-0.1056
Large - Small	0.1464	0.2107	0.0821	-0.1286

Table VIII

Time-series Regressions

We run time-series regressions for the different sample periods. The dependent variable is the reversal difference between large and small stocks (β_1) as in Table II. The independent variable is the difference in institutional weight of large and small size quintiles relative to market weights. We compute the difference at the beginning of each quarter and use it as the proxy for the institutional relative weight in the quarter. The Newey-West t-statistics are given in parentheses. *, **, and *** denote the significance at 10%, 5%, and 1%, respectively.

Panel A. The whole period 1980-2013

Intercept	-0.0046	-0.0288**	-0.0152***	0.0246***
	(-1.30)	(-2.06)	(-3.57)	(3.70)
All institutions	-0.3652***			
	(-6.68)			
Large stakeholders		-0.0478		
		(-0.76)		
Medium stakeholders			0.1474	
			(1.17)	
Small stakeholders				-0.2892***
				(-7.31)

Panel B. The subperiods

	1980-1996				1997-2013			
Intercept	-0.0099	-0.0542***	-0.0423***	0.0419**	0.0018	0.0239	0.0081	-0.0157

	(-1.06)	(-2.70)	(-7.93)	(1.96)	(0.44)	(1.27)	(1.33)	(-1.08)
All institutions	-0.3504***				0.3654**			
	(-3.31)				(2.00)			
Large stakeholders		-0.0787				0.1045		
		(-0.82)				(1.27)		
Medium stakeholders			-0.1682				0.4156*	
			(-1.21)				(1.84)	
Small stakeholders				-0.3735***				0.1899
				(-3.80)				(1.21)

Table IX

Time-series Regressions in Different Market States

This table runs time-series regressions as in Table VIII. The only difference is that we add the market return in the formation week as an additional explanatory variable.

Panel A. The whole period 1980-2013

Intercept	-0.0039	-0.0268*	-0.0141***	0.0250***
	(-1.08)	(-1.91)	(-3.33)	(3.78)
LAGMKRET	-0.4141***	-0.4380***	-0.4403***	-0.4099***
	(-3.14)	(-3.33)	(-3.37)	(-3.13)
All institutions	-0.3593***			
	(-6.62)			
Large stakeholders		-0.0433		
		(-0.69)		
Medium stakeholders			0.1491	
			(1.20)	
Small stakeholders				-0.2848***
				(-7.26)

Panel B. The subperiods

	1980-1996				1997-2013			
Intercept	-0.0086	-0.0525***	-0.0405***	0.0433**	0.0024	0.0256	0.0086	-0.0165
	(-0.92)	(-2.65)	(-7.62)	(2.05)	(0.61)	(1.35)	(1.43)	(-1.14)
LAGMKRET	-0.4959**	-0.5021***	-0.4966**	-0.5003***	-0.3704**	-0.3685**	-0.3610**	-0.3706**
	(-2.57)	(-2.58)	(-2.56)	(-2.60)	(-2.17)	(-2.15)	(-2.12)	(-2.14)
All institutions	-0.3477***				0.3752**			
	(-3.33)				(2.06)			
Large stakeholders		-0.0780				0.1092		
		(-0.82)				(1.32)		
Medium stakeholders			-0.1588				0.4108*	
			(-1.16)				(1.83)	
Small stakeholders				-0.3728***				0.2064
				(-3.85)				(1.32)

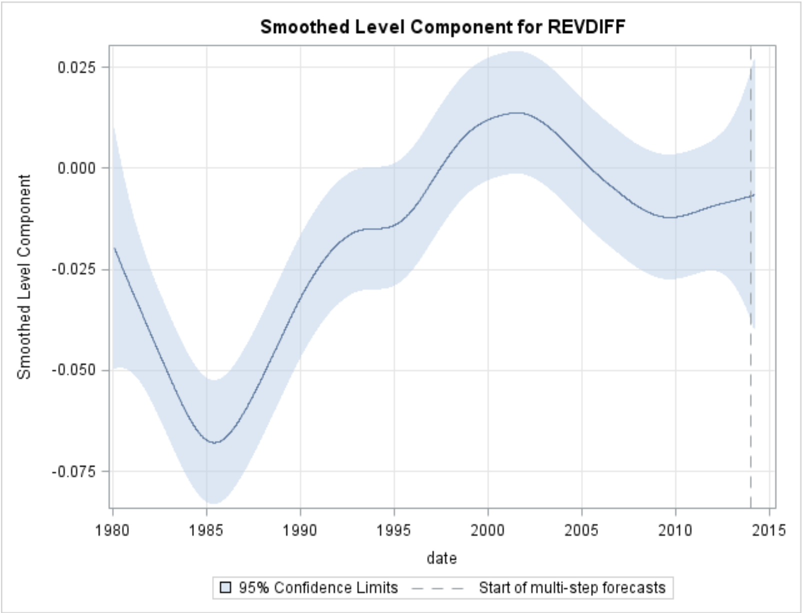
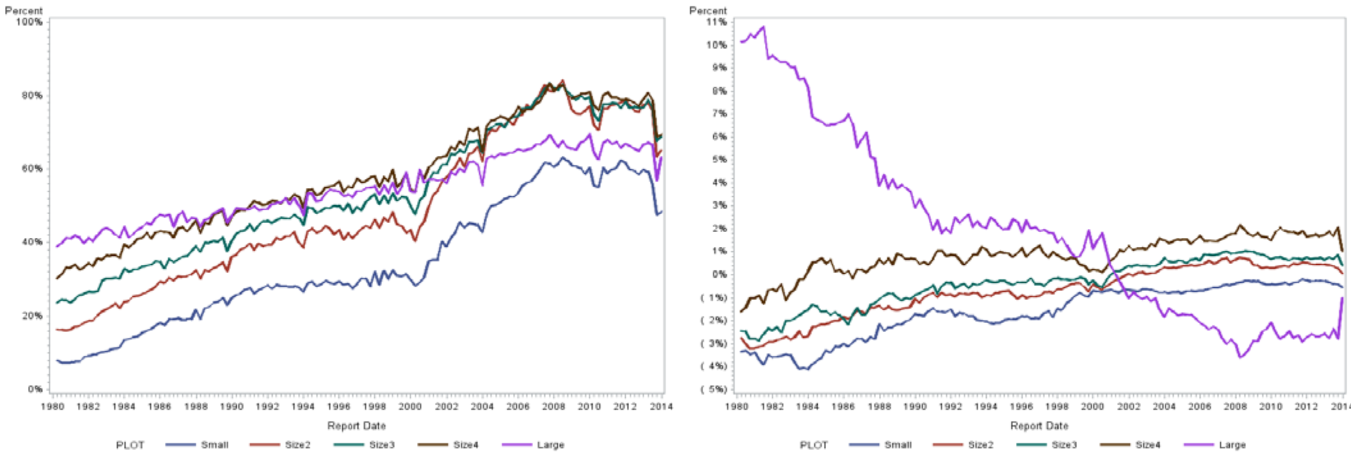
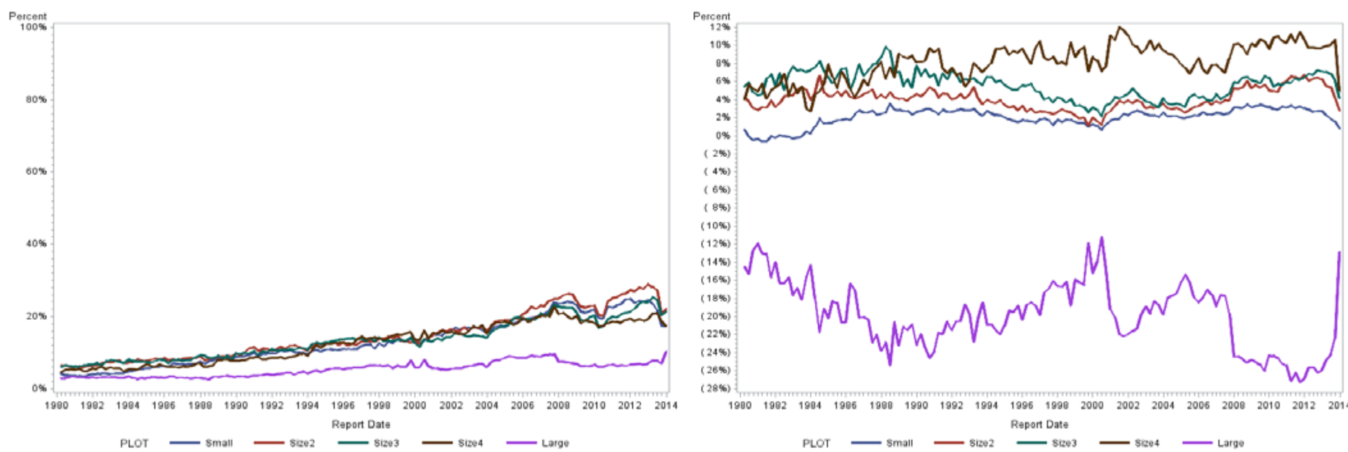


Figure 1. The time-series trend of the difference in return reversals between large and small stocks

This figure shows the fitted smooth trend of the difference in β_1 between large and small stocks from Table II using Hodrick-Prescott's (1997) filter. According to Ravn and Uhlig (2002), the multiple used is $1/(1600^* p^4)$, where p is the number of periods per quarter. There are around 13 weeks each quarter. Thus, we use p=13.

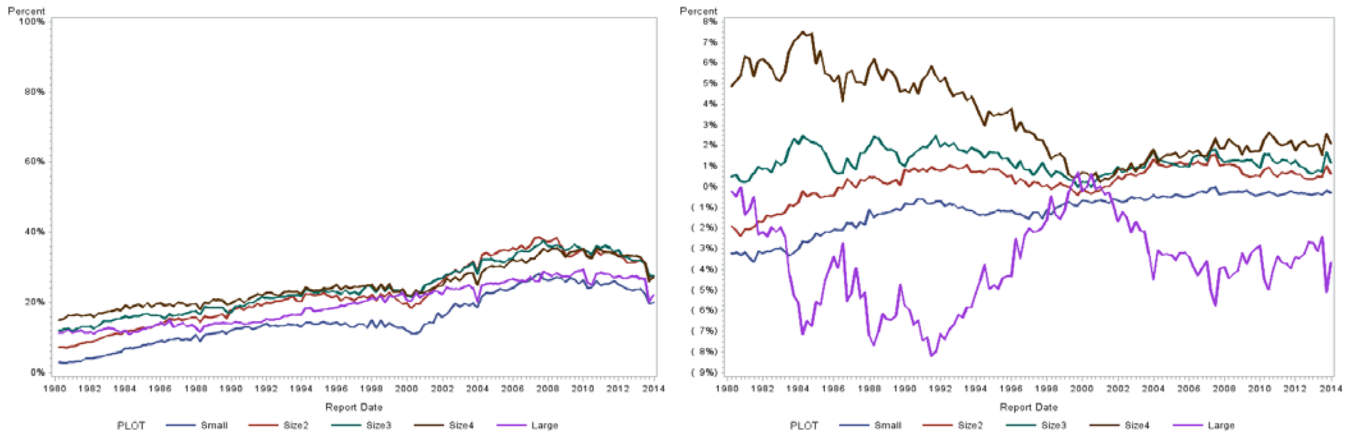


Panel A. All institutions

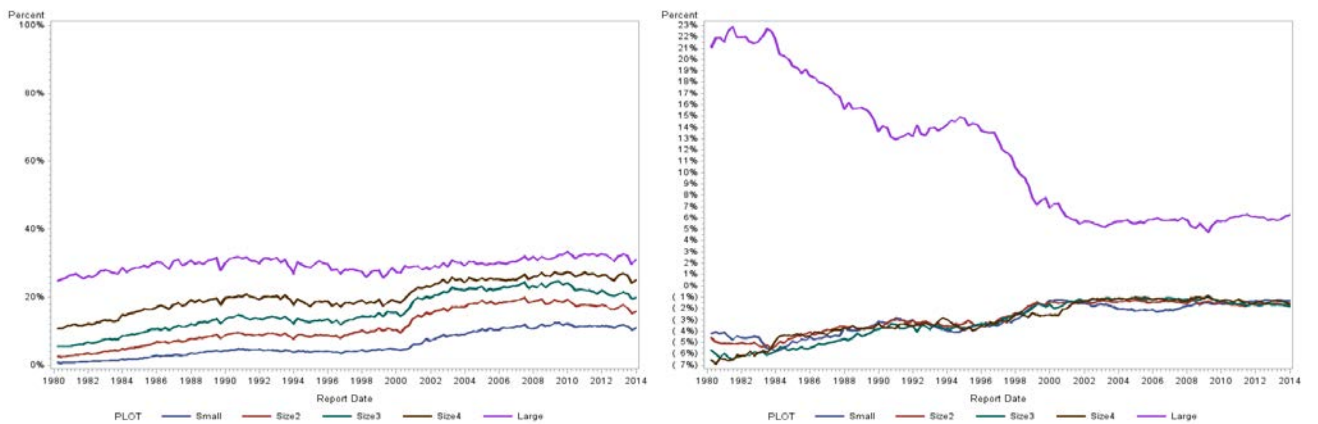


Panel B. Large stakeholders

Figure 2. Dynamics of percentage of institutional holdings and institutional weights relative to market weights



Panel C. Medium stakeholders



Panel D. Small stakeholders

Figure 2. Dynamics of percentage of institutional holdings and institutional weights relative to market weights (cont.)