Do Short-Term Institutions and Short Sellers Exploit the Net Share Issuance Effect?

Yinfei Chen, Wei Huang, and George J. Jiang

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Yinfei Chen is a Ph.D. candidate in the Department of Finance and Management Science, College of Business, Washington State University, Pullman, WA 99164. Email address: Yinfei.Chen@wsu.edu. Wei Huang is a Ph.D. candidate in the Department of Finance and Management Science, College of Business, Washington State University, Pullman, WA 99164. Email address: whuang4@wsu.edu. George J. Jiang is the Gary P. Brinson Chair of Investment Management in the Department of Finance and Management Science, College of Business, Washington State University, Pullman, WA 99164. Email address: george.jiang@wsu.edu. Tel: (509) 335-4474, Fax: (509) 335-3857. We wish to thank Chang Liu, Gulnara Zaynutdinova, Jason Turkiela, Jarl Kallberg, Sheen Liu and seminar participants at Washington State University for helpful comments and suggestions. The usual disclaimer applies.

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Abstract

Existing literature documents that net share issuance significantly predicts cross-sectional stock returns, and yet institutional investors in aggregate trade in the "wrong" direction. Motivated by the findings in the existing literature that short-term institutions and short sellers are better informed and more sophisticated, in this study we examine whether short-term institutions and short sellers exploit the net share issuance effect. We provide evidence that short-term institutions and short sellers indeed trade in the "right" direction of the net share issuance effect. Our results further show that short-term institutions and short sellers have advantage trading against long-term institutions when exploiting information contained in net share issuance.

JEL classification: G12, G14, G24, G32

Key words: Net Share Issuance; Cross-Sectional Stock Returns; Institutional Trading; Short Interest; Institution Type;

I. Introduction

Net share issuance (NSI) is defined as the net change in shares outstanding over a given time period. Exist literature documents that net share issuance is a strong predictor for cross-sectional stock returns (see, e.g., Daniel and Titman, 2006; Pontiff and Woodgate, 2008; and Fama and French, 2008a). For instance, Pontiff and Woodgate (2008) shows that one-standard deviation change in share issuance is associated with a 0.33% decrease in the monthly cross-sectional return. That is, firms with low net share issuance significantly outperform those with high net share issuance over both long and short horizons. This anomaly is referred to as the net share issuance effect.

Yet, in a recent comprehensive empirical study Edelen, Ince and Kadlece (2014) document that institutional investors in aggregate do not exploit the NSI effect. They show that institutions trade in the opposite direction of the NSI anomaly. Namely, institutions increase their holdings on stocks with high NSI and decrease their holdings on stocks with low NSI. Further, they show that portfolios formed with stocks where institutional trading is opposite to the NSI anomaly significantly outperform portfolios formed with the stocks where institutional trading is consistent with the NSI anomaly.

The main research question of our study is whether short-term institutions and short sellers exploit the NSI effect. Our study is motivated along the following dimensions. Several recent studies examine the robustness of NSI anomaly and show that NSI is one of the most robust stock return predictors. Fama and French (2008b) find that the NSI effect is pervasive across all size groups. Jiang and Zhang (2013) find that the NSI effect is significant in both long and short sides of hedge portfolios. Drechsler and Drechsler (2014) show that the NSI effect exists in all high/low short-sale fees sub-groups. In addition, compared to the predictability of equity issuance events such as SEOs, repurchases and stock mergers, the NSI effect reveals a more general association between equity issuance and stocks future returns. Pontiff and Woodgate (2008)

conducts a comprehensive analysis on the relation between future stock returns and NSI. They remove returns related to SEOs, repurchases and stock mergers and still find the significant predictability of NSI.

Second, NSI contains information about firm fundamentals and corporate policy. Following the rational explanation of the NSI effect, NSI contains information related to the future risk of the firm. Daniel and Titman (2006) argue that favorable intangible information will lead to investment funded externally, and the exercise of real option will reduce firm's uncertainty and marginal product of current investment. Thus, NSI captures the intangible information and reflects information about firms' investment policy. It's also widely believed that issuing firms tend to have large investments relative to earnings while the opposite is true for firms with repurchase (Fama and French, 2005; Li, Livdan and Zhang, 2009). Thus, NSI conveys crucial information about firms' investment policy to the investors. In addition, Hertzel and Li (2010) show that post-issue return is related to future growth options of the firm. They show that issuing firms with greater growth options will invest more but do not experience lower post-issue stocks return, while issuing firms with greater mispricing tend to increase cash holdings and earn lower returns. Moreover, Loughran and Ritter (1995), Ikenberry, Lakonishok and Vermaelen (1995) and Daniel and Titman (2008) argue that managers tend to issue while the stocks are overvalued and to repurchase while the stocks are undervalued. Such behavioral explanations of the NSI effect suggest that NSI contains information about the mispricing of the stocks. Given that NSI contains firms' information related to investment policy and future growth options and mispricing, it is expected that sophisticated investors have incentive to trade on such information accordingly.

Third, while institutions are generally considered as informed and sophisticated investors (Gompers and Metrick, 2001; Campbell, Ramadorai and Schwartz, 2009), recent literature provides evidence that the ability of exploiting information varies among different types of institutions classified by the characteristics of their trading. Bushee (2001) shows that short-term (transient) institutions change their holding according

to firms' disclosure more efficiently than long-term institutions. He explains that transient institutions have stronger incentives to gather private information because they engage in strategies to profit short-term price appreciation. Some extant literature also finds that short-term institutions are more sophisticated in terms of exploiting anomaly information. For example, while Ali, Hwang and Trombley (2000) find that in aggregate, institutions do not exploit the accruals information, Balsam, Bartov and Marquardt (2002), Collins, Gong and Hribar (2003) and Lev and Nissim (2006) show that short-term institutions are able to exploit accruals information. Barone and Magilke (2009) argue that the degree of sophistication plays a role in exploiting the mispricing information implied in accruals. Further, Yan and Zhang (2009) find evidence that short-term institutions' trading significantly correlate to future earnings surprise while long-term institutions' do not. Furthermore, they show that the predictability of institutional ownership for stock returns is driven by short-term institutions. Motivated by these, we examine whether short-term institutional investors exploit the NSI effect.

Finally, short sellers are widely believed to be informed and sophisticated. Extant studies show that short sellers' trading correctly predicts future negative abnormal returns (see e.g. Diether, Lee and Werner, 2009; Boehmer, Jones and Zhang, 2008). Moreover, Karpoff and Lou (2010), Christophe, Ferri and Angel (2004), and Boehmer, Jones and Zhang (2008) provide evidence that short sellers trade before public information releases and earn significant abnormal returns. In the meantime, Asquith, Pathak and Ritter (2005), Engelberg, Reed and Ringgenberg (2012), Boehmer and Wu (2013)'s work infers that short sellers do not possess private information and their trading advantage comes from their superior ability to analyze public information. More shorting flow accelerates the incorporation of public information into stock price. Even though the two sets of studies show different information process that short sellers exploit, both indicate that short sellers are informed and sophisticated in processing information.

We develop our hypotheses based on two important roles for institutional investors and short sellers: information production role suggested by Chemmanur and Jiao (2005) and manipulative role suggested by Gerard and Nanda (1993). Chemmanur and Jiao (2005) show that institutions increase their holdings on stocks both before and after share offerings if they obtain favorable information. Institutions engage in the information production role if they consistently trade in the same direction of the information they obtain. Gerad and Nanda (1993) introduce a model showing the potential manipulative role of the institutional investors. In their model, institutional investors manipulate the offering price by trading in the opposite direction as the information before the share offering and subsequently profit by trading in the same direction as the information after the share offering. Some extant literature shows that institutional investors and short sellers play the information production role around the share offerings. Gibson, Safieddine and Sonti (2004) look at the institutional trading in the pre-SEO market. They find that institutions buy shares in pre-SEO market when they have favorable private information about the firm. Also, Chemmanur, He and Hu (2009) state that institutions trade in the same direction as their private information in both pre- and post SEO and earn significant higher return than the naïve buy-and hold trading strategy. These findings are consistent with the hypothesis that institutional investors play the information production role in their trading. For short sellers, the evidence in the existing literature implies that short sellers play an information production role in exploiting certain type of information while they play a manipulative role in exploiting other type of information. Desai, Ramesh, Thiagarajan and Balachandran (2002), and Christophe, Ferri and Hsieh (2010) show that short sellers trade in the same direction as the unfavorable news (e.g. downgrade and delisting) of the firm and earn significant abnormal returns. However, Henry and Koski (2010) show that short sellers manipulate the offering price around SEOs and profit from the manipulate trading. In this study, we investigate whether institutional investors and short sellers play a manipulative role or an information product role when they trade on the NSI effect.

The institutional holdings data used in our study is obtained from Thompson-Reuters 13F database. The 13F data is from the first quarter of 1980 to the second quarter of 2013 with quarterly observations. In addition, we obtain stock information (return, price, date, etc.) from the Center for Research in Security Prices (CRSP) Monthly Stocks File for NYSE, Amex, and Nasdaq stocks. We perform the analysis on institutional investors classified by the measure used in Bushee (2001). Institutional investors are classified into three categories: transient, quasi-index and dedicated institutions. Transient institutions are short-term investors who focus on maximizing the short-term profit. Quasi-indexers are the institutions who focus on long-term investment with diversified portfolio. Dedicated institutions are the long-term investors with concentrated portfolio. Our data on short interest is obtained from COMPUSTAT. The data on short interest is from the first quarter of 1980 to the second quarter of 2013 with quarterly observation.

To examine how institutional investor trade on net share issuance effect, we sort stocks according to net share issuance into deciles and we calculate the average changes in institutional ownership and the average changes in institutional investors' portfolio weight for each decile. Our results show that the negative relation between NSI and change in institutions documented in Edelen, Ince and Kadlece (2014) is driven by long-term investors, namely, quasi-indexer and dedicated institutions. Quasi-indexer and dedicated institutions trade in the opposite direction of the NSI effect. In addition, we find that short-term (transient) institutions are able to exploit the NSI effect and adjust holdings to take advantage of the NSI effect.

Further, our results show that changes of short-sale interest in stocks with the lowest NSI are significantly lower than the stocks with highest NSI, which indicates that short sellers take advantage of the NSI effect. We contribute to the existing studies by presenting evidence that short sellers are more sophisticated than institutional investors in terms of taking advantage of stock return anomalies.

Existing studies (Gompers and Metrick, 2001; Barnett, Sias and Stark, 2003) show that institutional demand is related to certain firm characteristics, we perform Fama-Macbeth regressions of changes in

institutional ownership and changes in short interest on NSI by controlling for firm characteristics. The results show that even after controlling for firm characteristics, there is still a significantly positive association between NSI and changes in institutional ownership for quasi-indexers and dedicated institutions. This finding further confirms that long-term institutions trade against the NSI effect. The results for transient institutions show an insignificant relation between NSI and changes in institutional ownership in quarter t+1 but the relation turns significantly negative in quarter t+2. Thus, short-term institutions exploit NSI effect starting from two quarters after NSI information is available. The positive relations between NSI and short interest are significant in both quarter t+1 and t+2. That is consistent with our earlier finding that short sellers exploit the NSI effect starting from one quarter after NSI information is available.

As noted earlier, institutions and short sellers may manipulate information in their trading. To address this question, we further examine the performance of trading for three types of institutional investors and short sellers. Our analysis is under the premise that if investors play a manipulative role, they may trade against the information but realize positive abnormal return. Our results show that transient institutions and short sellers earn subsequent significant positive abnormal returns in quarter t+1 and t+2. All the significant abnormal returns are from their trading on the short side of the anomaly. Given that transient institutions and short sellers trade on the NSI effect, our finding supports the hypothesis that short-term institutions and short sellers play an information production role. The results for quasi-indexers and dedicated institutions show that neither group earns significantly positive abnormal return. Thus, there is no evidence that long-term institutions play a manipulative role either.

To further investigate the effect of information environment on the role of information production or, information manipulation by institutional investors and short sellers, we use the introduction of Regulation of Fair Disclosure (Reg FD) as a natural experiment. The implementation of Regulation of Fair Disclosure in August 2000 prevents the equity issuer from disclosing any private information about issuance to any

certain group of investors and thus provides us different information environment in pre-Reg FD and post-Reg FD periods. According to the extensive literature (see, Heflin, Subramanyam and Zhang, 2003; Ke, Petroni and Yu, 2008; Li, Radhakrishnan, Shin and Zhang, 2011), Reg FD significantly reduces institutions' and short sellers' advantage on exploiting private information. Thus, in pre-Reg FD period, institutional investors and short sellers may have better access to private information about NSI. We argue that while receiving private NSI information from firms, institutional investors and short sellers may not trade against the firms by using any NSI information so that they can keep receiving private information in the future and maintain business relations with firms they invested in. In other words, better access to private information may deter institutional investors and short sellers from exploiting NSI information. In regard of this, we expect that institutional investors and short sellers would perform better in terms of exploiting public information in the post-Reg FD period, especially for dedicated institutions who are usually close to firm's management with "relationship investment". In the analysis, we separate our whole sample into two sub-samples: pre- and post- Reg FD periods and we compare the trade of institutional investors and short sellers in the two sub-periods. Our results show that in pre-Reg FD period, quasi-indexers institutions trade less in the opposite direction to the NSI effect, but still do not exploit the NSI effect. Further, we show that dedicated institutions consistently with the NSI effect in post-FD period. This finding is consistent with our hypothesis that certain institutions do better in exploiting public NSI information in post-Reg FD period. While dedicated institutions may ignore private information on purpose, we consider it as the potential agency problems in dedicated institutions. Moreover, for transient institutions, we find that they exploit the NSI effect for at least two years in pre-Reg FD period and exploit the NSI effect for only one quarter after NSI information is released in post-Reg FD period. Finally, our results show that short sellers trade public NSI information more aggressively in post-Reg FD period. Similar as dedicated institutions, this finding is evidence that short sellers play better role in exploiting public NSI information while they are lack of access

to private information. Thus, our results imply that short sellers may not use the NSI information intentionally and may have agency problems while they hold private NSI information.

Noting that short-term institutions and short sellers exploit the NSI effect and long-term institutions do not, we are interested in whether NSI drives trading of institutional investors and short sellers or trading of institutional investors and short sellers contributes to the NSI anomaly. We perform the Granger-Causality test to investigate the causality relation among stock returns, NSI, change in institutional ownership and change in relative short interest. Our results show that stock returns cause NSI but NSI does not inversely causes stocks. This finding is consistent with the rational explanation of the NSI effect proposed in Daniel and Titman (2006) and Li, Livdan and Zhang (2009) that firms issue stocks while marginal returns of current investment are high. This finding is also align with the behavioral explanation of the NSI anomaly in Loughran and Ritter (1995), Ikenberry, Lakonishok and Vermaelen (1995) and Daniel and Titman (2006) that managers tent to issue stocks while stocks are with high returns and overvalued and tent to buy back stocks while stocks are with low returns and undervalued. Further, we observe that stock returns cause change in institutional ownership while the opposite is not true. This result further confirms Badrinath and Wahal (2002)'s finding that institutions are momentum traders. Moreover, we find that institutional ownership causes NSI. Alti and Sulaeman (2012) argues that besides high stock returns, high institutional demand is another necessary condition for firms to trigger SEOs. However, we don't find evidence that NSI is a cause of change in institutional ownership. It supports Edelen, Ince and Kadlec (2014)'s argument that institutional investors in aggregate do not take advantage of the NSI effect. Final our results show that change in relative short interest could be caused by the trade of institutional investor, NSI or stock returns. Our further analysis on causality relationship between long-term institutions and short sellers, and between short-term institutions and short sellers also shows that both long-term and short-term institutional trading may cause trading of short sellers. Based on the finding, we conjecture that

short sellers may take advantage of trade of institutional investors in terms of exploiting the NSI effect. It motives us to further examine the trading on NSI information among different parties. We observe that when institutions buy stocks in NSI quarter, they buy together. Short sellers always trade in the opposite direction. On the other hand, if one of the three type of institutions sell stocks, the other types buy back the stocks. The last but not the least finding is that in two quarters after NSI information is released, if long-term institutions trade in the opposite direction to the NSI effect, transient institutions and short sellers always do the opposite trading. Thus, we provide evidence that short-term institutions and short sellers take advantage of trading of long-term institutions in a short-run in terms of exploiting the NSI effect.

The rest of the paper is structured as follows. We introduce the data and variable construction in our analysis in section II. In section III, we discuss our empirical results. Finally, we conclude our finding in this paper in section IV.

II. Data

The main data used in our study is the holding of institutional investors. According to the Securities and Exchange Act, all institutions with greater than $100 million of securities under discretionary management are required to file Form 13F and report their holdings to the Security and Exchange Commission (SEC). In this paper, we define "institutional investors" as the institutions that file Form 13F. We obtain the institutional holding data from Thompson-Reuters 13F Holding database. Thompson-Reuters 13F collects institutional holding information starting from 1980 on quarter basis. Thus, we extract quarterly institutional holdings starting in the first quarter of 1980 and ending in the second quarter of 2013.

Besides, we obtain stock information (return, price, date, etc.) from the Center for Research in Security Prices (CRSP) Monthly Stocks File for NYSE, Amex, and Nasdaq stocks. To ensure our data quality, we exclude observations with stock price lower than $5. For matching the quarterly institutional holding data, we convert the monthly data into quarterly data. This leaves us with 689,916 firm-quarter observations. As

explanatory variables in regressions, we use stock price (PRC), market capitalization (Size), momentum (MOM), book-to-market (B/M), idiosyncratic volatility (IVOL), shares turnover (TURN), relative short interest (RSI), institutional ownership (IO) and net share issuance (NSI). Stock price (PRC) is the stock price at the end of each quarter. Table 1 reports the summary statistics for our explanatory variables for selected years. Firm's market capitalization is calculated as firm's shares outstanding times the stock price. Momentum (MOM) is the cumulative return for the past 12 months at the end of each quarter. Book-to-Market ratio (BM) is the log term of the ratio book equity over market equity. The book equity is obtained from COMPUSTAT. Following Fama and French (1993), BM is calculated in the end of June of every year. Idiosyncratic volatility (IVOL) is defined as the quarterly standard deviation of daily stock return residuals from the Fama and French 3-factor model. Shares turnover (TURN) is the number of shares traded as reported on CRSP, divided by shares outstanding each month and averaged within each quarter. Number of shares traded for NASDAQ is adjusted by a factor of .5. Relative short insterest (RSI) is calculated as the number of shares held short as reported on COMPUSTAT, divided by the shares outstanding and averaged within the quarter. We calculate firm's institutional ownership (IO) as dividing the sum of all reported institutional holding shares by the firms' shares outstanding in the same quarter. Stocks are assumed to have zero institutional holding if they are reported in CRSP but not in 13F.

While the abnormal return is defined as the difference between the raw return and benchmark return, we use the benchmark portfolio returns proposed by Daniel, Grinblatt, Titman and Wermers (1997).

In Bushee (2001)'s data, institutions are classified into three categories, according to the characteristics of their trading: transient, quasi-indexer and dedicated. Transient institutions are defined as short-term investors who focus on maximizing the short-term profit. Quasi-indexers are the institutions who focus on long-term investment with diversified portfolio. Dedicated institutions are the long-term investors with concentrated portfolio. In the analysis on different institution types, we use such classification of institution

types in Bushee (2001). Data in Bushee (2001) starts from 1981. Thus, our sample period for this analysis is from January 1981 to June 2013.

Following the previous studies (see, e.g., Daniel and Titman 2006; Pontiff and Woodgate, 2008; Fama and French 2008), we define the NSI as the net change of the log term of shares outstanding over the past 12 months. Table 1 also reports the summary statistics of NSI for the selected years. We construct the measure of net share issuance at the end of each month t as

$$ISSUE = Ln\ (Adjusted\ Shares_t) - Ln\ (Adjusted\ Shares_{t-12})$$

,where we compute the real number of shares outstanding adjusted for splits and other shares distribution events as the product of *cumulative factor to adjust shares outstanding* and with the number of shares outstanding:

$$Adjusted\ Shares_t = Shares\ Outstanding_t * the\ cumulative\ factor\ to\ adjust\ shares\ outstanding$$

For matching our quarterly 13F data, we convert the monthly NSI into quarterly data by keeping the NSI in the last month of each quarter.

Table I reports summary statistics of firm characteristics for the last quarter of selected years: 1980, 1990, 2000, 2010 and 2012. For each quarter, we report the log term of firm size (SIZE), the log term of book-to-market ratio (B/M), momentum (MOM), idiosyncratic volatility (IVOL), stock price (PRC), shares turnover (TURN), relative short interest (RSI), net share issuance (NSI) and institutional ownership (IO). Some firm's characteristics see increases overtime in the cross-sectional mean. Firm size monotonically increases from 1980 to 2012. The average relative short interest also continue increasing from 1% in 1980 to 5.00% in 2012. The average institutional ownership significantly increases from 12% in 1980 to 61% in 2012. Other firm's characteristics also see variation overtime. For example, the mean of the log term of BM decreases from -0.20 in 1980 to -1.04 in 2000 then increases to -0.65 in 2012. Mean IVOL increases from 0.02 in 1980 to 0.04 in 2000, but it drops to 0.02 in 2012. This is consistent with Campbell, et.al (2001)'s

finding that firm-level volatility increases dramatically from 1980 to 1997. Mean net share issuance varies overtime. It increases from 3.00% in 1980 to 6.00% in 2000 and drops to 2.00% in 2012.

III. Main Empirical Analysis

A. The NSI Effect and Institutional Trading

The net share issuance (NSI) effect is documented in the existing literature, that is, cross-sectionally stocks with high NSI underperform stocks with low NSI (Daniel and Titman, 2006; Pontiff and Woodgate, 2008; and Fama and French, 2008a). We revisit the anomaly net share issuance. Table II reports the net share issuance effect. At the end of each quarter t (Qt), stocks are sorted into decile based on NSI. For each decile, we calculate the equal-weighted (Panel A) and value-weighted (Panel B) quarterly average abnormal returns for quarter t-3 (Qt-3) to t+4 (Qt+4) and the cumulative abnormal returns of each decile for year 2 ([Qt+5, Qt+8]). The high-low spreads are differences of the returns between the two extreme deciles. Our value-weighted result shows that in quarter t+1, t+2, t+3 and t+4, the high-low spreads are -2.15%, -2.47%, -2.57% and -2.40%, respectively. The negative and significant spreads indicate that stocks with highest NSI earn significant lower abnormal returns than stocks with lowest NSI. The high-low spread for year 2 shows that the portfolio with highest NSI on average earns 9.32% lower cumulative abnormal return than the portfolio with lowest NSI. Thus, our result provides evidence that the NSI effect is significant and persistent for at least two years. The equal-weighted result shows the same pattern as the value-weighted result. Jiang and Zhang (2013) shows the NSI effect on portfolio's both long and short side returns, and Drechsler and Drechsler (2014) shows that the NSI effect is robust across short-sale fees groups. In our value-weighted result, for quarter t+1 to t+4 and for year 2, the top decile earns significant higher abnormal returns than the median decile (D5). Thus, we provide evidence that the NSI effect is driven by both sides of the hedge portfolio and cannot be driven by the short-sale constrain on the short side of the portfolio. In regard of this,

our results support the findings in Jiang and Zhang (2013) and Drechsler and Drechsler (2014). Fama and French (2008b) shows that the NSI effect is robust across size groups. We further examine the robustness of the NSI effect across the size groups. Our result shown in the appendix table A1 suggests that the NSI effect is robust in all size groups. In appendix table A2, we report the coefficients of Fama-MacBeth regressions of future returns on net share issuance and other return-predictive variables. We find the significant negative relation between stock future returns and NSI both before and after we control the firm's characteristics. Thus, our results imply that NSI is a strong, persistent and robust predictor for cross-sectional future stock returns.

B. Trading based on Institutional Types

While the NSI effect is strong, persistent and robust, Edelen, Ince and Kadlec (2014) finds that the institutional investors in aggregate trade in the opposite direction of the NSI effect. We use a different method to analyze the institutional investors' trading on the net share issuance and also find the evidence that institutional investors as a whole trade against the NSI effect. Using the portfolios we constructed before, we calculate the equal-weighted and value-weighted quarterly average change in institutional ownership of each portfolio. Table B in appendix reports the result of the analysis. The high-low spread shows the difference in the change in institutional ownership between the short-leg (bottom) portfolio and log-leg (top) portfolios. If the institutional investors exploit the NSI effect, the change in the institutional ownership in the top portfolio should be greater than that in the bottom portfolio, and thus the high-low spread should be negative. The equal-weighted result (Panel A) shows that for quarter t+1 to t+4 and for year 2, the high-low spreads are all positive and significant. Similar to Edelen, Ince and Kadlec (2014), our results provide evidence that institutions in aggregate increase more holding on the stocks with high NSI than on the stocks with low NSI, namely, institutional invests trade in the opposite direction to the NSI effect. For value-weighted results (Panel B), we don't find strong evidence that institutions trade against

the NSI effect except for quarter t+1. Thus, institutional investors trade in opposite direction to NSI effect mainly in small firms. Moreover, we calculate the change in institutional investors' portfolio weight. Change in holdings is part of the causality of change in weight. The change in institutional investors' portfolio weight can be attributed to the change in institutional holdings, or to the change of stock prices, or both. The change in weight driven by the change in holdings could be considered as active change while the change in weight driven by the change in stock prices could be considered as passive change. Thus, analyzing on both change in investors' holdings and weight helps us identify whether institutional investors trade to adjust their portfolio weight based on NSI. Our result shows that institutions trade against the NSI effect in quarter t+1, t+2 and t+4. Overall, our finding is consistent with Edelen, Ince and Kadlec (2014) that institutional investors trade in the opposite direction of the NSI effect.

It's documented in the existing literature that short-term institutions are more sophisticated in terms of exploiting anomaly information (Bushee, 2001; Ali, Hwang and Trombley, 2000; Balsam, Bartov and Marquardt, 2002; Collins, Gong and Hribar, 2003; Lev and Nissim, 2006; Barone and Magilke, 2009; Yan and Zhang, 2009). Based on findings in previous research, we further analyzes whether short-term institutional investors exploit the NSI effect. Using the classification proposed in Bushee (2001), we classify institutional investors into three types: transient, quasi-indexers and dedicated institutions. Table III shows the analysis on the trading of three types of institutions. For each type of institutions, we calculate the equal-weighted and value-weighted quarterly average change in institutional ownership and also the change in institutional investors' weight across the NSI portfolios we constructed before. The high-low spread is the difference of the change in institutional ownership between bottom and top decile. Panel A, B and C show the result for quasi-indexers, dedicated and transient institutions, respectively. In Panel A, the equal-weighted average high-low spreads of quasi-indexers institutions drops from 0.63% in quarter t+1 to 0.18% in year 2. Even though the spreads drops overtime, they are all positive and significant for two years.

Therefore, quasi-indexers institutions increase significantly more holding on the stocks with highest NSI (short-leg) than on the stocks with lowest NSI (long-leg). The value-weighted results and the results for institutional investors' portfolio weights are similar to the equal-weighted result. Thus, our evidence shows that quasi-indexers institutions trade in the opposite direction of the NSI effect. Moreover, for quarter t+1 to year 2, the increase in the top decile is close to that in the median decile (D5) while the increase in the bottom decile is significantly greater. It indicates that the trading opposite to the NSI effect is mainly driven by buying the stocks on the short side and is not due to the transaction frictions such as transaction cost.

In Panel B, the equal-weighted result for dedicated institutions shows that from quarter t+1 to t+4, the high-low spreads are positive and significant. Thus, similar to quasi-indexers institutions, dedicated institutions trade against the NSI effect. However, the significance of the high-low spreads disappears in the value-weighted result. That means dedicated institutions trade in the opposite direction to the NSI effect only on small firms. The insignificant high-low spreads for the change in institutional investors' weight provide further evidence that dedicated institutions actively trade against the NSI effect. Given that quasi-indexers and dedicated institutions are both long-term institutions, we note that long-term institutions trade in the opposite direction to the NSI effect.

Panel C shows the result for the trading of transient institutions. The equal-weighted result shows that after quarter t, transient institutions switch their trading on the stocks with highest NSI (short side). From quarter t+1 to t+4, transient institutions decrease their holdings on the stocks with highest NSI. Meanwhile, transient institutions increase their holdings on the stocks with lowest NSI (long side). Thus, transient institutions trade accordingly to the NSI effect on both long-side and short-side of the hedge portfolio. The significant negative high-low spreads are driven both by buying on the long side and selling on the short side. From quarter t+1 to year 2, high-low spreads are all negative and significant. It indicate that the average change in transient institutions' holding on stocks with lowest NSI (long side) is significantly greater than

that on stocks with highest NSI (short side), and such trading lasts for at least two years. The result for value-weighted change in institutional ownership is similar except that the high-low spread for year 2 is not significant. Given that transient institutions are short-term investors, our results provide evidence that short-term institutional investors exploit the NSI effect.

C. Trading of Short-Sellers

The extant studies show that short sellers predict future stock returns correctly (Diether, Lee and Werner, 2009; Boehmer, Jones and Zhang, 2008; Karpoff and Lou, 2010; Christophe, Ferri and Angel, 2004; Boehmer, Jones and Zhang, 2008). On the other hand, some other work shows that short sellers have superior ability on processing information (Asquith, Pathak and Ritter, 2005; Engelberg, Reed and Ringgenberg, 2012; Boehmer and Wu, 2013). While short sellers are widely considered as sophisticated investors, we analyze whether short sellers exploit the NSI effect. Table IV shows short sellers' trading on the NSI effect. In Panel A, the equal-weighted results show that from quarter t+1 to t+4, short sellers decrease the short interest in the portfolio with lowest NSI and increase the short interest in the portfolio with highest NSI. Thus, the trading of short sellers is in the same direction to the NSI effect. The high/low spreads are positive and significant for quarter t+1, t+2 and t+3. The results imply that short sellers exploit the NSI effect in one quarter after the NSI information is released and lasts for the subsequent two quarters. In the value-weighted results, the high-low spreads are not significant from quarter t+1 to year 2. Thus, the short sellers take advantage of the NSI effect only on small firms. The insignificant high-low spreads of the change in short sellers' portfolio weight provide further evidence that short sellers actively trade on the NSI effect.

D. Fama-MacBeth Regression

Gompers and Metrick (2001), Barnett, Sias and Stark (2003) content that institutional demand is related to certain firm's characteristics. They show evidence that institutional investors prefer firms with large size

and high liquidity. Motivated by their discussion, we control firm's characteristics and investigate the relationship between the trading of institutional investors and NSI. Table V reports the coefficients of Fama-MacBeth regressions of changes in different types of institutions' ownership on the net share issuance and other firm's characteristics. The firm's characteristics are firm's size, book-to-market value, momentum, stock price, idiosyncratic volatility, shares turnover, lagged return and relative short interest. NSI is the net share issuance at the end of quarter t. All the control variables are one quarter lagged to the corresponding dependent variable. Panel A shows the result for quasi-indexers institutions. We find the significant positive correlation between NSI and the change in institutional ownership from quarter t-1 to t+2. The result is consistent with our earlier finding that quasi-indexers institutions trade in the opposite direction to the NSI effect. In addition, the results also show that quasi-indexers institutions trade on certain firm's characteristics. For example, quasi-indexers institutions prefer low book-to-market (growth) stocks. The significant positive coefficient of momentum implies that quasi-indexers institutions are momentum traders. IVOL is negatively related to quasi-indexers institutional demand overtime, which means quasi-indexers institutions tend to buy firms with low firm-level risk.

Panel B shows the result for dedicated institutions. After controlling the firm's characteristics, the relationship between NSI and the change in dedicated institutional ownership is significantly positive from quarter t-1 to t+2. The results are consistent with our previous finding that dedicated institutions trade against the NSI effect. Similar to quasi-indexers institutions, dedicated institutions tend to acquire growth stocks. Also dedicated institutions are momentum traders, and they are in favor of the stocks with low idiosyncratic risk.

Panel C shows the result for transient institutions. After controlling on the firm's characteristics, NSI is significantly related to the change in transient institutions' ownership in quarter t+2 while the correlation in quarter t+1 is insignificant. In quarter t+1, transient institutions trade on the information embedded in

firm's characteristics such as momentum, stock price, shares turnover and lagged returns but not on NSI information. Transient institutions show different preference on the stocks from quasi-indexers and dedicated institutions. For example, transient institutions tend to hold high book-to-market (value) stocks. While transient institutions trade against 12-month momentum, they strongly tend to buy the stocks that perform well in last quarter. Our finding provide further evidence to Bush (2001)'s argument that transient institutions trade for short-term profits.

Overall, our results for regressions confirm our previous finding that different types of institutions trade differently on the NSI effect. Specifically, long-term institutions trade against the NSI effect while short-term institutions trade accordingly.

Panel D shows the results for short sellers. In quarter t+1 and t+2, the coefficient between NSI and the change in short interest is significantly positive after controlling the firm's characteristics. This result is consistent with our previous finding that in quarter t+1 and t+2, short sellers trade in the same direction of the NSI effect. The short sellers also trade on other firm's characteristics. For instance, they are more likely to short the firms with high momentum and low institutional ownership.

E. Performance of Institutional Trading

In this section, we analyze the roles that different types of institutions and short sellers play in their trading. Gerad and Nanda (1993) introduce a model showing the potential manipulative role that the institutional investors may play around SEOs. In their setting of the model, the informed institutional investors sell their holding prior to SEOs, even though they have the favorable information about the firm. The selling drives down the equity offering price, and thus the informed institutions are able to obtain the SEO share allocations at a lower offering price and profit by selling the allocations subsequently. In contrast, Chemmanur and Jiao (2005) argue that institutions increase their holdings on stocks both before and after share offerings if they obtain the favorable information about the firm. Institutions engage in the information

production role if they consistently trade in the same direction of the information they obtain. While quasi-indexers and dedicated institutions trade in the different direction to the NSI effect, it's possible that they play a manipulative role if they have private information about the firms. If the quasi-indexers and dedicated institutions engage in the manipulation, we expect that they earn significantly positive abnormal returns by doing manipulation. Based on the above discussion, we examine the trading performance of different types of institutional investors and short sellers. Table VI shows the results. We use the NSI portfolios constructed before. In each panel, the "Top NSI Deciles" portfolio is long side portfolio consist of the stocks in the top two deciles with lowest NSI. The "Bottom NSI Deciles" portfolio is the short side portfolio consist of the stocks in the bottom three deciles with highest NSI. For each portfolio, from quarter t (Q_t) to year 2 ([Q_{t+5}, Q_{t+8}]), we respectively calculate the equal-weighted and value-weighted average abnormal returns of the stocks bought, hold and sold by different types of institutional investors and also the mean buy-sell spreads of returns. Panel A shows the result for quasi-indexers institutions. Both equal-weighted and value-weighted results do not show any significant positive spreads of abnormal returns across our analysis period. Instead, in the equal-weighted result, for the "Bottom NSI Deciles", we find significant negative spreads of returns -0.52% and -1.31% for quarter t+3 and year 2, respectively. Thus, quasi-indexers institutions do not generate significant positive abnormal returns from trading in contrast to the NSI effect. We reject the hypothesis that quasi-indexers institutions play a manipulative role in their trading. Further, the magnitudes and significances of the buy-sell spreads of returns are greater in the "Bottom NSI Deciles" than in the "Top NSI Deciles". This finding provides further evidence to our previous argument that the trading in the different direction to the NSI effect is mainly driven by the trading on the stocks on the short side. In the "Bottom NSI Deciles", quasi-indexers institutions sell the stocks with negative abnormal returns, however, they buy stocks with even worse performance. Thus, this is consistent with our previous argument that trading in the opposite direction to the NSI effect is not due to transaction frictions.

Panel B shows the results for dedicated institutions. From quarter t+1 to year 2, the buy-sell spreads of returns for the "Top NSI Deciles" are all insignificant, except for quarter t+2. For the "Bottom NSI Deciles", from quarter t+1 to year 2, there is not significant positive buy-sell spreads of abnormal returns in both equal-weighted and value-weighted results. Thus, we do not find clear evidence that dedicated institutions profit from their buy-sell strategy which is against the NSI effect. Accordingly, we reject the hypothesis that dedicated institutions play a manipulative role.

Panel C shows the results for transient institutions. The evidence for transient institutions are clearer. For the equal-weighted result, in the "Bottom NSI Deciles", the buy-sell spreads of abnormal returns are positive and significant for quarter t+1 and t+2. That means transient institutions earn significant positive abnormal returns on the short side stocks when their buy-sell strategy are consistent with the NSI effect. Considering transient institutions are short-term institutions, the significant negative spreads of abnormal returns for year 2 is probably because transient institutions realize their profit in year 2. All the buy-sell spreads for the "Top NSI Deciles" are insignificant. Therefore, transient institutions do not earn significant abnormal returns on the long side stocks. In the value-weighted results, on both long-side and short-side portfolios, we don't find any evidence that transient institutions earn significant abnormal returns after the NSI quarter. Thus, while their trading is consistent with the NSI effect, transient institutions generate significant abnormal returns by trading the small stocks on the short side. Our finding is consistent with the hypothesis that transient institutions play an information production role.

Panel D shows the performance of short sellers' trading. In this panel, we calculate the equal-weighted and value-weighted average abnormal returns of the stocks with increased, decreased and hold relative short interest positions and also the mean increase-decrease spreads of abnormal returns. For equal-weighted results, in the "Bottom NSI Deciles", the increase-decrease spreads of abnormal returns are significantly negative for quarter 5+1, t+2 and year 2. It's indicative that short sellers earn 0.80%, 0.96% and 1.88%

significant abnormal returns in quarter t+1, t+2 and year 2, respectively. However, for "Top NSI Deciles", we don't find clear evidence that short sellers earn significant abnormal returns on those portfolios. The value-weighted result is weaker. In the "Bottom NSI Deciles", the only significant negative spread is for quarter t+2. In the "Top NSI Deciles", there is no evidence that short sellers earn significant abnormal returns. Instead, we find a significant positive spread for quarter t+4, which indicates that short sellers earn significant negative abnormal return in that quarter. Similar to transient institutions, short sellers earn significant abnormal returns mainly on small stocks on the short side. Our finding is consistent with the hypothesis that short sellers play an information production role.

IV. Further Analysis

A. The Effect of Reg FD

Our previous finding shows that Long-term institutions do not exploit the NSI effect while short-term institutions do. In terms of information process, private information plays an important role on exploiting information. In this section, we investigate whether any private information about NSI is used in the trading of different types of institutions and short sellers. We use the introduction of Regulation of Fair Disclosure (Reg FD) as a natural experiment. Reg FD implemented in August 2000 prevents equity issuers from disclosing any private information about issuance to any certain group of investors. Namely, after Reg FD is implemented, institutions and short sellers do not access to private information about NSI. Reg FD provides us different settings of information environment.

In pre-Reg FD period, certain institutions and short sellers have better access to private information about NSI. However, even though they obtain the private information about NSI from the invested firms, there are two possible reasons for them not to exploit the private information. First, their invested firms who are the information providers will not continue providing them private information if they trade against

the firms by exploiting the private information. Second, they may lost the business relation with the invested firms and thus lost the business interest shared with the invested firms. The latter reason is more applied to dedicated institutions who usually play a "relationship investment" role and keep business relation with the invested firms. Even after NSI information is released, the benefit of obtaining privation information would deter institutional investors and short sellers from exploiting public NSI information. While institutions and short sellers do not exploit NSI information on purpose, it's related to the agency problems in institutions and short sellers.

On the other hand, in post-Reg FD period, it is less likely that institutional investors and short sellers can obtain private information about NSI from the invested firms. Thus, certain institutions and short sellers may play a better role on exploiting public NSI information.

Based on the above discussion, we examine the institutional investors' and short sellers' trading before and after the implement of Regulation of Fair Disclosure (Reg FD). We separate our data into two subsamples, pre-Reg FD period and post-Reg FD period. In each sub-period, we use the portfolio we constructed before and for each types of institutional investors, we calculate the equal-weighted (EW) and value-weighted (VW) average change in institutional ownership and average change in institutional portfolio weight. In addition, we calculate the EW and VW average change in relative short interest and average change in short sellers' portfolio weight. Table VII shows the high-low spreads of the change in institutional ownership, institutional portfolio weight, relative short interest and short sellers' portfolio weight between the bottom and top deciles.

Panel A shows the result for quasi-indexers institutions. In both pre- and post- Reg FD periods, the high-low spreads are all positive and significant overtime. It's indicative that quasi-indexers institutions trade against the NSI effect in both pre- and post- Reg FD periods. For equal-weighted result, the magnitude and the significance of the high-low spreads for pre-Reg FD period are clearly lower than that for post-Reg FD

period. It implies that quasi-indexers institutions trade less in the opposite direction to the NSI effect while they have more access to private information about NSI. However, even quasi-indexers institutions have private information about NSI, they do not take advantage of it and still trade against the NSI effect. Value-weighted result and the result for the change in institutional portfolio weight show the similar but weaker pattern of equal-weighted result.

Panel B shows the result for dedicated institutions. For value-weighted result, in pre-Reg FD period, the high-low spreads for quarter t+1, t+4 and year 2 are positive and significant. While compare to the result for the whole sample period in Panel C of Table III, the results for pre-Reg FD period are even stronger. Thus, our results show that dedicated institutions ignore NSI information more when they have better access to private information. Further, in post-Reg FD period, the trading of dedicated institutions shift after quarter t. For quarter t+1 to t+2, we find negative high-low spreads. Even though the high-low spreads are not significant, our results indicate that dedicated institutions turn to trade accordingly to the NSI effect after quarter t from significantly trading against the NSI effect in the previous quarters. Moreover, for year 2, dedicated institutions trade significantly in the same direction of the NSI effect. Our results provide evidence that after NSI information becomes public, dedicated institutions perform even better when they are lack of access to private information. Since dedicated institutions usually have business relation with their invested firms, they are more possible to obtain private information from their invested firms in the pre-Reg FD period. For maintaining the benefit of getting private information, dedicated institutions have few incentive to trade against the firms who provide them private information by trading along the NSI effect before and after the NSI quarter. Thus, the benefit of receiving private information deters dedicated institutions from exploiting NSI information. This finding is consistent with our hypothesis that certain institutions play a better role on exploiting public NSI information in the post-Reg FD period. Also, our results provide further evidence that there is potential agency problems in dedicated institutions. The equal-

weighted result and the result for the change in dedicated institutional portfolio weight are weaker and do not show clear evidence.

Panel C shows the results for transient institutions. For equal-weighted result, from quarter t+1 to year 2, the high-low spreads for pre-Reg FD period are all significantly negative. For post-Reg FD period, only high-low spreads for quarter t+1 and t+2 are significantly negative. Our result indicates that while transient institutions have better access to private information about NSI, they exploit the NSI effect for at least two years. On the other hand, while transient institutions are lack of access to private information about NSI, they tend to exploit public NSI information in a relatively short term. Value-weighted result is similar. In post-Reg FD period, transient institutions significantly exploit NSI public information for quarter t+1, but in pre-Reg FD, transient institutions continue trading accordingly to the NSI effect for at least two years.

Panel D shows the results for short sellers. For value-weighed result, from quarter t-3 to t, in pre-Reg FD period while all the high-low spreads are negative, the spreads for quarter t-1 and t are significantly negative. Thus, while short sellers have better access to the private information about NSI, they do not adjust their trading according to the information in the quarters prior to the NSI quarter. In contrast, in the post-Reg FD period, high-low spreads are all positive from quarter t-3 to t and significant for quarter t-3, t-1 and t. Thus, in the quarters prior to the NSI quarter, trading of short sellers is consistent with the NSI effect even while they have less access to the private NSI information. For quarter t+1 to t+3, in pre-Reg FD period, only the high-low spread for quarter t+3 is positive and significant, but in post-Reg FD period, high-low spreads from quarter t+1 to t+3 are all significantly positive. Thus, our results provides evidence that with better access to private information, short sellers use NSI information less aggressively, in contrast, short sellers exploit public NSI information better when they have less access to private NSI information. This finding is consistent with our hypothesis that in post-Reg FD period, short sellers play a better role on exploiting public NSI information and receiving private information about NSI reduce short sellers'

incentive to exploit the NSI effect. Thus, our finding also imply the potential agency problems in short sellers.

B. Granger-Causality

While our finding indicates that certain types of institutions and short sellers exploit the NSI effect, it's important to know whether NSI drives the trading of institutional investors and short sellers or the trading of institutional investors and short sellers contributes to the NSI anomaly. Thus, we perform a Granger-Causality analysis to investigate the causality relation among stock returns, NSI, change in institutional ownership and change in relative short interest.

Table VIII shows the results for the Granger-Causality analysis. Horizontal variables are causal variables and the vertical variables are result variables. The null hypothesis is variable A is not the causality of variable B. In Panel A, we use the change in institutional ownership of all institutions. The *SSE* used in calculating statistics of Granger-Causality test is obtained from the vector auto-regressions shown in the appendix table C. We use the 1% significance level as the threshold to reject causality hypothesis.

According to literature about the rational and behavioral explanations of the NSI anomaly, NSI may cause the move of future stock returns, or the current stock returns may cause the future NSI. For rational explanations, Daniel and Titman (2006) state that low discount rate of current investment encourage managers to do more investment funded by issuing equity. Thus, current returns may trigger equity issuance. Daniel and Titman (2006) also content that exercising firm's real option funded by issuing equity will reduce firm's uncertainty and lower expected stock returns. Moreover, Li, Livdan and Zhang (2009) propose that the new investments funded by issuing equity reduce firm's marginal product of capital, and thus cause the drop of expected stock returns. In regard of this, NSI may cause future stock returns. On the other hand, for behavioral explanation, Loughran and Ritter (1995), Ikenberry, Lakonishok and Vermaelen (1995) and Daniel and Titman (2006) argue that managers tend to issue stocks while stocks are overpriced

and tend to repurchase stocks while stocks are underpriced. Equity issuance and repurchase convey the information about stock pricing to market and the adjustment on the price drives the negative relationship between NSI and future stock returns. Thus, following behavioral explanations, both causality relations are possible. Our results show that stock returns cause NSI but NSI hardly causes stock returns. The finding fits part of the discussions in existing literature.

Our results also show that stock returns cause change in institutional ownership while the opposite is not true. This is the evidence that institutional investors are momentum traders. Our results confirm Badrinath and Wahal (2002)'s finding that institutions adjust their ongoing holding according to momentum.

We further find that change in institutional ownership causes NSI. This finding confirms Alti and Sulaeman (2012)'s argument that SEOs follow periods of high stocks returns only when institutional investor demand is strong. Our results reject the hypothesis that NSI causes change in institutional ownership. It further confirms Edelen, Ince and Kadlec (2014)'s finding that institutional investors in aggregate do not take advantage of the NSI effect.

Our results show that change in institutional ownership, stock returns and NSI are all cause of change in relative short interest. This finding throws out the question that while short sellers trade to exploit the NSI effect, do they trade because they want to take advantage of the trading of institutional investors, or do they trade on stock returns as momentum traders, or even do they just trade on the information about NSI? For addressing this question, in the next section, we investigate the trading among different types of institutions and short sellers.

In Panel B, we use the change in institutional ownership of long-term institutions to do Granger-Causality test. Long-term institutions are quasi-indexers and dedicated institutions. The results show that for long-term institutions, stock returns cause the change in institutional ownership while the other way around is also true. Thus, long-term institutions are momentum trades. Meanwhile, their trading contributes

to the future stock returns. For the causality relation between trading of institutions and NSI, we still find that institutional demand causes NSI but NSI does not cause change in institutional ownership. For the causality between trading of long-term institutions and short sellers, we find evidence that they are the cause to each other.

In Panel C, we examine causality relation among change in short-term institutional ownership, stock returns, NSI and change in relative short interest. Our results show that short-term institutional trading causes stock returns while stock returns do not cause change in institutional ownership. Further, change in relative short interest does not cause change in institutional ownership while change in institutional ownership is the cause of the trading of short sellers.

Our results consistently show that trading of institutional investors could cause the trading of short sellers. Regarding that short sellers exploit the NSI effect while institutions in aggregate do not, we conjecture that short sellers may take advantage of the trading of certain institutions in terms of exploiting the NSI effect. It motivates us to investigate the trading among different types of institutions and short sellers.

C. Trading among Institutions and Short Sellers

In this section, we examine the trading among different types of institutions and short sellers to investigate whether short sellers take advantage of institutions' trading in terms of exploiting NSI effect. Table IX reports the result for the analysis. Each panel presents one party's average trading (bought or sold) of the stocks and the other parties' trading on the same stocks. For example, for the block "Stock with Positive NSI" in Panel A, Row "B" presents the trading of quasi-indexers institutions on the stocks bought in quarter t. For the same group of stocks, we calculate the change in dedicated and transient institutional ownership from quarter t-3 to year 2.

First of all, we observe different patterns of trading among three types of institutions and short sellers. In Panel A, the result for stocks bought or sold by quasi-indexers institutions in quarter t. The first block shows the results for stocks with positive NSI. For the stocks bought in quarter t, there is a net buying in following quarters. Similarly, for the stocks sold in quarter t, there is a gradual net buying in following quarters. The second block shows the results for stocks with negative NSI bought or sold by quasi-indexers institutions in quarter t. In quarter t+1, there is a net selling for those stock bought in quarter t. In other quarters, quasi-indexers consistently buy the stocks. Panel B shows the result for stocks bought or sold by dedicated institutions in quarter t. The first block shows the results for stocks with positive NSI. For stocks bought by the dedicated institutions in quarter t, there is a net buying in the next two quarters. Afterwards, from quarter t+3 to year 2, dedicated institutions unload the stocks. For stocks sold in quarter t, there is virtually no trading in the following two quarters followed by a net buying from quarter t+3 to year 2. The second block shows the result for stocks with negative NSI. For stocks bought in quarter t, dedicated institutions buy the stocks in quarter t+1, then shift the trading from quarter t+2 and gradually sell the stocks until year 2. For stocks sold in quarter t, there is a consistent selling in following three quarters. Panel C shows the result for stocks bought or sold by transient institutions in quarter t. The first block shows the result for stocks with positive NSI. For stocks bought in quarter t, transient institutions have almost no trading in quarter t and have gradual selling in following quarters. For stocks sold in quarter t, there is a selling in quarter t+1 and then gradual buying follows. The second block shows the result for stocks with negative NSI. For stocks bought in quarter t, there is consistent buying from quarter t+1 to year 2. The trading is same for stocks sold in quarter t. Panel D shows the result for stocks with increased or decreased short interest. The first block shows the result for stocks with positive NSI. Stocks with increased short interest in quarter t have consistent reduce in short interest in future quarters. On the other hand, stocks that experience decreased short interest in quarter t continue unloading short positions in the next quarter, then

short interest increases gradually. The second block shows the result for stocks with negative NSI. The trading pattern for stocks with negative NSI is the same as that for stocks with positive NSI.

Second, we observe that in quarter t, all three types of institutions tend to buy stocks together while short sellers always trade in the opposite direction. On the other hand, in quarter t, when quasi-indexers, dedicated or transient institution unload shares, the other two types of institutions are buying. Short sellers trade in the opposite direction to the institutions who are selling.

Third, in quarter t+1 or quarter t+2 or both, if long-term institutions trade in the opposite direction to the NSI effect, transient institutions and short sellers always do the opposite trading. For example, in panel A, for quarter t+1, while quasi-indexers and dedicated institutions buy stocks with positive NSI, transient institutions decrease their holding on the same stocks. While quasi-indexers and dedicated institutions sell stocks with negative NSI, transient institutions are buy the same stocks. Further, short sellers also always trade in the opposite direction to long-term institutions and thus in the same direction to the NSI effect. This finding is consistent with our previous finding that long-term institutions do not exploit the NSI effect while short-term institutions and short sellers can exploit in short-term. Thus, our results provide evidence that transient instructions and short sellers take advantage of trading of long-term institutional investors in short-term when long-term institutional investors do not exploit the NSI effect.

V. Conclusion

Edelen, Ince and Kadlece (2014) document that institutional investors in aggregate do not exploit the NSI anomaly. By classifying the institutional investors into three categories, quasi-indexers, and dedicated institutions, our study shows that the empirical result shown by Edelen, Ince and Kadlece (2014) is driven by quasi-indexers and dedicated institutions who are defined as long-term institutions. We show short-term institutions trade accordingly to the NSI information and exploit the NSI effect, while long-term institutions

trade in the opposite direction of NSI trading strategy. Our finding contributes to the recent comprehensive literature by showing that sophistication and investment horizon play a role in exploiting anomaly information. Also, we support Yan and Zhang (2009)'s argument that short-term institutions are more sophisticated than long-term institutions. Moreover, our study shows that short sellers exploit the NSI effect. In regard of this, our finding support the hypothesis that short sellers are sophisticated. We also investigate the roles that different types of institutional investors and short sellers play in their trading on NSI information. Transient and short sellers play an information production role by trading consistently with NSI trading strategy and earn subsequent significant abnormal return. Long-term institutions play neither an information production role nor manipulative role by their trading. We also investigate whether private information about NSI is used in the trade of institutional investors and short sellers. We find that dedicated institutions and short sellers do a better job in exploiting public information even when they are lack of access to private information. Thus, we provide evidence that dedicated institutions and short sellers ignore private information intentionally and there are potential agency problems when they obtain private NSI information. Finally, our study show that short sellers take the advantage of long-term institutional investors on the short side of the NSI effect.

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Appendix

A: Robustness Checks of Net Share Issuance Effect

Table A1: High/Low Spread of Average Return across NSI Quintiles: Size Subsamples

Table A1 reports the net share issuance effect in different size groups. At the end of each quarter t from January 1980 to June 2013, stocks are ranked by market capitalization (SIZE) as of quarter t-1. Stocks are sorted into five groups by Size, using quintile breakpoints. Each Size group are then subsequently sorted into deciles based on net share issuance (NSI) at the end of quarter t. The table presents the mean of return spreads between bottom and top deciles for each size group over quarter t-3 (Q_{t-3}) to t+4 (Q_{t+4}) and the period from quarter t+5 to t+8 [Q_{t+5},Q_{t+8}].

	Size 1	**Size 2**	**Size 3**	**Size 4**	**Size 5**
$\mathbf{Q_{t-3}}$	-5.91**	-8.40**	-10.08**	-8.68**	-5.33**
	(-9.28)	(-9.06)	(-9.63)	(-8.36)	(-5.90)
$\mathbf{Q_{t-2}}$	-4.79**	-6.78**	-7.82**	-6.90**	-4.20**
	(-7.88)	(-7.30)	(-7.87)	(-6.51)	(-5.09)
$\mathbf{Q_{t-1}}$	-3.61**	-4.22**	-4.31**	-4.74**	-2.87**
	(-4.98)	(-4.42)	(-4.66)	(-5.58)	(-3.98)
$\mathbf{Q_{t}}$	0.25	0.83	1.05	0.91	0.87
	(0.42)	(1.22)	(1.53)	(1.48)	(1.34)
$\mathbf{Q_{t+1}}$	1.76**	2.53**	2.12**	1.91**	1.46*
	(3.12)	(3.81)	(3.43)	(3.05)	(2.38)
$\mathbf{Q_{t+2}}$	2.44**	2.92**	2.35**	1.80**	1.71**
	(4.39)	(5.01)	(4.00)	(3.17)	(2.94)
$\mathbf{Q_{t+3}}$	2.23**	2.70**	1.95**	1.81**	1.46**
	(4.17)	(4.77)	(3.55)	(3.48)	(2.98)
$\mathbf{Q_{t+4}}$	2.26**	2.34**	1.87**	1.35**	1.34**
	(4.28)	(4.23)	(3.67)	(2.65)	(3.02)
$\mathbf{[Q_{t+5}, Q_{t+8}]}$	3.63*	6.55**	4.70**	3.30**	2.82*
	(2.51)	(4.07)	(3.86)	(2.90)	(2.33)

Table A2: Fama-MacBeth Regressions of Future Returns on NSI

Table A2 reports the coefficients from Fama-MacBeth regressions of future returns on net share issuance and other return-predictive variables. The dependent variables are the quarterly raw returns for quarter t+1 (Q_{t+1}) to t+4 (Q_{t+4}) and the cumulative future return for the period from quarter t+5 to t+8 [Q_{t+5}, Q_{t+8}], respectively. In univariate regressions, the independent variable is NSI. The control variables in multivariate regressions are change of institutional ownership in quarter t-1 (ΔIO_lag1), market capitalization (Size), book-to-market ratio (BM), momentum (MOM), stock price (PRC), idiosyncratic volatility (IVOL), shares turnover (TURN) and relative short interest (RSI). Size, BM, MOM, PRC, IVOL, TURN and RSI are constructed in quarter t.

	RET (Q_{t+1})		**RET (Q_{t+2})**		**RET (Q_{t+3})**		**RET (Q_{t+4})**		**RET [Q_{t+5}, Q_{t+8}]**	
NSI	-5.26**	-4.48**	-5.93**	-4.48**	-5.76**	-4.48**	-5.01**	-3.91**	-13.82**	-11.38**
	(-5.26)	(-8.14)	(-6.06)	(-7.60)	(-6.21)	(-7.77)	(-5.62)	(-7.13)	(-6.55)	(-7.92)
ΔIO_lag1		0.86		0.74		1.88		-2.24**		-0.78
		(0.81)		(0.85)		(1.81)		(-2.59)		(-0.39)
ln(SIZE)		-0.07		-0.01		-0.02		0.04		-0.12
		(-0.84)		(-0.12)		(-0.21)		(0.46)		(-0.54)
ln(B/M)		0.75**		0.71**		0.62**		0.60**		1.81**
		-3.83		-3.92		-3.34		-3.13		-3.14
MOM		1.30*		0.22		-0.38		-0.45		-2.45**
		(2.55)		(0.46)		(-1.12)		(-1.85)		(-3.61)
PRC		0.00		0.00		0.00		0.00		0.00
		(-0.22)		(0.50)		(0.80)		(0.29)		(-0.17)
IVOL		-23.65		-8.90		2.97		9.90		92.62
		(-1.39)		(-0.54)		(0.18)		(0.52)		(1.85)
TURN		-3.84		-8.59**		-7.05**		-6.33**		-13.39**
		(-1.64)		(-3.71)		(-3.36)		(-2.98)		(-2.63)
RSI		4.36*		6.81**		7.49**		7.78**		34.78**
		(2.45)		(4.13)		(4.40)		(4.70)		(8.32)
Intercept	3.85**	5.25**	3.88**	4.32**	3.88**	4.22**	3.91**	3.53*	16.33**	16.36**
	(3.95)	(3.39)	(4.37)	(2.75)	(4.30)	(2.74)	(4.27)	(2.27)	(7.59)	(3.95)
Adj R2	0.50%	5.23%	0.49%	4.87%	0.46%	4.34%	0.40%	4.15%	0.39%	4.45%
# of Obs	3620	2598	3564	2560	3506	2523	3446	2482	3197	2317

B: NSI Effect and Institutional Trading – Full Sample Results

Table B: Average Changes in Institutions across NSI Deciles

This table reports the quarterly average change in institutions of the stocks across the NSI deciles. At the end of quarter t (Q_t), stocks are sorted into deciles based on the net share issuance at the end of quarter t. Panel A and Panel B reports the equal-weighted and value-weighted average change in institutional ownership (ΔIO) for quarter t-3 (Q_{t-3}) to t+4 (Q_{t+4}) and the cumulative change in institutional ownership for period from quarter t+5 to quarter t+8 [Q_{t+5}, Q_{t+8}]. Panel C presents the quarterly average change in institutions' portfolio weight and the cumulative change in institutions' portfolio weight (ΔIW) for the same period. In each panel, the average spread between bottom and top deciles are reported. The t-statistics reported in parentheses are adjusted using Newey-West correction for heteroskedasticity and serial correlation. The numbers are reported in percentage term per quarter. The last row in each panel is the average number of stocks in each decile portfolio.

Panel A: Equal-Weighted Average Change in Firms' Institutional Ownership (ΔIO)

NSI	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	[Q_{t+5}, Q_{t+8}]
Low	1.10	1.02	1.08	1.21	0.07	0.31	0.35	0.36	0.45
2	0.86	0.81	0.74	0.73	0.15	0.30	0.27	0.32	0.35
3	0.87	0.79	0.84	0.74	0.12	0.25	0.26	0.24	0.31
4	0.97	1.02	0.98	0.77	0.13	0.31	0.34	0.35	0.35
5	1.13	1.03	0.96	0.82	0.14	0.30	0.36	0.34	0.36
6	1.26	1.19	1.04	0.88	0.16	0.39	0.45	0.47	0.53
7	1.36	1.31	1.26	1.04	0.27	0.43	0.47	0.55	0.61
8	1.52	1.53	1.53	1.46	0.26	0.45	0.46	0.51	0.69
9	1.95	2.02	1.91	1.62	0.38	0.55	0.54	0.45	0.68
High	2.66	2.84	2.81	2.26	0.62	0.60	0.51	0.54	0.62
High-Low	1.56**	1.82**	1.73**	1.05**	0.55**	0.29**	0.16*	0.18**	0.17*
	(10.93)	(11.38)	(11.10)	(7.37)	(8.85)	(5.04)	(2.44)	(2.73)	(2.54)
N	329	340	350	362	352	344	335	327	321

Panel B: Value-Weighted Average Change in Firms' Institutional Ownership (ΔIO)

NSI	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Low	0.61	0.22	0.27	0.37	0.18	0.09	0.16	0.06	0.08
2	0.50	0.08	0.05	0.10	0.23	0.06	0.09	0.12	0.11
3	0.57	0.19	0.13	0.08	0.20	0.20	0.11	0.11	0.02
4	0.66	0.23	0.15	0.15	0.21	0.06	0.06	0.09	0.10
5	0.75	0.21	0.20	0.05	0.08	0.12	0.08	0.07	0.09
6	1.02	0.32	0.28	0.03	0.21	0.12	0.16	0.16	0.22
7	0.98	0.24	0.16	0.09	0.15	0.08	-0.01	0.03	0.14
8	1.05	0.29	0.17	0.00	0.22	0.10	0.09	0.04	0.19
9	1.23	0.34	0.23	-0.15	0.17	-0.01	0.03	0.00	0.17
High	2.37	1.18	0.92	0.32	0.50	0.22	0.15	0.16	0.17
High-Low	1.76**	0.96**	0.64**	-0.05	0.32**	0.13	-0.02	0.10	0.09
	(6.82)	(4.97)	(4.35)	(-0.39)	(3.08)	(1.37)	(-0.14)	(0.96)	(1.01)
N	329	340	350	362	352	344	335	327	321

Panel C: Average Change in Institutions' Portfolio Weight (ΔIW)

NSI	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Low	-0.28	-0.23	-0.16	-0.10	-0.16	-0.14	-0.15	-0.14	-0.32
2	-0.15	-0.20	-0.13	-0.12	-0.17	-0.13	-0.08	-0.12	-0.36
3	-0.06	-0.01	-0.06	0.02	-0.10	-0.09	-0.09	-0.09	-0.32
4	-0.05	0.00	0.02	-0.03	-0.09	-0.07	-0.07	-0.09	-0.24
5	0.05	0.05	0.04	0.00	-0.11	-0.03	-0.06	0.00	-0.21
6	0.10	0.10	0.07	0.03	-0.03	-0.01	0.02	0.05	-0.04
7	0.18	0.20	0.15	0.06	-0.05	0.02	0.02	-0.01	-0.01
8	0.29	0.22	0.18	0.11	-0.12	-0.04	-0.02	-0.04	-0.07
9	0.35	0.34	0.30	0.22	-0.05	-0.02	-0.04	-0.05	-0.20
High	0.51	0.52	0.55	0.47	0.00	-0.01	-0.05	-0.04	-0.14
High-Low	0.79**	0.75**	0.70**	0.57**	0.16**	0.13*	0.09	0.10*	0.18
	(10.98)	(10.09)	(9.49)	(9.41)	(3.13)	(2.43)	(1.76)	(2.14)	(1.48)

C: Granger-Causality Analysis

Table C: Vector Auto-Regressions of Stock Returns, Change of Institutional Ownership, Net Share Issuance and Change of Relative Short Interest

This table reports the estimation results of the vector auto-regressions (VAR) of stock returns (RET), change in institutional ownership (ΔIO), net share issuance (NSI) and change in relative short interest (ΔRSI). Model 1 includes only lagged term of each variable, while Model 2 includes contemporaneous term of each variable. Regressions are based on quarterly observations of each variable as well as the lagged terms. The t-statistics reported in parentheses are adjusted using Newey-West (1987) correction for heteroskedasticity and serial correlation.

	Model 1				**Model 2**			
	RET	ΔIO	NSI	ΔRSI	RET	ΔIO	NSI	ΔRSI
RET_t						1.94	0.49	0.03
						(12.02)	(5.95)	(0.71)
RET_lag1	1.90	0.85	0.77	-0.19	1.23	0.89	0.96	-0.22
	(1.90)	(7.17)	(7.4)	(-3.38)	(1.29)	(7.67)	(9.17)	(-3.83)
RET_lag2	2.70	0.52	0.76	-0.03	2.41	0.52	0.85	-0.04
	(2.88)	(6.33)	(8.56)	(-0.71)	(2.72)	(6.4)	(9.90)	(-0.77)
RET_lag3	2.94	0.44	0.9	0.05	2.78	0.4	0.95	0.05
	(3.43)	(4.99)	(9.74)	(1.06)	(3.32)	(4.52)	(10.48)	(0.97)
RET_lag4	1.55	-0.05	0.49	0.02	1.58	-0.03	0.55	0.01
	(2.22)	(-0.57)	(5.65)	(0.50)	(2.31)	(-0.40)	(6.42)	(0.36)
RET_lag5	-0.65	-0.01	0.08	0.04	-0.66	0.02	0.11	0.04
	(-1.02)	(-0.14)	(1.03)	(1.29)	(-1.03)	(0.20)	(1.36)	(1.18)
RET_lag6	-1.21	-0.09	0.29	0.06	-1.17	-0.07	0.32	0.06
	(-1.99)	(-1.10)	(3.86)	(1.11)	(-1.96)	(-0.94)	(4.14)	(1.14)
RET_lag7	0.34	0.01	0.31	0.08	0.3	0.00	0.35	0.08
	(0.74)	(0.10)	(3.81)	(1.21)	(0.66)	(0.06)	(4.16)	(1.17)
RET_lag8	1.78	0.18	0.1	0.04	1.79	0.16	0.09	0.02
	(3.53)	(2.47)	(1.29)	(0.73)	(3.63)	(2.22)	(1.20)	(0.50)
RET_lag9	-0.99	0.1	0.00	0.05	-1.01	0.13	0.01	0.05
	(-1.66)	(1.32)	(0.07)	(1.31)	(-1.72)	(1.82)	(0.09)	(1.14)

	Model 1				Model 2			
	RET	ΔIO	NSI	ΔRSI	RET	ΔIO	NSI	ΔRSI
(continued)								
ΔIO_t					30.33		-3.7	2.35
					(10.37)		(-3.65)	(11.99)
ΔIO_lag1	-4.5	-10.03	7.59	1.51	-1.23	-10.26	7.48	1.81
	(-4.27)	(-12.05)	(16.01)	(6.54)	(-1.05)	(-12.64)	(15.94)	(7.44)
ΔIO_lag2	-1.51	-1.96	3.52	0.10	-1.14	-1.79	3.44	0.17
	(-1.35)	(-4.12)	(8.57)	(0.67)	(-1.09)	(-3.83)	(8.38)	(1.08)
ΔIO_lag3	-2.61	-2.55	1.41	0.15	-1.84	-2.42	1.32	0.18
	(-2.55)	(-5.56)	(4.69)	(0.86)	(-1.90)	(-5.32)	(4.29)	(1.07)
ΔIO_lag4	-1.57	-1.49	4.05	0.12	-1.36	-1.29	4.07	0.16
	(-1.50)	(-3.65)	(7.57)	(0.71)	(-1.30)	(-3.15)	(7.51)	(0.94)
ΔIO_lag5	-1.16	-2.53	-1.27	0.02	-0.66	-2.52	-1.34	0.00
	(-0.94)	(-5.45)	(-3.61)	(0.09)	(-0.53)	(-5.52)	(-3.83)	(0.01)
ΔIO_lag6	1.7	-2.33	-0.26	-0.03	2.44	-2.37	-0.38	0.01
	(1.48)	(-6.09)	(-0.82)	(-0.18)	(2.10)	(-6.25)	(-1.15)	(0.07)
ΔIO_lag7	2.43	-1.92	-0.35	0.1	2.65	-1.95	-0.41	0.11
	(2.27)	(-4.82)	(-1.10)	(0.62)	(2.50)	(-5.04)	(-1.28)	(0.65)
ΔIO_lag8	-0.02	-1.54	3.02	0.09	0.28	-1.41	2.93	0.18
	(-0.02)	(-4.14)	(6.86)	(0.57)	(0.27)	(-3.86)	(6.77)	(1.12)
ΔIO_lag9	-1.13	-1.45	-1.16	0.06	-0.57	-1.46	-1.27	0.08
	(-1.15)	(-5.04)	(-4.57)	(0.55)	(-0.61)	(-5.20)	(-4.96)	(0.65)
NSI_t					5.17	-0.37		-1.91
					(6.26)	(-0.52)		(-8.37)
NSI_lag1	-1.69	2.08	89.91	0.17	-7.45	2.36	89.91	1.86
	(-2.12)	(7.65)	(181.33)	(1.44)	(-7.53)	(3.58)	(181.9)	(8.23)
NSI_lag2	-1.01	-0.86	1.67	-0.21	-0.09	-0.83	1.66	-0.15
	(-1.13)	(-2.74)	(3.05)	(-1.59)	(-0.09)	(-2.63)	(3.05)	(-1.05)
NSI_lag3	-1.14	-0.23	0.84	0.07	-1.29	-0.22	0.81	0.1
	(-1.27)	(-0.78)	(1.77)	(0.54)	(-1.40)	(-0.75)	(1.72)	(0.76)
NSI_lag4	0.42	-0.01	-61.04	-0.01	3.69	-0.28	-60.87	-1.22
	(0.54)	(-0.05)	(-70.07)	(-0.10)	(4.07)	(-0.57)	(-70.53)	(-6.22)
NSI_lag5	-1.63	1.03	52.91	-0.07	-5.11	1.33	52.76	0.93
	(-1.99)	(4.29)	(57.38)	(-0.70)	(-5.53)	(3.21)	(57.81)	(5.91)
NSI_lag6	-0.88	0.00	0.82	-0.23	-0.5	0.06	0.7	-0.21
	(-1.17)	(0.01)	(2.03)	(-2.04)	(-0.67)	(0.27)	(1.72)	(-1.85)
NSI_lag7	-0.43	-0.56	0.61	0.12	-0.53	-0.56	0.65	0.15
	(-0.60)	(-2.39)	(1.46)	(1.03)	(-0.75)	(-2.36)	(1.52)	(1.30)
NSI_lag8	-0.07	0.02	-28.05	0.16	1.33	-0.25	-27.93	-0.36
	(-0.10)	(0.08)	(-32.79)	(1.80)	(1.78)	(-0.72)	(-32.46)	(-3.62)
NSI_lag9	-1.3	0.39	22.09	-0.05	-2.44	0.65	21.95	0.34
	(-2.37)	(2.41)	(27.95)	(-0.97)	(-4.51)	(2.78)	(27.77)	(5.26)

	Model 1				Model 2			
	RET	ΔIO	NSI	ΔRSI	RET	ΔIO	NSI	ΔRSI
(continued)								
ΔRSI_t					2.63	16.86	-16.43	
					(0.95)	(12.61)	(-11.11)	
ΔRSI_lag1	-5.26	2.99	5.83	-0.64	-6.45	1.83	6.85	-0.41
	(-2.37)	(3.20)	(5.39)	(-0.25)	(-2.90)	(1.97)	(6.12)	(-0.17)
ΔRSI_lag2	-4.51	2.11	3.84	-12.14	-4.97	3.81	2.09	-11.94
	(-1.91)	(1.84)	(4.48)	(-4.89)	(-1.98)	(3.12)	(3.18)	(-4.83)
ΔRSI_lag3	-4.87	1.98	2.52	-10.43	-4.91	3.34	1.11	-10.46
	(-1.97)	(2.01)	(3.46)	(-5.85)	(-1.84)	(3.08)	(1.45)	(-5.84)
ΔRSI_lag4	-1.44	0.59	9.02	-8.5	-2.16	1.07	8.3	-8.33
	(-0.62)	(0.67)	(12.76)	(-4.67)	(-0.82)	(1.15)	(11.48)	(-4.56)
ΔRSI_lag5	-6.04	1.29	-1.62	-10.33	-5.2	2.73	-2.84	-10.35
	(-2.60)	(1.24)	(-2.14)	(-6.11)	(-2.14)	(2.69)	(-3.90)	(-6.16)
ΔRSI_lag6	1.54	0.85	0.87	-7.97	0.89	1.8	-0.17	-7.95
	(0.67)	(1.27)	(1.53)	(-4.93)	(0.40)	(2.58)	(-0.28)	(-4.90)
ΔRSI_lag7	-1.13	0.63	1.75	-2.16	-1.53	1.14	1.18	-2.09
	(-0.50)	(1.11)	(2.86)	(-1.45)	(-0.7)	(1.92)	(1.89)	(-1.40)
ΔRSI_lag8	4.57	1.44	5.27	-3.57	3.27	1.72	4.83	-3.41
	(2.25)	(2.62)	(7.90)	(-2.85)	(1.65)	(3.01)	(7.19)	(-2.72)
ΔRSI_lag9	-3.08	0.73	0.03	-3.84	-2.69	1.21	-0.35	-3.87
	(-1.59)	(1.32)	(0.06)	(-3.32)	(-1.47)	(2.18)	(-0.63)	(-3.34)
Intercept	3.09	0.22	0.11	0.00	3.05	0.14	0.08	-0.01
	(5.08)	(2.53)	(4.21)	(-0.03)	(5.10)	(1.54)	(3.05)	(-0.32)
Adj R^2	0.07	0.04	0.71	0.31	0.08	0.06	0.71	0.32

Table I: Summary Statistics of Firm Characteristics

This table presents the firm statistics of the variables that we use in this paper. Sample period is from the first quarter in 1980 to the second quarter in 2013. Firm size (Size) is the log term of market capitalization calculated at the end of each quarter. Net share issuance (NSI) is defined as the net change of the log term of shares outstanding over the past 12 months at the end of each quarter. Momentum (MOM) is the cumulative return for the past 12 months at the end of each quarter. Book-to-Market ratio (BM) is the log term of the ratio book equity over market equity. BM is calculated in the end of June of every year. Idiosyncratic volatility (IVOL) is the quarterly standard deviation of the residuals of the Fama and French 3-factor model estimated with stock daily return in each quarter. Stock price (PRC) is the stock price at the end of each quarter. Shares turnover (TURN) is the trading volume divided by shares outstanding each month and averaged over the quarter. Trading volume for NASDAQ is adjusted by a factor of .5. Relative short interest (RSI) is calculated each month as number of shares held short divided by the shares outstanding and averaged over the quarter. Institutional ownership (IO) is the portion of shares outstanding held by institutions at the end of each quarter. We also report the number of stocks (N) with valid observations for each variable, the cross-sectional mean, median, standard deviation and 5th, 25th, 75th, and 95th percentiles for the last quarter of five selected during our sample period: 1980, 1990, 2000, 2010, and 2012.

Year	Variable	N	Mean	Std. Dev	25%	Median	75%
1980	Log(Size)	3593	11.19	1.66	9.97	11.01	12.28
	Log(BM)	2659	-0.20	0.80	-1.05	-0.53	-0.12
	MOM	3528	0.56	0.82	0.07	0.33	0.81
	IVOL	3621	0.02	0.01	0.02	0.02	0.03
	PRC	3593	22.24	17.99	10.63	17.50	28.50
	TURN	2012	0.04	0.04	0.02	0.03	0.06
	RSI	3434	0.01	0.03	0.00	0.00	0.00
	NSI	3444	0.03	0.11	0.00	0.00	0.02
	IO	3434	0.12	0.16	0.00	0.03	0.18
1990	Log(Size)	3142	11.78	1.84	10.41	11.58	12.97
	Log(BM)	2132	-0.62	0.77	-1.05	-0.53	-0.12
	MOM	3088	-0.12	0.38	-0.35	-0.17	0.03
	IVOL	3164	0.03	0.02	0.02	0.03	0.04
	PRC	3142	20.43	120.04	7.88	13.50	23.12
	TURN	3175	0.04	0.04	0.01	0.03	0.05
	RSI	2994	0.02	0.07	0.00	0.00	0.01
	NSI	3002	0.02	0.14	-0.01	0.00	0.02
	IO	2994	0.25	0.23	0.00	0.21	0.43

Year	Variable	N	Mean	Std. Dev	25%	Median	75%
2000	Log(Size)	4594	12.61	1.97	11.14	12.41	13.87
	Log(BM)	3137	-1.04	1.21	-1.76	-0.85	-0.17
	MOM	4466	0.09	0.77	-0.31	-0.04	0.31
	IVOL	4665	0.04	0.03	0.02	0.04	0.06
	PRC	4594	37.04	1048.13	7.50	14.50	27.43
	TURN	4706	0.09	0.10	0.02	0.06	0.13
	RSI	4268	0.01	0.03	0.00	0.00	0.00
	NSI	4284	0.06	0.20	-0.02	0.01	0.07
	IO	4268	0.33	0.29	0.04	0.30	0.58
2010	Log(Size)	2876	13.69	1.78	12.46	13.62	14.83
	Log(BM)	2161	-0.66	0.84	-1.12	-0.60	-0.13
	MOM	2870	0.31	0.53	0.03	0.21	0.46
	IVOL	2913	0.02	0.01	0.01	0.02	0.02
	PRC	2876	72.04	2246.01	11.95	20.88	37.03
	TURN	2925	0.13	0.14	0.04	0.09	0.17
	RSI	2680	0.05	0.08	0.01	0.03	0.06
	NSI	2816	0.03	0.14	0.00	0.01	0.02
	IO	2680	0.59	0.31	0.35	0.68	0.85
2012	Log(Size)	2820	13.73	1.83	12.44	13.64	14.92
	Log(BM)	2083	-0.65	0.86	-1.12	-0.59	-0.11
	MOM	2809	0.21	0.47	-0.04	0.14	0.35
	IVOL	2844	0.02	0.01	0.01	0.02	0.02
	PRC	2820	79.52	2524.67	11.16	20.64	39.26
	TURN	2857	0.12	0.14	0.03	0.08	0.15
	RSI	2647	0.05	0.08	0.02	0.03	0.05
	NSI	2743	0.02	0.12	-0.01	0.00	0.02
	IO	2647	0.61	0.28	0.43	0.70	0.83

Table II: Net Share Issuance Effect

This table reports the equal-weighted and value-weighted average abnormal returns of decile formed on net share issuance (NSI). NSI is the difference between the log term of shares outstanding for month t and the long term of shares outstanding for month t-12. Stocks are sorted into decile based on NSI at the end of each quarter t (Q_t). The table reports the equal-weighted average abnormal returns (Panel A) and value-weighted average abnormal returns (Panel B) of each decile for quarter t-3 (Q_{t-3}) to t+4 (Q_{t+4}) and the cumulative returns of each decile for the period from quarter t+5 to t+8 ($[Q_{t+5},Q_{t+8}]$). It also presents the mean of return spreads between the bottom and top deciles with their Newey-West (1987) t-statistics (in parentheses) adjusted for heteroskedasticity and serial correlation. The return spreads for value-weighted returns are also provided in both panels. The average number of stocks in each decile portfolio (Obs) is also presented.

NSI	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Panel A: Equal-Weighted Abnormal Returns across NSI Deciles									
Low	-0.62	-0.03	0.94	0.73	1.00	0.98	0.99	0.78	2.37
2	-0.81	-0.21	0.62	0.19	0.67	0.58	0.48	0.45	1.47
3	-0.50	-0.11	1.02	-0.30	0.24	0.18	0.03	0.07	1.22
4	-0.23	0.48	1.33	-0.17	0.17	0.43	0.42	0.25	2.05
5	0.79	0.89	1.60	0.32	0.50	0.70	0.61	0.89	1.78
6	1.44	1.73	1.88	0.12	0.28	0.47	0.66	0.57	2.55
7	3.13	2.81	2.99	0.33	0.16	0.33	0.40	0.78	2.78
8	5.17	4.56	3.73	0.27	-0.30	-0.18	0.02	0.06	1.37
9	7.03	5.74	4.40	-0.29	-0.96	-1.21	-0.90	-0.80	-1.15
High	9.53	7.89	5.86	-1.15	-2.19	-2.32	-1.98	-1.77	-4.78
High - Low	10.14**	7.92**	4.92**	-1.87**	-3.19**	-3.30**	-2.97**	-2.55**	-7.16**
	(10.24)	(8.26)	(5.44)	(-2.76)	(-5.02)	(-5.79)	(-5.79)	(-5.54)	(-7.20)
Obs	248	256	264	272	266	260	253	247	222
Panel B: Value-Weighted Abnormal Returns across NSI Deciles									
Low	-1.13	-0.56	0.02	0.92	0.88	0.93	0.99	0.87	3.02
2	-0.56	-0.52	-0.16	0.22	0.52	0.29	0.48	0.20	0.57
3	-0.82	-0.53	-0.27	-0.20	-0.09	0.24	-0.01	-0.05	0.92
4	-0.39	-0.12	-0.04	0.05	0.07	0.21	0.27	0.09	1.45
5	0.11	0.16	0.40	0.20	-0.16	0.17	0.11	0.54	0.03
6	0.39	0.33	0.44	-0.17	0.17	-0.37	-0.02	0.31	-0.22
7	1.07	0.86	0.49	0.38	0.21	0.68	0.17	-0.12	0.43
8	1.21	0.35	-0.01	-0.60	-0.51	-0.48	-0.30	0.02	-0.34
9	1.67	1.03	0.35	-0.42	-0.86	-0.67	-0.61	-0.80	-5.07
High	1.71	1.22	0.74	-0.71	-1.27	-1.54	-1.58	-1.53	-6.30
High - Low	2.84**	1.78**	0.71**	-1.63**	-2.15**	-2.47**	-2.57**	-2.40**	-9.32**
	(4.21)	(2.88)	(1.05)	(-2.28)	(-3.33)	(-3.70)	(-3.99)	(-4.16)	(-8.32)
Obs	248	256	264	272	266	260	253	247	222

Table III: NSI Effect and Institutional Trading – Different Types of Institutions

This table reports the change in three different types of institutions' ownership and the change in three different types of institutions' portfolio weights across the stocks of the net share issuance (NSI) deciles. Institutions are divided into three groups, transient, quasi-indexer and dedicated, based on classifications proposed in Bushee (2001). NSI is defined as the net change of shares outstanding in log term over the previous 12 months. At the end of quarter t (Q_t), stocks are sorted into deciles based on the NSI. This table presents the equal-weighted change in quasi-indexer institutional ownership (Panel A), the value-weighted change in quasi-indexer institutional ownership (Panel B), the change in quasi-indexer institutions' weight (Panel C), the equal-weighted change in dedicated institutional ownership (Panel D), the value-weighted change in dedicated institutional ownership (Panel E), the change in dedicated institutions' weight (Panel F), the equal-weighted change in transient institutional ownership (Panel G), the value-weighted change in transient institutional ownership (Panel H) and the change in transient institutions' weight (Panel I). The reported period is from quarter t-3 (Q_{t-3}) to t+4 (Q_{t+4}) and the period of quarter t+5 to t+8 [Q_{t+5}, Q_{t+8}]. In each panel, it also reports the spreads between the bottom and top decile with their Newey-West (1987) t-statistics (in parentheses) adjusted for heteroskedasticity and serial correlation. The numbers are reported in percent per quarter.

Panel A: Quasi-indexers

NSI	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Equal-Weighted Change in Institutional Ownership									
Low	0.78	0.73	0.68	0.67	0.01	0.14	0.15	0.16	0.16
2	0.58	0.54	0.50	0.46	0.07	0.14	0.14	0.16	0.15
3	0.55	0.56	0.51	0.41	0.07	0.12	0.15	0.14	0.13
4	0.65	0.63	0.54	0.42	0.03	0.16	0.15	0.16	0.14
5	0.79	0.73	0.62	0.48	0.08	0.15	0.20	0.19	0.18
6	0.84	0.77	0.66	0.51	0.14	0.24	0.27	0.33	0.25
7	0.81	0.84	0.79	0.73	0.18	0.29	0.29	0.32	0.33
8	0.89	0.92	0.95	0.86	0.28	0.37	0.37	0.36	0.37
9	0.96	1.06	1.06	0.93	0.43	0.47	0.40	0.33	0.36
High	1.18	1.38	1.40	1.26	0.64	0.56	0.47	0.42	0.34
High-Low	0.40**	0.65**	0.72**	0.59**	0.63**	0.42**	0.31**	0.26**	0.18**
	(5.92)	(8.68)	(9.59)	(6.95)	(12.40)	(8.99)	(7.02)	(5.60)	(3.63)
Obs	331	342	352	365	355	346	338	329	323
High/Low Spread of Value-Weighted Change in Institutional Ownership									
High-Low	0.82**	0.91**	0.78**	0.50**	0.55**	0.38**	0.25**	0.37**	0.27**
	(3.76)	(4.30)	(4.85)	(3.75)	(8.31)	(5.96)	(3.18)	(4.69)	(3.87)
High/Low Spread of Change in Institutional Investors' Weight									
High-Low	0.65**	0.65**	0.60**	0.51**	0.22**	0.18**	0.13**	0.16**	0.29*
	(9.01)	(8.57)	(7.79)	(8.79)	(4.38)	(3.82)	(2.58)	(3.16)	(2.48)

Panel B: Dedicated

NSI	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Equal-Weighted Change in Institutional Ownership									
Low	0.13	0.12	0.13	0.12	-0.01	0.01	0.02	0.02	0.02
2	0.10	0.10	0.09	0.08	-0.01	0.01	0.00	0.01	0.01
3	0.13	0.11	0.11	0.08	0.00	0.02	0.01	0.01	0.00
4	0.13	0.13	0.11	0.08	0.00	0.01	0.01	0.02	0.01
5	0.15	0.12	0.10	0.08	-0.01	0.01	0.00	0.00	0.00
6	0.15	0.14	0.11	0.08	0.00	0.04	0.04	0.05	0.02
7	0.15	0.14	0.14	0.12	0.02	0.05	0.05	0.04	0.04
8	0.17	0.18	0.17	0.16	0.02	0.06	0.05	0.07	0.05
9	0.20	0.22	0.23	0.18	0.06	0.05	0.05	0.05	0.03
High	0.32	0.37	0.35	0.30	0.09	0.08	0.06	0.06	0.03
High-Low	0.19**	0.25**	0.23**	0.17**	0.10**	0.07**	0.05**	0.04**	0.01
	(5.50)	(7.17)	(7.23)	(5.55)	(5.94)	(3.51)	(2.76)	(2.76)	(1.17)
Obs	331	342	352	365	355	346	338	329	323
High/Low Spread of Value-Weighted Change in Institutional Ownership									
High-Low	0.32**	0.27**	0.19**	0.08*	0.03	0.02	-0.02	0.04	0.01
	(5.67)	(4.83)	(3.77)	(2.07)	(1.16)	(0.55)	(-0.48)	(1.22)	(0.27)
High/Low Spread of Change in Institutional Investors' Weight									
High-Low	0.85**	0.74**	0.65**	0.49**	0.14	0.09	0.01	0.11	0.40*
	(9.17)	(7.53)	(7.03)	(5.78)	(1.90)	(1.33)	(0.16)	(1.66)	(2.09)

Panel C: Transient

NSI	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Equal-Weighted Change in Institutional Ownership									
Low	0.12	0.10	0.16	0.24	0.06	0.12	0.10	0.10	0.11
2	0.10	0.07	0.11	0.12	0.04	0.07	0.09	0.09	0.08
3	0.13	0.13	0.19	0.15	0.04	0.09	0.08	0.09	0.08
4	0.18	0.17	0.23	0.18	0.05	0.11	0.13	0.12	0.08
5	0.20	0.20	0.21	0.18	0.05	0.08	0.12	0.09	0.09
6	0.27	0.22	0.27	0.18	0.04	0.09	0.09	0.11	0.12
7	0.38	0.36	0.35	0.32	0.02	0.05	0.06	0.08	0.11
8	0.56	0.50	0.51	0.35	-0.05	0.00	0.02	0.02	0.10
9	0.78	0.74	0.64	0.42	-0.06	-0.03	-0.03	-0.01	0.07
High	1.08	1.03	0.94	0.62	-0.07	-0.07	-0.06	-0.01	0.05
High-Low	0.96**	0.93**	0.78**	0.38**	-0.13**	-0.18**	-0.16**	-0.11**	-0.06*
	(13.74)	(12.72)	(11.24)	(6.43)	(-3.43)	(-5.24)	(-4.64)	(-3.36)	(-2.37)
Obs	331	342	352	365	355	346	338	329	323
High/Low Spread of Value-Weighted Change in Institutional Ownership									
High-Low	0.72**	0.61**	0.44**	0.19**	-0.15**	-0.15**	-0.15**	-0.11*	-0.06
	(8.22)	(7.37)	(6.19)	(2.66)	(-3.18)	(-3.23)	(-2.69)	(-2.37)	(-1.66)
High/Low Spread of Change in Institutional Investors' Weight									
High-Low	1.14**	1.02**	0.87**	0.63**	-0.01	-0.01	-0.03	-0.02	-0.06
	(12.45)	(11.22)	(9.66)	(7.95)	(-0.08)	(-0.19)	(-0.40)	(-0.37)	(-0.36)

Table IV: NSI Effect and the Trading of Short Sellers

This table reports average change in short sellers across the net share issuance (NSI) deciles. NSI is defined as the net change of shares outstanding in log term over the previous 12 months at the end of each quarter. At the end of quarter t (Qt), firms are sorted into deciles based on the NSI. Panel A reports the equal-weighted quarterly average change in firms' relative short interest (ΔRSI) for the quarters from t-3 (Q_{t-3}) to t+4 (Q_{t+4}) and the cumulative change in firms' relative short interest for quarter t+5 to t+8 ([Q_{t+5}, Q_{t+8}]). Panel B reports the value weighted quarterly average change in firms' relative short interest for the same periods. Panel C reports quarterly average change in short sellers' portfolio weight for quarters from t-3 (Q_{t-3}) to t+4 (Q_{t+4}), and the cumulative change in short sellers' portfolio weight for the period of quarter t+5 to t+8 ([Q_{t+5}, Q_{t+8}]). The numbers are reported in percent per quarter. In each panel, the mean of spreads between bottom and top deciles are reported with the t-statistics (in parentheses) adjusted using Newey-West (1987) correction for heteroskedasticity and serial correlation. The last row of each panel is the average number of stocks (Obs) in each decile portfolio.

NSI	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	[Q_{t+5}, Q_{t+8}]
Panel A: Equal- Weighted Change in Relative Short Interest									
Low	0.12	0.12	0.10	0.09	-0.09	-0.04	-0.02	-0.02	0.01
2	0.07	0.05	0.01	0.07	-0.03	-0.02	-0.02	-0.01	0.01
3	0.05	0.06	0.04	0.01	-0.01	-0.01	-0.02	-0.01	0.01
4	0.04	0.05	0.04	0.03	-0.03	-0.02	0.00	-0.01	0.02
5	0.07	0.06	0.01	0.07	-0.05	0.04	-0.03	0.04	0.00
6	0.05	0.07	0.04	0.03	-0.03	-0.01	0.03	-0.08	0.03
7	0.07	0.06	0.05	0.08	-0.03	-0.01	-0.01	0.00	0.04
8	0.08	0.09	0.10	0.09	-0.04	-0.05	0.03	0.03	0.03
9	0.13	0.14	0.02	0.06	-0.02	0.02	-0.01	0.00	0.03
High	0.17	0.15	0.09	0.06	0.05	0.09	0.06	0.01	0.00
High-Low	0.05	0.04	-0.01	-0.03	0.14**	0.12**	0.09**	0.02	-0.01
	(1.21)	(0.84)	(-0.17)	(-0.87)	(4.44)	(4.06)	(3.12)	(0.67)	(-0.52)
Obs	329	340	350	362	352	344	335	327	321
Panel B: Value-Weighted Change in Relative Short Interest									
High-Low	0.14	-0.12	-0.29**	-0.33**	-0.08	0.06	0.01	0.03	0.01
	(2.14)	(-1.85)	(-4.97)	(-6.19)	(-1.81)	(1.16)	(0.30)	(0.56)	(0.35)
Panel C: Change in Short Sellers' Portfolio Weight									
High-Low	0.84**	0.36*	-0.04	-0.21	-0.01	0.29	0.12	0.16	0.66*
	(5.59)	(2.30)	(-0.17)	(-1.07)	(-0.07)	(1.61)	(0.80)	(1.03)	(2.10)

Table V: NSI Effect and Trading of Different Types of Institutions and Short Sellers – Fama-MacBeth Regression

Panel A, B and C reports Fama-MacBeth regressions of change in quasi-indexers, dedicated and transient institutional ownership on the net share issuance (NSI), respectively. Panel D reports the regression of change in relative short interest on the NSI. NSI is constructed as the net change of shares outstanding in log term over the previous 12 months at the end of each quarter t (Q_t). In panel A, B and C, the dependent variables are the quarterly average change in quasi-indexers, dedicated and transient institutional ownership, respectively, for quarters t-1 (Q_{t-1}) to t+2 (Q_{t+2}). In panel D, the dependent variable is the quarterly average change in relative short interest. In each panel, the independent variable NSI is the NSI in quarter t. All the control variables are one quarter lagged to the corresponding dependent variable. The control variables in multivariate regressions are market capitalization (Size), book-to-market ratio (BM), momentum (MOM), stock price (PRC), idiosyncratic volatility (IVOL), shares turnover (TURN), stock return (RET) and relative short interest (RSI). All the control variables are defined following the way introduced in Table 1.

Panel A: Quasi-Indexers

	ΔQIX (t-1)		**ΔQIX (t)**		**ΔQIX (t+1)**		**ΔQIX(t+2)**	
NSI	1.35**	0.45**	1.09**	0.62**	1.01**	1.00**	0.66**	0.70**
	(8.98)	(3.74)	(7.89)	(3.88)	(12.44)	(11.64)	(9.31)	(9.11)
ln(SIZE)		0.02		-0.02		0.01		0.01
		(0.83)		(-0.83)		(0.70)		(0.57)
ln(B/M)		-0.17**		-0.17**		-0.13**		-0.14**
		(-6.96)		(-7.74)		(-8.66)		(-8.97)
MOM		0.35**		0.28**		0.40**		0.43**
		(11.92)		(8.05)		(14.33)		(15.03)
PRC		-0.00*		-0.00*		-0.00**		-0.00**
		(-2.06)		(-2.05)		(-6.75)		(-6.60)
IVOL		-3.55*		-14.39**		-9.70**		-10.04**
		(-2.16)		(-7.98)		(-8.22)		(-8.73)
TURN		-0.10		0.91*		-1.39**		-1.41**
		(-0.56)		(2.30)		(-6.51)		(-6.57)
RET		-0.04		-0.36**		-0.31**		-0.34**
		(-0.75)		(-4.59)		(-4.04)		(-4.43)
RSI		-0.33		-2.25**		1.02**		1.12**
		(-1.88)		(-3.78)		(4.68)		(4.95)
Intercept	0.68**	0.14	0.60**	1.00**	0.13	0.19	0.21**	0.22
	(7.42)	(0.54)	(6.55)	(3.41)	(1.74)	(0.89)	(2.92)	(0.99)
Adj R2	0.26%	2.04%	0.19%	2.19%	0.22%	2.02%	0.09%	2.01%

Panel B: Dedicated

	ΔDED (t-1)		ΔDED (t)		ΔDED (t+1)		ΔDED (t+2)	
NSI	0.40**	0.19**	0.31**	0.21	0.17**	0.18**	0.11**	0.10**
	(8.16)	(3.82)	(6.63)	(4.08)	(6.08)	(5.83)	(3.71)	(3.01)
ln(SIZE)		-0.00		-0.01		-0.01		-0.01
		(-0.53)		(-1.84)		(-1.27)		(-1.01)
ln(B/M)		-0.03**		-0.04**		-0.03**		-0.03**
		(-3.96)		(-4.94)		(-4.69)		(-4.36)
MOM		0.02		0.00		0.03**		0.03**
		(1.61)		(0.29)		(3.67)		(3.28)
PRC		-0.00**		-0.00**		-0.00**		-0.00**
		(-3.22)		(-3.49)		(-4.96)		(-5.20)
IVOL		-0.45		-3.00**		-2.78		-2.77**
		(-1.26)		(-7.49)		(-7.84)		(-8.11)
TURN		0.13		0.26		-0.21		-0.18
		(0.96)		(1.76)		(-1.62)		(-1.36)
RET		-0.11**		-0.17**		-0.19**		-0.19**
		(-4.91)		(-6.26)		(-7.06)		(-6.86)
RSI		-0.05		-0.37**		0.25**		0.26**
		(-0.69)		(-2.96)		(3.23)		(3.24)
Intercept	0.13**	0.13*	0.11**	0.30**	0.01	0.18**	0.02*	0.16**
	(7.15)	(2.06)	(5.85)	(4.05)	(0.40)	(2.85)	(2.03)	(2.65)
Adj R2	0.14%	0.66%	0.12%	0.84%	0.04%	0.66%	0.04%	0.68%

Panel C: Transient

	ΔTRA (t-1)		**ΔTRA (t)**		**ΔTRA (t+1)**		**ΔTRA (t+2)**	
NSI	1.25**	0.77**	0.64**	0.41**	-0.11	0.01	-0.20**	-0.13**
	(9.65)	(8.81)	(5.92)	(4.22)	(-1.78)	(0.11)	(-3.71)	(-2.37)
ln(SIZE)		0.01		-0.02**		0.00		0.01
		(0.74)		(-2.74)		(0.61)		(0.86)
ln(B/M)		0.06**		0.02		0.04**		0.04**
		(4.47)		(1.67)		(3.50)		(3.23)
MOM		-0.10**		-0.08**		-0.06*		-0.06*
		(-3.72)		(-2.84)		(-2.46)		(-2.53)
PRC		-0.00**		-0.00**		-0.00**		-0.00**
		(-4.76)		(-4.22)		(-7.02)		(-6.87)
IVOL		0.81		-8.22**		-0.69		-1.22
		(0.64)		(-5.93)		(-0.57)		(-1.03)
TURN		-1.13**		-0.52		-1.92**		-1.97**
		-4.6024		(-1.64)		(-8.94)		(-9.20)
RET		1.65**		1.36**		1.46**		1.40**
		(20.80)		(19.72)		(21.55)		(20.30)
RSI		-0.20		-1.02**		0.51**		0.55**
		(-1.15)		(-2.67)		(3.09)		(3.28)
Intercept	0.28**	0.19	0.23**	0.76**	0.02	0.17	0.07	0.16
	(5.17)	(1.50)	(4.37)	(5.52)	(0.39)	(1.43)	(1.23)	(1.36)
Adj R2	0.39%	3.43%	0.17%	2.61%	0.07%	2.63%	0.07%	2.59%

Panel D: Relative Short Interest

	ΔRSI (t-1)		ΔRSI (t)		ΔRSI (t+1)		ΔRSI (t+2)	
NSI	0.01	-0.27**	-0.03	-0.33**	0.15**	0.12*	0.13**	0.16**
	(0.16)	(-2.70)	(-0.54)	(-5.91)	(3.31)	(2.34)	(2.72)	(3.25)
ln(SIZE)		0.03**		0.03**		0.03**		0.02*
		(2.64)		(2.61)		(2.86)		(2.30)
ln(B/M)		-0.00		-0.02		0.00		0.01
		(-0.22)		(-0.94)		(0.07)		(0.35)
MOM		0.08**		0.04		0.08**		0.07*
		(2.58)		(1.80)		(2.65)		(2.22)
PRC		-0.00**		-0.00*		-0.00**		-0.00*
		(-2.80)		(-2.32)		(-2.78)		(-2.46)
IVOL		3.26		-0.21		1.84		2.31
		(1.92)		(-0.16)		(1.31)		(1.47)
TURN		0.29		1.04**		0.18		0.19
		(0.96)		(3.51)		(0.63)		(0.65)
RET		-0.09		-0.05		-0.05		-0.07
		(-1.12)		(-0.86)		(-0.70)		(-0.95)
IO		-0.12**		-0.65**		-0.10*		-0.06
		(-2.63)		(-4.77)		(-2.16)		(-1.40)
Intercept	0.05	-0.30**	0.06	-0.00**	-0.03	-0.30**	-0.01	-0.25*
	(1.20)	(-2.58)	(1.48)	(5.80)	(-0.77)	(-2.72)	(-0.20)	(-2.33)
Adj R2	0.06%	1.88%	0.03%	2.67%	0.03%	1.66%	0.02%	1.45%

Table VI: Performance of Institutional Trading – Different Types of Institutions and Short Sellers' Trading

This table reports the abnormal returns earned by three different types of institutions and short sellers. Institutions are divided into three groups, transient, quasi-indexer and dedicated, based on classifications proposed in Bushee (2001). At the end of quarter t (Qt), stocks are sorted into deciles based on the net share issuance (NSI). The "Top NSI Deciles" portfolio is consist of the stocks in the top two deciles with lowest NSI, while the "Bottom NSI Deciles" portfolio is consist of the stocks in the bottom three deciles with highest NSI. In quarter t, stocks in both portfolios are classified into three groups by the change of institutional ownership (ΔIO), using buy (ΔIO>0), sell (ΔIO<0) and no change (ΔIO=0) as breakpoints. The table reports the average returns earned by three types of institutions' trading for quarter t (Qt) to t+4 (Qt+4) and the cumulative return for the period from quarter t+5 to t+8 ($[Q_{t+5}, Q_{t+8}]$). Panel A, B and C present average abnormal return of quasi-indexers, dedicated and transient institutions' trading, respectively. Both equal-weighted and value-weighted results are presented. The table also presents the mean of buy-sell spreads of returns. The buy-sell spreads is defined as the difference between the buy group (ΔIO>0) and the sell group (ΔIO<0). Panel D presents average abnormal return of short sellers trading. The Newey-West (1987) t-statistics in parentheses is adjusted for heteroskedasticity and serial correlation. The numbers are reported in percent per quarter.

Panel A: Quasi-Indexer

	Top NSI Deciles						Bottom NSI Deciles					
ΔIO	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Equal-Weighted Result												
Buy	0.29	0.81	0.82	0.76	0.57	2.08	-0.08	-0.98	-0.94	-0.78	-0.53	-1.19
Hold	-0.06	0.16	0.05	0.09	-0.13	0.44	-2.15	-2.77	-2.79	-2.13	-2.06	-4.48
Sell	0.77	0.96	0.81	0.81	0.85	1.99	0.16	-0.49	-0.63	-0.25	-0.41	0.12
Buy-Sell	-0.48*	-0.15	0.01	-0.05	-0.27	0.09	-0.24	-0.49	-0.31	-0.52*	-0.12	-1.31**
	(-2.14)	(-0.91)	(0.03)	(-0.24)	(-1.22)	(0.22)	(-0.67)	(-1.61)	(-1.39)	(-2.11)	(-0.56)	(-3.17)
Value-Weighted Result												
Buy	0.37	0.75	0.66	0.80	0.36	1.93	-0.79	-0.62	-1.10	-0.86	-0.74	-2.65
Hold	0.45	0.55	0.47	0.30	-0.08	0.20	-1.45	-1.86	-1.38	-0.84	-0.60	-6.29
Sell	0.40	0.62	0.63	0.48	0.73	2.62	0.12	-0.78	-0.34	-0.71	-0.58	-3.09
Buy-Sell	-0.03	0.13	0.03	0.32	-0.37	-0.69	-0.91*	0.16	-0.76	-0.16	-0.16	0.44
	(-0.05)	(0.34)	(0.08)	(0.87)	(-1.01)	(-0.96)	(-1.98)	(0.36)	(-1.85)	(-0.33)	(-0.35)	(0.47)

Panel B: Dedicated

	Top NSI Deciles						Bottom NSI Deciles					
ΔIO	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Equal-Weighted Result												
Buy	0.86	0.91	1.10	0.92	0.92	2.21	0.96	-0.49	-0.55	-0.37	-0.33	-0.14
Hold	-0.41	0.25	0.05	0.08	-0.12	0.20	-2.22	-2.32	-2.48	-1.74	-1.81	-3.83
Sell	0.54	1.07	0.79	0.88	0.93	2.69	-0.14	-0.69	-0.63	-0.66	-0.28	-0.32
Buy-Sell	0.32	-0.16	0.31*	0.04	0.00	-0.48	1.10**	0.20	0.08	0.30	-0.06	0.19
	(1.39)	(-0.83)	(1.99)	(0.21)	(-0.01)	(-1.11)	(3.81)	(0.87)	(0.33)	(1.30)	(-0.24)	-0.38
Value-Weighted Result												
Buy	1.08	0.74	0.67	0.53	0.92	2.67	0.16	-0.37	-0.88	-0.86	-0.63	-2.18
Hold	0.37	0.55	0.44	0.30	-0.07	0.00	-1.60	-1.87	-1.41	-0.89	-0.68	-6.27
Sell	-0.33	0.75	0.75	0.88	0.47	2.07	-0.94	-0.83	-0.56	-0.79	-0.81	-3.01
Buy-Sell	1.41**	-0.01	-0.08	-0.35	0.45	0.60	1.10**	0.45	-0.32	-0.08	0.18	0.83
	(3.11)	(-0.03)	(-0.24)	(-0.91)	(1.11)	(0.82)	(2.98)	(1.26)	(-1.03)	(-0.18)	(0.45)	(0.82)

Panel C: Transient

	Top NSI Deciles						Bottom NSI Deciles					
ΔIO	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Equal-Weighted Result												
Buy	2.78	0.95	1.03	0.90	0.78	2.22	5.23	-0.25	-0.49	-0.53	-0.44	-1.26
Hold	-0.22	0.24	0.17	0.17	-0.16	0.29	-2.17	-2.75	-2.65	-2.04	-2.01	-4.58
Sell	-1.87	0.73	0.60	0.75	0.79	2.17	-5.17	-1.27	-1.07	-0.60	-0.45	0.39
Buy-Sell	4.64**	0.22	0.43	0.15	-0.01	0.05	10.40**	1.02**	0.57*	0.07	0.02	-1.65**
	(14.94)	(0.95)	(1.97)	(0.55)	(-0.03)	(0.11)	(14.85)	(3.48)	(2.00)	(0.24)	(0.07)	(-2.80)
Value-Weighted Result												
Buy	3.07	0.44	1.00	0.71	0.40	2.74	3.96	-0.57	-0.52	-0.43	-0.61	-2.91
Hold	0.44	0.56	0.47	0.31	-0.08	0.18	-1.48	-1.87	-1.37	-0.83	-0.61	-6.31
Sell	-2.28	1.00	0.38	0.81	0.73	2.64	-4.31	-0.96	-0.81	-1.26	-0.88	-2.38
Buy-Sell	5.35**	-0.56	0.62	-0.10	-0.32	0.10	8.28**	0.39	0.29	0.83	0.28	-0.53
	(9.72)	(-1.47)	(1.64)	(-0.28)	(-0.77)	(0.12)	(11.73)	(0.97)	(0.66)	(1.69)	(0.59)	(-0.45)

Panel D: Short Seller

	Top NSI Decile						Bottom NSI Decile					
ΔRSI	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Equal-Weighted Result												
Increase	1.30	0.23	0.45	0.37	0.51	1.62	0.55	-1.63	-1.42	-0.86	-0.94	-2.74
Hold	3.32	3.52	2.49	1.40	0.36	2.28	4.55	3.45	3.05	2.44	0.58	-0.88
Decrease	-0.92	0.56	0.53	0.54	0.39	1.63	-1.80	-0.83	-0.46	-0.75	-0.45	-0.85
Increase-Decrease	2.22**	-0.34	-0.08	-0.18	0.13	0.00	2.34**	-0.80**	-0.96**	-0.11	-0.48	-1.88**
	(8.47)	(-1.74)	(-0.37)	(-0.85)	(0.62)	(-0.01)	(8.37)	(-3.37)	(-4.67)	(-0.41)	(-1.92)	(-3.14)
Value-Weighted Result												
Increase	1.48	0.24	0.06	0.29	0.51	1.65	0.17	-0.85	-1.14	-0.92	-0.42	-4.35
Hold	4.39	4.16	3.55	2.18	1.11	4.02	4.15	3.42	2.94	2.27	0.62	-0.97
Decrease	-1.16	0.31	0.06	0.35	-0.29	1.42	-1.38	-0.92	-0.29	-0.55	-1.02	-4.13
Increase-Decrease	2.64**	-0.07	0.01	-0.06	0.79*	0.23	1.55**	0.07	-0.85*	-0.36	0.60	-0.22
	(5.91)	(-0.18)	(0.01)	(-0.14)	(2.17)	(0.32)	(4.18)	(0.18)	(-2.10)	(-0.70)	(1.36)	(-0.31)

Table VII: NSI Effect and Trading of Different Types of Institutions and Short Sellers – Effect of Reg FD

In quarter t (Q_t), stocks are sorted into deciles based on the net share issuance (NSI). For the three types of institution, this table presents equal-weighted (EW) and value-weighted (VW) average high/low spreads of change in institutional ownership and the average high/low spreads of the change in institutional portfolio weight between the bottom and top NSI deciles in pre-RFD and post-RFD period. Panel A, B and C show the spreads of the change in quasi-indexers, dedicated and transient institutions, respectively. Panel D presents the high/low spread of the change in relative short interest and the high/low spread of the change in short sellers' portfolio between the bottom and top NSI decile in pre-RFD and post RFD period. The pre-RFD period is from the first quarter in 1981 to the fourth quarter in 2000. The post-RFD period is from the first quarter in 2001 to the second quarter in 2013.

Panel A: Quasi-Indexers

NSI		Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
High-low Spread of Change in Institutional Ownership										
EW	Pre	0.19**	0.40**	0.44**	0.25**	0.45**	0.30**	0.21**	0.19**	0.16**
		(3.31)	(6.02)	(5.93)	(3.58)	(9.37)	(6.94)	(5.43)	(4.47)	(5.61)
	Post	0.72**	1.03**	1.16**	1.11**	0.91**	0.60**	0.48**	0.37**	0.20
		(5.74)	(8.12)	(10.96)	(8.38)	(11.57)	(6.94)	(5.34)	(3.86)	(1.65)
VW	Pre	0.38**	0.55*	0.37*	0.16	0.51**	0.33**	0.15	0.29**	0.10
		(2.64)	(2.54)	(2.47)	(1.57)	(6.47)	(4.82)	(1.42)	(3.09)	(1.50)
	Post	1.48**	1.45**	1.40**	1.03**	0.62**	0.45**	0.41**	0.50**	0.28
		(3.11)	(3.53)	(4.72)	(3.77)	(5.26)	(3.70)	(3.85)	(3.66)	(1.76)
High-low Spread of Change in Institutional Portfolio Weight										
	Pre	0.59**	0.61**	0.56**	0.48**	0.15**	0.14*	0.13*	0.18**	0.28
		(6.84)	(5.92)	(5.23)	(6.62)	(2.97)	(2.35)	(1.96)	(2.82)	(1.76)
	Post	0.67**	0.70**	0.63**	0.56**	0.35**	0.26**	0.14	0.12	0.46**
		(5.96)	(5.92)	(5.88)	(5.60)	(3.48)	(3.33)	(1.95)	(1.55)	(2.77)

Panel B: Dedicated

NSI		Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
High-low Spread of Change in Institutional Ownership										
EW	Pre	0.05	0.10**	0.07**	0.02	0.07**	0.05*	0.04*	0.05**	0.04**
		(1.87)	(3.81)	(3.67)	(1.11)	(3.96)	(2.50)	(2.30)	(3.16)	(4.26)
	Post	0.39**	0.48**	0.46**	0.41**	0.15**	0.10*	0.06	0.03	-0.03
		(7.11)	(8.97)	(10.34)	(9.33)	(4.74)	(2.53)	(1.78)	(0.93)	(-1.12)
VW	Pre	0.19**	0.15*	0.07	0.01	0.07*	0.05	0.01	0.08*	0.07**
		(3.69)	(2.48)	(1.36)	(0.17)	(2.04)	(1.38)	(0.30)	(1.97)	(3.14)
	Post	0.52**	0.44**	0.36**	0.20**	-0.03	-0.04	-0.07	-0.03	-0.11*
		(4.88)	(4.31)	(3.99)	(2.91)	(-0.62)	(-0.74)	(-1.17)	(-0.40)	(-2.18)
High-low Spread of Change in Institutional Portfolio Weight										
	Pre	0.72**	0.61**	0.59**	0.47**	0.10	0.07	0.06	0.15	0.70**
		(6.47)	(4.81)	(4.92)	(4.54)	(1.34)	(0.94)	(0.67)	(1.82)	(2.90)
	Post	0.95**	0.94**	0.74**	0.53**	0.24	0.14	-0.03	0.05	-0.01
		(6.67)	(5.87)	(4.87)	(3.57)	(1.61)	(1.27)	(-0.31)	(0.38)	(-0.02)

Panel C: Transient

NSI		Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
High-low Spread of Change in Institutional Ownership										
EW	Pre	0.66**	0.63**	0.49**	0.18**	-0.10**	-0.18**	-0.18**	-0.14**	-0.08**
		(9.76)	(9.12)	(7.76)	(3.47)	(-2.81)	(-5.53)	(-5.53)	(-4.61)	(-5.62)
	Post	1.41**	1.38**	1.22**	0.69**	-0.18*	-0.18*	-0.12	-0.06	-0.02
		(17.22)	(13.66)	(13.01)	(6.89)	(-2.27)	(-2.46)	(-1.64)	(-0.89)	(-0.34)
VW	Pre	0.54**	0.47**	0.32**	0.03	-0.13*	-0.18**	-0.22**	-0.16**	-0.14**
		(6.65)	(4.64)	(4.02)	(0.40)	(-2.15)	(-2.85)	(-2.86)	(-2.71)	(-3.49)
	Post	0.98**	0.82**	0.63**	0.43**	-0.19*	-0.10	-0.06	-0.03	0.07
		(5.93)	(5.94)	(5.02)	(3.35)	(-2.43)	(-1.55)	(-0.63)	(-0.40)	(1.07)
High-low Spread of Change in Institutional Portfolio Weight										
	Pre	1.17**	1.02**	0.89**	0.60	-0.10	-0.10	-0.05	-0.05	-0.18
		(9.21)	(7.88)	(7.02)	(5.67)	(-1.04)	(-0.98)	(-0.42)	(-0.63)	(-0.72)
	Post	1.05**	1.04	0.85**	0.69**	0.16	0.15	0.04	0.04	0.31
		(8.24)	(7.88)	(6.66)	(5.76)	(1.26)	(1.59)	(0.50)	(0.41)	(1.35)

Panel D: Relative Short Interest

NSI		Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
High-low Spread of Change in Relative Short Interest										
EW	Pre	-0.03	-0.06	-0.08**	-0.13**	0.05	0.06	0.07*	0.04	0.02
		(-0.53)	(-1.62)	(-2.63)	(-4.48)	(1.66)	(1.83)	(2.41)	(1.08)	(1.60)
	Post	0.17*	0.19*	0.11	0.13*	0.28**	0.23**	0.11*	-0.01*	-0.07
		(2.43)	(2.37)	(1.81)	(2.01)	(5.20)	(4.28)	(2.01)	(-0.08)	(-1.13)
VW	Pre	0.18*	-0.12	-0.29**	-0.37**	-0.07	0.07	0.04	0.06	0.04
		(1.98)	(-1.30)	(-3.70)	(-5.70)	(-1.19)	(1.01)	(0.65)	(0.83)	(1.28)
	Post	0.08	-0.12	-0.29**	-0.26**	-0.10	0.04	-0.03	-0.02	-0.05
		(0.90)	(-1.38)	(-3.37)	(-2.89)	(-1.46)	(0.57)	(-0.56)	(-0.55)	(-1.62)
High-low Spread of Change in Short Sellers' Portfolio Weight										
	Pre	0.92**	0.37	-0.28	-0.50*	-0.33	0.15	0.02	0.15	0.73*
		(4.50)	(1.79)	(-1.26)	(-2.23)	(-1.61)	(0.69)	(0.10)	(0.78)	(2.14)
	Post	0.77**	0.43	0.42	0.26	0.52	0.58	0.31	0.22	0.73
		(3.34)	(1.78)	(1.01)	(0.71)	(1.58)	(1.80)	(0.96)	(0.77)	(1.06)

Table VIII: Granger-Causality Analysis

This table reports the p-values of the Granger-Causality test among stock returns (RET), change in institutional ownership (ΔIO), net share issuance (NSI) and change in relative short interest (ΔRSI). Horizontal variables are causal variables and the vertical variables are result variables. The null hypothesis is variable A is not the causality of variable B. Panel A shows the result of using change in aggregate institutional ownership. Panel B shows the result of using change in long-term institutional ownership where long-term institutional ownership is the total ownership of quasi-indexers and dedicated institutions. Panel C reports the result of using change in short-term institutional ownership where short-term institutional ownership is the ownership of transient institutions. P-value is calculated by using the SSEs from restricted and unrestricted models with nine lagged terms for each variable.

Panel A: Using change in aggregate institutional ownership

	Causal Variable			
Result Variable	**Ret**	**NSI**	**ΔIO**	**RSI**
Ret	-	0.04	0.03	0.07
NSI	0.00	-	0.00	0.03
ΔIO	0.00	0.04	-	0.01
RSI	0.00	0.00	0.00	-

Panel B: Using change in long-term institutional ownership

	Causal Variable			
Result Variable	**Ret**	**NSI**	**ΔL-TIO**	**RSI**
Ret	-	0.03	0.00	0.06
NSI	0.00	-	0.00	0.02
ΔIO	0.00	0.06	-	0.01
RSI	0.04	0.02	0.00	-

Panel C: Using change in short-term institutional ownership

	Causal Variable			
Result Variable	**Ret**	**NSI**	**ΔS-TIO**	**RSI**
Ret	-	0.03	0.00	0.06
NSI	0.00	-	0.00	0.02
ΔIO	0.02	0.10	-	0.01
RSI	0.04	0.02	0.01	-

Table IX: Trading among Different Parties

This table reports the trading among different types of institutions and the short sellers. It presents one party's average buying and selling of the stocks and the other parties' trading on the same buying and selling stocks. For example, in table of 'Result for All Stocks' of Panel A, row 'B' presents quasi-indexers' average buying, while row 'S' presents quasi-indexers' average selling. For other rows, DED and TRA are the change in dedicated and transient institutional ownership, respectively, on the quasi-indexers' buying and selling stocks. RSI is the change in relative short interest, while FIRM is the percentage change of shares outstanding of the stocks. Panel A, B, and C reports stocks bought or sold by quasi-indexers, dedicated, and transient institutions, respectively. Panel D reports the short sell interest increased or decreased by short sellers. The table reports the result for the periods from quarter t-3 (Q_{t-3}) to t+4 (Q_{t+4}) and the period of quarter t+5 to t+8 ($[Q_{t+5}, Q_{t+8}]$), where quarter t (Q_t) is the quarter that net share issuance (NSI) is constructed. Panel A reports the result for the whole sample. Panel B reports the result for the stocks with net share issuance greater than .5%, which implies the firms are issuing new equity. Panel C reports the result for the stocks with net share issuance lower than -0.5%, which implies the firms are buying back equity.

Panel A: Result for Stocks Bought or Sold by QIX

	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Stocks with Positive NSI (NSI>0.5%)									
B	1.09	1.15	1.12	3.69	0.31	0.41	0.34	0.33	0.27
DED	0.23	0.25	0.20	0.28	0.02	0.06	0.05	0.05	0.03
TRA	0.69	0.67	0.59	0.62	-0.06	0.00	0.00	0.04	0.08
RSI	0.09	0.09	0.05	0.27	0.04	0.02	0.02	0.00	0.04
Firm	9.09	10.21	11.73	12.57	10.58	8.77	6.91	5.81	5.04
S	1.13	1.15	1.15	-2.60	0.18	0.21	0.24	0.26	0.22
DED	0.21	0.20	0.25	0.05	0.02	0.01	0.02	0.00	-0.01
TRA	0.53	0.48	0.56	0.16	-0.03	-0.04	-0.01	-0.02	0.02
RSI	0.09	0.10	0.04	-0.18	-0.11	0.00	0.01	0.01	0.01
Firm	7.66	8.41	9.03	11.08	9.28	7.97	7.05	4.80	4.65

	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Stocks with Negative NSI (NSI< -0.5%)									
B	0.85	0.77	0.66	2.98	-0.07	0.15	0.13	0.13	0.09
DED	0.15	0.14	0.08	0.15	-0.07	0.00	0.01	0.02	0.01
TRA	0.16	0.16	0.15	0.22	0.01	0.12	0.11	0.12	0.10
RSI	0.09	0.08	0.05	0.23	-0.08	-0.02	-0.02	-0.01	0.02
Firm	-0.46	-2.03	-3.37	-5.56	-3.96	-2.76	-1.54	0.40	0.29
S	0.82	0.82	0.88	-2.36	0.06	0.00	0.04	0.08	0.06
DED	0.14	0.13	0.23	0.11	0.01	-0.01	-0.03	-0.02	-0.01
TRA	0.10	0.04	0.23	0.24	0.06	0.02	0.03	0.06	0.06
RSI	0.07	0.11	0.07	-0.13	-0.09	-0.04	-0.03	-0.01	0.01
Firm	-1.18	-2.74	-4.27	-5.23	-3.98	-2.80	-1.53	-0.71	-0.14

Panel B: Result for Stocks Bought or Sold by DED

	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Stocks with Positive NSI (NSI>0.5%)									
B	0.23	0.30	0.40	1.64	0.11	0.04	-0.01	-0.03	-0.04
QIX	1.22	1.29	1.18	1.90	0.26	0.43	0.37	0.37	0.34
TRA	0.70	0.68	0.52	0.76	-0.08	-0.01	0.01	0.03	0.08
RSI	0.08	0.10	0.05	0.27	0.02	0.03	0.00	-0.01	0.04
Firm	8.30	9.41	10.59	11.89	10.13	8.46	6.85	5.36	4.54
S	0.32	0.28	0.18	-1.15	-0.10	0.00	0.04	0.05	0.02
QIX	1.17	1.19	1.22	0.14	0.30	0.27	0.28	0.27	0.19
TRA	0.64	0.59	0.68	0.09	-0.07	-0.05	-0.04	-0.03	0.02
RSI	0.09	0.09	0.05	-0.11	-0.05	0.00	0.03	0.01	0.03
Firm	8.08	9.05	9.88	10.87	9.05	7.61	6.31	4.69	4.50
Stocks with Negative NSI (NSI< -0.5%)									
B	0.19	0.22	0.33	1.26	0.05	-0.01	-0.03	-0.05	-0.04
QIX	0.90	0.80	0.71	1.12	-0.11	0.14	0.13	0.18	0.19
TRA	0.15	0.09	0.11	0.31	0.02	0.13	0.11	0.13	0.12
RSI	0.13	0.08	0.05	0.19	-0.07	-0.04	0.00	-0.01	0.04
Firm	-0.55	-2.08	-3.54	-5.49	-4.11	-2.93	-1.75	0.10	0.02
S	0.23	0.18	0.07	-1.18	-0.18	-0.06	-0.02	0.01	0.01
QIX	0.90	0.91	0.89	0.22	0.09	0.05	0.11	0.06	0.02
TRA	0.13	0.14	0.28	0.15	0.06	0.04	0.07	0.07	0.05
RSI	0.04	0.11	0.10	-0.06	-0.10	-0.02	-0.07	-0.01	0.01
Firm	-0.76	-2.47	-3.89	-5.16	-3.80	-2.64	-1.34	-0.45	0.03

Panel C: Result for Stocks Bought or Sold by TRA

	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Stocks with Positive NSI (NSI>0.5%)									
B	0.53	0.53	0.63	2.88	0.01	-0.06	-0.08	-0.10	-0.02
QIX	1.13	1.17	1.04	1.69	0.28	0.45	0.42	0.42	0.32
DED	0.24	0.25	0.21	0.27	-0.02	0.06	0.05	0.05	0.03
RSI	0.10	0.10	0.03	0.25	0.01	0.01	0.03	0.01	0.05
Firm	8.18	9.12	10.41	12.10	10.56	9.25	7.69	6.20	5.08
S	0.77	0.71	0.59	-2.19	-0.15	0.00	0.06	0.10	0.11
QIX	1.14	1.18	1.25	0.29	0.28	0.20	0.20	0.18	0.16
DED	0.22	0.22	0.25	0.10	0.07	0.02	0.02	0.02	-0.01
RSI	0.09	0.09	0.08	-0.10	-0.05	0.01	-0.01	-0.01	0.01
Firm	8.70	9.67	10.59	11.47	9.27	7.39	5.90	4.39	4.45
Stocks with Negative NSI (NSI< -0.5%)									
B	0.09	0.09	0.20	1.95	0.02	0.05	0.03	0.03	0.03
QIX	0.87	0.87	0.66	1.09	-0.06	0.15	0.19	0.18	0.15
DED	0.19	0.17	0.13	0.14	-0.07	-0.01	0.00	0.01	0.02
RSI	0.11	0.10	0.04	0.24	-0.12	-0.06	-0.03	-0.01	0.03
Firm	-0.66	-2.30	-3.66	-5.57	-3.93	-2.65	-1.37	0.40	0.35
S	0.21	0.18	0.22	-1.65	0.03	0.11	0.12	0.15	0.13
QIX	0.88	0.78	0.86	0.36	0.05	0.03	0.00	0.02	0.02
DED	0.14	0.12	0.19	0.14	0.03	0.01	0.00	-0.02	-0.02
RSI	0.06	0.10	0.06	-0.08	-0.06	-0.02	-0.03	-0.02	0.00
Firm	-0.66	-2.21	-3.82	-5.20	-4.04	-2.94	-1.70	-0.72	-0.10

Panel D: Result for Stocks with Increased or Decreased RSI

	Q_{t-3}	Q_{t-2}	Q_{t-1}	Q_t	Q_{t+1}	Q_{t+2}	Q_{t+3}	Q_{t+4}	$[Q_{t+5}, Q_{t+8}]$
Stocks with Positive NSI (NSI>0.5%)									
Increase	0.10	0.03	0.13	1.41	-0.01	-0.10	-0.07	-0.14	-0.04
QIX	0.85	0.84	0.96	1.63	0.45	0.51	0.43	0.38	0.35
DED	0.17	0.16	0.18	0.34	0.07	0.10	0.08	0.06	0.06
TRA	0.46	0.43	0.47	0.73	0.01	0.07	0.06	0.08	0.10
Firm	8.30	9.47	10.45	11.90	9.84	8.34	6.72	5.61	5.38
Decrease	0.14	0.24	0.12	-1.25	-0.14	0.06	0.01	0.01	0.02
QIX	0.81	0.87	0.80	0.22	0.32	0.31	0.30	0.31	0.27
DED	0.16	0.17	0.15	0.01	0.06	0.07	0.05	0.06	0.03
TRA	0.45	0.46	0.34	-0.06	0.04	0.03	0.04	0.05	0.08
Firm	7.75	8.68	9.90	11.55	9.52	7.90	6.32	4.39	4.76
Stocks with Negative NSI (NSI< - 0.5%)									
Increase	0.12	0.00	0.12	1.13	-0.12	-0.16	-0.08	-0.09	-0.01
QIX	0.63	0.62	0.63	1.18	0.17	0.32	0.29	0.27	0.29
DED	0.10	0.10	0.15	0.28	0.04	0.07	0.07	0.04	0.04
TRA	0.08	0.09	0.13	0.42	0.09	0.15	0.15	0.14	0.14
Firm	-0.62	-2.25	-3.41	-5.27	-3.80	-2.56	-1.31	0.48	0.64
Decrease	0.16	0.28	0.17	-0.98	-0.07	0.04	-0.01	0.01	0.02
QIX	0.70	0.70	0.68	0.23	0.17	0.16	0.19	0.19	0.17
DED	0.15	0.17	0.13	0.04	0.03	0.04	0.01	0.02	0.03
TRA	0.14	0.18	0.24	0.05	0.10	0.13	0.11	0.10	0.09
Firm	-0.58	-2.13	-3.73	-5.04	-3.83	-2.62	-1.36	-0.35	0.26