Institutional Ownership and the Value of Cash Holdings*

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Abstract

We investigate how institutional ownership affects the value of corporate cash holdings. Using 13F filing data in the US, we find that the value of cash holdings is higher for firms with high institutional ownership. To address endogeneity problems, we employ a discontinuity in institutional ownership around Russell 1000/2000 index reconstitutions and our findings are robust to the composition of the Russell indexes. The valuation premium of institutional ownership for cash holdings remains significant after controlling for the types of institutional ownership. Moreover, the transient type of institutional ownership has the highest value of corporate cash holdings among the different types.

JEL classification: G23, G31, G32, G34

Keywords: institutional ownership, cash holdings, corporate governance, investment opportunity, financial constraints

1. Introduction

We examine the effect of large institutional ownership on the value of firm cash holdings. The institutional ownership of firms has dramatically increased during the last decades in the US (Harford et al., 2018). Institutional investors as one of the major investment groups have drawn much attention in academics and how they affect corporate governance and performance through financial policies has been an active debate. On one hand, institutional investors benefit firms through providing the role of monitoring (Shleifer and Vishny, 1986) and improving the efficiency of information (Boone and White, 2015). On the other hand, they have negative influences on firms through managers' obsession with short-term performance to meet their needs. In particular, Borochin and Yang (2017) show that institutional ownership types have effects on firms' corporate governance characteristics and firms' valuation and dedicated institutions tend to hold firms with better governance characteristics. However, past work has not considered the influence of institutional ownership on the value of cash holdings. This study tries to establish the link between institutional ownership and the value of cash holdings.

Our work is motivated by a large literature that examines what determine the value of cash holdings. Faulkender and Wang (2006) and Denis and Sibilkov (2010) find that cash holdings are more valuable for financially constrained firms, while Dittmar and Mahrt-Smith (2007) document that firms with better corporate governance has a higher value of cash holdings. Moreover, a recent paper, Bates et al. (2017) find that the value of corporate cash holdings has increased in recent decades and product market competition, credit market risk, and within-firm diversification are main drivers of the increase of the cash holding values. However, it is unclear whether institutional ownership increases the value of cash holdings. In this paper, this issue is addressed by separating institutional ownership by the Bushee (1998,

2001) classification of institutional investor types and examining whether the types of institutional ownership also affect the value of corporate cash holdings.

One may be concerned about a possible endogeneity issue: institutional investors prefer firms with the high value of cash holdings. To address the endogeneity problems, We test for causality in the relationship between institutional ownership and the value of corporate cash holdings using a regression discontinuity setting with Russell index threshold. The discontinuity in Russel index thresholds results in a substantial difference in institutional ownership which is not related to corporate policies. A growing literature has used the discontinuity in Russel index cutoff to correct for the endogeneity (e.g., Appel et al., 2016; Boone and White, 2015; Crane et al., 2014;, and Mullins, 2014).

Overall, we find that firms with higher institutional ownership have significantly higher values of corporate cash holdings. In particular, the influences of transient institutional investors on the cash holding values are stronger than those of quasi-indexers and dedicated institutional investors. These findings persist after considering the endogeneity issues with a discontinuity in institutional ownership around Russell index thresholds.

To provide insights into the economic channels through which institutional ownership affect the value of cash holdings, we analyze three important channels: corporate governance quality, investment opportunities, and financial constraints. We find that institutional ownership improves corporate governance by lowering takeover defenses and attracting more analyst coverage. The effect of institutional investors on corporate governance proxies is visible only for transient investors. With regard to investment opportunities, as per our anticipation, our results demonstrate that firms with higher institutional ownership have greater investment growth opportunities. Similar to governance results, the results for investment opportunities appear only for transient investors as opposed to either quasi- or dedicated investors. With regard to financial constraint as our third channel, in line with our

expectation, we find that the increasing value of cash holding with greater institutional ownership is lower for firms with financial constraints. However, we find that the higher value of cash holding with transient investor is more for financially constrained firms is somewhat surprising.

Our work joins a literature to examine the roles played by institutional ownership in explaining the value of corporate cash holdings. A number of research suggests that institutional ownership monitors corporate policies through either active intervention (voice) or the threat of selling (exit).[1] In particular, dedicated institutional investors influence managers to pursue corporate policies through the voice channel and transient institutional investors are associated with the threat of exit channel. However, prior research has mainly focused on the roles of the dedicated institutional investors and it has not explored the effect of the transient investors on the corporate policies. In contemporaneous work to our own, Giannetti and Yu (2017) only analyze the benefits of short-term institutional investors and find that firms with more short-term institutional investors enhance long-term performance in the aftermath of permanent negative shocks. In this paper, we separate institutional ownership by the types of institutional investor and find that firms with higher transient institutional investors have significantly higher values of corporate cash holdings than firms with higher quasi-indexers and dedicated institutional investors. Our findings provide evidence that short term institutional investors are important monitoring forces. Additionally, this study may have implications for shareholder activism around the issue of corporate cash holdings.

Furthermore, this study contributes to the research of the value of cash holdings. Previous research show that the value of cash holdings is determined by corporate governance, investment need, and financial constraint (Dittmar and Marht-Smith, 2007; Faulkender and

[1] See Edmans (2014) for an extensive review of the monitoring.

Wang, 2006; and Denis and Sibikov, 2009). This study provides institutional ownership as another important force that significantly impact the value of cash holdings. Finally, we also offer insights into three mechanisms – corporate governance, investment opportunities, and financial constraints) – through which institutional investors impact the value of cash holdings.

The paper is organized as follows. Section 2 presents literature review and develops hypotheses. Section 3 describe our data and variables to be used. Section 4 presents our empirical findings. In Section 5, the channels of the value of corporate cash holdings are explored. Section 6 concludes.

2. Literature Review and Hypotheses Development

2.1 Corporate Cash Holdings

Academics are continuously searching for reasons behind the growing average cash reserves of firms. In this regard, Bates et al. (2009) evaluate transaction, precautionary, tax and agency conflicts as motivations of firm cash holdings. Among others, they discover that firms with higher volatility of cash flow and intensive R&D would hold more cash. They also present that older firms with stabilized dividends hold less cash compare to new firms. Opler et al. (1999) demonstrate that there is an optimal level of cash holdings for firms and holding excess cash would incur higher costs for firms in terms of liquidity premium and tax disadvantages. They also evidence that firms with high growth opportunities, riskier activities and smaller in terms of size hold more liquid assets. Likewise, Foley et al. (2007) find that firms hold large cash reserves due to the tax costs associated with repatriating foreign income. Mikkelson and Partch (2003) present that firms with persistent large cash holdings (i.e., holding at least one quarter of the total asset as cash at least for past five consecutive years)

have comparable or better performance than their counterparts in terms of size and industry. Similar to Bates et al. (2009), they also note that high cash holdings are associated with greater investment, especially in R&D.

Faulkender and Wang (2006) creatively introduce an approach to evaluate the value of cash holdings by looking at the marginal value effect reflected by excess stock returns initiated by one additional dollar of cash. They find that this marginal value of cash decreases for firms with larger cash reserves, higher leverage, and easier access to the capital market.

Following Faulkender and Wang (2006), Dittmar and Marht-Smith (2007) illustrate that there is only 0.42 dollar increase in the firm value cause by one extra dollar of cash for poorly governed firms while that number almost doubled for well governed firms. In addition, they show that poorly governed firms waste excess cash more quickly through inefficient investment and laxity in monitoring.

Meanwhile, cash holdings can be extremely valuable for firms with less stable cash flow. Almeida et al. (2004) develop a new approach to see the effect of financial constraints on financial policy by establish a model to estimate firms' demand for liquidity. They establish the hypothesis that financially constrained firms should be more sensitive to the cash flow than firms which are less constrained, because constrained firms rely more on internal financing to meet the investment needs. After seeing a large sample from 1971 to 2000, empirical evidence which supports their theory is found.

Denis and Sibikov (2009) are interested in why cash holdings are more valuable for financially constrained firms and why some of these constrained firms hold so little cash. After testing a sample ranging from 1985 to 2006, they find evidence that support these reasons for the higher value of cash in constrained firms: i). cash holdings allow financially constrained firms to invest more; ii). The marginal investment is more related to firm value for financially constrained firms comparing to those unconstrained.

Besides, Im et al. (2017) creatively introduce uncertainty as a driver for firm level cash holdings, and they establish the hypotheses that higher uncertainty level would increase the value of cash holdings through three channels: financial constraints, agency conflicts, and real options. Their empirical method follows Faulkender and Wang (2006), Dittmar and Marht-Smith (2007) and Denis and Sibikov (2009), and they find that uncertainty would increase the probability to be financially constrained, mitigates agency conflicts, and increase the value of the option of waiting and seeing, therefore increase the value of corporate cash holdings.

2.2 Institutional Ownership

Among others, institutional shareholders are considered an important force of monitoring (e.g., McConnell and Servaes, 1990; Gillan and Starks, 2003; Shleifer and Vishny, 1986). In this regard, prior studies show firms with higher institutional ownership exhibits improved firm value (McConnell and Servaes, 1990), more transparency (Boone and White, 2015), increased earnings quality (Velury and Jenkins 2006), and greater operating cash flow (Marcu et al. 2007).

A growing number of studies examine the effects of institutional investors more detailed by breaking institutional ownership into different types based on their distinctive trading patterns. For instance, Del Guercio and Hawkins (1999) show that firms targeted by the pension fund activisms subsequently experienced major changes in corporate governance or corporate policies including assets sales, restructuring and layoffs. Therefore, pension funds as one of the major institutional investors are doing successful in monitoring and disciplining firms' actions to maximize fund value.

Also some scholars find evidence that the impacts of institutional investors on firms might be exaggerated, or even negative in the nature. For example, using two-stage least squares to tackle endogeneity, Duggal and Millar (1999) find no relation between institutional ownership and corporate performance. Bushee (1998) provides evidence that a large portion of institutional investors characterized as high turnover and momentum-trading, termed as transient investors, are more likely to reduce R&D investments to meet the short term earing goals. Bushee (2001) also presents that transient institutional investors exert short term earnings pressure on the managers, therefore induces managers to make myopic investment decisions. Thus, Bushee (2001) emphasizes on heterogeneity of institutional investors while relating institutional investors to various firm outcomes. To this end, he classify institutional investors as three types: transient, quasi-index, and dedicated investors. Dedicated investors are characterized as long-term large-holdings and quasi-indexers are those with high diversification and low turn-over. Unlike the Quasi-index and dedicated investors, transient investors are characterized by short-term trading, large turn-over and low level of commitment.

2.3 Hypotheses Development

Executives are constrained by rules and regulations in all kinds of daily activities and managing decisions, and often these rules and regulations not only conforms to the law and statuary requirements of the local and international authorities, but also affected invisibly by factors such as board of directors, financing agreements, the market for corporate control, labor agreements, etc. These factors could be summarized as internal control (e.g., board of directors) and external control (e.g. corporate control). Institutional investors also could be taken as one of the external control in that they are monitors in nature because of their value

maximizing goals. Gillan and Starks (2003) discuss the theoretical foundation and empirical implications of institutional investor's involvement in shareholder monitoring. And eventually they come to the conclusion that institutional investors are expected to increase the liquidity, volatility and price effectiveness of the market they invest in, and the improved information would yield lower monitoring costs and better corporate governance. Shleifer and Vishny (1986) argued that institutional investors have incentives to monitor firm performance because they have greater benefits from improved governance and they could enjoy greater voting rights that would reduce costs of error correction when needed.

Based on the discussion above, we can easily delineate a positive association between institutional ownership and the value of cash holdings.

H_1: Institutional ownership has causal impacts on the value of cash holdings;

We could also relate the value of cash holdings to corporate governance, investment opportunity and financial constraint. The positive relation between corporate governance and the value of cash holdings is wildly found in existing literature. Dittmar and Mahrt-Smith (2007) examine the value effect of corporate governance by comparing the value of cash holdings between well governed firms and poorly governed firms, and they find that one extra dollar of cash is valued only 0.42 dollar for poorly governance firms but valued 0.88 dollar for well governed firms. That result supports the positive relationship between corporate governance and the value of cash holdings. Harford et al. (2012) find that poorly governed firms tend to hold less cash reserves due to different ways of spending the cash flow between well governed and poorly governed firms. Poorly governed firms are associated with lower valuation of cash holdings because they are less likely to spend their cash internally (e.g. investment in R&D) but spend most of them in acquiring which are less profitable. Pinkowitz et al. (2006) conduct cross-country analysis and they find that lower value of cash holdings in countries with less poor investor protection, which means controlling shareholders would

have greater ability to extract resources to serve their own benefits and hinder firm performance. Thus, followed hypothesis should be made:

H_2: Institutional ownership has positive impacts on the value of cash holdings through improving corporate governance;

The second channel is to through investment opportunity. Institutional investors could induce firms to invest more or increase their sensitivity to investment opportunities (Wahal and McConnell, 2000; McConell and Servaes, 1990; Wong and Yi, 2015). Therefore, firms with more investment opportunities could have higher value of cash holdings. Wahal and McConnell (2000) find robust evidence that industry-adjusted expenditures for PP&E and R&D is positively related with institutional ownership, which means that institutional investors boosts corporate investment rather than myopically cut R&D as stated in the mainstream literature in 1980s. McConell and Servaes (1990) evidence that institutional ownership is positively correlated with Tobin's Q, which means that higher institutional ownership is associated with more investment opportunities. That make sense especially when it comes to long-term horizon institutional investors. Wong and Yi (2015) find that institutional investors induce firm to invest more by increasing their sensitivity to investment opportunities, and this impact is even more pronounced in high cash holdings subsamples.

At the same time, cash holdings are more valuable for firms with more investment opportunities or higher sensitivity to investment opportunities. Opler et al. (1999) believe that less cash holdings for firms with rich investment opportunities would means that firms have to give up some of the profitable projects which could increase firm value, thus one would expect firms with more investment opportunities to hold more cash. Thus, the following hypothesis is established:

H_3: Institutional ownership has positive impacts on the value of cash holdings through increasing sensitivity to investment opportunities;

Third, higher institutional ownership may lead to less value of cash holdings by relaxing financial constraints. Higher institutional ownership is associated with better credit ratings, bigger size, more stable cash flows and therefore, less financial constraints (Bhojraj and Sengupta, 2003).And evidence shows that the value of cash holdings is positively correlated with financial constraints as stated in literature review (Almeida et al. 2004; Denis and Sibikov, 2009).

Bhojraj and Sengupta (2003) find evidence that firms with higher institutional ownership enjoy higher ratings on the new bond issued, because the involvement of institutional investors typically associates with timely disclosure and less information asymmetry. Schiantarelli and Sembenelli (2000) believe that independent firms face more severe financial constraints because their financing costs might be larger due to information asymmetry and low ratings.

Pinkowitz and Williamson (2002) show that the market value of cash holdings is higher for firms that are less likely to engage in financial distress, also Denis and Sibikov (2009) show that financial constrained firms tend to hold higher level of cash due to costly external financing. Thus, hypothesis related to the financial constraint channel can be stated as follows:

H_4: Institutional ownership has negative impacts on the value of cash holdings through relaxing financial constraints.

3. Data and Variables

3.1 Data

The main dataset contains CRSP, Fama-French 25 portfolio returns, Compustat North America, Thompson Reuters 13F, and Russell Index weights. The data starts from 1980 and ends at 2015 containing 7,138 firms in 240 industries, and there are 118,643 firm-year observations. Financial firms are dropped due to their liquidity is hard to measure and utility firms are dropped because the governance and liquidity could be driven by regulatory issues, firms with market value lower than 25,000 in 1980 constant US dollars are dropped, and also stocks not traded on the major stock exchanges (NYSE, NASDAQ and AMEX) are excluded.

3.2 Measures and Variables

3.2.1 Excess Returns

The excess stock returns are defined as the annualized stock return of the firm minus the benchmark return in terms of size and book-to-market ratio, so it is constructed based on CRSP and Fama-French (FF) 25 portfolios. First, we calculate the annualized stock return of each firm using data from CRSP, and calculate the annualized benchmark FF 25 portfolio stock returns by accumulation of the monthly based returns. Secondly, we merge the two dataset and assign each firm two identifiers that tells which size and BE/ME group lies based on the breakpoints data downloaded from French website, and using the identifiers to find the benchmark return of each firms. The last step is simply to construct excess return by using their stock return minus the benchmark return to get excess return.

3.2.2 Institutional Ownership

The institutional ownership data comes from Thompson Reuters 13F, which contains quarterly holdings of mutual funds. They are documented as the holdings of the firms by the managers at the end of quarter. To calculate institutional ownership by each firm, simply sum up the holdings of the managers who hold shares of this firm. Following Bushee (2001), we break down institutional ownership as transient, quasi-indexers and dedicated, the type of the managers are downloaded from Bushee's website. Using Bushee's classification to merge with Thompson Reuter's 13F data, the institutional ownership of different types could be obtained.

3.2.3 Instrumental Variable (Regression Discontinuity Design)

The instrumental variable in this study is Russell 1000/2000 Indexes, which are constructed by the 3000 largest firms in US in terms of market capitalization. The indexes are updated every year by Russell Investment, the largest 1000 firms in terms of market cap are included in Russell 1000 index, and the next 2000 firms (ranked 1001 to 3000) are included to construct Russell 2000 index. Reconstitution normally happens once a year if there is no accidental event, and the constitution will remain for the whole next year. The rules are transparent and the firms could not intentionally manipulate their enrollment into 1000 index or 2000 index. The data to be included in this study is the Russell Indexes from 1990 to 2006.

The sample ends at 2006 because a new rule (banding rule) is introduced by Russell Investments since 2007. They allow the firms with market cap larger or smaller than the new threshold (cutoff) to change their index, which almost destroyed the local continuity condition for regression discontinuity design. Thus, Russell Index data after 2006 is not appropriate to serve as instrumental variable.

3.2.4 Corporate Governance

The proxy of corporate governance follows Gompers et al. (2003), they construct a measure called "Governance Index" to be the proxy for corporate governance through the level of shareholder rights. This index looks at the charter and the legal code of the state where the firm is incorporated to document the number of anti-takeover provision. That means higher G-index indicates more anti-takeover actions and more "dictatorship", which leads to lower level of shareholder rights and therefore worse governance. This index is established and updated every two years by IRRC (Investor Responsibility Research Center), and it takes the value of 0 to 24.

Another measure for corporate governance is analyst coverage. Bushman and Smith (2001) propose that analysts could act as the external monitors that oversee the management and decrease the level of information asymmetry. Thus, higher level of analyst coverage could be linked with better corporate governance. Analyst coverage data is downloaded from Thomson Reuters I/B/E/S dataset.

3.2.5 Investment Opportunities

There are several measures that could be used in the existing literature to proxy for investment opportunities, and they are primarily Tobin's Q, sales growth, market-value/book-value, R&D/Sales and ROE. This study applies Tobin' Q and sales growth as the measures for investment opportunities for they are relatively stable and less varied across industries. The data to construct Tobin' Q and sales growth comes from the financial statements information contained in Compustat. Lower Tobin's Q indicates lower market-to-book ratio and therefore more investment opportunities. Higher sales growth indicates more investment opportunities.

3.2.6 Financial Constraints

There are two approaches to find financial constraints measures, one is to directly use the external measures (paper ratings, debt ratings, firm size, age etc.), and the other is to use constructed measures based on firm characteristics. There exists a large body of literature suggesting different approaches to construct financial constraints measures, among them prevails three main indexes: KZ index based on investment-cash flow (Kaplan and Zingales, 1997), WW index based on empirical factors: cash flow, a dividend payer dummy, leverage, firm size, industry sales growth, and firm sales growth (Whited and Wu, 2006) and SA index based on size and age (Hadlock and Pierce, 2010). Hadlock and Pierce (2010) claim that they find evidence that KZ have serious problem as proxy for financial constraints even though they provide support in explaining investment-cash flow, while SA index seems to be robust and recommended. Following the existing literature, we choose to use WW index and SA index as financial constraints measures. These two measures are constructed based on firm level characteristics from financial statements, the corresponding data source is Compustat North America.

3.2.7 Control Variables

The inclusion of control variables follows Faukender and Wang (2006) and Im et al. (2017): change in cash, change in net assets, change in earnings before interest and extraordinary items, change in research and development (R&D) expenses, change in interest expenses, change in dividends, lagged cash holdings, leverage, and net financing during fiscal year. All variables are scaled by lagged market value of equity except leverage. And also to control for capital constraints, include the interaction terms between cash holdings and the change in cash holdings, and between leverage and change in cash. All those control variables

are change in firm characteristics that might be correlated with changes in cash that may also affect firm value.

3.3 Descriptive Statistics

Descriptive statistics are shown in Table 1 to see the difference between high institutional ownership firms and low institutional ownership firms. Mean, maximum, minimum and median are shown in different groups. There are four panels to show the group differences using total, transient, quasi-index, dedicated institutional ownership respectively.

Panel A of Table 1 shows that overall speaking, firms with higher institutional ownership tend to hold more cash comparing with lower institutional ownership counterpart by 1.7%. And the difference in the mean of cash ratio between high IO and Low IO is even larger (6.7%) when group is constructed using transient institutional ownership. While firms with high quasi-indexers' holdings tends to hold less cash assets by 2.3%, which shows that quasi-indexers' behavioral traits are quite different with transient institutional investors. And there is only slight difference in cash ratio between high IO (dedicated) and low IO (dedicated) firms.

4. Empirical Results

4.1 Baseline Regression

After seen that higher institutional ownership is associated with higher cash holdings, it is natural to guess that firms with higher institutional ownership would have higher value holding cash assets. Following Faulkender and Wang (2006), we use the below model to test the relation between institutional ownership and the value of cash holdings:

$$r_{i,t} - R_{i,t} = \alpha + \beta_1 \Delta Cash + \boldsymbol{\beta}\mathbf{Controls} + \varepsilon \quad (1)$$

The sign and significance of the coefficient on change in cash show the value of cash holdings, and it could be interpreted as the excess stock return due to one unexpected extra dollar of cash holdings. Controls are other changes in firm characteristics that might be correlated with change in cash and affect firm value. To include institutional ownership characteristics into the model, we consider if the value of cash holdings varies among firms with different level of institutional ownership:

$$\beta_1 = \gamma_0 + \gamma_1 D\_IO \quad (2)$$

where *D_IO* is a dummy variable equals to 1 if the firm is characterized by high institutional ownership. All firms are divided into three groups in terms of their institutional ownership, firms with institutional ownership higher than the 66.7 percentile are defined as high institutional ownership group and firms with institutional ownership lower than the 33.3 percentile are characterized as low institutional ownership.

Then the baseline model could be reduced as:

$$r_{i,t} - R_{i,t} = \alpha + \beta_1 \Delta Cash + \beta_2 D\_IO * \Delta Cash + \boldsymbol{\beta}\mathbf{Controls} + \varepsilon \quad (3)$$

The sign and significance of the interaction term between institutional ownership and change in cash are of the utmost importance in answering the question that whether there is relationship between institutional ownership and the value of cash holdings. If hypothesis H_1 stands, then β_2 should be significantly positive and this coefficient could be interpreted as the increase in the value of cash holdings caused by institutional ownership. Also, institutional ownership is divided into transient, quasi-indexers, and dedicated to see specifically which type of institutional investors affects the value of cash holdings. The results are shown in Table 2. We could see from column (1) that institutional ownership as a whole

indeed have a positive relationship with the value of cash holdings. And column (2) shows that the relationship is even stronger comparing firms with high level of transient institutional ownership and the low level counterpart. But the significance is gone when quasi-indexers and dedicated institutional ownership are used to group the firms according to column (3) and (4). It is tempting to conclude that it is transient part of institutional ownership that mainly influences the value of cash holdings, but this conclusion is not valid due to endogeneity problem. The first part in the next section gives a solution by using Russell 1000/2000 Index as an instrumental variable to examine the causal relationship of institutional ownership on the value of cash holdings.

4.2 Regression Discontinuity Design

4.2.1 Discontinuities around Russell Index Threshold: Graphical Illustration

Institutional ownership is endogenous as stated in section 1, therefore instrumental variable analysis has to be conducted to see whether causal relationship exists. Follow Wong and Yi (2015) and Cheung et al. (2017), we choose Russell 1000/2000 Index as exogenous shock on institutional ownership to conduct a regression discontinuity analysis.

Russell indices are constructed based on the market capitalization of the top 3000 firms in the US, the largest 1000 firms in terms of market capitalization on May 31 are included in Russell 1000 index and the next 2000 largest firms are included in Russell 2000 index. Firms cannot objectively control and manipulate their inclusions in Russell 1000/2000 because they don't have the information of the cutoff threshold in advance, which makes the reconstitution of Russell Index a perfect quasi-natural experiment.

The indexes are value-weighted, which means that firms at the bottom of Russell 1000 will have significantly lower weights than firms at the top of Russell 2000. Then there is

a discontinuity in weights around the threshold and the discontinuity could be seen in Figure 1. We could see that firms just below the threshold will be included in Russell 2000 index, and they receive much higher weights than firm just above the threshold and be included in Russell 1000 index. This discontinuity in weights would create a discontinuity in institutional ownership around the threshold as stated in Wong and Yi (2015). The discontinuity in different types of institutional ownership could be seen in the four panels in Figure 2. The discontinuity in institutional ownership is rather obvious in terms of total, transient, and quasi-indexers but not so obvious in terms of dedicated ownership. That means dedicated investors might care less about firms' membership in Russell 1000/2000 indexes. It is reasonable since dedicated investors concentrate more on the long-term growth of the firm and care less about the short term characteristics of the firms. And then, different levels of institutional ownership might have impacts on the value of cash holdings, that means firms with higher level of institutional ownership might holds more cash assets. The discontinuity in cash holdings is shown in figure 3. At last, the discontinuity in excess return is presented in the four panels in Figure 4 with different bandwidths respectively. The discontinuity still exists when the bandwidth grows to 399. The hypothesis is that institutional ownership improves firm performance by increase the value of cash holdings.

Figure 1 shows the relationship between Russel Index weights and their distances to the 1000^{th} largest threshold. Russell index weights are calculated based on the yearly reconstitution from 1990 to 2006. The dots represent the mean weights of each distance to the threshold. Clearly there is indeed discontinuity in weights around the threshold. Four panels are shown to present the discontinuity using different bandwidths.

Figure 2 presents the discontinuities in institutional ownership around Russell 1000/2000 threshold from year 1990 to 2006. The dots are the mean ownerships of each

distance to the threshold. Ownership data are downloaded from Thomson Reuters 13F and the classification follows Bushee (2001).

Figure 3 presents the discontinuity of the change in cash holdings around the Russell 1000/2000 Indexes threshold, and the four panels give the graphs using different bandwidths. Change in cash holdings is scaled by the lagged market value of the equity.

Figure 4 shows the discontinuity in excess return around 1000/2000 threshold from year 1990 to 2006. Fours panels are shown to present the discontinuities in different bandwidths respectively and to show how strong and significant the discontinuity is. Dots are the mean average excess return for each distance to the 1000th largest threshold.

4.2.2 Institutional Ownership around the Russell 1000/2000 Threshold

Graphical illustrations have already been shown previously, local linear regressions could be conducted to see the variation of institutional ownership around the threshold. Follow Cheung et al. (2017), the following model is adopted:

$$IO_{i,t} = a + bRus2000_{i,t} + \sum_{k=1}^{K} c_k Rank_{i,t}^{\ k} + \sum_{k=1}^{K} c_{K+k} Rus2000_{i,t} Rank_{i,t}^{\ k} + \mathbf{D}*\mathbf{CONTROLS}_{i,t} + YR_t + IND_j + \omega_{i,t} \quad (4)$$

where *IO* is institutional ownership; *Rus2000* is the dummy variable equals 1 if the firm is included in Russell 2000 Index and 0 otherwise; *Rank* is the distance to the 1000/2000 threshold, and equals (+x) for firm which is the x smallest firm in Russell 1000 and equals (-x) for firm which is the x largest firm in Russell 2000. Controls, year dummy and industry dummy are included. The coefficient on *Rus2000* is of particular interest since the sign and significance of this coefficient denotes whether discontinuity around the threshold exists. Also, following Cheung et al. (2017), to test whether none-linearity of predicted values exists, the

1^{st} to K^{th} order polynomials of Russell Rank and their interaction terms with the treatment dummy are included.

Table 3 gives the estimated coefficients and robust standard errors of the model specified above. There are four panels showing the results for different types of institutional ownership and five columns in each panel showing the results for different bandwidths (h=10, 20, 30, 40,and 50 for columns (1) to (5)). Only results when K=3 are given for simplicity, which means that up to 3^{rd} order polynomials is included in the model to see whether none-linearity exists.

Panel A of Table 3 shows that there is a 39.7% jump of total institutional ownership around the threshold when h=10 given the coefficient on *Rus2000* is significant, which support the graphical results shown before that indeed there is a significant discontinuity around the Russell 1000/2000 Threshold. Meanwhile, though the coefficients on the rank polynomials and their interaction terms with lagged Russell dummy are mostly significant, but the value of 0 indicates that there is no non-linearity in the predicted values. Also the magnitude of the discontinuity shrinks along with the increase of the bandwidth.

Panel B shows that it is the transient institutional ownership that contributes most of the discontinuity around the Russell 1000/2000 index threshold. Averagely speaking, the largest ten firms in Russell 2000 index have 17.2% higher transient institutional ownership than smallest ten firms in Russell 1000 index. And also this difference in ownership decreases sharply along with the increase of the bandwidth.

Panel C and Panel D give the results of quasi-indexers and dedicated institutional ownership respectively. Though the sign of the coefficient on *Rus2000* dummy is positive, the significance of the coefficients will be doubted.

The results in the regression discontinuity are in line with the graphical parts in Section 4.2.1, which indicates that institutional ownership indeed have discontinuity around Russell 1000/2000 threshold, and this discontinuity mainly stems from the transient type of institutional ownership rather than quasi-indexers and dedicated.

4.2.3 Value of Cash Holdings around the Russell 1000/2000 Threshold

After seeing the discontinuity of institutional ownership around 1000/2000 threshold, we take a step further to examine whether the value of cash holding could be explained by predicted institutional ownership. Follow Chueng et al. (2017) and Wong and Yi (2015), model specification would be as follows:

$$IO_{i,t} = a + bRus2000_{i,t} + cRus2000_{i,t} * \Delta Cash_{i,t} + \sum_{k=1}^{K} d_k Rank_{i,t}^{\ k} + \sum_{k=1}^{K} d_{K+k} Rus2000_{i,t} Rank_{i,t}^{\ k} + \mathbf{E} * \mathbf{CONTROLS}_{i,t} + YR_t + IND_j + \omega_{i,t} \quad (5)$$

$$IO_{i,t} * \Delta Cash_{i,t} = a + bRus2000_{i,t} + cRus2000_{i,t} * \Delta Cash_{i,t} + \sum_{k=1}^{K} d_k Rank_{i,t}^{\ k} + \sum_{k=1}^{K} d_{K+k} Rus2000_{i,t} Rank_{i,t}^{\ k} + \mathbf{E} * \mathbf{CONTROLS}_{i,t} + YR_t + IND_j + \omega_{i,t} \quad (6)$$

$$r_{i,t} - R_{i,t} = a + bIO_{i,t} + cIO_{i,t} * \Delta Cash_{i,t} + \sum_{k=1}^{K} d_k Rank_{i,t}^{\ k} + \sum_{k=1}^{K} d_{K+k} Rus2000_{i,t} Rank_{i,t}^{\ k} + \mathbf{E} * \mathbf{CONTROLS}_{i,t} + YR_t + IND_j + \varepsilon_{i,t} \quad (7)$$

There are literally two instruments, which are institutional ownership and the interaction term between institutional ownership and change in cash. In the first stage, the exogenous shock of Russell 2000 membership on institutional ownership will be estimated just like Section 4.2.2 but without restrictions on the bandwidth. Also the interaction term of institutional ownership and change in cash is estimated in the first stage regression. In the

second stage, the value of cash holdings will be estimated using the instrumented institutional ownership and the instrumented interaction term of institutional ownership and change in cash. The polynomials of the distance (rank) to the threshold and their interaction terms with *Rus2000* are included to check the non-linearity of the predicted value. Again, control variables, year dummy and industry dummy are included.

The intuition behind the second stage regression is nothing much more than Faulkender and Wang (2006) and in line with model (1). The sign and significance of the coefficient on the predicted value of the interaction term of institutional ownership and change in cash would be of the central interest. A significant positive coefficient would indicate a positive impact of institutional ownership on the value of cash holdings and a supportive result for hypothesis H_1.

The estimated coefficients and firm clustered robust standard errors of the 2SLS (two-staged least square) regression specified above are given in Table 4. Each three columns from column (1) to (12) show the 2SLS regression of each type of institutional ownership. The relative Russell Ranks are not listed for simplicity since all the coefficients on them are either not significant or equal to zero, which means that there is no none-linearity of the predicted values. Year dummy and industry dummy are included to control for fixed effects.

Columns (1), (4), (7) and (10) show the estimated coefficients and robust standard errors in the first-stage regressions on institutional ownership, the coefficient on the interaction term of change in cash and *Rus2000* is of the central interest. And this coefficient in column (1) and (3) are significantly positive and read 0.157 and 0.128 respectively, which means that the exogenous shocks from Russell 2000 membership on total and transient institutional ownership are obvious. But this coefficient is not significant in column (7) and too small even though significant in column (10), which means that Russell index might not be a successful exogenous shock on quasi-indexer and dedicated institutional ownership.

Columns (3), (6), (9) and (12) present the estimated coefficients and robust standard errors in the second-stage regressions. The sign and significance of the coefficient on the interaction term between institutional ownership and the change in cash holdings tells whether predicted institutional ownership has impacts on the value of cash holdings. Even though this coefficient is significantly positive in all columns (3), (6), (9) and (12), given the invalidity of the first stage regression in column (7) and (10), one can only conclude that total institutional ownership have positive causal impacts on the value of cash holdings, and the impacts are mainly through transient institutional ownership, which is in line with what have already been shown in the baseline regression.

5. Channels of cash holding values

There is indeed causal relationship of institutional ownership on the value of cash holdings according as tested in the previous regression discontinuity design. The next step is to see the economic mechanisms behind the causal relationship, and the model to test the channel would be in line with model (1) introduced in Section 4.1:

$$r_{i,t} - R_{i,t} = \alpha + \beta_1 \Delta Cash + \boldsymbol{\beta}\mathbf{Controls} + \varepsilon \qquad (8)$$

And to test the channels, revisions have to be made on the decomposition of β_1 :

$$\beta_1 = \gamma_0 + \gamma_1 D\_IO + \gamma_2 D\_Channel + \gamma_3 D\_IO * D\_Channel \qquad (9)$$

where D_IO is a dummy variable indicating high institutional ownership same as before. And *D_Channel* is a dummy variable equals 1 for firms with the channel characteristics. For example, for corporate governance channel, firms are divided into three groups in terms of their corporate governance measures. Firms have better corporate

governance than the 66.7 percentile would be characterized as good governance firms and firms that are worse than the 33.3 percentile be characterized as bad governance.

Substituting β_1 into model (8), we could get the reduced form:

$$r_{i,t} - R_{i,t} = \alpha + \beta_1 D\_IO * \Delta Cash + \beta_2 D\_Channel * \Delta Cash + \beta_4 D\_IO * D\_Channel * \Delta Cash + \boldsymbol{\beta}\mathbf{Controls} + \varepsilon \quad (10)$$

The sign and significance of the coefficient on the interaction term of high institutional ownership dummy, channel dummy and change in cash scaled by lagged market value of equity would be of the central interest. If this coefficient is significantly positive, that means institutional ownership positively affects the value of cash through this channel. All of the control variables specified before would be included.

5.1 Corporate Governance Channel

As stated before, hypothesis H_2 states that institutional ownership would have a positive impact on the value of cash holding through corporate governance channel. Increased institutional ownership would yield better corporate governance because institutional investors would act like a monitor to watch and discipline the management and firm decisions. And in line with Dittmar and Mahrt-Smith (2007), cash holdings are more valuable for firms with better corporate governance. Thus, the first channel to be tested is corporate governance channel. There are two indexes to be used as the proxies for corporate governance: GIM index suggested by Gompers et al. (2003) and analyst coverage.

Since results in Section 4 suggest that the impacts of institutional ownership on the value of cash holdings mainly relies on the transient part, it is of less meaning testing whether corporate governance channel is supported when quasi-indexers and dedicated institutional ownership are applied. The estimated coefficients and robust standard errors are presented in

Table 5. Two panels are provided to see how corporate governance channel is supported when total and transient institutional ownership are applied respectively.

We could see from column (2) and (4) of Table 5 that the coefficient on the interaction term of high institutional ownership dummy, good governance dummy and change in cash scaled by lagged market value of equity are significantly positive for both GIM index measure and analyst coverage measure, and for both total and transient institutional ownership. That means total institutional ownership indeed have positive impacts on the value of cash holdings through corporate governance channel, and corporate governance channel is supported for both total and transient institutional ownership. This result might be contrary to the prevailing views that transient institutional investors have less intention to monitor the firms. Since higher percentage holdings would indicate higher benefit from costly monitoring, it does not matter that the institutional investors are transient or dedicated, they both have the incentives to monitor the firms. In such case, transient institutional investors are the same as active investors.

Also, the interaction term of good governance dummy and change in cash is significantly positive as shown in column (1) and (3). That means cash is more valuable for firms with better corporate governance, which is consistent with Dittmar and Mahrt-Smith (2007).

5.2 Investment Opportunity Channel

Hypothesis H_3 states that Institutional ownership have positive impacts on the value of cash holdings through increasing investment opportunities or increase sensitivity to investment opportunities. That means a positive sign on the coefficient of the interaction term

of high institutional ownership dummy, more investment opportunities dummy and the change in cash.

The estimated coefficients and robust standard errors are shown in Table 6. Also, there are two panels presenting results for total and transient institutional ownership respectively same as Table 5. All of the signs of the coefficient on the interaction term of high institutional ownership dummy, more investment opportunities dummy and the change in cash are positive according to column (2) and (4) in both Panel A and Panel B, and statistically significant at 0.01 level except for Tobin's Q when applying total institutional ownership. The coefficient of central interest is even larger when transient institutional ownership is applied comparing with total institutional ownership. The results mean that investment opportunity channel is supported for total institutional ownership, and even more pronounced for transient institutional ownership.

Also, coefficients on the interaction term of more investment opportunities dummy and change in cash are statistically significantly positive for both total and transient, which means that cash is more valuable for firms with more investment opportunities. This result is in line with Opler et al. (1999) and Im et al. (2017).

5.3 Financial Constraint Channel

Hypothesis H_4 states that Institutional ownership have negative impacts on the value of cash holdings through relaxing financial constraints. Thereby a negative sign on the coefficient of the interaction term of high institutional ownership dummy, financial constrained dummy and the change in cash is expected.

Table 7 presents the estimated coefficients and robust standard errors. It could be seen from column (2) of Panel A that the coefficient on the interaction term of high

institutional ownership dummy, financial constrained dummy measured by WW index and the change in cash is -0.579 and significant at 0.01 level, which means that indeed total institutional ownership decrease the value of cash holdings by relaxing financial constraint. But when it comes to transient institutional ownership, financial constraint channel is no longer supported, which means that higher transient institutional ownership does not necessarily be associated with relaxed financial constraint. One possible explanation is that shareholders in financially constrained firms are concerned that transient institutional investors might leave the company anytime and thus increase uncertainty and financial constraints. Another explanation is that the involvement of transient institutional investors cannot exert signal that the firm has better governance or operating conditions which could be associated with higher ratings and less financial constraints.

In addition, the interaction term of constrained dummy and change in cash in column (1) and (3) are significantly positive at 0.01 level, which means that cash indeed is more valuable for financially constrained firms. And this conclusion is in line with Almeida et al. (2004) and Denis and Sibikov (2009).

6. Conclusion

This study tries to explore the causal relationship of institutional ownership on the value of cash holdings. Russell 1000/2000 Index reconstitution is applied as exogenous shock on institutional ownership to avoid endogeneity problem and statistically significant positive causal relationship of institutional ownership on the value of cash holdings is supported by the data from 1980 to 2015. Also, we find that it is the transient part of institutional ownership that plays the dominate role in affecting the value of cash holdings rather than quasi-indexers and dedicated institutional ownership. Moreover, three channels through which institutional

ownership affects the value of cash holdings are tested: corporate governance, investment opportunity, and financial constraint. We find that institutional ownership has positive impacts on the value of cash holdings through improving corporate governance and increasing sensitivity to investment opportunities, while it has negative impacts through relaxing financial constraint.

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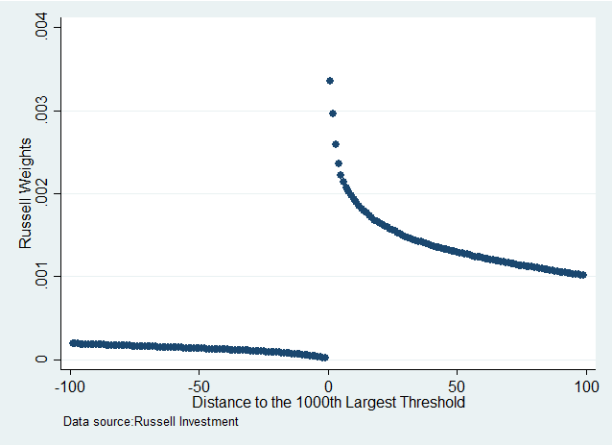
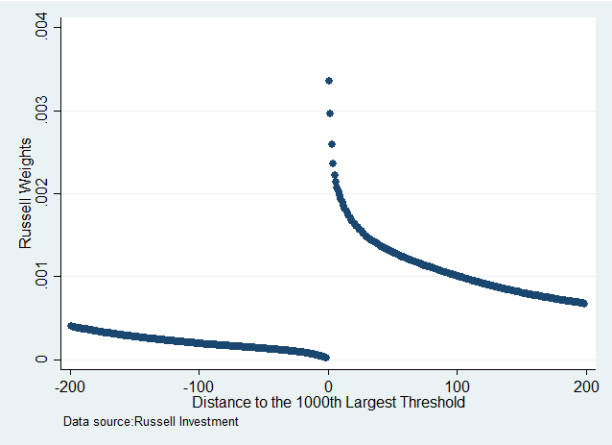
Figure 1: Russell Index Weights and the Distance to the Threshold

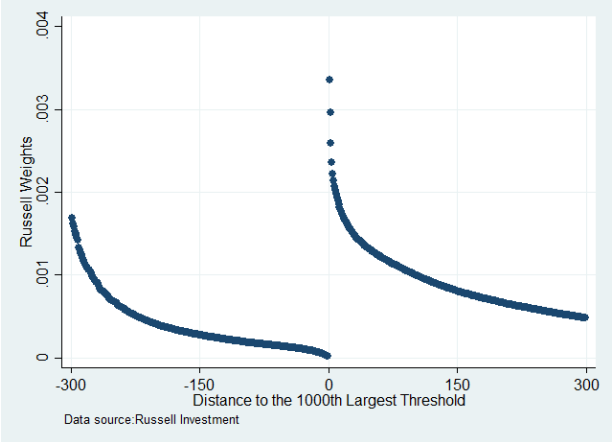
Panel A: 99 Bandwidth



Panel B: 199 Bandwidth



Panel C: 299 Bandwidth



Panel D: 399 Bandwidth

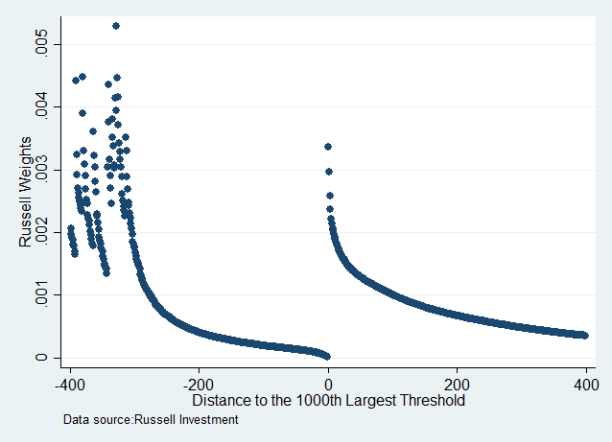
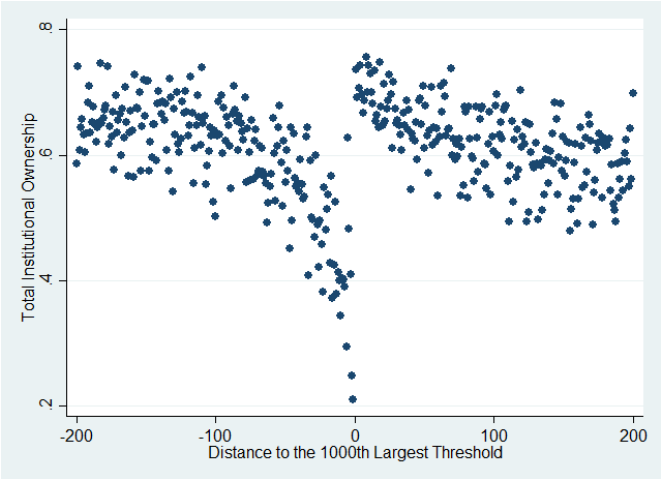
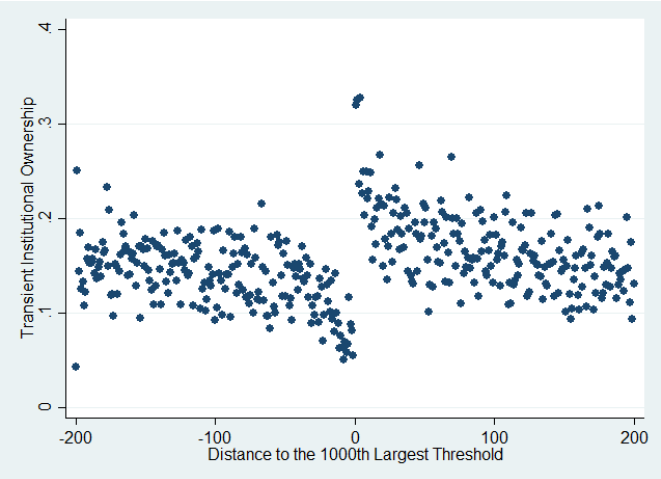


Figure 2: Institutional Ownership around Russell 1000/2000 Index Threshold

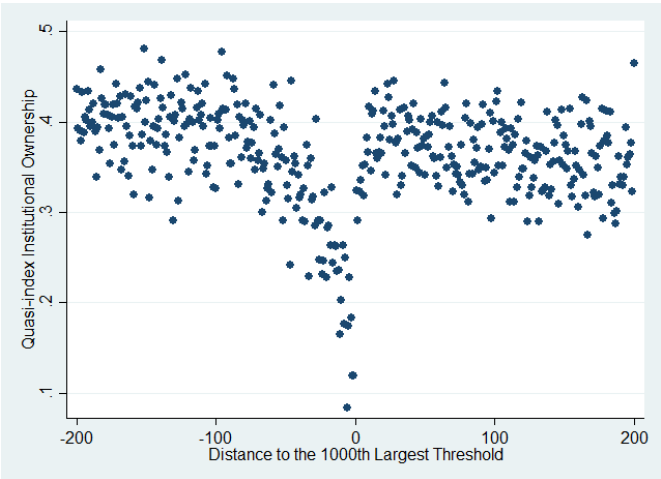
Panel A: Total Institutional Ownership



Panel B: Transient Institutional Ownership



Panel C: Quasi-index Institutional Ownership



Panel D: Dedicated Institutional Ownership

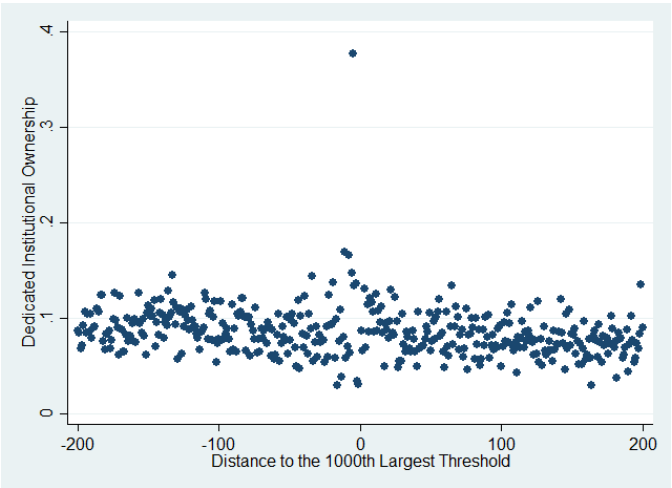
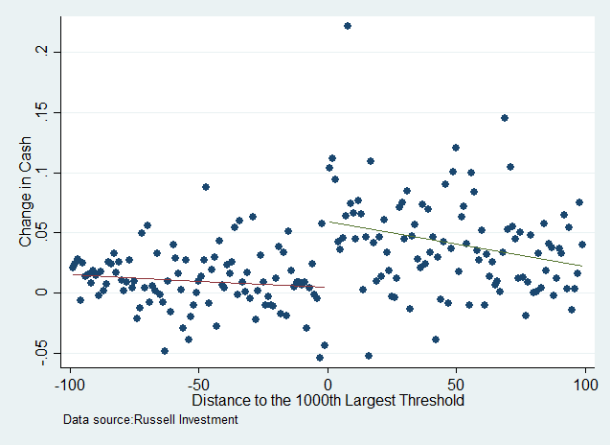
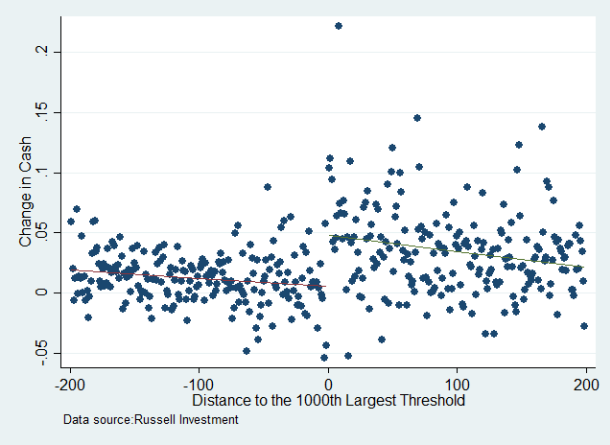


Figure 3: Change in Cash Holdings around Russell 1000/2000 Indexes Threshold

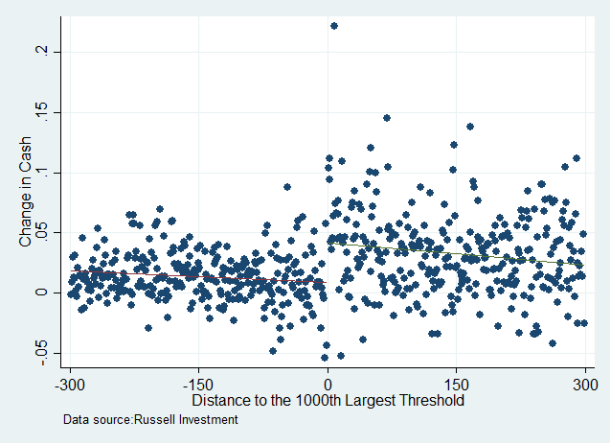
Panel A: 99 Bandwidth



Panel B: 199 Bandwidth



Panel C: 299 Bandwidth



Panel D: 399 Bandwidth

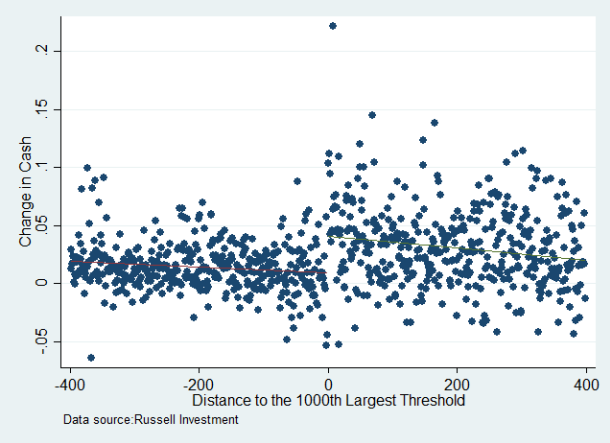
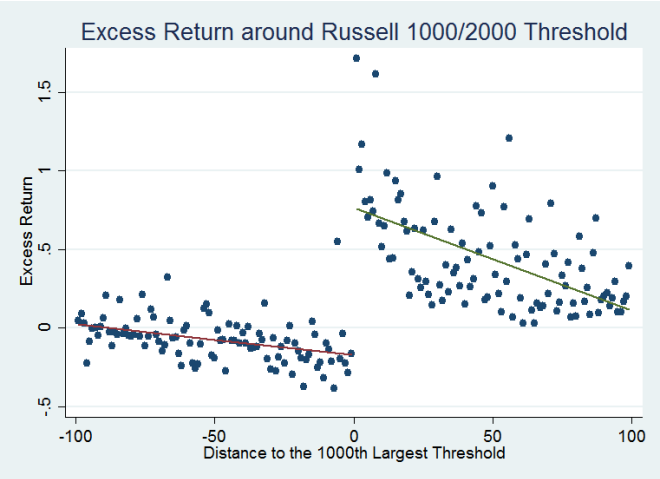
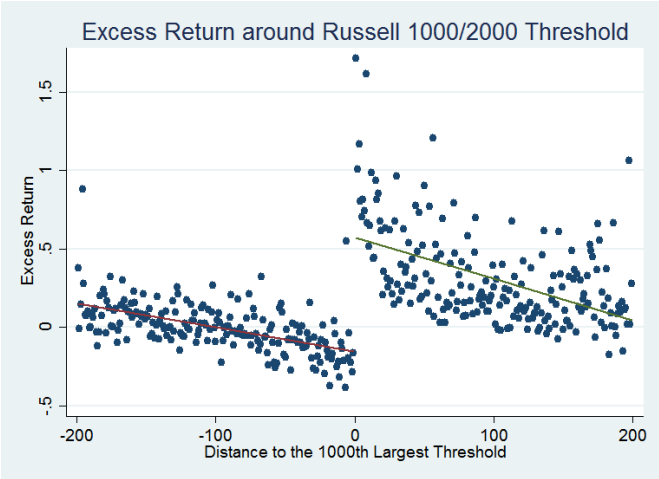


Figure 4: Excess Return around Russell 1000/2000 Indexes Threshold

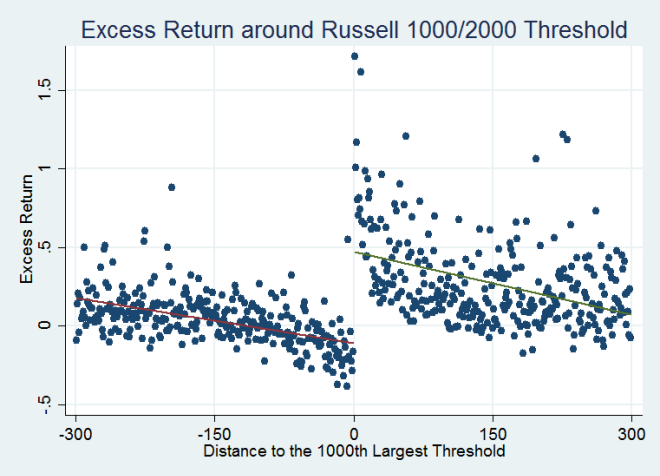
Panel A: 99 Bandwidth



Panel B: 199 Bandwidth



Panel C: 299 Bandwidth



Panel D: 399 Bandwidth

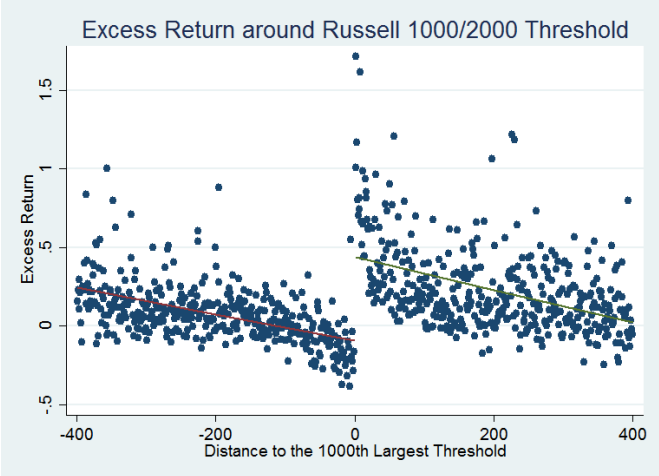


Table 1: Summary of Cash Holdings, Firm Level Characteristics and Constructed Measures

	Panel A: Results Based on Total Institutional Ownership								
	Low IO (Total) Firms				High IO (Total) Firms				
variable	mean	max	min	median	mean	max	min	median	mean_dif
Cash	0.158611	0.994458	0	0.069863	0.175146	1	0	0.087405	-0.017***
Sd_cash	0.086738	0.530085	0	0.069075	0.081404	0.700966	0	0.067421	0.005***
Sd_cash_change	0.083467	0.713506	0	0.066625	0.073153	0.713506	0	0.060708	0.010***
Earnings	-0.03106	1.62339	-7.54419	0.052674	0.072351	1.67618	-4.07341	0.095306	-0.103***
Net_Investment	-0.00045	0.823628	-9.883	0.000591	0.020809	0.741303	-11.0689	0.009245	-0.021***
Assets	230.7442	30317.21	25.0021	73.71341	7392.875	1784147	25.59081	1184.63	-7.2e+03***
R&D	0.095363	6.434771	0	0.038402	0.072135	2.356451	0	0.039729	0.023***
Debt	0.280585	8.149505	0	0.242126	0.217297	3.675735	0	0.188786	0.063***
MV/BV	1.361465	52.31889	0.019035	0.935221	1.803845	57.91546	0.072337	1.306767	-0.442***
PAYOUT	0.115514	1247.415	-178.122	0	0.076505	276.1129	-337.216	0	0.0390
KZ	-7.80868	27.67446	-128.751	-0.38624	-6.2119	26.13374	-168.711	-1.52966	-1.597***
WW	-0.13965	0.696013	-0.44114	-0.15295	-0.26745	0.678981	-0.54785	-0.27589	0.128***
SA	-2.85095	-1.96795	-4.63689	-2.79361	-3.67959	-2.03071	-4.63689	-3.59689	0.829***
Gindx	7.380503	16	3	7	9.262227	18	1	9	-1.882***
Block	0.093457	1.085403	0.05004	0.071881	0.316576	16.52245	0.050066	0.300786	-0.223***
Analysts	1.379239	34	0	0	11.84332	67	0	9	-10.464***
TQ	1.327376	56.18124	0.019035	0.927539	1.786105	56.26334	0.072292	1.29739	-0.459***
SG	1.304831	8843.353	-1.91243	0.067383	0.369895	3701.467	-1	0.093877	0.935*

	Panel B: Results Based on Transient Institutional Ownership								
	Low IO (Transient) Firms				High IO (Transient) Firms				
variable	mean	max	min	median	mean	max	min	median	mean_dif
Cash	0.139609	0.994458	0	0.059392	0.207106	1	0	0.114601	-0.067***
Sd_cash	0.081717	0.466101	0	0.064789	0.089035	0.700966	0	0.076988	-0.007***
Sd_cash_change	0.076323	0.713506	0	0.06066	0.082164	0.713506	0	0.070111	-0.006***
Earnings	-0.00449	1.102844	-7.54419	0.057815	0.046599	7.698528	-22.0306	0.087368	-0.051***
Net_Investment	-0.00282	0.823628	-13.5827	0.000237	0.021852	0.741303	-17.9883	0.009151	-0.025***
Assets	278.6205	103764.8	25.0021	83.14071	4957.937	1761751	25.02644	780.7008	-4.7e+03***
R&D	0.077909	6.434771	-0.00991	0.028504	0.088403	2.056086	0	0.050779	-0.010***
Debt	0.274366	8.149505	0	0.236873	0.213008	4.43E+00	0	0.172549	0.061***
MV/BV	1.162522	20.96509	0.017316	0.873738	1.981101	78.42283	0.03607	1.379035	-0.819***
PAYOUT	-0.02544	1247.415	-2843.16	0	0.068709	462.7553	-337.216	0	-0.0940
KZ	-4.75185	27.67446	-128.358	-0.28201	-7.22996	26.13374	-168.711	-1.54626	2.478***
WW	-0.15085	0.696013	-0.48453	-0.16079	-0.24711	0.681329	-0.54785	-0.2605	0.096***
SA	-2.95009	-2.00832	-4.63689	-2.88335	-3.50838	-2.01919	-4.63689	-3.42206	0.558***
Gindx	7.731742	19	2	7	9.085641	18	1	9	-1.354***
Block	0.183003	1.141291	0.05004	0.136613	0.289559	16.52245	0.050023	0.270657	-0.107***
Analysts	1.487637	62	0	0	10.53415	67	0	8	-9.047***
TQ	1.144554	20.96509	0.017316	0.869964	1.947141	75.94267	0.028105	1.365565	-0.803***
SG	1.04539	8843.353	-1.91243	0.047796	0.943	11879.5	-9.28571	0.114295	0.102

	Panel C: Results Based on Quasi-Index Institutional Ownership								
	Low IO (Quasi-Index) Firms				High IO (Quasi-Index) Firms				
variable	mean	max	min	median	mean	max	min	median	mean_dif
Cash	0.175468	1	0	0.078691	0.152752	0.995107	0	0.075098	0.023***
Sd_cash	0.089183	0.700966	0	0.071636	0.077331	0.360959	0	0.063702	0.012***
Sd_cash_change	0.086343	0.713506	0	0.069861	0.068675	0.530999	0	0.056417	0.018***
Earnings	-0.03719	7.698528	-7.54419	0.052182	0.08002	0.706438	-2.778	0.097419	-0.117***
Net_Investment	-0.00063	0.823628	-17.9883	0.001027	0.019813	0.741303	-11.0689	0.00918	-0.020***
Assets	243.3321	30317.21	25.0021	77.05521	7935.727	1784147	25.06999	1241.606	-7.7e+03***
R&D	0.105406	6.434771	0	0.044673	0.062436	2.356451	0	0.034294	0.043***
Debt	0.276081	8.149505	0	0.230205	0.218184	3.675735	0	0.196026	0.058***
MV/BV	1.478778	52.31889	0.019035	0.977425	1.63E+00	40.40193	0.109722	1.231817	-0.151***
PAYOUT	0.045437	172.3333	-178.122	0	0.098676	276.1129	-292	0	-0.053*
KZ	-8.68934	27.67446	-128.751	-0.4662	-5.80084	26.13374	-168.711	-1.50673	-2.888***
WW	-0.13912	0.696013	-0.46157	-0.15401	-0.27009	0.617422	-0.54785	-0.27722	0.131***
SA	-2.84576	-1.96795	-4.63689	-2.7863	-3.71979	-2.0795	-4.63689	-3.65739	0.874***
Gindx	7.08982	16	2	7	9.294097	18	1	9	-2.204***
Block	0.15519	1.141291	0.05004	0.100987	0.306836	16.52245	0.050009	0.292609	-0.152***
Analysts	1.565274	41	0	0	11.96325	67	0	9	-10.398***
TQ	1.435349	56.18124	0.019035	0.966166	1.620006	39.76997	0.108549	1.227899	-0.185***
SG	2.159736	11879.5	-9.28571	0.076135	0.317789	3701.467	-1	0.084619	1.842**

	Panel D: Results Based on Dedicated Institutional Ownership								
	Low IO (Dedicated) Firms				High IO (Dedicated) Firms				
variable	mean	max	min	median	mean	max	min	median	mean_dif
Cash	0.172933	0.999815	0	0.078822	0.176502	1	0	0.085663	-0.004*
Sd_cash	0.090133	0.530085	0.000015	0.074019	0.0817	0.700966	0	0.067936	0.008***
Sd_cash_change	0.085472	0.713506	1.82E-05	0.070268	0.074131	0.713506	0	0.062092	0.011***
Earnings	-0.03073	1.62339	-6.97291	0.048962	0.052185	1.67618	-22.0306	0.089537	-0.083***
Net_Investment	-0.00123	0.823628	-9.883	-0.00017	0.017671	0.745517	-13.5827	0.008342	-0.019***
Assets	248.5673	75026.6	25.0021	89.06937	5864.078	1507193	25.03163	711.1402	-5.6e+03***
R&D	0.093556	6.434771	-0.00991	0.041128	0.084895	2.847421	0	0.042184	0.009***
Debt	0.255814	8.149505	0	0.205729	0.226259	3.675735	0	0.191545	0.030***
MV/BV	1.358294	68.60448	0.017316	0.942388	1.691236	48.69257	0.040052	1.216509	-0.333***
PAYOUT	0.126931	1247.415	-53.2513	0	-0.04177	276.1129	-2843.16	0	0.169
KZ	-8.65959	27.67446	-168.711	-1.17425	-6.04	21.93016	-162.491	-1.28116	-2.620***
WW	-0.14826	0.696013	-0.45534	-0.15997	-0.24247	0.681345	-0.54785	-0.25492	0.094***
SA	-2.9368	-2.00832	-4.63689	-2.88734	-3.52092	-2.0116	-4.63689	-3.44202	0.584***
Gindx	7.92126	17	2	8	9.167994	19	1	9	-1.247***
Block	0.1983	1.302661	0.05005	0.156423	0.300398	1.406715	0.050066	0.2816	-0.102***
Analysts	1.827497	54	0	1	9.840562	67	0	7	-8.013***
TQ	1.326101	62.19571	0.017316	0.934576	1.672291	46.19083	0.039645	1.206811	-0.346***
SG	1.808018	11879.5	-6.48789	0.063774	0.397522	3701.467	-9.28571	0.087088	1.410*

Note: The last column of the table shows the difference in mean and significance of t-test between firms with high institutional ownership and low institutional ownership. *** p<0.01, ** p<0.05, * p<0.1. Cash, Earnings, Net_Investment, R&D, and Debt are scaled by total assets.

Table 2: Institutional Ownership and the Value of Cash Holdings

	(1)	(2)	(3)	(4)
	TOL_IO	TRA_IO	QIX_IO	DED_IO
VARIABLES	EXRET	EXRET	EXRET	EXRET
$\Delta Cash$	1.448***	1.286***	1.583***	1.609***
	(0.067)	(0.075)	(0.071)	(0.068)
$D\_IO * \Delta Cash$	0.433***	0.495***	0.068	-0.074
	(0.051)	(0.055)	(0.057)	(0.052)
D_IO	0.071***	0.178***	-0.003	0.037***
	(0.008)	(0.009)	(0.008)	(0.008)
$\Delta Equity$	0.561***	0.602***	0.570***	0.594***
	(0.014)	(0.016)	(0.015)	(0.015)
ΔNet_Asset	0.169***	0.180***	0.187***	0.159***
	(0.009)	(0.010)	(0.009)	(0.009)
$\Delta R \& D$	-0.026	0.348*	-0.522***	0.323*
	(0.174)	(0.188)	(0.184)	(0.172)
$\Delta Interest$	-1.287***	-1.364***	-1.266***	-1.271***
	(0.124)	(0.137)	(0.131)	(0.128)
$\Delta Dividends$	1.572***	1.346**	1.529***	2.013***
	(0.542)	(0.594)	(0.570)	(0.573)
$L.Cash$	0.479***	0.478***	0.524***	0.476***
	(0.018)	(0.020)	(0.019)	(0.018)
$Leverage$	-0.538***	-0.527***	-0.574***	-0.545***
	(0.016)	(0.018)	(0.017)	(0.017)
$Net\_Financing$	0.116***	0.078***	0.093***	0.100***
	(0.017)	(0.019)	(0.018)	(0.018)
$Cash * \Delta Cash$	0.493***	0.739***	0.532***	0.598***
	(0.060)	(0.064)	(0.065)	(0.062)
$Leverage * \Delta Cash$	-2.591***	-2.707***	-2.639***	-2.746***
	(0.113)	(0.123)	(0.119)	(0.114)
Constant	0.001	-0.055***	0.041***	0.013
	(0.009)	(0.010)	(0.009)	(0.009)
Observations	33,554	33,521	33,714	33,656
Adjusted R-squared	0.215	0.220	0.194	0.204

Note: Robust standard errors are shown in parentheses, *** p<0.01, ** p<0.05, * p<0.1. All control variables are scaled by lagged market value of equity except for leverage. Dependent variable is excess return for all the four columns, the only difference in the four columns is that different types of institutional ownership are applied to construct high institutional ownership dummy.

Table 3: Institutional Ownership around the Russell 1000/2000 Threshold

Panel A: Total Institutional Ownership around the Russell 1000/2000 Threshold					
	(1)	(2)	(3)	(4)	(5)
VARIABLES	IO_TOL(h=10)	IO_TOL(h=20)	IO_TOL(h=30)	IO_TOL(h=40)	IO_TOL(h=50)
$Rus2000$	0.397***	0.208***	0.189***	0.158***	0.132***
	(0.101)	(0.055)	(0.031)	(0.025)	(0.020)
$lagged\_Rank$	-0.007*	-0.006***	-0.006***	-0.004**	-0.004***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.001)
$lagged\_Rus2000*Rank$	0.006	0.006***	0.006***	0.004**	0.003***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.001)
$lagged\_Rank^2$	-0.000**	-0.000***	-0.000***	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000*Rank^2$	0.000**	0.000***	0.000***	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rank^3$	-0.000**	-0.000***	-0.000***	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000*Rank^3$	0.000**	0.000***	0.000***	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000$	0.114	0.210***	0.236***	0.194***	0.197***
	(0.111)	(0.078)	(0.061)	(0.052)	(0.045)
Controls	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included
Observations	182	366	544	725	907
R-squared	0.865	0.741	0.720	0.662	0.644

Panel B: Transient Institutional Ownership around the Russell 1000/2000 Threshold					
	(1)	(2)	(3)	(4)	(5)
VARIABLES	IO_TRA(h=10)	IO_TRA(h=20)	IO_TRA(h=30)	IO_TRA(h=40)	IO_TRA(h=50)
*Rus*2000	0.172***	0.087***	0.080***	0.059***	0.042***
	(0.045)	(0.025)	(0.015)	(0.012)	(0.010)
lagged _ Rank	-0.002	-0.001	-0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
*lagged _ Rus*2000 * *Rank*	0.002	0.002*	0.001	0.000	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
$lagged\_Rank^2$	-0.000	-0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000*Rank^2$	0.000	0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rank^3$	-0.000*	-0.000**	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000*Rank^3$	0.000*	0.000**	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
*lagged _ Rus*2000	-0.071	-0.007	0.012	0.006	0.012
	(0.070)	(0.037)	(0.025)	(0.021)	(0.019)
Controls	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included
Industry	Included	Included	Included	Included	Included
Observations	182	366	544	725	907
R-squared	0.865	0.732	0.696	0.630	0.594

Panel C: Quasi-indexer Institutional Ownership around the Russell 1000/2000 Threshold					
	(1)	(2)	(3)	(4)	(5)
VARIABLES	IO_QIX(h=10)	IO_QIX(h=20)	IO_QIX(h=30)	IO_QIX(h=40)	IO_QIX(h=50)
$Rus2000$	0.105*	0.069**	0.083***	0.082***	0.076***
	(0.062)	(0.033)	(0.021)	(0.015)	(0.012)
$lagged\_Rank$	-0.002	-0.004**	-0.004***	-0.003**	-0.003***
	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
$lagged\_Rus2000*Rank$	0.001	0.003*	0.003**	0.002*	0.002**
	(0.004)	(0.002)	(0.001)	(0.001)	(0.001)
$lagged\_Rank^2$	-0.000	-0.000**	-0.000**	-0.000*	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000*Rank^2$	0.000	0.000**	0.000**	0.000*	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rank^3$	-0.000	-0.000**	-0.000**	-0.000*	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000*Rank^3$	0.000	0.000**	0.000**	0.000*	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000$	0.186**	0.193***	0.180***	0.149***	0.148***
	(0.076)	(0.054)	(0.044)	(0.038)	(0.032)
Controls	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included
Observations	182	366	544	725	907
R-squared	0.800	0.696	0.665	0.628	0.613

Panel D: Dedicated Institutional Ownership around the Russell 1000/2000 Threshold					
	(1)	(2)	(3)	(4)	(5)
VARIABLES	IO_DED(h=10)	IO_DED(h=20)	IO_DED(h=30)	IO_DED(h=40)	IO_DED(h=50)
$Rus2000$	0.115**	0.050***	0.025**	0.016*	0.014*
	(0.045)	(0.019)	(0.012)	(0.010)	(0.008)
$lagged\_Rank$	-0.003**	-0.001**	-0.002***	-0.001*	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
$lagged\_Rus2000*Rank$	0.003**	0.001	0.002***	0.001	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
$lagged\_Rank^2$	-0.000**	-0.000**	-0.000***	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000*Rank^2$	0.000**	0.000***	0.000***	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rank^3$	-0.000**	-0.000***	-0.000***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000*Rank^3$	0.000**	0.000***	0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$lagged\_Rus2000$	0.001	0.024	0.041**	0.035*	0.034**
	(0.040)	(0.028)	(0.021)	(0.020)	(0.016)
Controls	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included
Observations	182	366	544	725	907
R-squared	0.949	0.869	0.806	0.742	0.709

Note: Firm clustered robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Controls include all control variables specified in Section 3.6, year dummy and industry dummy are concluded.

Table 4: 2SLS of Institutional Ownership on the Value of Cash Holdings

	(1)	(2)	(3)	(4)	(5)	(6)
	1st Stage	1st Stage	2nd Stage	1st Stage	1st Stage	2nd Stage
VARIABLES	IO_TOL	IO_TOL* $\Delta Cash$	EXRET	IO_TRA	IO_TRA* $\Delta Cash$	EXRET
$Rus2000 * \Delta Cash$	0.157***	0.498***		0.128***	0.154***	
	(0.022)	(0.013)		(0.012)	(0.007)	
$Rus2000$	0.032***	0.000		0.008**	0.000	
	(0.007)	(0.002)		(0.003)	(0.000)	
$IO * \Delta Cash$			3.919***			18.379***
			(0.444)			(4.682)
IO			-2.244***			-9.684*
			(0.825)			(5.385)
$\Delta Equity$	0.015	0.005	0.892***	0.029***	0.002	1.110***
	(0.014)	(0.006)	(0.094)	(0.006)	(0.002)	(0.183)
ΔNet_Asset	0.056***	-0.008**	0.308***	0.022***	-0.002	0.391***
	(0.008)	(0.004)	(0.070)	(0.003)	(0.002)	(0.139)
$\Delta R \& D$	0.337***	-0.063*	1.894**	0.292***	0.004	3.633**
	(0.100)	(0.036)	(0.744)	(0.053)	(0.016)	(1.799)
$\Delta Interest$	-0.259**	-0.092*	-3.109***	-0.156***	-0.043**	-3.604***
	(0.128)	(0.049)	(0.993)	(0.059)	(0.021)	(1.389)
$\Delta Dividends$	-0.301	-0.125	2.404**	-0.092	0.001	1.678
	(0.318)	(0.088)	(1.194)	(0.119)	(0.030)	(1.671)
$L.Cash$	-0.023**	-0.003	0.454***	0.040***	0.003	0.824***
	(0.012)	(0.006)	(0.075)	(0.006)	(0.002)	(0.227)
$Leverage$	-0.010	-0.002	-0.474***	-0.046***	-0.003***	-0.854***
	(0.010)	(0.002)	(0.042)	(0.004)	(0.001)	(0.243)
$Net\_Financing$	-0.016	0.032***	0.057	0.034***	0.015***	0.269*
	(0.015)	(0.008)	(0.094)	(0.007)	(0.003)	(0.159)
Constant	0.862***	0.005**	1.861**	0.214***	0.001*	2.001*
	(0.009)	(0.002)	(0.725)	(0.004)	(0.001)	(1.173)
Relative Russell Rank	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
Observations	11,615	11,615	11,615	11,615	11,615	11,615
R-squared			-0.400			-2.144

	(7)	(8)	(9)	(10)	(11)	(12)
	1st Stage	1st Stage	2nd Stage	1st Stage	1st Stage	2nd Stage
VARIABLES	IO_QIX	IO_QIX * $\Delta Cash$	EXRET	IO_DED	IO_DED * $\Delta Cash$	EXRET
$Rus2000 * \Delta Cash$	-0.004	0.265***		0.031***	0.068***	
	(0.014)	(0.007)		(0.009)	(0.004)	
$Rus2000$	0.036***	0.000		-0.013***	0.000***	
	(0.005)	(0.001)		(0.003)	(0.001)	
$IO * \Delta Cash$			5.993***			21.139***
			(0.670)			(2.946)
IO			-1.967***			5.103**
			(0.578)			(2.251)
$\Delta Equity$	-0.015*	0.004	0.827***	0.000	-0.001	0.903***
	(0.009)	(0.003)	(0.089)	(0.006)	(0.002)	(0.092)
ΔNet_Asset	0.026***	-0.006***	0.236***	0.007**	-0.001	0.125**
	(0.005)	(0.002)	(0.050)	(0.003)	(0.001)	(0.051)
$\Delta R \& D$	-0.066	-0.063***	1.136*	0.122***	-0.004	0.351
	(0.065)	(0.021)	(0.625)	(0.036)	(0.009)	(0.681)
$\Delta Interest$	-0.055	-0.020	-2.873***	-0.038	-0.028*	-2.101**
	(0.086)	(0.029)	(0.901)	(0.056)	(0.016)	(1.005)
$\Delta Dividends$	-0.247	-0.067	2.504**	0.003	-0.063	3.896**
	(0.220)	(0.061)	(1.031)	(0.158)	(0.040)	(1.645)
$L.Cash$	-0.089***	-0.006*	0.354***	0.024***	0.000	0.366***
	(0.007)	(0.004)	(0.083)	(0.007)	(0.003)	(0.093)
$Leverage$	0.019***	0.001	-0.427***	0.016***	0.000	-0.536***
	(0.007)	(0.001)	(0.036)	(0.004)	(0.001)	(0.055)
$Net\_Financing$	-0.044***	0.013***	0.058	-0.006	0.004**	0.158
	(0.010)	(0.004)	(0.094)	(0.005)	(0.002)	(0.098)
Constant	0.523***	0.003**	0.959***	0.112***	0.001	-0.639***
	(0.007)	(0.001)	(0.313)	(0.004)	(0.001)	(0.237)
Relative Russell Rank	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
Observations	11,615	11,615	11,615	11,615	11,615	11,615
R-squared			-0.022			-0.317

Note: Clustered robust standard errors are given, *** p<0.01, ** p<0.05, * p<0.1. All control variables are scaled by lagged market value of equity except for leverage. Four 2SLS regressions are conducted, each regression is reported in each three columns. There are two first-stage regressions and one second-stage regression for each 2SLS regression.

Table 5: Testing Corporate Governance Channel

Panel A: Testing Corporate Governance Channel of Total Institutional Ownership				
	GIM Index		Analyst Coverage	
	(1)	(2)	(3)	(4)
VARIABLES	EXRET	EXRET	EXRET	EXRET
$\Delta Cash$	1.158***	1.283***	1.460***	1.610***
	(0.131)	(0.371)	(0.060)	(0.098)
$D\_IO*\Delta Cash$		-0.352		-0.635***
		(0.353)		(0.141)
$D\_G*\Delta Cash$	0.880***	-0.324	0.467***	-0.096
	(0.102)	(0.366)	(0.049)	(0.186)
$D\_IO*D\_G*\Delta Cash$		1.052***		1.023***
		(0.395)		(0.234)
D_IO		0.108***		0.095***
		(0.038)		(0.019)
D_G	-0.026**	-0.013	0.043***	-0.014
	(0.012)	(0.013)	(0.008)	(0.019)
$\Delta Equity$	0.491***	0.550***	0.483***	0.482***
	(0.028)	(0.039)	(0.014)	(0.022)
ΔNet_Asset	0.211***	0.092***	0.180***	0.166***
	(0.018)	(0.023)	(0.009)	(0.015)
$\Delta R\&D$	-1.168***	-0.571	0.166	-0.936***
	(0.340)	(0.449)	(0.157)	(0.237)
$\Delta Interest$	-1.261***	-1.267***	-1.637***	-1.897***
	(0.262)	(0.383)	(0.131)	(0.210)
$\Delta Dividends$	2.696***	1.424	2.757***	3.132***
	(0.840)	(1.064)	(0.500)	(0.806)
$L.Cash$	0.415***	0.359***	0.513***	0.598***
	(0.033)	(0.044)	(0.018)	(0.028)
$Leverage$	-0.490***	-0.498***	-0.565***	-0.586***
	(0.028)	(0.034)	(0.016)	(0.025)
$Net\_Financing$	-0.190***	0.086*	0.075***	0.157***
	(0.038)	(0.050)	(0.018)	(0.028)
$Cash*\Delta Cash$	0.532***	0.674***	0.535***	0.820***
	(0.119)	(0.162)	(0.058)	(0.093)
$Leverage*\Delta Cash$	-2.940***	-2.103***	-2.958***	-2.939***
	(0.232)	(0.321)	(0.110)	(0.177)
Constant	0.055***	-0.033	-0.002	-0.018
	(0.011)	(0.042)	(0.008)	(0.013)
Observations	9,559	5,337	39,585	19,122
Adjusted R-squared	0.177	0.174	0.185	0.188

Panel B: Testing Corporate Governance Channel of Transient Institutional Ownership				
	GIM Index		Analyst Coverage	
	(1)	(2)	(3)	(4)
VARIABLES	EXRET	EXRET	EXRET	EXRET
$\Delta Cash$	1.158***	1.613***	1.460***	1.392***
	(0.131)	(0.398)	(0.060)	(0.100)
$D\_IO*\Delta Cash$		-0.754**		-0.252**
		(0.378)		(0.115)
$D\_G*\Delta Cash$	0.880***	-0.157	0.467***	-0.272
	(0.102)	(0.386)	(0.049)	(0.198)
$D\_IO*D\_G*\Delta Cash$		1.621***		0.918***
		(0.438)		(0.227)
D_IO		0.220***		0.211***
		(0.036)		(0.017)
D_G	-0.026**	-0.026	0.043***	-0.067***
	(0.012)	(0.020)	(0.008)	(0.017)
$\Delta Equity$	0.491***	0.527***	0.483***	0.517***
	(0.028)	(0.050)	(0.014)	(0.022)
ΔNet_Asset	0.211***	0.283***	0.180***	0.151***
	(0.018)	(0.030)	(0.009)	(0.015)
$\Delta R\ \&\ D$	-1.168***	-3.435***	0.166	-0.053
	(0.340)	(0.576)	(0.157)	(0.243)
$\Delta Interest$	-1.261***	-1.308***	-1.637***	-1.143***
	(0.262)	(0.478)	(0.131)	(0.212)
$\Delta Dividends$	2.696***	1.141	2.757***	2.760***
	(0.840)	(1.537)	(0.500)	(0.805)
$L.Cash$	0.415***	0.588***	0.513***	0.479***
	(0.033)	(0.059)	(0.018)	(0.028)
$Leverage$	-0.490***	-0.557***	-0.565***	-0.586***
	(0.028)	(0.049)	(0.016)	(0.025)
$Net\_Financing$	-0.190***	-0.202***	0.075***	0.111***
	(0.038)	(0.067)	(0.018)	(0.028)
$Cash*\Delta Cash$	0.532***	1.741***	0.535***	0.955***
	(0.119)	(0.200)	(0.058)	(0.091)
$Leverage*\Delta Cash$	-2.940***	-4.155***	-2.958***	-2.895***
	(0.232)	(0.420)	(0.110)	(0.174)
Constant	0.055***	-0.124***	-0.002	-0.039***
	(0.011)	(0.042)	(0.008)	(0.014)
Observations	9,559	4,481	39,585	17,914
Adjusted R-squared	0.177	0.240	0.185	0.208

Note: Clustered robust standard errors are given, *** p<0.01, ** p<0.05, * p<0.1. All control variables are scaled by lagged market value of equity except for leverage. D_IO is high institutional ownership dummy and D_G is better corporate governance dummy.

Table 6: Testing Investment Opportunity Channel

Panel A: Testing Investment Opportunity Channel of Total Institutional Ownership				
	Tobin's Q		Sales Growth	
	(1)	(2)	(3)	(4)
VARIABLES	EXRET	EXRET	EXRET	EXRET
$\Delta Cash$	0.541***	0.455***	1.149***	1.208***
	(0.057)	(0.093)	(0.052)	(0.084)
$D\_IO * \Delta Cash$		0.065		-0.106
		(0.085)		(0.096)
$D\_I * \Delta Cash$	1.974***	2.072***	0.798***	0.662***
	(0.050)	(0.089)	(0.039)	(0.073)
$D\_IO * D\_I * \Delta Cash$		0.066		0.446***
		(0.138)		(0.130)
D_IO		0.044***		0.055***
		(0.010)		(0.010)
D_R	0.495***	0.479***	0.239***	0.227***
	(0.008)	(0.013)	(0.008)	(0.011)
$\Delta Equity$	0.470***	0.467***	0.436***	0.444***
	(0.012)	(0.018)	(0.011)	(0.017)
ΔNet_Asset	0.202***	0.173***	0.141***	0.129***
	(0.007)	(0.011)	(0.007)	(0.011)
$\Delta R \& D$	0.158	-0.714***	0.223*	-0.448**
	(0.132)	(0.198)	(0.127)	(0.190)
$\Delta Interest$	-1.314***	-0.967***	-1.593***	-1.306***
	(0.104)	(0.164)	(0.099)	(0.152)
$\Delta Dividends$	0.795*	1.140	0.952**	0.460
	(0.459)	(0.732)	(0.462)	(0.721)
$L.Cash$	0.545***	0.621***	0.464***	0.548***
	(0.015)	(0.024)	(0.015)	(0.023)
$Leverage$	-0.192***	-0.204***	-0.593***	-0.601***
	(0.016)	(0.026)	(0.014)	(0.021)
$Net\_Financing$	0.036**	0.109***	0.137***	0.164***
	(0.015)	(0.022)	(0.014)	(0.021)
$Cash * \Delta Cash$	0.652***	0.795***	0.439***	0.533***
	(0.049)	(0.076)	(0.047)	(0.073)
$Leverage * \Delta Cash$	-1.097***	-1.081***	-2.542***	-2.533***
	(0.100)	(0.157)	(0.088)	(0.138)
Constant	-0.299***	-0.328***	-0.072***	-0.102***
	(0.009)	(0.014)	(0.007)	(0.012)
Observations	59,557	26,053	59,004	25,789
Adjusted R-squared	0.252	0.264	0.209	0.223

Panel B: Testing Investment Opportunity Channel of Transient Institutional Ownership				
	Tobin's Q		Sales Growth	
	(1)	(2)	(3)	(4)
VARIABLES	EXRET	EXRET	EXRET	EXRET
$\Delta Cash$	0.541***	0.426***	1.149***	0.912***
	(0.057)	(0.095)	(0.052)	(0.088)
$D\_IO * \Delta Cash$		0.064		0.142
		(0.085)		(0.093)
$D\_I * \Delta Cash$	1.974***	1.411***	0.798***	0.552***
	(0.050)	(0.104)	(0.039)	(0.081)
$D\_IO * D\_I * \Delta Cash$		0.757***		0.452***
		(0.140)		(0.126)
D_IO		0.129***		0.149***
		(0.011)		(0.011)
D_R	0.495***	0.501***	0.239***	0.224***
	(0.008)	(0.014)	(0.008)	(0.012)
$\Delta Equity$	0.470***	0.503***	0.436***	0.468***
	(0.012)	(0.018)	(0.011)	(0.017)
ΔNet_Asset	0.202***	0.188***	0.141***	0.130***
	(0.007)	(0.012)	(0.007)	(0.012)
$\Delta R \& D$	0.158	-0.417**	0.223*	0.073
	(0.132)	(0.206)	(0.127)	(0.196)
$\Delta Interest$	-1.314***	-1.064***	-1.593***	-1.553***
	(0.104)	(0.171)	(0.099)	(0.158)
$\Delta Dividends$	0.795*	0.949	0.952**	0.333
	(0.459)	(0.751)	(0.462)	(0.734)
$L.Cash$	0.545***	0.595***	0.464***	0.499***
	(0.015)	(0.024)	(0.015)	(0.023)
$Leverage$	-0.192***	-0.176***	-0.593***	-0.582***
	(0.016)	(0.027)	(0.014)	(0.022)
$Net\_Financing$	0.036**	0.064***	0.137***	0.160***
	(0.015)	(0.024)	(0.014)	(0.022)
$Cash * \Delta Cash$	0.652***	0.902***	0.439***	0.744***
	(0.049)	(0.077)	(0.047)	(0.074)
$Leverage * \Delta Cash$	-1.097***	-1.063***	-2.542***	-2.358***
	(0.100)	(0.161)	(0.088)	(0.141)
Constant	-0.299***	-0.371***	-0.072***	-0.142***
	(0.009)	(0.015)	(0.007)	(0.012)
Observations	59,557	25,903	59,004	26,270
Adjusted R-squared	0.252	0.270	0.209	0.230

Note: Clustered robust standard errors are given, *** p<0.01, ** p<0.05, * p<0.1. All control variables are scaled by lagged market value of equity except for leverage. D_IO is high institutional ownership dummy and D_I is more investment opportunities dummy.

Table 7: Testing Financial Constraint Channel

Panel A: Testing Financial Constraint Channel of Total Institutional Ownership				
	WW Index		SA Index	
	(1)	(2)	(3)	(4)
VARIABLES	EXRET	EXRET	EXRET	EXRET
$\Delta Cash$	1.558***	1.091***	1.262***	0.481***
	(0.061)	(0.128)	(0.061)	(0.125)
$D\_IO*\Delta Cash$		0.707***		0.728***
		(0.114)		(0.107)
$D\_F*\Delta Cash$	0.103**	0.455***	0.454***	1.040***
	(0.044)	(0.106)	(0.045)	(0.100)
$D\_IO*D\_F*\Delta Cash$		-0.597***		0.044
		(0.156)		(0.166)
D_IO		0.024*		0.041***
		(0.014)		(0.014)
D_F	-0.095***	-0.093***	-0.054***	-0.046***
	(0.007)	(0.015)	(0.007)	(0.015)
$\Delta Equity$	0.413***	0.411***	0.505***	0.519***
	(0.011)	(0.017)	(0.012)	(0.018)
ΔNet_Asset	0.158***	0.147***	0.187***	0.173***
	(0.007)	(0.011)	(0.008)	(0.012)
$\Delta R\ \&\ D$	0.149	-0.521***	0.496***	-0.263
	(0.123)	(0.181)	(0.128)	(0.192)
$\Delta Interest$	-1.369***	-1.425***	-1.343***	-1.092***
	(0.102)	(0.159)	(0.107)	(0.170)
$\Delta Dividends$	2.325***	2.941***	2.014***	1.843**
	(0.466)	(0.710)	(0.467)	(0.746)
$L.Cash$	0.494***	0.525***	0.507***	0.572***
	(0.014)	(0.022)	(0.015)	(0.023)
$Leverage$	-0.633***	-0.646***	-0.636***	-0.657***
	(0.014)	(0.021)	(0.015)	(0.023)
$Net\_Financing$	0.222***	0.247***	0.149***	0.170***
	(0.014)	(0.021)	(0.015)	(0.023)
$Cash*\Delta Cash$	0.301***	0.663***	0.454***	0.910***
	(0.048)	(0.074)	(0.049)	(0.079)
$Leverage*\Delta Cash$	-2.631***	-2.548***	-2.448***	-2.017***
	(0.095)	(0.149)	(0.101)	(0.165)
Constant	0.092***	0.079***	0.073***	0.047***
	(0.006)	(0.017)	(0.006)	(0.017)
Observations	58,270	26,471	60,467	27,064
Adjusted R-squared	0.171	0.187	0.169	0.188

Panel B: Testing Financial Constraint Channel of Transient Institutional Ownership				
	WW Index		SA Index	
	(1)	(2)	(3)	(4)
VARIABLES	EXRET	EXRET	EXRET	EXRET
$\Delta Cash$	1.558***	1.036***	1.262***	0.450***
	(0.061)	(0.132)	(0.061)	(0.123)
$D\_IO*\Delta Cash$		0.630***		0.647***
		(0.117)		(0.106)
$D\_F*\Delta Cash$	0.103**	0.207*	0.454***	0.705***
	(0.044)	(0.113)	(0.045)	(0.100)
$D\_IO*D\_F*\Delta Cash$		0.050		0.590***
		(0.144)		(0.142)
D_IO		0.160***		0.190***
		(0.013)		(0.013)
D_F	-0.095***	-0.044***	-0.054***	0.018
	(0.007)	(0.013)	(0.007)	(0.013)
$\Delta Equity$	0.413***	0.400***	0.505***	0.521***
	(0.011)	(0.018)	(0.012)	(0.019)
ΔNet_Asset	0.158***	0.140***	0.187***	0.198***
	(0.007)	(0.012)	(0.008)	(0.013)
$\Delta R\ \&\ D$	0.149	-0.036	0.496***	0.045
	(0.123)	(0.187)	(0.128)	(0.202)
$\Delta Interest$	-1.369***	-1.085***	-1.343***	-1.318***
	(0.102)	(0.165)	(0.107)	(0.178)
$\Delta Dividends$	2.325***	1.908***	2.014***	1.592**
	(0.466)	(0.730)	(0.467)	(0.759)
$L.Cash$	0.494***	0.509***	0.507***	0.547***
	(0.014)	(0.023)	(0.015)	(0.024)
$Leverage$	-0.633***	-0.610***	-0.636***	-0.585***
	(0.014)	(0.022)	(0.015)	(0.025)
$Net\_Financing$	0.222***	0.190***	0.149***	0.103***
	(0.014)	(0.022)	(0.015)	(0.024)
$Cash*\Delta Cash$	0.301***	0.592***	0.454***	0.875***
	(0.048)	(0.074)	(0.049)	(0.081)
$Leverage*\Delta Cash$	-2.631***	-2.259***	-2.448***	-1.638***
	(0.095)	(0.152)	(0.101)	(0.169)
Constant	0.092***	-0.019	0.073***	-0.065***
	(0.006)	(0.016)	(0.006)	(0.015)
Observations	58,270	24,912	60,467	25,625
Adjusted R-squared	0.171	0.190	0.169	0.193

Note: Clustered robust standard errors are given, *** p<0.01, ** p<0.05, * p<0.1. All control variables are scaled by lagged market value of equity except for leverage. D_IO is high institutional ownership dummy and D_F is financial constraint dummy equals 1 for constrained firms.