Inertia of Institutional Investors: Rational or Behavioral?

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Abstract

We examine institutional investors' tendency not to change their portfolio for an extended period, called portfolio inertia. Studying over 39 million investor-stock-quarter observations, we document that institutional investors do not trade a single share in one of five stocks in their portfolio for at least a quarter of the year. Trading costs do not fully explain this inertia behavior. We find that the inertia is associated with the inferior future performance of institutional investors. The results suggest that the inertia is driven by a potential behavioral bias, rather than a rational attention allocation strategy aimed at improving overall performance.

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1. Introduction

Inaction is a widely observed behavior of economic agents. The literature on household finance shows that retail investors often do not change their portfolio positions for extended periods, often called portfolio inertia (e.g., Agnew, Balduzzi, and Sunden (2003), Madrian and Shea (2001)). Households' portfolio inertia increases risk premia for risky assets due to incomplete risk-sharing among investors (Chien, Cole, and Lustig (2012); Gust and Lopez-Salido (2009)). So far, however, there has been little research investigating institutional investors' inertia in portfolio management. It is unknown whether institutional investors engage in portfolio inertia as household investors do, and, if so, whether such inactions are the result of a strategic investment decision to minimize the cost of information collection and processing (Sims (2003, 2010), Steiner, Stewart, and Matějka (2017)) or just a manifestation of investors' behavioral biases (Gabaix (2019)). Investigating the inertia of institutional investors and the potential reasons for such behaviors is crucial to understand the impact of increasing influence of institutional investors on asset prices in recent years. In this paper, we first document the degree of inertia among institutional investors in managing their portfolios and evaluate potential reasons for such behaviors. Specifically, we assess how institutional investors' inertia is related to their overall future performance.

We first document the extent of institutional investors' inertia in portfolio management by examining stock-holding information in their 13F filings. We consider a stock untraded during a calendar quarter if the number of shares held by an institutional investor has not changed from the number held in the previous calendar quarter. Our analysis shows that institutional investors engage in portfolio inertia to a large degree. On average, they do not trade any shares for one out of five stocks in their portfolio. Moreover, there is great heterogeneity across institutional investors in their inertia behavior. Institutional investors with small portfolios are likely to choose inertia in their portfolio management. This behavior is more likely to happen when a stock's portfolio weight is small relative to the overall portfolio value and the investor has a concentrated portfolio.

Inertia and the traditional portfolio turnover ratio are inversely related but they are different concepts. Inertia is an inaction of trading any shares for specific holdings but turnover is the ratio of bought or sold value of holdings to a fund's net asset value. It is possible that these two measures can deviate from each other. For example, both inertia and turnover ratio can be high when a fund actively buy or sell shares only for a tiny group of portfolio. In addition, if a fund trade a small portion of each stock holdings in its portfolio, the inertia is low while the turnover will be also

negligible. Our inertia measure hence captures the extent of portfolio rebalancing activity of a fund while the turnover does not necessarily do so.[1]

Regarding stock-level characteristics, inertia stocks are likely to be small and illiquid, suggesting that the transaction cost at least partially contributes to the inertia behavior. Size and illiquidity, however, do not fully explain institutional investors' decision to choose inertia for such stocks. Inertia stocks also have lower volatility, lower profitability, and lower institutional ownership. Interestingly, inertia stocks do not have higher book-to-market ratios. The characteristics of inertia stocks are not consistent with the common belief that institutional investors just buy-and-hold value stocks for extended periods to benefit from the value premium. In addition, we show that security lending is not the main reason institutional investors choose inertia. Another noteworthy finding is that institutional investors sell fewer or buy more shares (rather than choosing inertia) in high-momentum stocks.

To further explore the main driver of inertia, we next evaluate how institutional investors' inertia relates to their overall future performance. According to the rational inattention literature (Verrecchia (1982), Geanakoplos and Milgrom (1991), Sims (2003)), inertia should be a strategic decision for institutional investors, based on the calculation of the overall costs and benefits of allocating attention across stock holdings. This idea predicts that inertia should not adversely affect institutional investors' overall performance. In contrast, the literature on behavioral inattention (Gabaix (2019)) posits that inertia is an indication of behavioral bias (e.g., disposition effect for losing stocks, lack of attention) and would be adversely related to future performance. We distinguish between the rational and behavioral motivations for institutional investors' inertia by evaluating how inertia is related to their risk-adjusted returns in the future.

Our analysis shows that the length of inertia is *negatively* related to the profits of subsequent trading activities of institutional investors. The result implies that institutional investors do not choose inertia to time profitable future trades. This result is more consistent with the idea that institutional investors are seemingly ignorant of these stocks rather than the rational motives to maximize profits of future trades.

We also report that inertia negatively affects the overall performance of institutional investors in the future. Controlling for various characteristics of institutional investors, we estimate

[1] In our sample, we find that a fund's inertia and turnover are negatively correlated. Whenever possible, we control for turnover ratio to assess the impact of inertia in our empirical models.

a predictive regression model of 3-months ahead risk-adjusted returns on the inertia level of institutional investors and find that the coefficient estimate on the inertia level is negative and statistically significant. The result still holds for a longer-term 12-months ahead risk-adjusted returns, suggesting that the detrimental impact of inertia lasts for a long time.

In addition, we evaluate the performance implication of inertia and active trading strategies at the aggregate level, for all institutional investors. Every quarter, we categorize each institutional investor's stock trades into inertia and active trading groups. We then compute one-month-ahead value-weighted returns on each trading strategy for each fund. Averaging such returns across all funds, we form a time-series of portfolio returns representing inertia and active trading strategies. We measure annualized alphas from time-series regressions of the portfolio returns representing inertia and active tradings based on various asset pricing models. The results show that the alpha for the inertia trading is negative and statistically significant across all asset pricing models employed. This is not the case for the active trading portfolio. These results suggest that inertia might undermine institutional investors' performance at the aggregate level.

Someone might argue that inertia is a low-cost way of following market-portfolio for institutional investors, who hold a diversified portfolio of stocks. If this claim is correct, we would be underestimating the benefit of inertia for institutional investors. Refuting this claim, however, our analysis shows that the active trading emulates a market portfolio with a beta of one, but the inertia portfolio deviates considerably from the market portfolio.

Subsample analyses show that the negative impact of inertia on performance is most pronounced for institutional investors with small asset under management and concentrated portfolios. This result is more consistent with the behavioral explanation, which predicts that inertia is not a strategic choice, but rather signifies slack in institutional investors' portfolio management due to limited attention. Managers of small funds may not be well equipped to deal with changing investment environments, exposing them to the risk of inefficient portfolio management. And a concentrated portfolio is likely to reflect investors' initial lack of efficiency in allocating their attention across a large group of stocks.

We then evaluate a possible rational motivation, namely that institutional investors choose inertia to buy-and-hold well-performing stocks. We calculate the inertia ratio for each stock as the fraction of non-traded shares out of the total number of shares held by institutional investors. Every quarter, we sort stocks into quintile portfolios based on the inertia ratio. The portfolio-sorting

analysis shows that the risk-adjusted returns are lower for stocks with higher inertia ratios than for those with lower inertia ratios. Stocks in the highest-inertia portfolio are likely to underperform those in the lowest. We also run Fama-MacBeth regressions of the excess returns of stocks, on the inertia ratio and other well-documented firm characteristics associated with stock returns, such as size, book-to-market, momentum, volatility, leverage, and profitability. Because the inertia is based on the institutional investors' ownership of stocks, the impact of the inertia on the stock returns is also likely to be influenced by institutional ownership. To this end, we estimate the Fama-MacBeth regressions separately for subsamples with institutional ownership above and below the median. For stocks with institutional investors' ownership less than the median, the analysis results show that there is a negative and significant correlation between the inertia ratios of stocks and future stock returns.

Taken together, the analysis results are more consistent with the behavioral motivation for inertia, suggesting that institutional investors do not choose inertia as a way of improving their performance. The inertia stocks are likely to underperform, hence undermining the overall performance of institutional investors. This result suggests that institutional investors have limited attention, thus focusing on a specific group of stocks in their trading ((Kacperczyk, Van Nieuwerburgh, and Veldkamp (2016), Van Nieuwerburgh and Veldkamp (2010)). Given the value-destroying effect of the inertia trading strategy, we attribute this evidence to the potential behavioral bias of institutional investors arising from limited resources and attention.

In several robustness checks, we extend the length of the period with no trading to 6 months to define institutional investors' inertia. The analysis results based on these stringent criteria still show that institutional investors with a high degree of inertia underperform their peers with a lower degree of inertia. Our result is also not adversely biased by potential intra-quarter round-trip trading (i.e., buying and selling the same number of shares within a quarter). Puckett and Yan (2011) report that intra-quarter round-trip trading by institutional investors generates higher returns. Because some inertia trades could have been short-term round-trip trading with positive returns, our result of negative returns for inertia funds would be upward biased; the actual returns for inertia would be even more negative than we report in our analysis. Moreover, in a series of untabulated analyses, we find our results are not driven by a specific sample period (e.g., financial crisis) or a group of long-term investors. The result is also robust to excluding institutional investors with a short lifespan in the sample.

The rest of our paper proceeds as follows. Section 2 discusses this paper's contribution to the literature on the trading behaviors of institutional investors. Section 3 develops hypotheses and section 4 describes the data and key variables, with summary statistics. Section 5 provides our analysis results for the determinants of institutional investors' inertia trading. Section 6 presents the analysis results for the impact of inertia on institutional investors' future performance. Section 7 reports a heterogeneity analysis of fund portfolios' concentration and size. Section 8 reports the asset pricing implications of inertia stocks. Section 9 presents the robustness checks. Section 10 concludes.

2. Contribution to the literature on the trading behaviors of institutional investors

Institutional investors are considered more rational decision-makers compared to retail investors. For example, they are less overconfident (Chuang and Susmel (2011)) and less prone to the disposition effect (O'Connell and Teo (2009)). Institutional investors also respond sensitively to profitable news, correcting prices to their equilibrium level (Froot, Scharfstein, and Stein (1992)). However, emerging literature shows they are also affected by behavioral biases. Institutional investors chase returns (Grinblatt, Titman, and Wermers (1995)), do not profit from well-documented stock market anomalies, or even exacerbate such anomalies (Lewellen (2011), Edelen, Ince, and Kadlec (2016)). They are also overly distracted by events relating to the firms in which they invest (Kempf, Manconi, and Spalt (2017), Schmidt (forthcoming)), and often herd due to psychological factors.[2] Our paper contributes to the literature by documenting another seemingly irrational behavior of institutional investors, portfolio inertia, a tendency not to trade any shares in some of their holdings for an extended period.

As often posited in the household finance literature, inertia could be a manifestation of institutional investors' behavioral bias, such as anchoring or the disposition effect. Lack of attention could also generate portfolio inertia.[3] Alternatively, the inertia could be a strategic investment decision to maximize performance by minimizing the cost of information collection and processing (Sims (2003)).[4] Depending on the underlying mechanism of the inertia behavior of

[2] See, for example, Froot, Scharfstein, and Stein (1992), Lakonishok, Shleifer, and Vishny (1994),Wermers (1999), Sias (2004), Dasgupta, Prat, and Verardo (2011a), and Dasgupta, Prat, and Verardo (2011b).

[3] Investor inattention can influence a wide range of phenomena in the financial markets. See, for example, Dellavigna and Pollet (2009), Hirshleifer and Teoh (2003), Peng and Xiong (2006), Da, Gurun, and Warachka (2014), Cohen and Frazzini (2008), and Hirshleifer, Lim, and Teoh (2009).

[4] Literature on the rational inattention posits that information acquisition and processing is costly and economic agents do not fully extract information about their environment, which often leads to decision-making based on imperfect

institutional investors, we could infer different implications of such behavior for their portfolio management practices and their potential impact on asset prices. In this paper, we provide evidence that inertia is related to the underperformance of institutional investors, which is consistent with behavioral bias.

The existing literature on trading behaviors of institutional investors is extensive. A large body of the literature focuses particularly on their trading skills, but empirical evidence is mixed. Starting with the seminal work by Jensen (1968), this literature finds that actively managed mutual funds underperform the passive benchmark, net of fees (Gruber (1996), Carhart (1997), Wermers (2000), Fama and French (2010)). Edelen, Ince, and Kadlec (2016) report that institutional investors are not sophisticated enough to exploit traditional asset pricing anomalies, and even contribute to the emergence of mispricing. Studying intra-quarter data on institutional investors' trading, Chakrabarty, Moulton, and Trzcinka (2017) report that most of their short-term investments have negative returns. Another strand of literature argues that institutional investors have superior trading skills. Nofsinger and Sias (1999) document a positive relationship between institutional ownership and stock returns and Puckett and Yan (2011) report that institutional investors consistently generate positive abnormal returns on their intra-quarter round-trip trades. Studying institutional investors' portfolios internationally, Choi et al. (2017) document that those with concentrated portfolios outperform the benchmark because they concentrate their investments on a few countries or sectors, about which they have an informational advantage (Van Nieuwerburgh and Veldkamp (2010)). Kacperczyk, Nieuwerburgh, and Veldkamp (2014) argue that fund managers' skills are time-varying. They find evidence that skilled fund managers have the superior stock-picking ability during booms and superior market-timing ability during recessions.[5] Our paper contributes to the literature by finding a novel predictor, portfolio inertia, of the future performance of institutional investors.

In contrast to most studies focusing on institutional investors' trading, our paper focuses on their non-trading activity. To date, stocks seldom traded by institutional investors for an extended period have received little attention, and it is unclear to what extent institutional investors are involved in such behavior. Additionally, there is no study investigating the rationale for such

information (Stigler (1961), Verrecchia (1982), Geanakoplos and Milgrom (1991), Sims (2003)).

[5] Other studies that find persistent investment skills among institutional investors include, among others, Grinblatt and Titman (1992), Elton, Gruber, and Blake (1996), Busse and Irvine (2006), Kosowski et al. (2006), Chen, Jegadeesh, and Wermers (2000), Kacperczyk, Sialm, and Zheng (2005), and Alexander, Cici, and Gibson (2007).

behavior, nor assessing the impact of institutional investors' non-trading behavior on fund-level returns[6] or on the types of stocks they are likely to hold.[7] A recent study by Cremers and Pareek (2016) explores the relation between 'patient capital' and future fund performance. They find that the institutional investors that deviate more from their benchmarks, as measured by 'active share,' outperform their benchmarks only when they trade infrequently.[8] In our paper, we further investigate the characteristics of stocks and the types of institutional investors that often engage in the non-trading behavior in their portfolios.

Unlike the literature on institutional investors, the literature on retail investors has well-documented investors' inactive trading behavior. Analyzing Panel Study of Income Dynamics (PSID) data, Bilias, Georgarakos, and Haliassos (2010) document that up to 70% of stock account owners do not trade any stocks they held in the previous year. The inertia behavior of retail investors is widely observed in retirement plan accounts too.[9] We extend this literature by documenting that professional asset managers, who are more sophisticated investors than the retail investors, also show inertia behavior in managing their portfolios.

3. Hypothesis development

Attention is a scarce resource and investors' decision-making is often affected by their limited attention (Simon (1971)). As discussed above, the inertia of institutional investors could be arising from either rational or behavioral decision-making under conditions of limited attention.

[6] A large body of research has investigated the impact of institutional investors' trading on asset prices. Because of their appetite for large stocks, institutional ownership of large stocks has contributed to the mitigated size of the small stock premium (Gompers and Metrick (2001)). Stocks held by distressed mutual funds are likely to experience a price drop (Wermers (1999)). Other papers on the impact of mutual fund flows on stock prices include, among others, Frazzini and Lamont (2008) and Coval and Stafford (2007). Institutional ownership is associated with an increase in stock volatility (Sias (1996), Bushee and Noe (2000)).

[7] For instance, institutional investors prefer to buy stocks that are big in size (Gompers and Metrick (2001), Ferreira and Matos (2008)) and have superior disclosure practices (Healy, Hutton, and Palepu (1999), Bushee and Noe (2000)).

[8] Our measure of inertia is different from their patient capital measure. Cremers and Pareek (2016) use a weighted-average duration of stock holdings of a portfolio to capture the non-trading tendency of institutional investors. As long as an investor holds a stock, even with marginal buys and sells in intermediate periods, that stock contributes to their non-trading measure. However, we characterize those marginal changes as active trading.

[9] Studying TIAA-CREF accountholders, Ameriks and Zeldes (2004) show 73% of investors never altered their portfolio over a decade-long horizon. Additional evidence of inertia among retail investors is provided by Agnew, Balduzzi, and Sunden (2003), Calvet, Campbell, and Sodini (2009), Choi et al. (2002), DellaVigna and Pollet (2009), and Madrian and Shea (2001). Barber and Odean (2000) document over-trading behavior among retail investors at a large discount brokerage company, but this may be because active traders would have been more likely to open brokerage accounts in order to trade more. Kim, Maurer, and Mitchell (2016) provide a theoretical explanation for the inertia behavior. They show that the attention cost (in terms of time) of active stock trading can be significant over the life-cycle because individuals lose valuable time to accumulate job-specific skills in a learning-by-doing fashion.

The rational inattention literature (e.g., Verrecchia (1982), Geanakoplos and Milgrom (1991), Sims (2003), Kim, Maurer, and Mitchell (2016)) argues that inertia may be a strategic decision for institutional investors. They will calculate the costs and benefits of allocating attention across stock holdings, and optimally allocate their attention to more profitable stocks, temporarily ignoring trading opportunities in other stocks. Although some stocks are seemingly ignored, the profits from the actively traded stocks will outweigh the costs of those non-traded stocks. Thus, the rational inattention theory predicts that inertia will positively influence institutional investors' overall performance.

On the other hand, the literature on behavioral inattention (Gabaix (2019)) argues that inertia is a symptom of behavioral bias. For example, institutional investors may hold their stock positions when the stock price is below the original purchase price (e.g., Wang, Yan, and Yu (2017)). Institutional investors are distracted by major corporate events regarding some stocks in their portfolio, and lose dearly on other stock holdings in their portfolio (e.g., Kempf, Manconi, Spalt (2017), Schmidt (forthcoming)). The behavioral inattention theory predicts that the inertia of institutional investors will negatively predict their future performance.

We distinguish between the rational and behavioral motivations for institutional investors' inertia by evaluating how inertia is related to the overall future returns of institutional investors. The rational inattention channel postulates that institutional investors' inertia is a way to improve their overall performance at the expense of some seemingly ignored stocks:

Hypothesis (rational inertia)*: The inertia of institutional investors is positively related to their future returns.*

To the extent that institutional investors are suboptimal in allocating their attention across stocks, or even negligent regarding some stocks, the inertia will be a manifestation of their limited information-processing ability, subsequently hurting their overall returns:

Hypothesis (behavioral inertia): *The inertia of institutional investors is negatively related to their future returns.*

4. Inertia stocks of institutional investors

This section introduces the dataset used in the analysis and key variables related to institutional investors' inertia in their stock trading.

4.1. Data and inertia stocks

The data for this paper come from three different sources. First, we retrieve institutional investors' quarterly stock holdings from the Thomson Financial CDA/Spectrum database of Securities and Exchange Commission (SEC) 13F filings.[10] The SEC requires all institutional investors to report their holdings on Form 13F if they have more than $100 million of securities under management. Institutions have needed to disclose all common stock positions greater than $200,000 or 10,000 shares, every quarter since 1980. Second, we obtain daily and monthly stock returns from CRSP. We exclude firms in the financial (SIC 6000-6999) and regulated utility (SIC 4000-4999) industries and only include US common stocks (CRSP share codes of 10 or 11) traded on the NYSE, Amex, and Nasdaq. To avoid delisting bias, we follow Shumway (1997) and Shumway and Warther (1999) in adjusting stock returns for delistings. Finally, the accounting information and short interest data come from the Compustat database. The final sample includes 7,813 unique institutional investors from March 1980 to December 2017. Our analysis is mainly based on three different samples: 39,820,077 investor-stock-quarter-level observations, 191,713 investor-quarter-level observations, and 1,393,938 stock-month-level observations.

The key variable in our analysis is institutional investors' inertia in stock trading. We construct a binary variable of stock trading inertia (*Inertia*), in the following way:

$$Inertia_{i,s,t} = \begin{cases} 1, & N_{i,s,t} = N_{i,s,t-1} \\ 0, & N_{i,s,t} \neq N_{i,s,t-1}, \end{cases} \quad (1)$$

where $N_{i,s,t}$ represents the number of shares of firm *s* held by institutional investor *i* at quarter *t*. *Inertia* for each stock held by an institutional investor is hence equal to one if the number of shares held in quarter *t* is unchanged from the number held in the prior quarter *t-1*. To ensure the above definition properly captures the inertia behavior of institutional investors, we carefully examine potential issues arising from the data. The holding information on one reporting date (RDATE) could be associated with multiple filing dates (FDATE) due to, for example, delayed reporting by the institutional investor. We therefore employ the information as of the RDATE. When a stock split happens between the RDATE and the FDATE, Thomson Financial reports the number of shares held by the investors on the latter date. To minimize potential bias arising from this

[10] Instead of focusing on equity mutual funds, we consider all institutional investors in our sample because our main research question is about institutional investors' behavior encompassing mutual funds. The extensive sample also helps us to investigate the overall impact of institutional investors' portfolio inertia on stock returns in later sections.

mismatch, we adjust the number of shares to reflect the fact that the split had not happened at the RDATE. To ensure that reused manager identification variables in 13F (*mgrno*) do not bias our main variable, we consider an *mgrno* as a new investor if there is more than a nine-month time lag between its current and previous reports. To the extent that exact round-trip trading (i.e., buying and selling exactly the same number of shares) within the reporting periods is not widespread, our inertia measure captures non-active-trading of institutional investors well.

As an equally weighted measure of inertia at the institutional investor level, we compute the fraction of non-traded stocks out of the total number of stocks held by an institutional investor (*Inertia holdings (EW)*), in the following way:

$$Inertia\ holdings\ (EW)_{i,t} = \frac{\sum_{s \in Q} I_{i,s,t}}{H_{i,t}}, \tag{2}$$

where *i* and *t* index the investor and calendar quarter, respectively. *Q* is the set of firms institutional investor *i* holds shares in, at quarter *t*, $I_{i,s,t}$ is the binary variable (*Inertia*), equal to one if institutional investor *i* does not trade a single share of firm *s* at time *t* and zero otherwise, and $H_{i,t}$ is the number of firms held in the portfolio of institutional investor *i* at quarter *t*. In a similar manner, we compute a value-weighted measure of inertia (*Inertia holdings (VW)*) in the following way:

$$Inertia\ holdings\ (VW)_{i,t} = \sum_{s \in Q} (\omega_{i,s,t} \times I_{i,s,t}), \tag{3}$$

where $\omega_{i,s,t}$ is the portfolio weight of firm *s* in the portfolio of institutional investor *i* at quarter *t*. *Inertia holdings (VW)* represents the ratio of the non-traded stocks' value to the total portfolio value for a given institutional investor.

We also derive the fraction of non-traded shares of a given stock, out of the total shares in that stock held by institutional investors (*Inertia ownership*), in the following way:

$$Inertia\ ownership_{s,t} = \frac{\sum_{i \in K} (O_{i,s,t} \times I_{i,s,t})}{\sum_{i \in K} O_{i,s,t}}, \tag{4}$$

where *K* is the set of institutional investors holding stock *s* at quarter *t*, $O_{i,s,t}$ is the number of shares of firm *s* held by institutional investor *i* at quarter *t*, and $I_{i,s,t}$ is defined as above.

In the analysis, we include characteristics of institutional investors such as the portfolio weight for each stock (*Port. weight*), the size of the stock portfolio (*Ln(fund size)*), calculated as the natural logarithm of the total market value of all stocks held, the concentration of the portfolios (*Port. HHI*), defined as the Herfindahl-Hirschman index based on each stock held in a portfolio,

and the portfolio turnover ratio (*Turnover ratio*) calculated as the percentage of holdings that have changed from the previous quarter to the current quarter (Gaspar, Massa, and Matos (2005)). We also include variables for stock-level characteristics, to analyze the types of stocks not traded by institutional investors. We include each firm's size (*Ln(ME))*, book-to-market ratio (*BE_ME*), momentum returns in the months -12 to -2 (*Momentum*), Amihud (2002) illiquidity measure (*Amihud illiq.*), leverage ratio (*Firm leverage*), return on equity (*Profitability*), tangibility of assets (*Tangibility*), fraction of shares held by all institutional investors (*Inst_share*), return volatility in the prior 12 months (*Firm vol.*), beta coefficient from the market model of daily returns during the past 12 months (*Firm beta*), standard deviation of residuals from the market model estimated during the past 12 months (*Firm idio. vol.*), and ratio of number of shares sold short to total number of outstanding shares (*Short interest*). To construct the stock-level variables, we mainly follow the procedures detailed in Lemmon, Roberts, and Zender (2008). To control for stock-market-wide shocks, we also include calendar time (monthly or quarterly) fixed effects in the multivariate regressions. Detailed definitions of all variables are given in Appendix A. We winsorize all variables at the 1% level to mitigate the impact of extreme values, except in the case of the return variables.

4.2. Summary statistics

Panel A of Figure 1 illustrates the trend in institutional investors' inertia in their stock trading over time. The vertical axis represents the ratio of inertia, measured as *Inertia holdings (EW)* and *Inertia holdings (VW)*, at the fund level. Over the sample period, on average, institutional investors do not trade a single share in about 23.6% of firms in their portfolios (*Inertia holdings (EW)*) and in stocks comprising around 14.8% of their portfolio value (*Inertia holdings (VW)*) for more than three months. The graph shows that there were major reshufflings of stock portfolios following the 1987 Black Monday crash and the 2008 Financial Crisis. However, there was a downward trend in inertia behaviors until 2008. This trend may have been due to the emergence and popularity of index-tracking investment vehicles (e.g., ETFs, index funds), which need to rebalance their portfolios as a firm’s market capitalization changes, or because of inflows and outflows. Following the 2008 Financial Crisis period, the fraction of inertia reverts to a moderate upward trend. Another notable aspect of this graph is that there is a large degree of heterogeneity in inertia across institutional investors. The 80th percentile line and the 20th percentile line of

Inertia holdings (EW) are on average 33 percentage points apart, and this gap does not narrow over time. A similar pattern is observed in the portfolio-value-based inertia measure (*Inertia holdings (VW)*).

Panel B of Figure 1 presents the pattern of the inertia fraction of stock shares held by institutional investors (*Inertia Ownership*). The vertical axis shows the ratio of non-traded shares out of all shares held by institutional investors for each stock. As with the investor-level inertia (Panel A, Figure 1), there is a downward trend in inertia at the stock level, but on average, 13% - 48% of shares held by institutional investors are not traded in each quarter over the sample period.

Panel A, Table 1 presents the summary statistics for the main variables in this study. Average *Inertia* is 0.177, implying that the likelihood of an institutional investor choosing inertia over trading is 17.7% at the investor-stock-quarter level. This likelihood corresponds to the fact that an institutional investor chooses inertia for every 4.6 active tradings (= (1-0.177) / 0.177). Moreover, there is a wide dispersion of inertia across institutional investors, as shown in the percentiles of the *Inertia* (at trade level) variable. The 10^{th} percentile of *Inertia* is 0%, and the 90^{th} percentile is 100%.

Average cross-sectional *Inertia holdings (EW)* is 21.2%, suggesting that one out of five firms in institutional investors' portfolios are not traded, even a single share, for more than three months at a time. Again, the inertia level is widely dispersed across investors, as shown by the 10^{th} and 90^{th} percentile values, at 0% and 51.9%, respectively. Based on the inertia measure with portfolio weighting (*Inertia holdings (VW)*), we observe that, on average, about 12.1% of the total portfolio value is not traded by institutional investors for more than three months at a time.

At the stock level, *Inertia ownership* has an average of 26.2%, with 10^{th} and 90^{th} percentile values of 1.2% and 80.8%, respectively. These numbers imply that, on average, 26.2% of shares held by institutional investors are not traded, and this non-trading tendency is widely dispersed across stocks.

As for other variables, an individual stock's weight in the portfolio (*Port.weight*) has a mean of 0.6%, and the median is 0.1%, implying that institutional investors generally have highly diversified portfolios. At the same time, its distribution is highly skewed, with the 10th percentile at less than 0.1% and the 90th at 1.7%, suggesting that institutional investors tilt their portfolio allocations towards a relatively small group of stocks. The average size of portfolios managed by institutional investors (*fund size*) is $3.3 billion. The portfolio concentration measure based on the

Herfindahl-Hirschman index (*Port. HHI*) has a mean of 0.058 and a standard deviation of 0.073. Its distribution is right-skewed with a 10^{th} percentile value of 0.012 and a 90^{th} percentile value of 0.127. This distribution implies that a small group of institutional investors are likely to hold much more highly concentrated portfolios than the majority of institutional investors.

Turning to the stock-level variables, the average market capitalization of stocks held by institutional investors is $2.21 billion, and the book-to-market (*BE_ME*) has a mean of 0.71. The average returns for the past 11 months (*Momentum*) are 13.3%. The Amihud illiquidity measure (*Amihud illiq.*) has a mean of 0.389. The leverage ratio (*Firm leverage*) is, on average, 34.4%. The average net income scaled by book assets (*Profitability*) is -6.5% and firms have on average 26.4% of assets as tangible asset (*Tangibility*). The average institutional investor ownership (*Inst. Shares*) is 41.9% of outstanding shares. The averages of return volatility, beta, and idiosyncratic volatility are 3.8%, 0.847, and 3.7%, respectively. On average, about 3.5% of a stock's total outstanding shares are shorted over the sample period.

Using 39,820,077 investor-stock-quarter level observations, Panel B of Table 1 reports a matrix of Pearson correlations among the variables of analysis. This table suggests that institutional investors are likely to choose inertia (*Inertia*) when they put only a small proportion of the portfolio's weight (*Port. weight*) on a given firm, when the size of the fund is small (*Ln(fund size)*), and when they have a more concentrated portfolio (*Port.HHI*). Nor surprisingly, inertia is inversely correlated with a fund's turnover ratio (*Turnover ratio*). Regarding stock-level characteristics, non-traded stocks are likely to be small (*Ln(ME)*), have high book-to-market values (*BE_ME*), to have low momentum returns (*Momentum*), and more illiquid (*Amihud illiq.*), to be highly leveraged (*Firm leverage*), and to have lower profitability (*Profitability*), higher volatility (*Firm vol.*) and lower market beta (*Firm beta*). Moreover, they have less institutional ownership (*Inst.shares*), more tangible assets (*Tangibility*) and lower short-interest ratios (*Short interest*). Overall, the simple correlation results suggest that institutional investors are likely to choose inertia for stocks with high information uncertainty.

In Panel C of Table 1, we separately report descriptive statistics for inertia trading and active trading. There is substantial heterogeneity of variables at the investor- and stock-level between inertia trades and active trades. Generally, the differences in the variables are consistent with the correlation matrix.

Panel D of Table 1 presents summary statistics for the inertia level (*Inertia holdings (EW)* and *Inertia holdings (VW)*) by legal type of institutional investor: banks (BNK), insurers (INS), investment companies (INV), independent investment advisors (IIA), corporate (private) pension funds (CPS), public pension funds (PPS), university and foundation endowments (UFE), and miscellaneous (MSC).[11] There is a wide dispersion of trading inertia across and within types of the institutional investor. For example, insurance companies do not trade a single share, on average, for 38.2% of the firms in which they invest in a given quarter. Corporate pension funds, public pension funds, and university endowments are similarly inactive. Independent investment advisors are the largest and the most active group, but they still do not trade a single share of about 20% of the firms in their portfolio, on average. Even within the same type of institutional investor, there is substantial dispersion of *Inertia holdings (EW)*. For the most active group (IIA), the 10th and 90th percentile values of *Inertia holdings (EW)* are 0% and 45.5%, respectively. When we group institutional investors based on Bushee's Transient/Quasi-indexer and Dedicated classification (Bushee (2001) and Bushee and Noe (2000)), the summary statistics for *Inertia holdings* are generally consistent with the rationale behind this classification. Transient investors (TRA) and quasi-indexers (QIX) have average trading inertia of 13.4% and 23.3%, respectively. Dedicated investors (DED), who are mainly considered as long-term investors, have higher average inertia of 37.5%.

5. Determinants of inertia

To characterize the determinants of institutional investors' inertia with regards stock trading, we estimate the following multivariate model:

$$Inertia_{i,s,t} = \beta' X_{i,t-1} + \delta' W_{s,t-1} + \alpha_i + \tau_t + \epsilon_{i,s,t,} \quad (5)$$

where *i* indexes the investors, *s* the stocks, and *t* time at a year-quarter level. The dependent variable (*Inertia*) is a binary variable equal to one if institutional investor *i* does not trade a single share of firm *s* at time *t*, and zero otherwise. We match one-quarter-lagged investor-level ($X_{i,t-1}$) and firm-level ($W_{s,t-1}$) characteristics to avoid look-ahead bias. We include investor fixed effects (α_i) to control for omitted time-invariant institutional investor characteristics (e.g., target investment

[11] The legal type of institutional investors is not reliable in the CDA/Spectrum database after 1998. Our type code is based on Bushee's institutional investor classification data (http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html).

horizon). We also incorporate time fixed effects (τ_t) at the year-quarter level, so our estimates from the regression model (5) are not biased by any market-wide shocks at a quarter level.

Given the binary nature of the dependent variable, we can use probit, logit or linear probability models. We adopt the linear probability model to avoid biases that could occur when using the probit or logit with investor fixed effects (Chamberlain (1980)). We cluster standard errors at the investor and year-quarter level to correct for potential serial and cross-sectional correlation in the error term.

Table 2, Panel A presents coefficient estimates from the linear probability model of inertia versus active trading on investor- and stock-level characteristics, with varying control variables across columns 1–4. In the baseline specification (column 1), the coefficient estimate on *Port.weight* is negative and statistically significant at the 1% level, implying that institutional investors are likely to choose inertia when the portfolio weight of a stock is small compared to other stocks in their portfolio. Institutional investors with a small fund size are likely to choose inertia, as shown by the negative and significant coefficient on *Ln(fund size)*. The coefficient on *Port.HHI* is positive and significant at the 1% level, suggesting that institutional investors with concentrated portfolios are likely to choose inertia. This result is consistent with Van Nieuwerburgh and Veldkamp (2010), who show that investors with limited information-processing capacity hold more concentrated portfolios, and, according to Table 2's results, they are also likely to choose inertia instead of actively trading securities. Not surprisingly, a fund's turnover ratio (*Turnover ratio*) is negatively correlated with inertia. Across the different specifications in columns 1-4, the above results are all statistically significant. Taken together, this analysis result is consistent with the argument that institutional investors with limited information-processing capacity are likely to choose inertia in their portfolios.

The estimated coefficients on the stock-level controls also reveal interesting characteristics of stocks not traded by institutional investors, inertia stocks. The inertia stocks are likely to be small (a negative coefficient on *Ln(ME)*), have high prior momentum returns (a positive coefficient on *Momentum*), and to be illiquid (a positive coefficient on *Amihud illiq.*). Surprisingly, inertia stocks are less profitable (a negative coefficient on *Profitability*) and to a lesser extent held by institutional investors (a negative coefficient on *Inst. shares*). Inertia stocks also have low volatility (negative coefficients on *Firm vol, Firm beta,* and *Firm idio. vol.*), suggesting that investors choose inertia when the level of uncertainty is low. Although some of the characteristics are as expected

(e.g., illiquid stocks), the characteristics of inertia stocks are not perfectly consistent with the notion that institutional investors might choose inertia to earn higher returns. The insignificant (or sometimes negative) coefficient on *BE_ME* suggests that institutional investors do not buy-and-hold value stocks to benefit from future appreciation (Edelen, Ince, and Kadlec (2016)). The negative coefficient on *Profitability* implies that institutional investors would not earn much stock price appreciation going forward (Novy-Marx (2013)). Although it is a hard call to assess the return implications of inertia stocks based on this result, the trading-level analysis implies that institutional investors are potentially losing money by not trading on stocks of growth and unprofitable firms. In the following sections (Section 6), we formally evaluate investor-level performance in relation to investors' degree of inertia.

To address a potential concern that inertia stocks are actually traded in the market through security lending for short positions,[12] we include short interest as one of the regressors in columns 3 and 4. Interestingly, the coefficient on *Short interest* is negative and significant at the 1% level, suggesting that inertia stocks are likely to have lower short interest, which goes against the security-lending and short-selling channel. This result shows that security lending followed by shorting is not the main driver of the inertia of institutional investors.

Overall, the results in Table 2, Panel A imply that funds with limited attention, proxied by the small size and high portfolio concentration (Van Nieuwerburgh and Veldkamp (2010)), are more likely to choose inertia in their trading of stocks, especially those with low portfolio weight. Those inertia stocks tend to have small capitalization, higher momentum, lower liquidity, lower profitability, lower volatility, and lower institutional ownership.

We further investigate the determinants of inertia over each type of active trading: selling and buying. Panel B of Table 2 replicates Panel A but replaces the dependent variable with the alternative of inertia as sell or buy only. In columns 1-4, the dependent variable is a binary variable equal to one if an institutional investor chooses inertia and zero if it chooses to sell the stock. In columns 5-8, the dependent variable is a binary variable equal to one if an institutional investor chooses inertia and zero if it chooses to buy additional shares of the stock. The coefficient estimates on most variables are similar to those in Panel A; small-sized funds with high portfolio concentration (proxying for limited information processing capacity) are likely to choose inertia.

[12] Asquith, Pathak, and Ritter (2005), among others, presume that institutional investors lend shares for short-selling activities in the market.

When comparing the magnitude of coefficients in Panel B, Table 2, we find that the estimated coefficients on *Port.weight* in columns 5-8 are greater in magnitude than those in columns 1-4. This result implies that, for stocks with low portfolio weight, the alternative of inertia is likely to be buying more shares of such stocks. However, the larger magnitude of the estimated coefficients on *Amihud illiq.* in columns 1-4 than those in columns 5-8 suggests that the alternative action of inertia is selling shares for illiquid stocks.

Another notable finding in Panel B, Table 2 is that the coefficients on *Momentum* are positive when inertia is considered in contrast to selling the stock (columns 1-4) and it is negative when inertia is considered in contrast to buying more shares (columns 5-8). This finding suggests that institutional investors are at least partially rational in choosing inertia for stocks with high momentum returns. By choosing to sell fewer or buy more shares over inertia for high momentum stocks, institutional investors would expect to gain higher returns on such stocks in the future. However, the trading-level analysis does not provide a comprehensive assessment of the impact of inertia on the overall performance of institutional investors. We investigate the fund-level performance implications of inertia in the next section.

6. Inertia and performance of institutional investors

In this section, based on the inertia measures defined above, we evaluate the impact of institutional investors' portfolio inertia on their future returns. To the extent that inertia is a manifestation of institutional investors' lack of attention to their portfolio management (behavioral motive) rather than a rational allocation of limited attention, inertia would be related to inferior performance in the future. We consider the impact of inertia on future fund returns from three perspectives: profitable trades, overall fund returns, and aggregate industry-level returns.

We first calculate the institutional investor's performance as holdings-based gross returns, defined as a value-weighted average returns of individual stocks in their portfolio.[13] Following Cremers and Pareek (2016), we assume that all trades happen just before the holdings reports become public, and weights are based on the market capitalization of the previous month.

To evaluate whether funds use inertia to time profitable trades in the future, we test whether the length of inertia periods is positively related to profits of a fund's subsequent active trades. We

[13] To avoid bias from funds that hold a small number of stocks, we only consider funds with at least five stock holdings in their portfolio. In a robustness check (untabulated), we only include funds with at least 10 or 20 stocks. The results are qualitatively and quantitatively similar (and available upon request).

measure the length of inertia (*Length of inertia*) as the number of quarters passed from the first time a fund purchases shares of a stock until the fund change their positions (i.e., sell or buy any shares). The length of inertia is allowed to be between one and 16 quarters. The average length of inertia is 2.21 quarters, the median is 1 quarter. Next, we estimate a regression model of a trade's profit on the length of inertia. A trade's profit is based on "signed returns" defined with a positive weight to future returns for buy trades and a negative weight to future returns for sell trades. We consider the signed return's excess returns over risk-free rate and market-adjusted returns (the signed return over CRSP value-weighted return) for the next quarter.

Table 3 reports the estimated coefficients from regressions of trade profits on the length of inertia. Considering all buy- and sell-trades (in columns 1 and 2), we find that the coefficient on the *Length of inertia* is negative and statistically significant at 5% level. This result implies that the trading activities of institutional investors following long inertia periods are likely to be unprofitable, going against the idea that investors use inertia periods to time profitable trading opportunities. When considering only buy-trades (columns 3 and 4) or sell-trades (columns 5 and 6), we find that the negative relation between the *Length of inertia* and profits of subsequent trading activities is mainly due to unprofitable sell-trades. The result suggests that institutional investors do not choose inertia to time profitable trades in the future. This result is more consistent with the idea that institutional investors are seemingly ignorant of these stocks and do not actively involve in trading them, rather than the rational motives to maximize profits of future trades.

Next, we evaluate the impact of inertia on a fund's overall returns in the future by estimating a predictive regression model of the overall performance of institutional investors on their inertia level. Using various asset pricing models, as in Cremers and Pareek (2016), we first estimate a fund's risk factor loadings based on the comovement between a fund's monthly returns and relevant risk factors over the previous 36 months. We estimate a fund's loadings when it has at least 24 monthly non-missing returns in that 36-month window. We use the estimated loadings to derive expected returns of the fund in the future month and estimate the fund's risk-adjusted returns as the difference between its realized and expected returns. We roll this window to estimate each fund's monthly risk-adjusted returns over its sample period and then compound those monthly returns to construct future three-month and one-year risk-adjusted returns (Panels A and B of Table 4, respectively). For asset pricing models, we use Fama-French three factors (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-Stambaugh liquidity factor (Pastor and

Stambaugh (2003)), Fama-French five factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)). In the predictive regressions, we include institutional investor and year-quarter fixed effects to control for time-invariant unobserved heterogeneity across investors and market-wide omitted variables, respectively. Standard errors are clustered at the investor and year-quarter level.

Table 4 reports the coefficient estimates from regressions of a fund's excess and risk-adjusted returns on the level of a fund's inertia (*Inertia holdings (VW)*)[14]. In Panel A, we consider the future three-month returns. The estimated coefficient on the *Inertia holdings (VW)* is negative and statistically significant at 1% or 5% level across all asset pricing models we employed for calculating risk-adjusted returns. A one-standard deviation increase in *Inertia holdings (VW)* is associated with 0.1% less excess returns for the next three months. The detrimental impact of inertia is not a short-term result. In Panel B, Table 4, we consider the impact of inertia on future one-year returns.[15] The coefficient estimates on *Inertia holdings (VW)* are again negative and statistically significant at 1% or 5% level, suggesting that the detrimental impact of inertia lasts for a long time. A one-standard deviation increase in *Inertia holdings (VW)* is associated with 0.36% less excess returns for the next 12 months.[16] Overall, the result of Table 4 suggests that funds with high inertia are likely to underperform compared to those with low inertia.

Regarding the control variables, the coefficients on the *Ln(fund size)* are negative across all employed asset pricing models, implying that small funds perform better than larger funds (c.f., Berk and Green (2004)). *Turnover ratio* is not significantly related to funds' performance. The estimated coefficients on *Port. HHI* are negative and statistically significant across most asset pricing models. This result indicates that institutional invesetors with more dispersed portfolio holdings perform better than those with concentrated holdings unlike institutional investors investing focusing on international stocks (Choi et al. (2017)).

We also evaluate the performance implication of inertia and active trading strategies at the aggregate level, for all institutional investors. Every quarter, we categorize each institutional investors' stock trades into inertia and active trading groups. We then compute one-month-ahead

[14] The results in Table 2 indicate that the institutional investors put lower weights on the inertia stocks. We hence use *Inertia holdings (VW)* instead of *Inertia holdings (EW),* which does not overestimate the weight of inertia stocks in their portfolios.

[15] The number of observations in Panel B is less than that in Panel A since one-year return data is missing for some funds which were out of the business or not compliant with SEC's reporting requirements.

[16] This result holds when we use future one-, six- and nine-month risk-adjusted returns (results available upon request).

value-weighted returns on each trading strategy, for each institutional investor. Averaging such returns across all funds, we form time-series of equal- or value-weighted portfolio returns (weights are based on the asset under management), representing the inertia and active trading strategies. We measure the annualized alphas from the time-series regressions of the portfolio returns of the inertia and active trading strategies on the Fama-French three factors (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-Stambaugh liquidity factor (Pastor and Stambaugh (2003)), Fama-French five factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)).

Panel A of Table 5 reports the annualized alpha of the inertia and active trading strategies of the institutional investors. Columns 1 and 2 show the alphas from the time-series regressions of the equal-weighted portfolios returns of the inertia and active trading strategies on the risk factors, respectively. Column 3 reports the annualized alpha of a hedged portfolio, long in inertia and short in active-trading stocks. The results show that inertia trading is related to future losses. The annualized excess returns on the inertia and active trading are -1.93% (*t*-statistic = -4.14) and 7.16% (*t*-statistic = 3.14), respectively. A portfolio long in inertia stocks and short in active-trading stocks generates an annualized exccess return of -9.09% (*t*-statistic = -4.89).[17] The annualized alpha for the inertia trading is negative and statistically significant across all asset pricing models employed. This is not the case for the active trading portfolio.The differences in the returns of the inertia and active trading strategies are statistically significant across all asset pricing models. In columns 4-6 of Panel A, Table 5, we report the case of the value-weighted portfolios. The results still show that the inertia trading strategy generates lower returns than an active trading strategy. In other words, the subpar performance of inertia trading is also attributable to institutional investors with large assets under management. Overall, the results suggest that inertia undermines institutional investors' performance at the industry level.

Someone might argue that inertia is a low-cost method of following market-portfolio for institutional investors. If this claim is correct, we would be underestimating the benefit of inertia for institutional investors. In Panel B of Table 5, we report the market-beta of the inertia and active trading strategies of institutional investors. Interestingly, our analysis result shows that the

[17] Our unreported aggregate results of institutional investors' performance are comparable to those in Lewellen (2011), with the alpha of around 1% per annum.

aggregate active trading emulates a market portfolio with a beta of one, but the aggregate inertia portfolio deviates considerably from the market portfolio.

Overall, the results in Tables 3, 4 and 5 provide clear evidence that institutional investors' inertia is related to inferior performance in the future. This result implies that taking no actions on some stocks may not be a result of institutional investors' optimal attention allocation across their holdings. The result supports the *behavioral inertia hypothesis* rather than the *rational inertia hypothesis* as a rationale for the inertia of institutional investors.

7. Portfolio concentration, fund size, and the impact of inertia on fund performance

A rational explanation for inertia predicts that funds with more concentrated portfolios (high *Port.HHI*) will optimally allocate their limited attention to a small group of stocks. Meanwhile, other non-traded stocks should not undermine their overall performance because rational institutional investors would have used their limited attention (carved out by not trading the inertia stocks) to increase their overall performance. On the other hand, the behavioral explanation for inertia argues that inertia is not a strategic choice, but rather signifies a slack in institutional investors' portfolio management. Here, a more concentrated portfolio (high *Port.HHI*) proxies for the limited attention level of investors, and funds with higher *Port.HHI* will be more adversely affected by inertia in terms of their overall performance.

Table 6, Panel A reports the coefficients from regressions of future risk-adjusted fund returns on inertia and other controls, for the subsample of funds with more concentrated portfolio (i.e., *Port.HHI* above the median). Panel B reports the results for the subsample of funds with less concentrated portfolio (i.e., *Port.HHI* below the median). The results show that the adverse impact of inertia on future returns is stronger for funds with higher portfolio concentration levels, supporting the behavioral explanation for inertia.

We also investigate whether the fund size affects inertia's impact on fund performance. A rational explanation for inertia would claim that small funds are less equipped with human or physical capital for information collection and processing. They would focus more on their choice of stocks for trading vs. inertia, and inertia should be a strategic choice for them to maximize overall performance. Thus, inertia would predict superior overall returns in the future, especially for small funds, ceteris paribus. However, the behavioral explanation would contend that managers of small funds may not be well equipped to deal with changing investment environments, exposing

them to the risk of inefficient portfolio management. To small funds, inertia is a manifestation of ignorance or lack of attention, and its negative impact would be greater for such funds.

Table 7, Panel A presents the coefficient estimates from regressions of future risk-adjusted fund returns on inertia and other controls, for a subsample with fund size (*Ln(fund size)*) above the median. Panel B reports the result for the subsample of funds with *Ln(fund size)* below the median. We observe that the adverse impact of inertia on future returns is stronger for smaller funds, supporting the behavioral explanation for inertia.

Taking the results from Tables 6 and 7 together, we find further evidence that the inertia of institutional investors is driven by behavioral bias rather than optimal attention allocation across their portfolio holdings.[18]

8. Inertia and cross-section of stock returns

We next evaluate a possible rational motivation, namely that institutional investors choose inertia to buy-and-hold stocks with superior returns in the future. To do so, we examine the impact of institutional investors' inertia on future stock returns. The above-mentioned linear probability regression results in Section 5 indicate that institutional investors are likely to choose inertia on stocks with lower profits, which would lead to lower returns going forward. However, they keep holding small stocks with less volatility, potentially benefiting from the small-stock premium and the low-volatility premium (Ang et al. (2006)). They are also likely to choose inertia rather than selling (buying, respectively) high (low, respectively) momentum stocks. It is thus a hard call to assess the return implications of inertia stocks based on this set of results. To do so, we first examine the relationship between inertia and the cross-section of stock returns, by analyzing the performance of inertia-based portfolios of stocks, sorted by institutional investors' trading inertia.

Every quarter, we sort the stocks into quintile portfolios based on the stock's inertia measure, defined as the ratio of non-traded shares in a given stock to its total number of shares held by all institutional investors (*Inertia ownership)*. We calculate annualized alphas from monthly time-series regressions of the value-weighted returns of the stocks in each portfolio, on the Fama-French three factors (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-

[18] We use future one-year returns of institutional investors in this section because it is more stringent performance measure to show the behavioral motives behind the inertia decisions. However, these results hold when we employ future one-, three- and nine-month risk-adjusted returns (results are untabulated and available upon request).

Stambaugh liquidity factor (Pastor and Stambaugh (2003)), Fama-French five factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)).

Table 8 reports the performance of the inertia-based portfolios of stocks. Q5 (Q1) denotes a value-weighted portfolio of the stocks with the highest (lowest) inertia measure (*Inertia ownership*). Q5-Q1 refers to annualized alphas from a portfolio long in Q5 and short in Q1. The results show that the excess returns for stocks in the highest quintile of *Inertia ownership* are 3.21% per annum, while those for stocks in the lowest quintile are 8.24%. The difference, -5.03%, is statistically significant at the 5% level. Similarly, the annualized alphas of the hedge portfolio (Q5 - Q1) range between -6.59% and -3.13% and are statistically significant at the 1% or 5% level across all asset pricing models. The result, that high-inertia stocks perform worse than low-inertia stocks, is not driven by small stocks with noisy information. Omitting stocks with prices less than $1 at the time of portfolio formation, we find a similar result, that high inertia is correlated with lower annualized alpha.[19]

We next study the impact of inertia on stock returns, controlling for traditional firm characteristics. Table 9 presents coefficient estimates from Fama-MacBeth regressions of excess stock returns on the inertia measure, from 1980:Q2 to 2017:Q4. The dependent variable is the monthly stock returns in excess of the three-month Treasury bill rate. The key independent variable of interest is *Inertia ownership*. We include traditional firm characteristics, such as size, value and momentum returns. We also control for other firm-level characteristics, as in Table 2 for the analysis of institutional investors' inertia. All control variables are lagged by one month to avoid a look-ahead bias. Because the inertia is based on the institutional investors' ownership of stocks, the impact of the inertia on the stock returns is also likely to be influenced by institutional ownership. To this end, we estimate the Fama-MacBeth regressions separately for subsamples with institutional ownership above and below the median.[20]

For the subsample of stocks with institutional ownership below the median, the estimated coefficient on *Inertia ownership* is negative and statistically significant at the 5% level. This result implies that stocks not traded by institutional investors are likely to have lower returns than those

[19] To address the potential concern that all the results are driven by microcap stocks (Fama and French (2008), Hou, Xue, and Zhang (2015)), we repeat the test using only NYSE stocks to construct the quintile portfolios for *Inertia ownership*. We continue to find that stocks with high inertia have lower alphas. We also find similar results when we use $5 as the price threshold instead of 1$. We do not report these results for brevity reasons, but they are available upon request.

[20] When we do not split our sample based on institutional ownership, we still find a negative relation between *Inertia ownership* and the risk premium, though the statistical significance is reduced (available upon request).

that are actively traded. The coefficient estimate on *Inertia ownership* suggests that a one-standard-deviation increase in *Inertia ownership* is associated with a reduction in future returns of about 1% per annum. For the subsample of stocks with institutional ownership above the median, the impact of *Inertia ownership* is reduced, with lower statistical significance. This result signifies the role that institutional investors' ownership plays in determining the impact of inertia on the cross-section of stock returns.

Other firm characteristics have loadings consistent with prior studies in the asset pricing literature. Firm size (*Ln(ME)*) has a negative loading, and the book-to-market ratio (*BE_ME*) a positive loading on stock returns (Fama and French (1992)). Momentum return (*Momentum*) has a positive loading (Jegadeesh and Titman (1993)). Stock volatility (*Firm vol.*) has a negative loading, consistent with findings of Ang et al. (2006).

Taken together, our findings in this section suggest that inertia stocks held by institutional investors are likely to underperform, undermining the overall performance of institutional investors. If inertia stocks are likely to underperform in the future, rational institutional investors should have sold, rather than held, them. This evidence goes against the rational motivation for portfolio inertia (*rational inertia hypothesis*), rather supporting a behavioral motivation (*behavioral inertia hypothesis*).

9. Robustness checks and additional analyses

9.1. Inertia defined over longer periods of inaction

In additional analyses, we replicate Table 4 using longer-term inertia of institutional investors. We now define the inertia as non-trading behavior exhibited by institutional investors over more than 6 months (*Semi-Annual Inertia holdings (VW)*), which has a mean value of 6.8% and standard deviation of 16.1%. In Table B1 (Appendix B), we report the coefficients estimates from predictive regressions of future six-months and one-year risk-adjusted fund returns on the newly defined stringent inertia level. The results still show that funds with a higher level of inertia generate lower returns than funds with a lower level of inertia. This test confirms that our main result of the inertia of institutional investors predicting lower returns is robust to a longer period of inertia, further supporting the idea that inertia is a manifestation of a potential behavioral bias among institutional investors (*behavioral inertia hypothesis*).

9.2. Intra-quarter round-trip trading

A potential concern about measurement error regarding inertia trading arises from the fact that stock-holding information in the 13F dataset is disclosed quarterly, and intra-quarter round-trip trading of institutional investors may be mistakenly labeled as inertia trading based on our definition. Studying intra-quarter trading data provided by Ancerno Ltd.,[21] Puckett and Yan (2011) indeed report that institutional investors engage in round-trip trading within a calendar quarter. They report, however, that intra-quarter round-trip trading generates higher returns and the return is persistent in the following quarters. Puckett and Yan (2011)'s finding implies that our result of subpar returns on inertia stocks is upwardly biased. Because some inertia trades could have been short-term round-trip trading, generating positive returns, the returns for the actual inertia trading could be even more negative than in our analysis reported above.

9.3. Additional robustness checks

We also study the impact of inertia on the future risk-adjusted return by the Bushee's Transient/Quasi-indexer/Dedicated classification of investors (untabulated). We find a negative relationship between the inertia holdings and future risk-adjusted returns both for the transient and the quasi-index/dedicated funds. The latter group has a longer investment horizon. This result suggests that inertia is not a way of implementing the long-term investment horizon. The detrimental impact of inertia is still present among this type of institutional investors.

The inertia is trending downwards during our sample period as Figure 1 shows. One concern might be that our findings stem mainly from the early part of the sample, during which index-tracking investment vehicles were not widespread. We thus split our sample period into two equal subperiods and repeat our analysis in Table 4. In untabulated results, we still find significant results in both subperiods. Also, we continue to find a significant negative relationship between a fund's inertia and its future portfolio return when we exclude the recent financial crisis period (i.e. from Dec. 2007 to Jun. 2009) from the data.

There are institutional investors that appear in our sample period for only a short period of time. Such funds might go out of business quickly or might be non-professional equity investors.

[21] We note that the sample provided by Ancerno Ltd. does not properly represent the population of institutional investors. The firm provided a consulting service to institutional investors aimed at minimizing stock-trading costs, and naturally had more actively trading institutional investors in their clientele base than would be seen across the whole population of institutional investors.

In either case, they might invest differently to typical long-term funds to improve their survival rates. To address potential bias arising from this type of fund, we replicate our analysis only including institutional investors that feature in our sample for at least 3, 4, or 5 years. In untabulated results, we continue to find quantitatively and qualitatively similar results to those reported in Table 4.

10. Conclusion

The main goal of this paper is to examine the extent of institutional investors' inertia in their stock trading and potential reasons for such behavior. Our analysis results show that institutional investors often do not trade any shares of certain stocks in their portfolio for an extended period. On average, institutional investors do not trade even a single share in one out of five firms in their portfolio for more than a quarter of the year. The inertia stocks are likely to have lower portfolio weights, small market capitalization, lower profitability, lower liquidity, and lower volatility. Interestingly, being an inertia stock is not positively correlated with the book-to-market ratio. These characteristics are not consistent with the common belief that institutional investors buy-and-hold stocks for extended periods to benefit from the value premium.

A fund-level performance analysis shows that institutional investors' inertia is negatively related to their overall future performance. We also find evidence that institutional investors do not choose inertia to time profitable trades in the future. After an institutial investor trades shares after choosing inertia for a longer period, the stock prices are likely to move in an unprofitable manner for them. A stock-level performance analysis based on portfolio sorting and the Fama-MacBeth regression also shows that inertia stocks are likely to underperform in the future, undermining the overall performance of institutional investors.

Taken together, these results suggest that institutional investors are not optimally allocating their attention across stocks in their portfolios, which may underperform in the future. These findings are more consistent with the behavioral motivation for such actions, rather than rational inattention. Institutional investors might improve their overall performance by understanding the adverse effect of inertia stocks.

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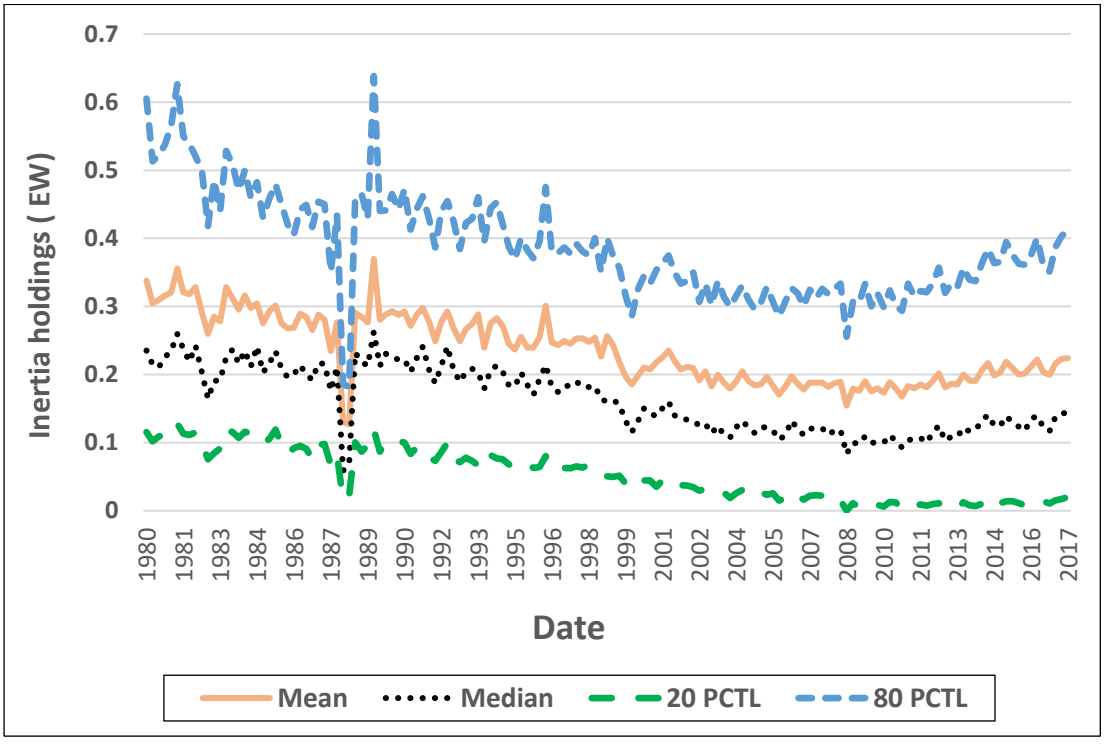
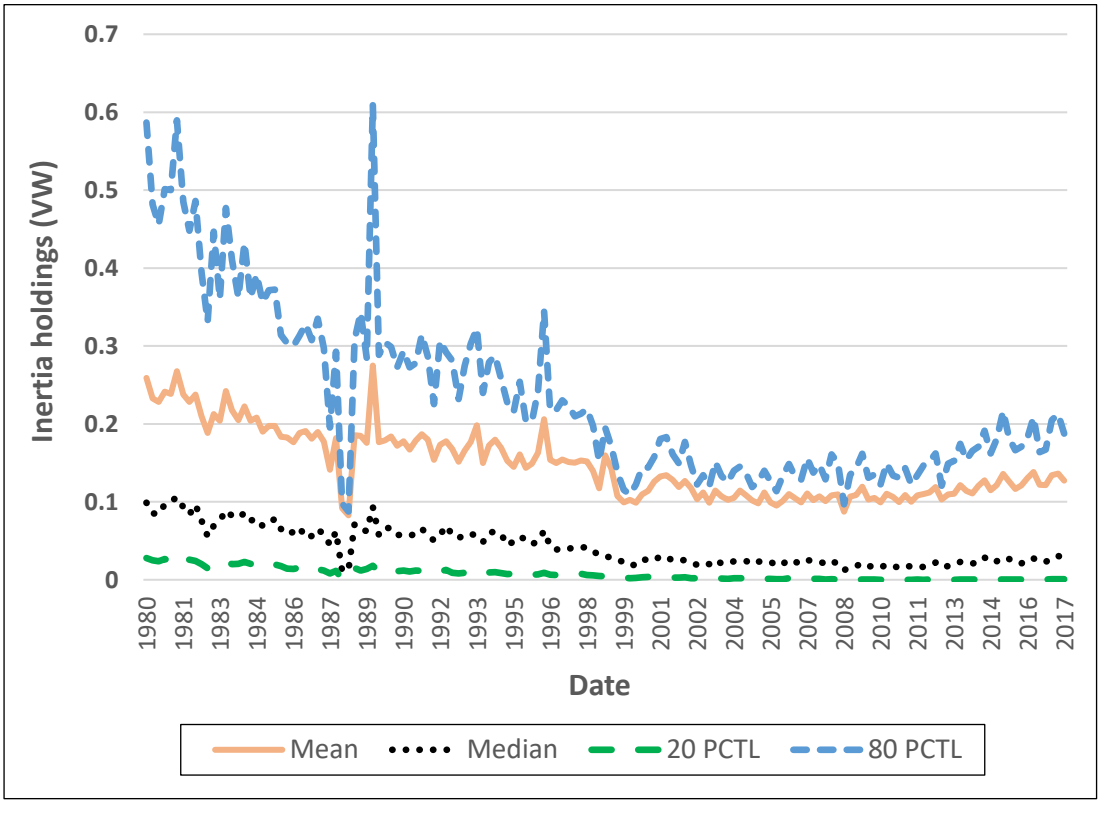
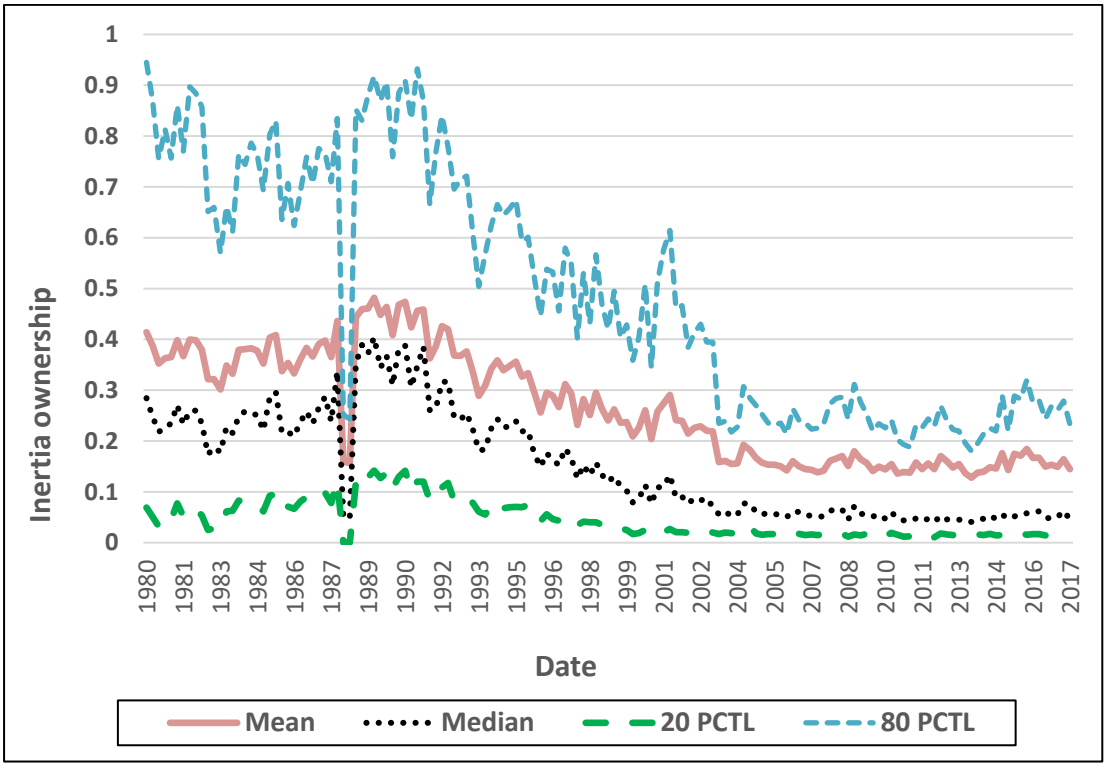
Figure 1: Distribution of institutional investors' inertia in stock trading over time

Panel A: Pattern of inertia fraction of stocks for institutional investors (*Inertia holdings*)





Panel B: Pattern of non-traded shares of stocks by institutional investors (*Inertia ownership*)



Note: These graphs plot the trend of institutional investors' inertia in their stock trading over time. In Panel A, the vertical axis is representing the ratio of inertia measured as *Inertia holdings (EW)* and *Inertia holdings (VW)* at the fund level. *Inertia holdings (EW)* is a sum of non-trade firms scaled by the total number of firms held by an institutional investor at each quarter. *Inertia holdings (VW)* is a value-weighted sum of non-traded firms held by an institutional investor at each quarter. In Panel B, the vertical axis is representing a sum of non-traded shares of a stock scaled by its total shares held by institutional investors (*Inertia ownership*). All variables are formally defined in Appendix. Source: Authors' calculation.

Table 1: Descriptive statistics for the sample

Panel A presents the summary statistics for the sample used in this paper. *Inertia* is a binary variable equal to one if the number of shares of a firm held by an institutional investor in the year-quarter *t* is the same as the number of shares held in the year-quarter *t*-1. *Inertia holdings (EW)* is the number of firms having *Inertia* equal to one scaled by the total number of firms in a portfolio held by an institutional investor at each quarter. *Inertia holdings (VW)* is the weighted-sum of firms having *Inertia* equal to one scaled by the total number of firms in a portfolio held by an institutional investor at each quarter. *Inertia ownership* is the sum of non-traded shares of a stock (*Inertia* =1) scaled by its total shares held by all institutional investors. Definitions of all other variables are provided in Appendix A. The sample includes 7,813 unique institutional investors and is from March 1980 to December 2017. This table uses three different samples: 39,820,077 investor-stock-quarter level observations, 1,393,938 stock-month level observations, and 191,713 investor-quarter-level observations. Using investor-stock-month level observations, Panel B reports the correlation between the fund- and firm-characteristics used in the analysis. Panel C presents the summary statistics for inertia and active trading subsamples and compares the difference between their averages using Welch's (1947) unpaired unequal variance option of the *t-test*. Using investor-quarter level observations, Panel D reports the summary statistics for fund inertia by legal types of institutional investors and types as defined in Bushee (2001). Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

Panel A: Summary statistics for the sample

	N	Mean	St.Dev.	10th percentile	Median	90th percentile
Inertia measure – Trade level						
Inertia	39,820,077	0.177	0.381	0.000	0.000	1.000
Length of inertia	2,919,936	2.112	2.140	1	1	4
Inertia measure – Fund level						
Inertia holdings (EW)	191,713	0.212	0.222	0.000	0.143	0.519
Inertia holdings (VW)	191,713	0.121	0.219	0.000	0.026	0.402
Inertia measure – Stock level						
Inertia ownership	1,393,938	0.262	0.299	0.012	0.133	0.808
Fund characteristics						
Port. weight	39,820,077	0.0056	0.0123	0.0000	0.0007	0.0171
Ln(fund size)	191,713	26.710	1.781	24.694	26.486	29.139
Port. HHI	191,713	0.058	0.073	0.012	0.035	0.127
Turnover ratio	191,713	0.371	0.409	0.055	0.222	0.920
Stock characteristics						
Ln(ME)	1,393,938	18.910	2.138	16.218	18.774	21.800

BE_ME	1,393,938	0.711	0.349	0.261	0.694	1.154
Momentum	1,393,938	0.133	0.543	-0.499	0.115	0.759
Amihud illiq.	1,393,938	0.880	1.495	0.001	0.067	4.313
Firm leverage	1,393,938	0.344	0.238	0.060	0.302	0.700
Profitability	1,393,938	-0.065	0.789	-0.537	0.074	0.241
Tangibility	1,393,938	0.264	0.218	0.039	0.206	0.602
Inst. Shares	1,393,938	0.419	0.317	0.029	0.372	0.901
Firm vol.	1,393,938	0.038	0.023	0.016	0.032	0.068
Firm beta	1,393,938	0.847	0.617	0.108	0.802	1.662
Firm idio. vol.	1,393,938	0.037	0.023	0.015	0.031	0.067
Short interest	782,084	0.035	0.049	0.000	0.016	0.097

Panel B: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) *Inertia*	1											
(2) *Port. weight*	-0.076***	1										
(3) *Ln(fund size)*	-0.118***	-0.376***	1									
(4) *Port. HHI*	0.078***	0.298***	-0.328***	1								
(5) Turnover ratio	-0.079***	0.055***	-0.196***	0.021***	1							
(6) *Ln(ME)*	-0.142***	0.327***	-0.317***	0.141***	-0.018***	1						
(7) *BE_ME*	0.061***	-0.081***	0.046***	-0.014***	-0.002***	-0.305***	1					
(8) *Momentum*	-0.029***	0.018***	0.013***	-0.019***	0.029***	0.058***	-0.153***	1				
(9) *Amihud illiq.*	0.148***	-0.065***	0.077***	-0.021***	-0.022***	-0.372***	0.166***	-0.106***	1			
(10) *Firm leverage*	0.037***	-0.041***	0.004***	0.008***	0.002***	-0.137***	0.738***	-0.106***	0.104***	1		
(11) *Profitability*	-0.036***	0.080***	-0.098***	0.030***	-0.011***	0.262***	-0.141***	0.030***	-0.109***	-0.081***	1	
(12) *Tangibility*	0.015***	0.021***	-0.056***	0.036***	0.003***	0.031***	0.244***	-0.026***	-0.004***	0.193***	0.020***	1
(13) *Inst. shares*	-0.138***	-0.012***	0.009***	-0.048***	0.016***	0.287***	-0.097***	0.024***	-0.352***	-0.052***	0.095***	-0.110***
(14) *Firm vol.*	0.046***	-0.156***	0.194***	-0.066***	0.040***	-0.524***	0.061***	-0.040***	0.289***	0.009***	-0.310***	-0.086***
(15) *Firm beta*	-0.071***	-0.040***	0.042***	-0.034***	0.030***	-0.005***	-0.078***	0.101***	-0.194***	-0.080***	-0.118***	-0.079***
(16) *Firm idio. vol.*	0.066***	-0.173***	0.214***	-0.070***	0.039***	-0.587***	0.056***	-0.018***	0.333***	0.006***	-0.322***	-0.083***
(17) *Short interest*	-0.039***	-0.119***	0.135***	-0.077***	0.029***	-0.236***	-0.045***	-0.040***	-0.083***	-0.022***	-0.113***	-0.076***

	(13)	(14)	(15)	(16)	(17)
(13) *Inst. shares*	1				
(14) *Firm vol.*	-0.232***	1			
(15) *Firm beta*	0.197***	0.352***	1		
(16) *Firm idio. vol.*	-0.291***	0.974***	0.249***	1	
(17) *Short interest*	0.380***	0.295***	0.289***	0.289***	1

Panel C: Summary statistics by *Inertia (trading)*

	Inertia trading (*Inertia* = 1)			Active trading (*Inertia* = 0)			Difference (Inertia - Active)
	N	Mean	St.Dev.	N	Mean	St.Dev.	Mean difference
Port. weight	7,033,785	0.004	0.010	32,786,292	0.006	0.013	-0.002***
Ln(fund size)	7,033,785	20.90	2.144	32,786,292	21.580	2.184	-0.680***
Port. HHI	7,033,785	0.032	0.044	32,786,292	0.024	0.033	0.007***
Turnover ratio	7,033,785	0.31	0.424	32,786,292	0.405	0.462	-0.094***
Ln(ME)	7,033,785	21.085	2.277	32,786,292	21.874	2.054	-0.789***
BE_ME	7,033,785	0.634	0.294	32,786,292	0.589	0.278	0.045***
Momentum	7,033,785	0.135	0.396	32,786,292	0.166	0.391	-0.030***
Amihud illiq.	7,033,785	0.226	0.758	32,786,292	0.052	0.337	0.174***
Firm leverage	7,033,785	0.319	0.206	32,786,292	0.299	0.196	0.019***
Profitability	7,033,785	0.06	0.403	32,786,292	0.095	0.354	-0.035***
Tangibility	7,033,785	0.277	0.216	32,786,292	0.268	0.216	0.009***
Inst.shares	7,033,785	0.63	0.261	32,786,292	0.713	0.221	-0.083***
Firm vol.	7,033,785	0.027	0.016	32,786,292	0.025	0.014	0.002***
Firm beta	7,033,785	1.009	0.520	32,786,292	1.103	0.497	-0.094***
Firm idio.vol.	7,033,785	0.024	0.015	32,786,292	0.022	0.013	0.002***
Short interest	5,598,615	0.036	0.046	28,560,244	0.041	0.049	-0.005***

Panel D: Summary statistics for *Inertia* by investor type

	Inertia holdings (EW)						*Inertia holdings (VW)*				
	N	Mean	St.Dev.	10^{th} percentile	Median	90^{th} percentile	Mean	St.Dev.	10^{th} percentile	Median	90^{th} percentile
Bank (BNK)	22,968	0.213	0.191	0.038	0.163	0.437	0.082	0.175	0.003	0.027	0.176
Insurance (INS)	7,780	0.382	0.310	0.023	0.304	0.868	0.314	0.339	0.002	0.153	0.897
Investment co. (INV)	6,049	0.308	0.250	0.033	0.246	0.694	0.226	0.273	0.002	0.102	0.695
Indep. investment adv. (IIA)	136,779	0.187	0.201	0.000	0.125	0.455	0.099	0.191	0.000	0.021	0.297
Corp. pension (CPS)	3,818	0.424	0.318	0.019	0.384	0.900	0.384	0.350	0.003	0.296	0.924
Pub. pension (PPS)	2,301	0.373	0.308	0.012	0.318	0.836	0.255	0.308	0.002	0.094	0.772
Univ. fund (UFE)	1,508	0.465	0.275	0.083	0.469	0.848	0.418	0.311	0.027	0.373	0.896
Miscellaneous (MSC)	10,510	0.209	0.220	0.000	0.136	0.523	0.128	0.215	0.000	0.032	0.429
Bushee classification											
Dedicated (DED)	6,604	0.375	0.275	0.059	0.320	0.800	0.324	0.339	0.005	0.175	0.916
Quasi-indexer (QIX)	133,460	0.233	0.226	0.014	0.167	0.553	0.126	0.225	0.000	0.029	0.428
Transient (TRA)	50,483	0.134	0.172	0.000	0.074	0.347	0.082	0.162	0.000	0.014	0.246
Others	1,166	0.197	0.226	0.000	0.110	0.545	0.123	0.212	0.000	0.029	0.402

Table 2: Determinants of inertia of institutional investors' portfolio

This table presents coefficient estimates from linear probability models of inertia on fund- and stock-level characteristics. In Panel A, the dependent variable is *Inertia* defined as a binary variable equal to one if the number of shares of a firm held by an institutional investor in the year-quarter *t* is same as the number of shares held in the year-quarter *t-1*, and zero otherwise. In Panel B, the dependent variable is similarly defined as *Inertia* but it equals to zero only when the number of shares decreases (*Sell*) in columns 1-4 or increases (*Buy*) in columns 5-8. The sample includes 7,813 unique institutional investors with 39,820,077 institutional investor-stock-quarter observations from 1980:Q2 to 2017:Q4. *t*-statistics are reported in parentheses and are based on standard errors adjusted for heteroskedasticity and clustered at the institutional investor and year-quarter level. Adjusted R-squared is reported. The coefficient on the constant term is omitted for brevity. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

Panel A: Determinants of choosing *Inertia* over active trading (buying or selling shares)

	Dep. = *Inertia* vs. *Active trading (Buy or Sell)*			
	(1)	(2)	(3)	(4)
Port.weight	-4.204***	-4.213***	-4.333***	-4.337***
	(-44.836)	(-45.124)	(-46.616)	(-46.772)
Ln(fund size)	-0.030***	-0.030***	-0.031***	-0.030***
	(-13.023)	(-13.009)	(-13.997)	(-13.992)
Port.HHI	0.477***	0.477***	0.477***	0.477***
	(10.709)	(10.702)	(11.333)	(11.323)
Turnover ratio	-0.024***	-0.024***	-0.023***	-0.022***
	(-9.369)	(-9.331)	(-9.787)	(-9.751)
Ln(ME)	-0.033***	-0.032***	-0.033***	-0.033***
	(-27.468)	(-27.109)	(-26.399)	(-26.428)
BE_ME	0.001	0.001	-0.007***	-0.006***
	(0.326)	(0.571)	(-3.140)	(-2.659)
Momentum	0.003**	0.004***	0.005***	0.006***
	(2.312)	(2.937)	(3.553)	(4.164)
Amihud illiq.	0.069***	0.064***	0.070***	0.067***
	(15.348)	(15.059)	(11.680)	(11.777)
Firm leverage	-0.001	-0.003	0.006**	0.005*
	(-0.333)	(-0.948)	(2.112)	(1.836)
Profitability	-0.007***	-0.007***	-0.006***	-0.006***
	(-8.230)	(-8.955)	(-7.713)	(-8.403)
Tangibility	-0.001	-0.002	0.001	0.001
	(-0.903)	(-1.337)	(0.612)	(0.496)
Inst. shares	-0.114***	-0.107***	-0.094***	-0.090***
	(-17.026)	(-17.580)	(-14.704)	(-15.384)
Firm vol.	-1.092***		-1.031***	
	(-13.585)		(-12.152)	
Firm beta		-0.019***		-0.015***

		(-9.253)		(-6.916)
Firm idio. vol.		-0.639***		-0.730***
		(-6.087)		(-6.763)
Short interest			-0.130***	-0.119***
			(-10.539)	(-10.177)
Fund FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adj. R-squared	0.200	0.201	0.202	0.202
N	39,820,022	39,820,022	34,158,859	34,158,859

Panel B: Determinants of choosing inertia over each type of active trading

	Dep. = *Inertia* vs. *Sell*				Dep. = *Inertia* vs. *Buy*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Port.weight	-5.400***	-5.407***	-5.570***	-5.573***	-7.146***	-7.167***	-7.341***	-7.352***
	(-46.465)	(-46.700)	(-47.406)	(-47.543)	(-46.690)	(-47.107)	(-49.236)	(-49.458)
Ln(fund size)	-0.039***	-0.039***	-0.041***	-0.041***	-0.050***	-0.050***	-0.051***	-0.051***
	(-12.192)	(-12.192)	(-13.730)	(-13.730)	(-16.054)	(-16.016)	(-16.008)	(-15.990)
Port.HHI	0.629***	0.629***	0.634***	0.634***	0.615***	0.614***	0.610***	0.609***
	(10.790)	(10.788)	(11.667)	(11.663)	(11.935)	(11.920)	(11.699)	(11.678)
Turnover ratio	-0.008*	-0.007*	-0.007*	-0.007*	-0.058***	-0.058***	-0.054***	-0.054***
	(-1.715)	(-1.697)	(-1.920)	(-1.908)	(-14.971)	(-14.903)	(-14.181)	(-14.132)
Ln(ME)	-0.040***	-0.039***	-0.041***	-0.040***	-0.054***	-0.052***	-0.055***	-0.053***
	(-28.073)	(-28.071)	(-27.165)	(-27.555)	(-34.070)	(-32.964)	(-32.409)	(-31.754)
BE_ME	-0.004	-0.004	-0.012***	-0.011***	0.007*	0.009**	-0.007**	-0.004
	(-1.366)	(-1.272)	(-4.363)	(-4.049)	(1.790)	(2.256)	(-2.196)	(-1.341)
Momentum	0.014***	0.015***	0.015***	0.017***	-0.011***	-0.009***	-0.006***	-0.005**
	(7.097)	(7.469)	(7.200)	(7.727)	(-4.717)	(-4.053)	(-2.653)	(-2.006)
Amihud illiq.	0.062***	0.058***	0.068***	0.065***	0.040***	0.035***	0.045***	0.041***
	(15.029)	(14.718)	(12.566)	(12.845)	(10.719)	(9.565)	(9.093)	(8.454)
Firm leverage	-0.005	-0.007**	0.005	0.004	0.006	0.002	0.014***	0.013***
	(-1.566)	(-2.080)	(1.325)	(1.086)	(1.425)	(0.554)	(3.739)	(3.321)
Profitability	-0.010***	-0.010***	-0.009***	-0.009***	-0.008***	-0.008***	-0.006***	-0.006***
	(-8.386)	(-9.095)	(-8.323)	(-9.098)	(-7.529)	(-7.943)	(-6.250)	(-6.562)
Tangibility	0.000	-0.000	0.003	0.002	-0.003	-0.004*	0.001	0.000
	(0.150)	(-0.232)	(1.264)	(1.138)	(-1.397)	(-1.904)	(0.270)	(0.171)
Inst. shares	-0.150***	-0.142***	-0.127***	-0.123***	-0.171***	-0.154***	-0.140***	-0.129***
	(-18.212)	(-19.609)	(-16.403)	(-17.794)	(-19.481)	(-19.613)	(-17.007)	(-17.178)
Firm vol.	-1.738***		-1.577***		-1.144***		-1.048***	
	(-17.063)		(-13.355)		(-11.553)		(-9.646)	

Firm beta		-0.021***		-0.016***		-0.034***		-0.028***
		(-8.067)		(-5.873)		(-12.530)		(-9.770)
Firm idio. vol.		-1.304***		-1.295***		-0.203		-0.328**
		(-9.679)		(-8.656)		(-1.584)		(-2.317)
Short interest			-0.174***	-0.160***			-0.220***	-0.203***
			(-10.397)	(-10.134)			(-11.476)	(-11.443)
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Quarter	Fund, Quarter	Fund, Quarter	Fund, Quarter	Fund, Quarter	Fund, Quarter	Fund, Quarter	Fund, Quarter
Adj. R-squared	0.244	0.244	0.246	0.246	0.292	0.293	0.298	0.298
N	25,474,181	25,474,181	21,676,638	21,676,638	21,379,538	21,379,538	18,080,803	18,080,803

Table 3: Do institutional investors choose inertia to time future profitable trades?

This table reports the coefficients estimates from regressions of one-quarter ahead returns of traded stocks on the length of inertia of institutional investors. The purpose of this analysis to examine the profitability of institutional investors' stock trades initiated after periods of inertia. The dependent variable is either future compounded quarterly stock return above the risk-free rate or future compounded quarterly stock return above the market portfolio return (CRSP value-weighted return). Each specification in column (1) and (2) contains both buy and sell trades. To track the profitability in those specifications, we multiply the returns of sell trades by a (-1). Columns (3) and (4) contain only buy trades while columns (5) and (6) contain only sell trades. The main independent variable is *Length of inertia* which measures the number of quarters that an institutional investor holds a non-traded stock before trading it at year-quarter *t*. The minimum length of inertia is one quarter and the maximum is 16 quarters. *t*-statistics are reported in parentheses and are based on standard errors robust to heteroskedasticity and clustered at the institutional investor and year-quarter level. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

	All Trades		*Buy Trades*		*Sell Trades*	
	(1)	(2)	(3)	(4)	(5)	(6)
	Quarterly excess returns	*Quarterly market-adjusted returns*	*Quarterly excess returns*	*Quarterly market-adjusted returns*	*Quarterly excess returns*	*Quarterly market-adjusted returns*
Length of inertia	-0.0003**	-0.0002**	0.0002	0.0003	0.0004**	0.0004**
	(-2.084)	(-2.107)	(1.588)	(1.633)	(2.468)	(2.324)
Port.weight	-0.0532	-0.0172	0.0179	0.0212	0.0497	0.0517
	(-1.654)	(-0.549)	(0.345)	(0.399)	(1.169)	(1.184)
Ln(fund size)	0.0013	0.0009	-0.0007	-0.0008	0.0000	0.0000
	(1.023)	(1.541)	(-1.303)	(-1.348)	(0.060)	(0.014)
Port.HHI	-0.0275**	-0.0073	0.0255**	0.0255**	-0.0018	-0.0020
	(-2.061)	(-1.045)	(2.067)	(2.173)	(-0.265)	(-0.285)
Turnover ratio	-0.0064**	0.0000	0.0027	0.0028	0.0002	0.0002
	(-2.012)	(0.024)	(1.166)	(1.231)	(0.168)	(0.153)
Ln(ME)	0.0018***	0.0005	-0.0017	-0.0017	-0.0008	-0.0009
	(2.615)	(0.875)	(-0.981)	(-1.026)	(-0.514)	(-0.556)
BE_ME	-0.0108***	-0.0100***	0.0100*	0.0101*	0.0215***	0.0210***
	(-3.709)	(-3.902)	(1.703)	(1.756)	(3.148)	(3.173)
Momentum	-0.0018	-0.0017	0.0134	0.0133	0.0110	0.0111
	(-0.471)	(-0.498)	(1.265)	(1.279)	(1.134)	(1.133)
Amihud illiq.	-0.0009	-0.0004	0.0018	0.0019	0.0004	0.0005
	(-0.771)	(-0.400)	(0.572)	(0.579)	(0.197)	(0.232)
Firm leverage	0.0049	0.0050	0.0039	0.0043	-0.0077	-0.0066
	(0.874)	(0.934)	(0.306)	(0.347)	(-0.510)	(-0.444)
Profitability	-0.0010	-0.0006	0.0045	0.0046*	0.0037	0.0037

	(-0.848)	(-0.540)	(1.630)	(1.698)	(1.420)	(1.421)
Tangibility	0.0040	0.0040	-0.0121	-0.0108	-0.0145	-0.0129
	(1.519)	(1.566)	(-1.213)	(-1.086)	(-1.449)	(-1.305)
Inst. shares	0.0040	0.0019	0.0012	0.0011	-0.0008	-0.0005
	(0.965)	(0.600)	(0.190)	(0.178)	(-0.126)	(-0.072)
Firm vol.	-0.0619	-0.0463	0.1402	0.0580	0.1886	0.1142
	(-0.352)	(-0.278)	(0.245)	(0.103)	(0.345)	(0.212)
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Quarter	Fund, Quarter	Fund, Quarter	Fund, Quarter	Fund, Quarter	Fund, Quarter
Adjusted R-squared	0.014	0.004	0.168	0.028	0.156	0.030
N	2,919,442	2,919,442	1,111,420	1,111,420	1,808,022	1,808,022

Table 4: Do institutional investors perform better by choosing inertia?

This table reports the coefficients estimates from regressions of risk-adjusted returns on fund inertia and fund characteristics. The dependent variables are excess returns of funds over the risk-free rate and risk-adjusted returns of funds based on Fama-French 3 factors (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-Stambaugh liquidity factor (Pastor and Stambaugh (2003)), Fama-French 5 factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)). In particular, we estimate a fund's risk factor loadings based on the comovement between a fund's monthly returns and relevant risk factors over the previous 36 months (requiring at least 24 monthly non-missing returns in this estimation window). The estimated loadings are then used to derive expected returns of funds in the future month. The fund's risk-adjusted returns are the difference between its realized and expected returns. We roll this window to estimate each fund's monthly risk-adjusted returns over its sample period and then compound those monthly returns to construct future three-month and one-year risk-adjusted returns (Panels A and B, respectively). The coefficient on the constant term is omitted for brevity. *t*-statistics are reported in parentheses and are based on standard errors robust to heteroskedasticity and clustered at the institutional investor and year-quarter level. Adjusted R-squared is reported. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

Panel A: The impact of inertia on future three-month returns

	(1) *Excess returns*	(2) *Risk-adj. ret.* *(3 factors)*	(3) *Risk-adj. ret.* *(4 factors)*	(4) *Risk-adj. ret.* *(PS 5 factors)*	(5) *Risk-adj. ret.* *(FF 5 factors)*	(6) *Risk-adj. ret.* *(HXZ q-factor)*
Inertia holdings (VW)	-0.00416**	-0.00445***	-0.00554***	-0.00607***	-0.00362**	-0.00429***
	(-2.437)	(-3.042)	(-3.866)	(-4.163)	(-2.386)	(-2.922)
Ln(fund size)	-0.00255***	-0.00284***	-0.00327***	-0.00346***	-0.00234***	-0.00284***
	(-2.741)	(-4.920)	(-6.857)	(-7.024)	(-3.554)	(-4.057)
Turnover ratio	0.00090	0.00091	0.00072	0.00053	0.00114	0.00094
	(0.727)	(0.939)	(0.784)	(0.598)	(1.313)	(0.887)
Port. HHI	-0.01418	-0.02756***	-0.03210***	-0.03491***	-0.02330**	-0.02874***
	(-1.156)	(-3.441)	(-3.835)	(-4.120)	(-2.590)	(-3.364)
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adjusted. R-squared	0.703	0.048	0.048	0.046	0.049	0.047
N	191,595	191,595	191,595	191,595	191,595	191,595

Panel B: The impact of inertia on future one-year returns

	(1) *Excess returns*	(2) *Risk-adj. ret.* *(3 factors)*	(3) *Risk-adj. ret.* *(4 factors)*	(4) *Risk-adj. ret.* *(PS 5 factors)*	(5) *Risk-adj. ret.* *(FF 5 factors)*	(6) *Risk-adj. ret.* *(HXZ q-factor)*
Inertia holdings (VW)	-0.01637***	-0.01088***	-0.01115***	-0.01164***	-0.01203**	-0.01173***
	(-3.604)	(-3.347)	(-3.557)	(-3.399)	(-2.459)	(-3.613)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adjusted. R-squared	0.694	0.115	0.111	0.124	0.128	0.109
N	170,263	170,263	170,263	170,263	170,263	170,263

Table 5: The performance and beta of inertia and active trading strategies

This table reports the impact of inertia on the performance of institutional investors at the aggregate industry level. Panel A reports the performance of inertia and active trading strategies at the aggregate level. Every quarter, we categorize each institutional investors' stock trades into inertia and active trading groups. We then compute one-month ahead value-weighted returns on each trading strategy. Averaging such returns across all funds, we form a time-series of equal- or value-weighted of portfolio returns (weights are based on the asset under management) representing inertia and active trading strategy. We measure annualized alphas from monthly time-series regressions of portfolio returns of inertia and active tradings on Fama-French 3 factors (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-Stambaugh liquidity factor (Pastor and Stambaugh (2003)), Fama-French 5 factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)). Panel B reports the market-beta for inertia and active trading strategies based on the above asset pricing models. *t*-statistics are reported in parentheses and are based on Huber-White robust standard errors. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

Panel A: Performance of inertia and active trading strategies

	Equal-weighted portfolio of funds (annual %)			Value-weighted portfolio of funds (annual %)		
	(1) *Inertia*	(2) *Active*	(3) *(Inertia - Active)*	(4) *Inertia*	(5) *Active*	(6) *(Inertia - Active)*
Excess Return	-1.93***	7.16***	-9.09***	1.33	8.14***	-6.81***
	(-4.14)	(3.14)	(-4.89)	(1.20)	(3.26)	(-4.61)
Alpha (FF 3-Factors)	-3.32***	-0.14	-3.18***	-2.12***	0.13	-2.25***
	(-15.59)	(-0.34)	(-7.98)	(-6.15)	(0.30)	(-4.78)
Alpha (Carhart 4-Factor)	-3.23***	0.15	-3.38***	-2.12***	0.74*	-2.86***
	(-15.81)	(0.41)	(-8.60)	(-6.09)	(1.93)	(-6.50)
Alpha (Pastor-Stambaugh 5-Factor)	-3.16***	0.35	-3.51***	-2.13***	0.73*	-2.86***
	(-14.84)	(0.96)	(-8.93)	(-5.84)	(1.87)	(-6.66)
Alpha (Fama French 5-Factor)	-3.11***	0.23	-3.33***	-2.02***	0.63	-2.66***
	(-15.12)	(0.62)	(-8.72)	(-5.70)	(1.62)	(-6.28)
Alpha (HXZ q-Factor)	-3.56***	0.03	-3.59***	-3.01***	0.60	-3.61***
	(-16.82)	(0.09)	(-8.55)	(-9.26)	(1.47)	(-7.84)

Panel B: Market beta of inertia and active trading strategies

	Equal-weighted portfolio of funds		Value-weighted portfolio of funds	
	(1)	(2)	(3)	(4)
	Inertia	*Active*	*Inertia*	*Active*
CAPM	0.17	0.91	0.43	1.00
Fama French 3-Factor	0.17	0.89	0.43	0.97
Carhart 4-Factor	0.16	0.88	0.43	0.97
Pastor-Stambaugh 5-Factor	0.16	0.88	0.43	0.97
Fama French 5-Factor	0.17	0.89	0.45	0.98
HXZ q-Factor	0.17	0.89	0.44	0.98

Table 6: Portfolio concentration level (HHI) and the impact of inertia on the future performance of institutional investors

This table replicates Table 4 for samples with portfolio concentration (*Port. HHI*) above and below the median (Panels A and B, respectively). The dependent variables are excess returns of funds over the risk-free rate and risk-adjusted returns of funds based on Fama-French 3 factors (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-Stambaugh liquidity factor (Pastor and Stambaugh (2003)), Fama-French 5 factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)). In particular, we estimate a fund's risk factor loadings based on the comovement between a fund's monthly returns and relevant risk factors over the previous 36 months (requiring at least 24 monthly non-missing returns in this estimation window). The estimated loadings are then used to derive expected returns of funds in the future month. The fund's risk-adjusted returns are the difference between its realized and expected returns. We roll this window to estimate each fund's monthly risk-adjusted returns over its sample period and then compound those monthly returns to construct future one-year risk-adjusted returns. Other controls include *Ln(fund size)*, *Port. HHI*, and *Turnover ratio*. The coefficients on the control variables and the constant term are omitted for brevity. *t*-statistics are reported in parentheses and are based on standard errors robust to heteroskedasticity and clustered at the institutional investor and year-quarter level. Adjusted R-squared is reported. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

Panel A: The impact of inertia on future one-year performance of institutional investors with portfolio HHI above the median

	(1) *Excess returns*	(2) *Risk-adj. ret.* *(3 factors)*	(3) *Risk-adj. ret.* *(4 factors)*	(4) *Risk-adj. ret.* *(PS 5 factors)*	(5) *Risk-adj. ret.* *(FF 5 factors)*	(6) *Risk-adj. ret.* *(HXZ q-factor)*
Inertia holdings(VW)	-0.02147***	-0.01804***	-0.01781***	-0.01780***	-0.02313***	-0.01830***
	(-3.203)	(-3.701)	(-3.719)	(-3.448)	(-2.999)	(-3.748)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adjusted. R-squared	0.620	0.102	0.100	0.117	0.125	0.094
N	84,727	84,727	84,727	84,727	84,727	84,727

Panel B: The impact of inertia on the future one-year performance of institutional investors with portfolio HHI below the median

	(1) *Excess returns*	(2) *Risk-adj. ret.* *(3 factors)*	(3) *Risk-adj. ret.* *(4 factors)*	(4) *Risk-adj. ret.* *(PS 5 factors)*	(5) *Risk-adj. ret.* *(FF 5 factors)*	(6) *Risk-adj. ret.* *(HXZ q-factor)*
Inertia holdings(VW)	-0.00541	-0.00212	-0.00353	-0.00445	-0.00072	-0.00256
	(-1.127)	(-0.777)	(-1.393)	(-1.506)	(-0.189)	(-0.832)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adjusted. R-squared	0.816	0.186	0.174	0.177	0.177	0.182
N	85,022	85,022	85,022	85,022	85,022	85,022

Table 7: Fund size and the impact of inertia on the future performance of institutional investors

This table replicates Table 4 for samples with fund size (*Ln(fund size*) above and below the median (Panels A and B, respectively). The dependent variables are excess returns of funds over the risk-free rate and risk-adjusted returns of funds based on Fama-French 3 factors (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-Stambaugh liquidity factor (Pastor and Stambaugh (2003)), Fama-French 5 factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)). In particular, we estimate a fund's risk factor loadings based on the comovement between a fund's monthly returns and relevant risk factors over the previous 36 months (requiring at least 24 monthly non-missing returns in this estimation window). The estimated loadings are then used to derive expected returns of funds in the future month. The fund's risk-adjusted returns are the difference between its realized and expected returns. We roll this window to estimate each fund's monthly risk-adjusted returns over its sample period and then compound those monthly returns to construct future one-year risk-adjusted returns. Other controls include *Ln(fund size)*, *Port. HHI*, and *Turnover ratio*. The coefficients on the control variables and the constant term are omitted for brevity. *t*-statistics are reported in parentheses and are based on standard errors robust to heteroskedasticity and clustered at the institutional investor and year-quarter level. Adjusted R-squared is reported. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

Panel A: The impact of inertia on the future one-year performance of institutional investors with fund size above the median

	(1) *Excess returns*	(2) *Risk-adj. ret.* *(3 factors)*	(3) *Risk-adj. ret.* *(4 factors)*	(4) *Risk-adj. ret.* *(PS 5 factors)*	(5) *Risk-adj. ret.* *(FF 5 factors)*	(6) *Risk-adj. ret.* *(HXZ q-factor)*
Inertia holdings(VW)	-0.00332	-0.00019	0.00032	-0.00000	0.00565	-0.00102
	(-0.487)	(-0.034)	(0.059)	(-0.000)	(0.862)	(-0.180)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adjusted. R-squared	0.743	0.146	0.139	0.151	0.155	0.138
N	85,030	85,030	85,030	85,030	85,030	85,030

Panel B: The impact of inertia on the future one-year performance of institutional investors with fund size below the median

	(1) *Excess returns*	(2) *Risk-adj. ret.* *(3 factors)*	(3) *Risk-adj. ret.* *(4 factors)*	(4) *Risk-adj. ret.* *(PS 5 factors)*	(5) *Risk-adj. ret.* *(FF 5 factors)*	(6) *Risk-adj. ret.* *(HXZ q-factor)*
Inertia holdings(VW)	-0.01920***	-0.01478***	-0.01549***	-0.01612***	-0.02063***	-0.01596***
	(-3.074)	(-3.301)	(-3.472)	(-3.275)	(-2.679)	(-3.377)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adjusted. R-squared	0.672	0.133	0.131	0.146	0.145	0.133
N	84,899	84,899	84,899	84,899	84,899	84,899

Table 8: Inertia of institutional investors and the cross-section of stock returns

This table examines the profitability of inertia-based trading strategy of stocks sorted by institutional investors' inertia. Every quarter, stocks are sorted into quintile portfolios based on a stock's exposure to the inertia of institutional investors (*Inertia ownership*). *Inertia ownership* is the sum of non-traded shares of a stock scaled by its total shares held by all institutional investors. Q5 (Q1) denotes a value-weighted portfolio of stocks having the highest (lowest) inertia measures. We report annualized alphas from monthly regressions of value-weighted returns of stocks in each portfolio on Fama-French 3 factor (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-Stambaugh liquidity factor (Pastor and Stambaugh (2003)), Fama-French 5 factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)). Q5-Q1 refers to alphas from a portfolio long in Q5 (quintile portfolio with highest *Inertia ownership*) and short in Q1 (quintile portfolio with lowest *Inertia ownership*). *t*-statistics are reported in parentheses and are based on Huber-White robust standard errors. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

	Full sample						Stocks with a share price > $1					
	Q1	Q2	Q3	Q4	Q5	(Q5 - Q1)	Q1	Q2	Q3	Q4	Q5	(Q5 - Q1)
Excess Return	8.24***	9.4***	8.48***	7.31***	3.21	-5.03**	8.29***	9.37***	8.86***	6.96***	4.32	-3.97**
	(2.99)	(3.69)	(3.23)	(2.67)	(1.01)	(-2.52)	(3.01)	(3.66)	(3.36)	(2.62)	(1.38)	(-2.11)
Alpha (FF 3-Factors)	0.77	1.77**	0.33	-0.70	-5.82***	-6.59***	0.91	1.68**	0.73	-0.89	-4.76***	-5.67***
	(1.32)	(2.37)	(0.40)	(-0.61)	(-4.25)	(-4.52)	(1.54)	(2.27)	(0.89)	(-0.79)	(-3.80)	(-4.17)
Alpha (Carhart 4-Factor)	0.73	1.62**	0.55	-0.12	-4.33***	-5.07***	0.91	1.47**	0.87	-0.41	-3.64***	-4.55***
	(1.21)	(2.12)	(0.63)	(-0.11)	(-3.11)	(-3.42)	(1.48)	(1.99)	(1.03)	(-0.36)	(-2.83)	(-3.26)
Alpha (Pastor-Stambaugh 5-Factor)	0.73	1.54**	0.73	0.18	-4.42***	-5.14***	0.88	1.38*	1.06	-0.15	-3.53***	-4.42***
	(1.17)	(2.00)	(0.85)	(0.16)	(-3.10)	(-3.42)	(1.42)	(1.85)	(1.27)	(-0.14)	(-2.66)	(-3.08)
Alpha (Fama French 5-Factor)	0.86	0.90	-0.65	-1.87	-4.09***	-4.96***	0.98	0.85	-0.15	-2.53**	-3.25**	-4.22***
	(1.43)	(1.17)	(-0.77)	(-1.42)	(-2.96)	(-3.32)	(1.61)	(1.10)	(-0.19)	(-2.04)	(-2.58)	(-3.05)
Alpha (HXZ q-Factor)	0.98	1.37	0.21	-1.21	-2.16	-3.13**	1.15	1.30	0.55	-1.85	-1.65	-2.80**
	(1.41)	(1.57)	(0.24)	(-0.86)	(-1.57)	(-2.12)	(1.63)	(1.51)	(0.59)	(-1.41)	(-1.31)	(-1.97)

Table 9: The coefficients estimates from Fama-MacBeth regressions of stock returns on the inertia of institutional investors

This table reports the results from Fama-MacBeth (1973) cross-sectional regressions of excess stock returns on stock's exposure to the inertia of institutional investors (*Inertia ownership*). The dependent variable is the monthly stock returns in excess of the three-month Treasury bill rate. *Inertia ownership* is the sum of non-traded shares of a stock (*Inertia*=1) scaled by its total shares held by all institutional investors. The sample includes 7,813 unique institutional investors with 1,395,201 stock-quarter observations from 1980:Q2 to 2017:Q4. *t*-statistics are reported in parentheses and are based on Newey-West standard errors with 11 lags. The coefficient on the constant term is omitted for brevity. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

	Institutional ownership > Median		*Institutional ownership* < Median	
	(1)	(2)	(3)	(4)
Inertia ownership	-0.0028	-0.0030	-0.0027**	-0.0026**
	(-1.491)	(-1.521)	(-2.215)	(-2.138)
Ln(ME)	-0.0012***	-0.0011***	-0.0038***	-0.0038***
	(-2.797)	(-2.670)	(-7.408)	(-7.416)
BE_ME	0.0021	0.0022	0.0100***	0.0100***
	(1.269)	(1.378)	(5.668)	(5.839)
Momentum	0.0087***	0.0086***	0.0052***	0.0052***
	(4.052)	(3.928)	(3.497)	(3.497)
Amihud illiq.	-0.0051	-0.0057	0.0001***	0.0001***
	(-1.086)	(-1.082)	(3.608)	(3.824)
Firm leverage	-0.0015	-0.0020	-0.0083***	-0.0086***
	(-0.457)	(-0.631)	(-2.732)	(-2.874)
Profitability	0.0025**	0.0025**	0.0008*	0.0007*
	(2.106)	(2.195)	(1.761)	(1.653)
Tangibility	-0.0026	-0.0027	-0.0082**	-0.0080**
	(-1.135)	(-1.275)	(-2.452)	(-2.499)
Firm vol.	-0.1807**		-0.2187***	
	(-1.990)		(-3.327)	
Firm beta		-0.0010		-0.0004
		(-0.630)		(-0.331)
Firm idio. vol.		-0.1548**		-0.2164***
		(-2.060)		(-3.620)
Adj. R-squared	0.072	0.080	0.041	0.045
N	696,860	696,860	697,078	697,078

Appendix A

Table A1: Variable Descriptions

Variable	Description
"Inertia measures"	
Inertia	A binary variable equal to one if the number of shares of a firm held by an institutional investor in the year-quarter *t* is same as the number of shares held in the year-quarter *t*-1.
Length of inertia	The number of quarters that an institutional investor holds the same number of shares on a stock before changing its position at year-quarter *t*.
Inertia holdings (EW)	The ratio of stocks having *Inertia* =1 to the total number of stocks in the portfolio of an institutional investor.
Inertia holdings (VW)	The value-weighted sum of the number of stocks having *Inertia* equal to one in the year-quarter *t* in which weights are based on the value of each stock in the portfolio of an institutional investor in the year-quarter *t-1*.
Inertia owership	The sum of non-traded shares of a stock (*Inertia*=1) in the year-quarter *t* scaled by its total shares held by all institutional investors in the year-quarter *t*.
"Fund characteristics"	
Port. weight	The ratio of a stock's value to the total portfolio value of an institutional investor.
Ln(fund size)	The natural log of the market value of a stock portfolio held by an institutional investor.
Port. HHI	The Herfindahl-Hirschman index (HHI) of stock values for an institutional investor defined as the sum of squared portfolio weight of each stock.
Turnover ratio	The percentage of total value of holdings for an institutional investor that changed from the previous quarter to the current quarter.
"Firm characteristics"	
Ln(ME)	The natural log of the market value of a firm defined as the number of outstanding shares (in 1,000) multiplied by the market price per share.

BE_ME	The book value of equity defined as the total stockholder's equity plus deferred taxes and investment tax credit minus preferred stock value divided by the market value of a firm.
Momentum	Stock returns over the last 11 months (months *t*-12 to *t*-2).
Amihud illiq.	The ratio of the absolute daily return to daily dollar volume multiplied by 1,000,000 and averaged over a month.
Firm leverage	Total debt divided by total market value of assets.
Profitability	ROE, i.e. the ratio of net income over book value of total equity.
Tangibility	Net Property, Plant and Equipment/book assets.
Inst. Shares	A total number of shares held by institutional investors divided by the total number of outstanding shares.
Firm vol.	Standard deviation of daily stock returns over the last 12 months.
Firm beta	The coefficient from the market model, based on regressing daily stock returns on daily returns on the CRSP value-weighted index over the last 12 months.
Firm idio. vol.	The standard deviation of residuals from the market model estimated over the last 12 months.
Short interest	The ratio of the total number of shorted shares to the total numbers of outstanding shares.

"Fund returns"

Excess returns	Value-weighted average of monthly holding-based returns of a fund in excess of the three-month Treasury bill rate.
Excess ret. (3 factors)	Risk-adjusted monthly holding-based excess returns of a fund based on the Fama-French 3 factors model (Fama and French (1992)).
Excess ret. (4 factors)	Risk-adjusted monthly holding-based excess returns of a fund based on the Carhart 4 factors model (Carhart (1997)).
Excess ret. (PS 5 factors)	Risk-adjusted monthly holding-based excess returns of a fund based on the Pastor-Stambaugh 5 factors model (Pastor and Stambaugh (2003)).
Excess ret. (FF 5 factors)	Risk-adjusted monthly holding-based excess returns of a fund based on the Fama-French 5 factors model (Fama and French (2016)).
Excess ret. (HXZ q-factor)	Risk-adjusted monthly holding-based excess returns of a fund based on the Hou-Xue-Zhang q-factors model (Hou, Xue, and Zhang (2015)).

Appendix B

Table B1: Inertia over longer periods and the fund performance

Similar to Table 4, this table presents the impact of inertia on the performance of institutional investors, but we measure *Inertia holdings (VW)* over 6 months. The dependent variables are excess returns of funds over the risk-free rate and risk-adjusted returns of funds based on Fama-French 3 factors (Fama and French (1992)), momentum factor (Carhart (1997)), Pastor-Stambaugh liquidity factor (Pastor and Stambaugh (2003)), Fama-French 5 factors (Fama and French (2016)), and Hou-Xue-Zhang q-factors (Hou, Xue, and Zhang (2015)). In particular, we estimate a fund's risk factor loadings based on the comovement between a fund's monthly returns and relevant risk factors over the previous 36 months (requiring at least 24 monthly non-missing returns in this estimation window)). The estimated loadings are then used to derive expected returns of funds in the future month. The fund's risk-adjusted returns are the difference between its realized and expected returns. We roll this window to estimate each fund's monthly risk-adjusted returns over its sample period and then compound those monthly returns to construct future six-month and one-year risk-adjusted returns (Panels A and B, respectively). Other controls include *Ln(fund size)*, *Port. HHI*, and *Turnover ratio*. The coefficient on the constant term and other control variables are omitted for brevity. *t*-statistics are reported in parentheses and are based on standard errors robust to heteroskedasticity and clustered at the institutional investor and year-quarter level. Adjusted R-squared is reported. Statistical significance at the 10%, 5%, and 1% levels is denoted by *, **, and ***, respectively.

Panel A: The impact of semi-annual inertia on the future six-month returns

	(1) *Excess returns*	(2) *Risk-adj. ret.* *(3 factors)*	(3) *Risk-adj. ret.* *(4 factors)*	(4) *Risk-adj. ret.* *(PS 5 factors)*	(5) *Risk-adj. ret.* *(FF 5 factors)*	(6) *Risk-adj. ret.* *(HXZ q-factor)*
Semi-Annual Inertia holdings (VW)	-0.01025**	-0.00896***	-0.00874***	-0.00913***	-0.00911**	-0.00833***
	(-2.397)	(-2.649)	(-2.756)	(-2.744)	(-2.181)	(-2.752)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adjusted. R-squared	0.708	0.075	0.074	0.077	0.077	0.071
N	184,042	184,042	184,042	184,042	184,042	184,042

Panel B: The impact of annual inertia on the future one-year returns

	(1) *Excess returns*	(2) *Risk-adj. ret.* *(3 factors)*	(3) *Risk-adj. ret.* *(4 factors)*	(4) *Risk-adj. ret.* *(PS 5 factors)*	(5) *Risk-adj. ret.* *(FF 5 factors)*	(6) *Risk-adj. ret.* *(HXZ q-factor)*
Semi-Annual Inertia holdings (VW)	-0.01556**	-0.00795*	-0.00728	-0.00765	-0.01295*	-0.00940*
	(-2.149)	(-1.657)	(-1.480)	(-1.381)	(-1.729)	(-1.937)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered S.E.	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter	Fund, Year-Quarter
Adjusted. R-squared	0.694	0.115	0.110	0.124	0.128	0.109
N	170,263	170,263	170,263	170,263	170,263	170,263