# Institutional Investors and Corporate Investment

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**Abstract**

This paper investigates whether institutional investors influence firms' investment policies. By virtue of their significant ownership stakes and investment horizons, long-term institutional investors should closely monitor management and thus reduce agency conflicts in investment choices. Using a panel dataset of 2,511 U.S. manufacturing firms that went public between 1980 and 2003, I find that firms with long-term institutional investors tend to have lower capital expenditure than widely-held firms. Investment is reduced precisely in firms that are more exposed to the danger of over-investment: (a) firms that invest too much after controlling for their growth opportunities, financing constraints and industry affiliation, and (b) firms that have few investment opportunities but large cash flows. Most importantly, a reduction in capital expenditure in these firms leads to higher subsequent firm profitability and stock market performance, confirming that institutional investors' actions aimed at removing over-investment are value-enhancing.

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## 1. Introduction

Institutional investors have become increasingly important in firms' ownership structures. As shown in Figure 1, institutional investors' holdings of U.S. firms have gone from 10% of shares outstanding in 1960, to well over 60% in 2005.[1] Because of their significant ownership stakes and investment horizons, we should expect that institutional investors influence important firm decisions through various channels. In this paper, I investigate their impact on the crucial decision of capital expenditure.

[Insert Figure 1 here]

Firms' investment policies are crucial for shareholders because, as Jensen and Meckling (1976) argue, they directly impact corporate value. An important component of such policies is capital expenditure. While existing literature mostly investigates the impact of institutional investors on research and development (Bushee (1998), Aghion *et al.* (2008)) and take-over activities (Massa *et al.* (2005), and Chen *et al.* (2007)), their potential influence on investment in real assets has not been investigated. This is a surprising gap in the literature, since capital expenditure directly determines a firm's ability to transform investment opportunities into real output, and is therefore a key determinant of firm value. This paper aims to fill this gap in the literature.

Investors rely on managers to choose investment projects that enhance firm value. While in a frictionless environment, investment opportunities should be the only determinant of firms' optimal investment decisions, empirical research has shown that investment can deviate from its optimal level when firms suffer from asymmetric information (Myers and Majluf (1984)) and agency conflicts (Jensen and Meckling (1976), Jensen (1986), Stein (2003)).

By deviating from the optimal investment level, managers jeopardize firm value and overall returns of shareholders. Deviations, such as over-investment, may occur because insiders can behave opportunistically (Stulz (2005)). Small investors have no incentive to monitor management, but institutional investors can carry out that task efficiently by virtue of their large shareholdings and long-term investment horizons (Shleifer and Vishny (1986)).

Institutional investors' monitoring can influence management choices in various ways. For example, Carleton *et al.* (1998) show that institutions with large ownership positions often have access to board members and senior managers. Anecdotal evidence also shows that fund managers often meet with managers of the largest companies in their portfolio during "investors conferences" organized by soft dollars brokers. During these meetings institutional investors acquire valuable information about firms' policies and can make suggestions to managers. Most importantly, by "voting with their feet" when they are dissatisfied with corporate performance, institutions also exercise significant discipline on

[1] Federal Reserve Board Flow of Funds Report and Aghion *et al.* (2008).

management (Bolton and Scharfstein (1990), Parrino *et al.* (2003), Admati and Pfleiderer (2006), Edmans and Manso (2009)). Yet an important distinction has to be drawn among different types of institutional investors. In particular, it is important to distinguish between long-term and short-term institutional investors. This distinction is fundamental to understand the level of monitoring that institutional investors carry out and, hence, their impact on investment decisions. If institutions simply trade for short-term gains, such as the case of short-term institutional investors, then they should have very little incentive to monitor and their presence may end up exacerbating managers' myopia (Drucker (1986), Porter (1992), Graves and Waddock (1990)).

I conduct my investigation using a panel dataset containing all U.S. manufacturing companies that went public during the period 1980-2003. Such dataset allows the possibility of observing the evolution of a firm's ownership structure and its investment through time, from its IPO onwards. In this way, I can conduct clear tests to investigate the before- and after-effects of changes in a firm's ownership structure on its level of investment. I collect data starting from firms' IPOs because the decisions that firms make at the IPO stage are fundamental to understand the evolution of their ownership structure. In fact, at the time of the IPO a firm decides the type of ownership structure (dispersed ownership versus concentrated ownership) because of the level of monitoring required (Booth and Chua (1996), Pagano and Roell (1998)). This decision is particularly important because once a firm has created its initial ownership structure, only slowly it will adjust to a new one (Bebchuk and Roe (1999)).[2] Moreover, it is important to note that firms going public are larger and usually have very high investment opportunities (Pagano *et al.* (1998)).

To determine institutional investors' incentive to monitor, I use their ownership stakes and investment horizons, which should indicate how much effort they are willing to invest in monitoring firms' management. In each firm, I focus on the five largest institutional investors[3] and distinguish between long-term and short-term investors. As in Chen *et al.* (2007), I define long-term institutional investors as large blockholders that remain in a firm's ownership structure for at least one year to distinguish them from short-term institutional investors that remain in a firm's ownership structure for less than one year.

I first find that long-term institutional investors have a direct and negative impact on capital expenditure, while short-term institutions have no influence on capital expenditure. Results are robust also using a first difference approach and a two-stage least square approach. While these findings confirm that institutional investors that are expected to monitor have an important influence on capital

[2] Bebchuk and Roe (1999) argue that if a company decides to have a diffuse ownership structure at the IPO, it may also develop incentive compensation schemes for managers, add more independent directors, and create a debt structure that reduces agency costs.

[3] Barclay and Holderness (1991) suggest that a mere 10-15% block ownership can bring about substantial corporate control.

expenditure, in turn, they raise an important question as to why long-term institutions are associated with reductions of capital expenditure.

If institutional investors improve investment choices, then their influence depends on the level of firms' over- or under-investment. Under-investment arises when managers opt to be conservative in directing corporate investment, even passing up value enhancing projects. In contrast, over-investment arises in those firms that select all positive NPV projects, and then make additional negative NPV investments. If a manager over-invests then we should expect that institutional investors' intervention should lead to a reduction of capital expenditure to maximize shareholders' wealth.

I investigate this hypothesis by identifying firms that over-invest in various ways. First, I decompose investment using the technique developed by Richardson (2006). A firm's optimal level of investment is defined as the level of investment that a firm should have after controlling for its investment opportunities, financial constraints and industry affiliation. The difference between a firm's actual level of investment and its optimal level of investment captures over-investment. *I find that in firms that over-invest, the larger the stake held by long-term institutional investors, the lower the level of over-investment.* Second, I assume that the industry median level of investment represents a good benchmark for a company's optimal level of investment. Thus, I use the deviation between a firm's actual level of investment and the median level in its industry as a proxy for over-investment. Following Harvey *et al.* (2003), I split the sample into firms with above- and below-median industry level of investment in real assets. *I find that in companies that invest above their industry peers, the larger the stake held by long-term institutional investors, the lower the level of over-investment.* Third, I focus on firms with large availability of cash flows and few investment opportunities with respect to their industry level. I find that in these firms the larger the stake held by institutional investors, the lower the level of investment, while I find no impact in firms with few investment opportunities and little cash on hand. Results are robust using a first difference approach. Together, these findings show that institutional investors' major impact takes place precisely where it is needed: managers that over-invest destroy value and in such cases capital expenditure must be reduced.

The finding that institutional investors curb over-investment should naturally lead to improved firm performance. Monitoring is a costly activity and improved firm performance is the way for institutional investors to reap rewards on their monitoring activities (Jensen and Meckling (1976)). I investigate this hypothesis by investigating Return on Assets (ROA) and stock returns after a reduction of investment caused by the presence of institutional investors. I find that reductions in investment are associated with positive changes in firms' ROA and stock returns in the *subsequent* years. This suggests that institutional investors alleviate agency problems and therefore create value for all shareholders.

To mitigate enodogeneity concerns, I investigate competing hypotheses that could explain the results. For instance, I consider the possibility that reductions in the investment level may be driven by risk-avoidance in institutional investors' choices. If institutional investors are under-diversified, then they will be too exposed to firms' idiosyncratic risk and they may want to reduce such risk by avoiding some risky projects, even if they have a positive expected NPV. If this is the case, by monitoring the manager, institutional investors may not necessarily be curbing any agency problem, but rather they are creating a new problem by imposing an excessively high risk-adjustment in the model used for capital budgeting decisions.[4] To capture institutional investors' risk-avoidance tendencies I use a measure of their portfolios' diversification and a measure of their specialization at industry level. I find that institutional investors' diversification and industry specialization have no influence on the level of over-investment.

Finally, it can be argued that institutional investors may have preferences to invest in firms with certain levels of investment. Since institutional investors' preferences for investment policies are not directly observable, as in Sulaeman (2009), I infer these preferences from their past shareholdings. I find that institutional investors' preferences have no impact whatsoever on investment. Likewise, it can also be argued that my results from cross-sectional tests may be capturing reverse-causality where institutional investors invest in firms after these have reduced their investments. Although my first-difference tests should already assure that this is not the case, I carry out further tests to examine the analysis in the reverse direction. I find no evidence that higher/lower levels of investment attract more or less institutional investors.

This paper brings a novel contribution to the existing literature as follows. First, my findings extend empirical evidence about institutional investors. While the theoretical work on institutional investors is extensive and includes notable papers such as Shleifer and Vishny (1986), Grossman and Hart (1988), Harris and Raviv (1988), Bebchuk (1994), and Burkart *et al.* (1997, 1998), the majority of the empirical studies on ownership have focused on insider ownership. Relatively little research has been conducted on institutional investors, and investment policies represent a particularly under-researched area.[5] Second, I contribute to the vast literature on the role of institutional investors as potential monitors of firms' managers (see Gillan and Starks (2007) for a survey) showing that long-term institutional investors effectively intervene to reduce agency costs in investment decisions. Furthermore, this paper provides more evidence consistent with the conclusion recently reached by some scholars (see for instance Bushee (1998), Gaspar *et al* (2005), Chen *et al.* (2007) and Aghion *et al.* (2008)) that not all

[4] Consistent with the risk-avoidance argument, Morck *et al.* (2000) show that insiders can be conservative in investing in innovations and Brav *et al.* (2008) find that hedge funds tend to invest more in companies with less *R&D* expenditure.

[5] Exceptions include Cho (1998), who focuses on insider ownership and concludes that this has no influence on investment, and Wahal and MacConnell (2000) who conclude that institutional ownership has a positive influence on investment. More recently, Bohren *et al.* (2007) look at how corporate governance affect investment in real assets and find that increased governance quality (measured using the G-index) is positively associated with higher levels of investment.

institutional investors have an entirely short-termist approach and inhibit investment, but long-term institutional investors appear to be beneficial for investment choices.

The rest of the paper is organized as follows. Section 2 summarizes existing literature and describes the main empirical predictions. Section 3 describes the data. Section 4 describes the methodology used and reviews the results. Section 5 concludes.

## 2. Literature Review and Empirical Predictions

There are several reasons to believe that institutional investors monitor firms' managers. Using survey data, McCahery *et al.* (2009) find that institutional investors frequently intervene (either directly, by using their "voice", or indirectly, by "voting with their feet") if they are dissatisfied with the manager and are willing to coordinate their actions. In particular they highlight that "the most important trigger for shareholders to intervene is not dissatisfaction with a company's stock price performance but rather with its long-term corporate strategy". Recently, in the U.S., some institutional investors have claimed to be closely monitoring firms in their portfolios.[6] Moreover, regulatory barriers have been relaxed over the last 15 years making it easier for different institutional owners to forge alliances, monitor CEOs and coordinate more activist policies.[7]

As a matter of fact, we could not expect that all institutional investors care about firms' policies and investment choices. Coffee (1991) and Bhide (1994) suggest that monitoring is the exception rather than the rule because institutions generally view liquidity as more important than monitoring, and the cost of being involved in corporate governance may be too large. Maug (1998), on the other hand, argues that the relation between liquidity and control is theoretically ambiguous. Liquid markets make it easier for investors to sell a large ownership position but also make it easier for them to acquire large positions, and thereby profit from their increased monitoring activities.

Existing literature suggests that institutional investors' incentive to monitor increases with their cash-flow stakes and their investment horizons. The longer institutional investors stay in a company, the cheaper for them to gather and process information. Further, the larger their stake, the larger the financial benefit from successfully influencing management (Grossman and Hart (1980), Shleifer and Vishny (1986), and Huddart (1993)). McConnell and Servaes (1990) detect a positive relation between Tobin's Q and the fraction of shares owned by institutions. Importantly, Woidtke (2002) shows that firm value is only positively related to ownership by private pension funds. Brickley *et al.* (1988), Agrawal and Mendelker (1990), Bushee (1998), Hartzell and Starks (2003), Almazan *et al.* (2005), and Borokhovich *et*

[6] CalPERS, the Council of Institutional Investors, and TIAA-CREF represent some of these institutions.

[7] In particular, the 1992 changes to the American Proxy Rules permitted an unlimited number of shareholders to coordinate activist efforts and share information about governance issues in their portfolio firms provided they supplied the SEC with a brief description of any substantive discussions. Prior to the changes, if a group of ten or more owners wanted to discuss firm/management performance, etc., a detailed filing had to be made to the SEC prior to the meeting.

*al.* (2006), Aghion *et al.*(2008) also show that only certain types of institutional investors exert influence on antitakeover amendments, *R&D* and CEO compensation. In particular, Gaspar *et al.* (2005) conclude that institutional investors with high turnover portfolios leave managers undisciplined in acquisition decisions, and Chen *et al.*(2007) show that long-term institutions make withdrawal of bad bids more likely and are related to post-merger performance.

As suggested by the literature, I distinguish between long-term and short-term investors with large stakes. I focus my attention on their effect on over-investment and under-investment. If a manager over-invests, some negative NPV projects will not be rejected, while if a manager under-invests, not all positive NPV projects will be undertaken.

Managers may over-invest because they derive private benefits from controlling more assets (Jensen (1986, 1993)). They could also be overconfident in evaluating the value of the assets under their control (Roll (1986), Heaton (2002)) or particularly keen to invest in projects that require their specific human capital, thereby strengthening their chances of keeping their jobs (Shleifer and Vishny (1989)). Over-investment could also be related to excessive continuation of existing negative-NPV projects. This could occur because of a managerial preference for the "quiet life" (Bertrand and Mullainathan (2003)) or because of reputational concerns (Baker (2000)).

On the other hand, managers may under-invest because they are concerned with maintaining short-term earnings growth (e.g., Stein (1988, 1989, 1993), Shleifer and Vishny (1990), Thakor (1990), Narayanan (1985, 1996), Bebchuk and Stole (1993) among others). While there is no clear empirical evidence about under-investment induced by myopia (McConnell and Wahal (2000) among others), theoretical (Agaarwal and Samwick (1999)) and empirical evidence (Bertran and Mullainathan (2003)), suggest that managers in general prefer to work less, and since investing requires them to spend more time overseeing firms' activities, managers may under-invest because additional investment imposes private costs on them.

Whatever the reason for a manager to deviate from a firm's optimal level of investment, long-term institutional investors should reduce asymmetric information and, in theory, alleviate agency costs through monitoring (Jensen and Meckling (1976)). Thus, if a firm suffers from over-investment, we expect the presence of institutional investors with large stakes and long-term investment horizons to be associated with lower levels of investment. Conversely, if the problem is under-investment, institutional investors should favour additional investment and their presence should be associated with higher levels of investment. In both cases, I expect the value of the company to increase, after the change in the investment policy, if the actions of the institutional investors are aimed at reducing agency costs and enhance value.

## 3. Sample and Variables Construction

### 3.1 Data

My analysis involves tracking the evolution of firms' ownership after their IPO. I identify all IPOs that occurred between 1980 and 2003 using the Securities Data Corporation (SDC) dataset. I exclude regulated utilities (SIC codes 4900-4949) and financial institutions (SIC codes in the 6000 range), on the assumption that the relation between fundamental characteristics and firm ownership differs for these firms because of regulatory constraints. Further, I only consider common stock offerings, and I eliminate any IPOs that are flagged as offerings, unit offerings, rights offerings, reverse LBOs, and spin-offs. This screen provides me with 3,477 IPOs for which I can find annual financial data from COMPUSTAT and data on monthly prices, stock returns, share volume and shares outstanding from CRSP. I follow the firms for at most 15 years after their IPO. Data is collected over the period 1980 to 2008. Finally, using the 6-digit cusips, I obtain data on firms' ownership structures from CDA/Spectrum which provides quarterly reports from the first quarter of 1980 through the fourth quarter of 2008.[8] Thus I use the 13F filed by each institutional investor for the last quarter of each year.[9] I drop outliers by winsorising all variables at the 1% level and disregard firms that have investment above one or have disinvested more than their existing capital. These screens leave me with a total of 2,511 firms for a total of 19,244 firm-year observations from 1980 to 2008.

For a sub-sample of 1,921 firms, I also obtain data on insiders' holdings of common shares from Thomson Reuters. Data on insiders are available only starting from 1986. Consequently, this sub-sample contains a total of 17,050 firm-year observations over the period 1986 to 2008.

### 3.2 Sample Description and Variables Used

I now describe the key variables used in this study. Table 1 gives a concise description of them.

[Insert Table 1 here]

The main variable of interest is investment in real assets. I use a firm's new level of investment (Investment),[10] normalized by expenditure in PP&E at time t-1, as proxy for its level of investment in real assets. Investment, for company *i* in year *t*, is computed as total investment (Total Investment) minus investment to keep existing assets in place (Maintenance). Total investment is given by the sum of all

[8] A 1978 amendment to the Securities and Exchange Act of 1934 required all investors with greater than $100 million of securities under discretionary management to report their holdings to the SEC. Holdings are reported quarterly on the SEC's form 13F; all common-stock positions greater than 10,000 shares or $200,000 must be disclosed.

[9] Pension funds and endowment funds represent the majority of the institutional investors in my dataset. In some cases, mutual funds are also represented; in this case, I have information about the fund family rather than information for each individual fund so I capture the net impact of the fund family holding in the firms in which it invests.

[10] See Richardson (2006) for more details about the construction of this variable.

outlays on capital expenditure, acquisitions and *R&D* less receipts from the sale of PP&E,[11] and depreciation and amortization[12] is the measure of investment to maintain assets in place. For robustness checks, I use capital expenditure at time t divided by net value of PP&E at time t-1[13] as measure of investment in real assets.

The main independent variable of interest is the cash-flow stake held by long-term institutional investors. For each firm, I measure institutional investors' cash-flow stakes as the number of shares they own divided by the total number of shares outstanding. I consider both the cash-flow stake held by the five largest institutional investors (TOP_5), and the cash-flow stake held by the single largest institutional investor (TOP_1).[14] To measure institutional investors' investment horizons, I use two different approaches. First, I use the turnover ratio proposed by Gaspar *et al.* (2005). For each investor I calculate the churn ratio which is a measure of how frequently investors rotate their positions on the stocks in their portfolio.[15]

To capture the investment horizon of the five largest institutional investors I average their individual churn ratios. The churn ratio is, by construction, a number that ranges from 0 to 2 and the lower the churn ratio, the longer institutional investors' investment horizons. In the second approach, I implement the strategy used by Chen *et al.* (2007) and distinguish between long-term and short-term institutional investors. Long-term investors are defined as those that hold their stakes in a firm for at least one year, while short-term investors hold their stakes for less than one year. Given this classification, each year I split the group of the five largest institutional investors in long-term (TOP_5lt) and short-term (TOP_5st) institutional investors.

Next, I discuss the control variables used in the analysis and their expected sign. Insiders can engage in opportunistic behaviour with a direct impact on a firm's investment. I capture this effect by using insider ownership. To the extent that insiders care about control, their holdings further increase their ability to influence firms' decisions. In particular, the larger the stake held by insiders, the easier it should be for them to take decisions that may reflect their personal interests rather than those of others shareholders (Shleifer and Vishny (1997)). I expect the coefficient of insider ownership to have the opposite sign than the coefficient of the cash-flow stake held by institutional investors.

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[11] It is important to notice that only 2% of the companies in my dataset report *R&D* expenditure. Acquisitions are also not very common. Therefore, these two variables do not impact the general conclusion about capital expenditure. Moreover, in unreported tables, I run robustness checks excluding *R&D* expenditure and Acquisitions. Results do not change.

[12] Since depreciation and amortization may misrepresent investment to maintain assets in place in some firms, I repeated the entire analysis removing maintenance from the calculations and just decompose total investment. Results are qualitatively unchanged.

[13] I do not report these tables, but notice that results are qualitatively unchanged and statistically stronger.

[14] In the interest of space, I only present results based on the first measure of ownership, and note that all of my results are qualitatively unchanged (and statistically stronger) using the stake held by the largest institutional investor.

[15] I use one-year history of information for each investor. Because churn rates are basically changes in holdings, using one year of data minimizes the influence of a single quarter in the calculations and makes this measure appropriate to test a long-run effect such as monitoring.

A firm's capital expenditure depends on its investment opportunities and financial constraints (e.g., Fazzari *et al.* (1988), Hubbard (1998)). To control for these important characteristics, I include the following control variables: investment opportunities, leverage, firm's size and cash flows (e.g., Barro (1990), Bates (2005), Hubbard (1998), Lamont *et al.* (2001)). I measure investment opportunities as the natural logarithm of the company market-to-book ratio measured each year as the average market capitalization divided by the value of total assets. My proxy for firms' cash flows is earnings before interest, depreciation and amortization divided by total assets both at the end of year t. Investment should be higher in companies with more investment opportunities and larger availability of internal funds. Hence, I expect my proxies for investment opportunities and cash flows to have positive signs.

Leverage is measured as the book value of debt to the sum of the book value of debt and the market value of equity both at the end of year t. Existing literature finds conflicting results about the impact of leverage on investment. While Myers (1977) suggests that leverage could be detrimental on investment decisions, Jensen (1986b) argues that it could have a positive effect, and other scholars, such as Stulz (1990) and McConnell and Servaes (1995), argue that leverage may have both positive and negative effects. I consider that debt may have a disciplining effect on the manager and may discourage investment especially in the presence of asymmetric information. Therefore, within the monitoring framework, I expect the variable measuring leverage to have a negative sign.

Firm's size is measured as the natural logarithm of total assets at the end of year t. Large companies may have reached a more mature state of their business cycle and may have more cash on hand. However, these firms may also have lower investment opportunities with respect to those companies with larger degrees of growth. Therefore I expect my proxy of firm's size to have a negative sign.

Finally, I employ the Z-score of Altman (1968) and Altman (2000) to ensure that the determinants of investment behaviour picked up by the ownership variable differ from those captured by the financial constraint measures.[16] I use a modified version of the Z-score, as in MacKie-Mason (1990), to avoid multicollinearity with other measures of financial constraints already included in the analysis.[17] The lower the Z-score, the more financially constrained a firm should be. [18] Thus, I expect the Z-score to have a positive sign so that companies with lower financial constraints should invest more.

[16] Denis and Sibilkov (2009) find that constrained firms with low cash have significantly lower Altman's *Z*-scores.
[17] In fact, Altman's (1968) Z-score includes the ratio of market-to-book and debt, and I exclude these terms since I already use them directly in the analysis.
[18] Following Lamont *et al.* (2001) I indicated as "financial constraints" those frictions that prevent the firm from funding all desired investment.

### 3.3 Measures of Abnormal Investment

The aim of this paper is to investigate the impact that institutional investors have on investments in real assets. I expect institutional investors to intervene on the manager when he deviates from the optimal investment level. Therefore, to answer my research question the biggest challenge is to find appropriate proxies for a firm's optimal level of investment. I rely on existing findings and economic reasoning to find these proxies, measure investment deviations and identify companies that are likely to suffer from agency conflicts in investment decisions.

I use two different methodologies to find a firm's optimal level of investment. First, I consider that a firm's optimal level of investment depends on its investment opportunities, financing constraints and the industry it occupies. Thus, following Richardson (2006), to find a firm's optimal level of investment I use the following regression:

$$\text{Investment}_{it} = \alpha_0+\alpha_1\text{Insider Ownership}_{it-1}+\alpha_2\text{Market-to-Book}_{it-1}+\alpha_3\text{Cash flows}_{it-1}+\alpha_4\text{Leverage}_{it-1}+\alpha_5\text{Size}_{it-1}+\alpha_6\text{Age}_{it-1}+\alpha_7\text{Stock Returns}_{it-1}+\alpha_8\text{Investment}_{it-1}+\alpha_9\text{Z-score}_{it-1}+\varepsilon_{it} \quad (1)$$

In this regression the dependent variable is the level of new investment at time t, and the independent variables (measured at time t-1) are the proxies for investment opportunities and financial constraints described in the previous section. I also include firms' age (the number of years since the IPO) to capture the stage of a firm's life cycle, past stock returns to capture firms' performance, and, firms' prior levels of investment to capture persistency in investment decisions. I also include fixed effects to control for firm and industry time invariant omitted variables. The fitted value regression (1) is the estimate of a firm's optimal level of investment, while the unexplained portion (or residual) is the estimate of abnormal investment.

In addition to the optimal level of investment found by using Richardson's decomposition, I use a firm's industry median level of capital expenditure as a proxy for its optimal level and measure abnormal investment as the difference between a firm's actual level of investment and its industry median.

### 3.4 Sample Characteristics

Table 2 shows the number of IPOs each year, descriptive statistics for firms-level characteristics, and firms' ownership characteristics for the firms in my sample.

[Insert Table 2 here]

I start from describing Panel A which provides information on my sample for different IPO years. Consistently with the evidence provided by the literature on IPOs,[19] IPOs activity has been quite moderate in the 1980s and particularly intense in the 1990s. The number of IPOs varies sharply over time,

[19] See Ritter and Welch (2002) for a survey of IPOs activity from 1980 to 2001.

and I have a large number of IPOs in the year 1983, but the market slows down towards the late 1980s before rebounding again in the early 1990s. It slows down sharply at the end of my sample period.

Panel B describes firm-level characteristics. The average firm has new investment equal to 0.265 of PP&E. The major component of total investment is capital expenditure. The average firm in my sample spends 0.32 of PP&E to acquire or upgrade physical assets, such as property, industrial buildings or equipment.[20] Depreciation and amortization account for 0.056 of PP&E.[21] The mean level of market-to-book is about 6.97. The average firm has cash flows equal to 0.039 of total assets and a leverage ratio of about 0.21. Moreover, the average value of total assets is about $681 million and the average Z-score is 1.55, implying that the companies in my sample are relatively small and financially constrained.

Turning to Panel C, I next describe firms' ownership structure. Insiders hold an average cash-flow stake of 12.72%. The average firm has 67 institutional investors that filed a 13F at least once during the year. The largest institutional investors own an average cash-flow stake of about 8.74%, while the five largest institutional investors own an average cash-flow stake of about 22%. Within the five largest institutional investors, long-term investors have a total average cash-flow stake of about 21%, while short-term institutional investors own a total average cash-flow stake of about 0.97%. The five largest shareholders stay in a firm for at least 4 years and have an average churn ratio of 0.2245. The churn ratio indicates that, on average, the five largest institutional investors churn 0.2245 of their portfolio in a quarter, or around 0.89 of the position is turned over in a given year. In other words, the average investor holds an average stock in his portfolio for about 13 months.[22] The large (average) number of years spent in the company by the five largest institutional investors and their low churn ratio suggest that these investors have long-term investment horizons[23] and therefore should have even more incentive to monitor the manager.

## 4. Empirical Methodology and Main Findings

If investors randomly choose firms in which they invest, the specification that estimates the causal effect of institutional ownership on investment is a basic linear regression. Unfortunately, the decisions made by an institution to invest in a given firm and to monitor management are not random.[24] These choices create and identification problem and OLS will yield inconsistent coefficients. Moreover, the IPO

[20] These figures are consistent with those found by existing literature. For example, Wahal and McConnell (2000) find an average level of investment equal of 24% over the period 1988-1994, while Bøhren *et al.* (2007) find an average level of investment equal to 23% of PP&E over the period 1991-2003.

[21] Notice that, for the sake of clarity, in the text I often refer to new investment as capital expenditure to avoid confusion with the investment choice made by institutional investors.

[22] This number is given by 12 divided by the annualized churn ratio (0.89).

[23] Also notice that the pair-wise correlation between the cash-flow stake held by the five largest institutional investors and the stake held by long-term investors as defined by using the definition of Chen et al. (2007) is about 0.98.

[24] Brav et al. (2008) claim that activist hedge funds behave as "value investors" seeking to identify undervalued companies where the potential for improvement is high.

literature shows that ownership structure is endogenously determined, hence treating ownership structure as exogenous can confuse the direction of causality. For example, if institutional investors are attracted to certain investment policies, then regressing a measure of corporate investment against a measure of ownership can lead to a misinterpretation of the relation between institutional ownership and corporate investments. Finally, it is possible that, over-time, the aggregate level of capital expenditure in my sample has decreased (increased) because of a lower (higher) number of investment opportunities available to firms, while at the same time, large investors have increased their shareholdings of firms. In this circumstance, there is spurious correlation. I will address each of these problems in my empirical methodology.

To mitigate enodogeneity problems, I use a first difference regression approach and test for reverse causality. On the other hand, to mitigate omitted variables concerns, I include a set of control variables that existing literature deems important for corporate investments, and I use panel fixed effects regressions to control for industry, firm-specific time-invariant omitted variables, and possible trends in the main variables. To further exclude the possibility of spurious correlation, I start by graphically analyzing the trend in the main variables of interest.

[Insert Figure 2 here]

Figure 2 shows the evolution over time of firms' investment in real assets and institutional investors' holding for the entire sample of 2,511 firms. Each year I calculate the median level of capital expenditure and the median level of the cash-flow stake held by long-term institutional investors including firms that had an IPO that year and firms that had an IPO in the previous years. Figure 2 illustrates that there is no pattern in the evolution of investments in real assets made by manufacturing firms from 1980 to 2008. Instead, consistent with the findings represented in Figure 1, the stake held by institutional investors in the ownership structures of these firms have been steadily increasing through time. Taken together these findings suggest that there should not be any spurious correlation between investments in real assets and institutional investors' holdings over the period 1980-2008.

I begin by investigating the influence of institutional investors on firms' levels of investment using a model in which I regress the capital expenditure at time *t* on the cash-flow holdings of institutional investors at the end of the previous year.

$$\text{Investment}_{it} = \alpha_0 + \alpha_1 \text{TOP\_5}_{it-1} + \alpha_2 X_{it-1} + \alpha_3 \text{SIC}_i + \alpha_4 \sum_{i=1}^{N} \beta i + \alpha_5 \sum_{t=1}^{T} \beta t + e_{it} \qquad (2)$$

In this regression, $\text{TOP\_5}_{it-1}$ represents the cash-flow stake held by institutional investors, $X_{it-1}$ represents the set of control variables, SIC controls for industry fixed effects, $\beta_i$ controls for firm specific effects and $\beta_t$ controls time fixed effect.

Institutional investors' incentive to monitor increases in the stake they own and in their investment horizons. I begin by investigating the impact of institutional investors only considering their stake as a determinant of their monitoring activity and, then, to account for their investment horizons, I distinguish between the stake held by long-term and short term institutional investors. Results are summarized in Table 3.

[Insert Table 3 here]

In column (a), I use the cash-flow stake held by the five largest shareholders. The estimated coefficient for the ownership variable is negative (-7.1%) and statistically significant at the 1% level of confidence; hence, firms with more institutional ownership invest less. Given the average cash-flow stake held by the five largest shareholders (22%), this result suggests that for an increase of one standard deviation in the fraction of shares owned by the five largest institutional investors, investment on average decreases by 4.25 percentage points. These results confirm the prediction that large institutional investors have a significant influence on a firm's capital expenditure.

Next, I consider the importance of institutional investors' investment horizon. Column (b) uses the cash-flow stake held by long-term institutional investors, while column (c) uses the cash-flow stake held by short-term investors, and column (d) uses both the cash-flow stake held by long-term and short-term institutional investors.

Column (b) shows that results are economically and statistically stronger when considering the stake held by long-term investors (-8.1% significant at the 1% level of confidence). Column (c) shows that the stake held by short-term investors has a positive influence on capital expenditure but is not statistically significant. Results in column (d) support the findings in columns (b) and (c). Thus, as expected, not all large institutional investors have a significant influence on a firm's capital expenditure, because not all of them really care about investment policies. In fact, consistent with the claim that only large long-term institutional investors have enough at stake to pay the cost of monitoring, results confirm that only the largest long-term institutional investors appear to influence capital expenditure, while short term investors have no effect. This, in turn, suggests that the effect of institutional investors on capital expenditure should be driven by their monitoring activity because only investors that have the biggest incentives to monitor appear to influence investment policy.

Notice that in each of the columns, the signs of the control variables are as expected and most of the coefficients are statistically significant. For instance, insider ownership has a positive influence on investment (with the exception of model (c) where the variable has the expected sign but is not statistically significant). The larger the set of investment opportunities and the cash flows available, the more a firm invests. Moreover, consistent with both the asymmetric information theory and the findings

about the role of debt financing in disciplining the manager, large use of debt appears to be detrimental to investment. Finally, size and Z-score also have the expected sign, negative and positive respectively.

However, results in Table 3 must be treated with prudence. In fact, Table 3 presents the findings of a cross-sectional test in which ownership structure is treated as an exogenous variable and control variables and fixed effects are included to control for omitted variables. Nevertheless, since firm ownership structure is endogenously determined, this test could confuse the direction of causality. Thus, further analysis is needed to corroborate the finding that large long-term institutional investors influence investments.

Existing literature shows that capital expenditure usually has no impact on institutional investors' investment choices (Brav *et al.* (2008)),[25] and do not seem to matter for insiders when they decide to sell their stakes (Helwege *et al.* (2007)). Nonetheless, I conduct an analysis in the reverse direction with the stake held by institutional investors as the dependent variable and the levels of capital expenditure as explanatory variable. I conduct this analysis using two main methodologies. First, a first difference regression approach, and, second, a cross-sectional model in which I control for variables that theories deem important for the investment choice of institutions. At this stage, I limit myself to describe the results of the first difference approach while the cross-sectional test is illustrated in the section that describes robustness checks.

In Table 4, column (a), I start by investigating if changes in capital expenditure have any impact on changes in the stake held by institutional investors in the *subsequent* period. Changes in the control variables are measured over the same time period as are changes in the ownership structure and changes in the investment policy. I find that past changes in the level of capital expenditure have no impact on changes in institutional ownership. This confirms the prediction that capital expenditure is not a determinant of institutions' investment choices and suggests that reverse causality should not be influencing my results.

[Insert Table 4 here]

Next, in Table 4 column (b), I study if, over time, changes in institutional ownership have any impact on changes in capital expenditure. Therefore, I use changes in the level of investment as the dependent variable, and changes in the fraction of shares owned by the five largest institutional investors the previous period as the explanatory variable. Changes in the control variables are measured over the same time period as are changes in the ownership structure. I find that positive changes in the fraction of shares owned by the five largest institutional investors lead to a significant reduction in investment; these

[25] Brav *et al.* (2008) also suggest that institutions may invest less in companies that have high investment in *R&D*. However, investment in *R&D* should not be a concern in my investigation since only 2% of the companies in my dataset report to have investments in *R&D*.

results have both economic and statistical significance. For robustness checks, I also use a two stage least square approach. Results are economically and statistically stronger.

The coefficient of the change in the cash-flow stake of the five largest long-term institutional investors is -8%, and it is significant at the 1% level of confidence. This means that for a one standard deviation increase in the stake held by long-term institutional investors, capital expenditure decreases of about 4.86 percentage points. All controlling variables are statistically significant at the 1% level of confidence with the exception of the change in the Z-score which has the expected positive sign but is statistically insignificant. Hence, I also find confirmations that an increase in the stake held by long-term institutional investors is associated with *subsequent* reductions in investment.

Taken together the findings in Table 4 do not only confirm that institutional investors have an important influence on capital expenditure, but they also endorse the conclusion that this effect could be driven by their direct monitoring activity since the reduction in the level of investment occurs after they have increased their stakes. This is consistent with Maug (1998), who suggests that when institutional investors are dissatisfied with the manager, they may want to increase their stake to make their monitoring activity more effective.

### 4.1 Over-investment Reduction

In this paper I claim that the monitoring activity of long-term institutional investors curbs agency conflicts in investment choices. Agency costs in investment choices occur when managers deviate from firms' optimal level of investment. So far, I provide evidence in favour of the monitoring activity of institutional investors showing that only those with enough incentive to monitor appear to influence investment policies. Therefore, the next step of this analysis is to investigate whether by monitoring management institutional investors reduce abnormal investment.

In the previous section, I find that large long-term institutional investors are associated with lower levels of capital expenditure, thus, under the assumption that institutional investors curb agency conflicts, the firms in which capital expenditure decreases after an increase in the stake held by institutional investors should suffer from over-investment problems. If this is the case, then, institutional investors' influence on capital expenditure should be economically and statistically stronger on that portion of investment that exceeds a firm's optimal level. I refer to this as the over-investment reduction hypothesis.

To investigate the over-investment reduction hypothesis, I begin by studying the influence of institutional investors on my proxies for over-investment. First, I regress positive levels of firms' abnormal investment over the variable measuring the ownership variable.

$$\text{Abnormal Investment}_{it} = \alpha_0 + \alpha_1 \text{TOP\_5}_{it-1} + \alpha_2 \text{SIC}_i + \alpha_3 \sum_{i=1}^{N} \beta i + \alpha_4 \sum_{t=1}^{T} \beta t + e_{it} \qquad (3)$$

In this regression, $TOP\_5_{it-1}$ represents the cash-flow stake held by institutional investors, $X_{it-1}$ represents the set of control variables, SIC controls for industry fixed effects, $\beta_i$ controls for firm specific effects and $\beta_t$ controls time fixed effect.

In this regression I use the cash-flow stake of institutional investors (TOP_5) as the independent variable and do not include control variables. The proxy for over-investment is (positive levels of) abnormal investment measured as the difference between a firm's actual level of investment and its optimal level after controlling for its investment opportunities, financial constraints and industry affiliation as measured using regression (1). Hence, including control variables in regression (3) is not necessary. Results are presented in Table 5.

For robustness, I run a second regression that uses positive investment deviations from firms' industry median as the dependent variable:

$$\text{Investment Deviation}_{it} = \alpha_0 + \alpha_1 TOP\_5_{it-1} + \alpha_2 X_{it-1} + \alpha_3 SIC_i + \alpha_4 \sum_{i=1}^{N} \beta i + \alpha_5 \sum_{t=1}^{T} \beta t + e_{it} \quad (4)$$

In this regression, $TOP\_5_{it-1}$ represents the cash-flow stake held by institutional investors, $X_{it-1}$ represents the set of control variables, SIC controls for industry fixed effects, $\beta_i$ controls for firm specific effects and $\beta_t$ controls time fixed effect. Results are presented in Table 6.

[Insert Table 5 and Table 6 here]

In both Table 5 and Table 6, to capture institutional investors' incentive to monitor, I begin by using only the stake held by institutional investors and then I also include their investment horizons. Hence, column (a) uses the cash-flow stake held by the five largest shareholders. Column (b) uses the cash-flow stake held by long-term institutional investors. Column (c) uses the cash-flow stake held by short-term investors, and column (d) uses both the cash-flow stake held by long-term and short-term institutional investors.

I start by describing results in Table 5. Column (a) in Table 5 shows that the larger the stake held by institutional investors, the lower the part of investment not necessary to the firm to meet its investment opportunities. The coefficient of the ownership variable is -5.4% and is significant at the 5% level of confidence. Columns (b), (c) and (d) show that the impact is driven by long-term investors (their stake has a coefficient of -5.4% significant at 5% in both column (b) and column (d)), while short-term investors have no significant impact on over-investment. Thus, as expected large long-term institutional investors are associated with lower levels of over-investment.

Table 6 shows that, in companies that over-invest with respect to their industry median, the larger the stake held by long-term institutional investors, the lower levels of over-investment, while large short-term investors have no effect on over-investment. The stake held by long-term investors has a negative

and statistically significant coefficient (-5% significant at 10% in column (c) and -6.1% significant at 5% in column (d)). The control variables have the expected sign and are mostly statistically significant.

The findings in Table 5 and Table 6 support the over-investment reduction hypothesis: the monitoring activity of long-term institutional investors alleviates agency conflicts, thus, their holdings are associated with lower levels of over-investment. However, this result, important as it may be, suggests further analysis on different dimensions.

For example, we do not directly observe managers' behaviour, and we have incomplete information about firms' investment choices (we only observe the result of the capital budgeting process and only have imperfect proxies for investment opportunities). Thus, in some circumstances, the proxies for over-investment may be inappropriate.

To mitigate this concern, I use an alternative methodology to individuate firms that are more likely to suffer from over-invest problems. To identify firms that over-invest, I consider that external capital market limits the extent to which managers can pursue self-interested investment. If managers are empire-builders, large availability of internal funds enables them to invest more and may increase investment distortions[26] especially in companies that have a few investment opportunities. Given this argument, I classify each firm in my sample based on its investment opportunities and cash flows levels with respect to its industry peer.

I start by comparing firms' investment opportunities, measured by the market-to-book ratio, with those of their industry peers. In each industry, at the end of year t-1, I calculate the median level of investment opportunities, and create a dummy variable that is equal to 1 if a firm's market-to-book is below the median in the industry and zero otherwise. Then, I create an interaction variable between the investment opportunities dummy variable and the variable measuring internal cash flows. This interaction captures companies with low investment opportunities and their cash flows. Every year, using the median value that the interaction takes in each industry, I split the sample in two parts: (a) companies that have low investment opportunities and more cash than their industry benchmark, and (b) companies with low investment opportunities and less cash than their peers. Companies in sub-sample (a) should be more exposed to over-investment problems as argued by existing literature.

Given these two sub-samples, I use two different tests to capture the effect of institutional ownership on the level of investment and over-investment. First of all, to confirm the influence that institutional investors have on the level of investment and the importance of their monitoring activity, in each sub-sample, I run a regression using firms' level of capital expenditure as the dependent variable. If institutional investors curb agency conflicts and target over-investment I should find that the coefficient

[26] The empirical literature, starting with Fazzari *et al.* (1988), confirms the existence and robustness of investment-cash-flow sensitivity after controlling for investment opportunities.

of the ownership variable is economically and statistically significant only in firms with high cash flows and few investment opportunities. I summarize the findings of this test in Table 7.

[Insert Table 7 here]

In Table 7, the first four columns show results for companies with high cash on hand and low investment opportunities, while the last four columns show results for companies with low cash on hand and low investment opportunities. The dependent variable in each column is the level of firms' investment.

In this table I find confirmation that institutional ownership is associated with lower levels of investment, and, as expected, only long-term institutional investors appear to have a significant effect on investments. Specifically, in column (a) the coefficient of the stake held by the five largest institutional investors is -9% significant at the 1% level of confidence. Most importantly, consistent with the hypothesis that institutional investors monitoring reduces over-investment, I find that long-term institutional investors are significantly associated with lower levels of capital expenditure only in firms with high availability of cash flows and low investment opportunities, while the coefficients of the ownership variables are not statistically significant in firms with low cash on hand and low investment opportunities. The last three columns in the table show that results are economically and statistically stronger when considering the stake held by long-term investors. In both the first and the second column the coefficient of the ownership variable is about -10% and statistically significant at the 1% level of confidence. Control variables have the expected sign and are mostly statistically significant.

Next, I investigate the over-investment reduction hypothesis by concentrating on the firms in sub-sample (a). The idea of this test is that all firms in sub-sample (a) have the potential to over-invest, however, they do not necessarily do it. Thus, assuming that all firms with high cash flows and low investment opportunities over-invest can bias the result. To solve this issue, I follow Harvey *et al.* (2003) and split the firms in this sub-sample into firms with above- and below-median industry level of investment in real assets. In both sub-samples, then, I directly study the effect of institutional ownership on abnormal investment employing regression (4) in which investment deviation with respect to the industry median is the dependent variable. I expect that if institutional investors mostly target over-investment, then their stake should be significantly associated with lower levels of investment deviation only in firms that have investment above their industry median and therefore over-invest. This is because firms with investments below their industry median do not over-invest, but do not necessary under-invest either. In fact, despite the large availability of internal funds, these firms have fewer investment opportunities than their industry peers, thus, all else equal, they should invest less that their industry peers. Hence, I expect institutional investors not to have any impact in these firms. Results are summarized in Table 8.

[Insert Table 8 here]

In Table 8, the first four columns investigate the impact of institutional ownership on investment deviations in companies that over-invest. I define these as firms that have low investment opportunities, large availability of cash-flow, and invest too much with respect to their industry median. Instead, in last four columns, I use companies that have low investment opportunities and large availability of cash flows and invest below their industry median.

The results presented in Table 8 strongly support the conclusion that long-term institutional investors curb over-investment problems: the more concentrated the ownership structure, the smaller the deviation from firms' optimal levels of investment. This table further shows that institutional investors have no impact on investment deviation in those companies that have few investment opportunities and invest below their benchmark, while for those company that over-invest with respect to their industry peers, results confirm the findings in the previous tables. It is important to note that both the statistical and economic significances of the results increase dramatically. For instance, the impact of long-term institutional investors on investment deviation is about -18% (significant at the 5% level of confidence), while short-term investors have, as expected, no significant impact. The signs of the control variables are all as expected, with most of them statistically significant.

To conclude, the findings in Table 7 and Table 8 show that in firms that clearly over-invest with respect to their industry peers large long-term institutional investors are associated with lower levels of over-investment. The results strictly hold and are economically stronger than those shown in previous Tables.

To further mitigate enodogeneity issues, I next use a first difference approach and study if changes in the stake held by institutional investors affect changes in the level of investment and, most importantly, over-investment. In particular, I investigate the effect of changes in the stake held by institutional investors in companies that clearly suffered from over-investment when institutional investors increased/decreased their stakes.

As explained above, Maug (1998) suggests that, when managers make inefficient choices, institutions could increase their stake in the companies to boost their ability to monitor and increase the benefits from their monitoring activity. Institutions, of course, could also follow the "Wall Street Rule" and sell their stake (Parrino *et al.* (2003)), yet, by voting with their feet they still exercise significant discipline on the manager. Given the arguments above, I design the following test. First, in the sub-sample of firms with large availability of cash flows and low investment opportunities, I first classify all companies with respect to their investment deviation at time t-2. Then, focusing only on companies that over-invested, I imply a first difference approach, in which the dependent variable are changes

institutional investors holdings, from time t-2 to time t-1, and the dependent variable are changes in the level of investment and the level of over-investment in the *subsequent* period. If institutional investors are not interested in monitoring and are indifferent to over-investment problems, then, we should find that the changes in their stakes have no effect on changes in investments in the subsequent years. Results are presented in Table 9.

[Insert Table 9 here]

In Table 9, column (a) uses the change in a firm's level of investment, column (b) uses the change in a firm's level of investment deviation, and column (c) uses the change in a firm's level of abnormal investment. In each model, the main explanatory variable is the change in the stake held by the five largest institutional investors between t-2 and t-1. In column (a) and (b) I also include control variables.

Table 9 shows that, in firms suffering from over-investment problems when institutional investors adjusted their stakes, an increase in the stake held by institutional investors is significantly associated with lower levels of investment and, more importantly, lower levels of over-investment in the *subsequent* period. More conspicuously, in column (a) a positive change in the stake held by institutional investors is associated with a 16.2% decrease (significant at 1%) in the level of investment in capital expenditure in subsequent years. Moreover, the decrease in the level of over-investment, subsequent to an increase in the institutional holdings, is about -14.5% (significant at the 10% level of confidence) in column (b), and -13% (significant at the 5% level of confidence) in column (c). Thus, consistently with the results presented so far, Table 9 confirms the conclusion that institutional investors' monitoring activity targets and effectively curbs over-investment problems.

**4.2 Firm Performance**

While the analysis developed before fully supports the over-investment reduction hypothesis, if institutional investors' actions effectively reduce agency costs and are value-enhancing, then firm performance should improve after their intervention. Monitoring, in fact, is a costly activity, and improved firm performance is the best way for institutional investors to reap rewards on their monitoring activities (Jensen and Meckling (1976)). To investigate this issue, I investigate if changes in investment brought about by institutional investors are conducive to value creation. Thus, I use a first difference approach to study the response of the firm's performance after a reduction of investment caused by the presence of institutional investors. In particular, I use the change in performance, from year t to year to t+1, as the dependent variable, and, the change in investment, from year t-1 to year t, as the dependent variable.

In this analysis, I use two measures of firms' performance: Return on Assets (ROA) and stock returns. In fact, it could be argued that negative changes in investment may mechanically result in

positive changes in ROA in the sense that if we assume diminishing marginal rates of returns, then decreasing investment in capital expenditure will increase returns. Therefore, to address this concern, I use firms' stock market returns as an alternative measure of firm's performance. I expect that if institutional intervention is beneficial for all investors, the coefficient of the change in investment should have a negative sign to capture the fact that a reduction in investment is actually followed by an increase in performance. Results are summarized in Table 10. The first column of Table 10 shows results using changes in ROA and the dependent variable, while the second column uses changes in stock returns as the dependent variable.

[Insert Table 10 here]

Table 10 shows that negative changes in the level of firms' investments have a significant impact on firm value; these results have both economic and statistical significance and imply that a decrease in investment has a positive impact on firm value.[27] In particular, for a one standard deviation decrease in capital expenditure ROA increases of about 28 percentage points and stock returns increase of about 51 percentage points.

The result that institutional investors monitoring activity improves firm performance is even more important if we consider that distortions in corporate investment decrease firm value, and, as a consequence, firms that suffer from agency costs in investment choices are more likely to under-perform their industry peers. Obviously, in such companies, we would expect institutional investors to be more likely to effectively monitor managers. However, being their monitoring value enhancing, if institutional investors actively intervene in these firms then, their intervention is greatly beneficial to all shareholders.

To investigate this issue, I classify all firms in my sample with respect to their performance at the end of the year t-1 and, then, I compare the ROA of each firm with the average ROA in its industry and create two groups: (a) firms with ROA above their industry mean, and (b) firms with ROA below their industry mean. In each of the sub-samples created, I study the effect of institutional investors' holdings at time t-1 on investment at time t. If one of the reasons why a manager under-performs is over-investment,[28] I should find that the stake of long-term institutional investors is associated with lower levels of investment. Results are described in Table 11.

In Table 11, the first four columns show results for firms that under-perform their industries' peers, while the last four columns show results for firms that over-perform their industries' peers.

[27] Results also hold using a three-stage least squares approach where I also control for various variables that could be important determinants of institutional ownership (stock liquidity, past returns, firm's size, etc.).

[28] The literature on overconfident managers suggests that when a manager picks investment projects he is likely to believe he can control its outcome and to underestimate the likelihood of failure (March and Shapira (1987); Malmendier and Tate (2005)). Thus, the firm could under-perform. Heaton (2002) first showed that distortions in corporate investment may be the result of managers overestimating the returns to their investment. Overconfidence, in turn, may lead to over-investment (Heaton (2002), Roll (1986))

[Insert Table 11 here]

As expected, column (a) shows that in companies that under-perform their industry benchmark, the larger the fraction of shares owned by the five largest institutional investors, the lower the level of capital expenditure. The coefficient of the ownership variable is, in fact, negative (- 7.5%) and statistically significant (at the 10% level of confidence). Columns (b), (c) and (d) show that long-term investors are those who drive this result (the coefficients of the ownership variable in column (b) and (d) are, respectively, -8.6% significant at the 1% level of confidence and -8.3% significant at the 10% level of confidence), while short-term investors have no impact on capital expenditure. Instead, columns (e), (f), (g) and (h) show that institutional investors have no impact in companies that over-perform their industry benchmark. In all columns, the signs of the control variables are all as expected, with most of them statistically significant. Results in Table 10 confirm that the monitoring activity of institutional investors seems to be concentrated in those companies in which managers are more likely to jeopardize firm value.

Taken together, the findings in this section suggest that institutional investors are associated with lower levels of investment in companies that over-invest, and, that their monitoring activities create value for all shareholders.

### 4.3 Institutional Investors' Risk-avoidance

There are also alternative hypothesis to the main conclusion that institutional investors curb over-investment problems. In particular, I consider that, rather than monitoring management to reduce agency conflicts, institutional investors may be excessively conservative in investment choices. Under-diversified institutional investors could impose an excessively high risk-adjustment in the model used for capital budgeting decisions, thus discouraging the manager from taking some investment projects that otherwise would have had positive NPV.

When institutional investors have non-trivial cash-flow rights in a firm and long-term investment horizons, they face the problem generated by the undiversified nature of their portfolios.[29] Thus, their high exposure to firm's specific risk may lead them to be conservative in directing corporate investment, even to the extent of intervening on the manager to avoid some value enhancing projects. If this is the case, the reduction in investment associated with the stake held by institutional investors could also be led by excessive risk-avoidance due to their under-diversification.

To capture institutional investors' exposure to firms' specific risk, I collect information on the entire portfolio owned by each of the five largest institutional investors in each of the firms in my dataset,

[29] Recent empirical evidence (Grinblatt and Keloharju (2001), Huberman (2001), Kang and Stulz (1997), Falkenstein (1996)) suggests that investors select stocks not only on the basis of corporate risk and return, but also taking into account other company characteristics—which may or may not be related to returns—such as growth prospects and their familiarity with the nature of the business.

and, I consider their portfolio diversification and the concentration of their investment at the industry level as proxies for their risk-avoidance.

To compute institutional investors' portfolio diversification, following Blume and Friends (1975) and Kumar and Goetzmann (2002), I use the deviation of their portfolio from the market portfolio as follows:

$$Portfolio'sDiversification = \sum_{i=1}^{N}(w_i - w_m)^2 \approx \sum_{i=1}^{N} w_i^2 \quad (5)$$

The weight of each security in the market portfolio is very small, so the diversification measure is approximated by the sum of squared portfolio weights, where N is the number of securities in the institutional investor's portfolio, $w_i$ is the portfolio weight assigned to stock *i* in the investor's portfolio and $w_m$ the weight assigned to a stock in the market portfolio. The measure of diversification proposed is equivalent to the Herfindhal's Index of the institutional investors' portfolio, so a lower value of portfolio's diversification is indicative of a higher level of diversification.

If institutional investors have largely diversified portfolios, the larger the stake they hold at the industry level, the lower the benefit from diversification. Likewise, the more investors specialize in a certain industry, the cheaper it becomes for them to gather and process information about firms in that industry and hence they can monitor more. Thus, institutions' specialization in the invested firms' industry may alleviate asymmetric information with the invested firms' managers, but could also exacerbate their risk-avoidance tendencies. To measure institutional investors' specialization, I use the percentage of portfolio's wealth that institutional investors spend in a firm's industry. For each firm in my sample, I average the level of the portfolio diversification and industry specialization over the five largest institutional investors.

Panel C in Table 2 provides descriptive statistics for the variables described above. The average portfolio's diversification in my sample is about 0.62%. As explained above, the diversification index is equivalent to the Herfindhal's Index of the institutional investors' portfolio, thus the average diversification index indicates that institutional investors hold well diversified portfolios. Moreover, they have on average 1.5% of their portfolios invested in a given industry. These statistics indicate that the five largest institutional investors in my sample are highly diversified and own a significant stake at industry level.

Under the risk-avoidance hypothesis, I expect that the more under-diversified institutional investors are (the larger the value of the diversification measure), the lower the level of firms' investments should be. Thus, to disentangle the over-investment reduction hypothesis from the risk-avoidance hypothesis, I focus on firms that over-invest and directly test the impact that my proxies for investors' risk-avoidance have on over-investment measured as (positive levels of) abnormal investment.

I expect that the proxy for institutional investors' risk avoidance have a negative impact on abnormal investment. If, under the monitoring of institutional investors, empire-builder managers invest less this would result in a reduction of the level of over-investment. However, risk-avoidance becomes an important concern if institutional investors induce the manager to excessively reduce investment to the point of avoiding risky projects with positive NPV. In this case, the presence of under-diversified institutional investors exacerbates agency conflicts. Thus, to unravel this effect, in firms that over-invest, I also study the impact of institutional ownership on the optimal level of investment and, under the null hypothesis that excessive risk-avoidance exacerbate agency costs, I expect the proxies for investors' risk avoidance to have a negative impact on this variable. Results are reported in Table 12.

Table 12 shows that institutional investors' risk-avoidance has no effect on over-investment, while it has a positive influence on firms' optimal level of investments. In Table 12, the first three columns present results using as proxy for over-investment abnormal investment, measured as the difference between firms' actual level of investment and their optimal level of investment, as the dependent variable. The last three columns use the level of expected investment as the dependent variable.

[Insert Table 12 here]

I start by describing the results and, then, I discuss their importance. In column (a) and (d), I consider the proxy for portfolio's diversification as the explanatory variable. Column (a) shows that the less diversified the portfolio of the five largest institutional investors, the lower the level of over-investment, but the results are not statistically significant. Column (d) shows that the level of portfolio's diversification has a positive and significant impact on expected investment: the less diversified the five largest institutional investors, the larger the level of expected investment. This latter result is not only economically significant, but also statistically significant at the 1% level of confidence. In columns (b) and (e), I consider investors' specialization at the industry level as the explanatory variable. This variable captures institutional investors' under-diversification at the industry level, and the information advantage that institutions acquire by being largely invested in a given industry. In column (b) I find that the more specialized the institutional investors, the larger the over-investment problem, although this result is not statistically significant. On the other hand, column (e) shows that the more specialized investors are, the larger the level of investment that a firm makes after controlling for investment opportunities and financial constraints. This latter result is not only economically significant, but also statistically significant at the 1% level of confidence. Finally, in columns (c) and (d), I include both the measures of portfolios' diversification and institutional investors' industry specialization as explanatory variables. Column (c) shows that institutional investors' portfolio diversification and their industry specialization have no impact on the level of over-investment. On the other hand, column (f) shows that specialized institutional investors with highly undiversified portfolios have a positive and statistically significant

effect on the level of expected investment. Both the coefficients are positive and statistically significant at the 1% level of confidence.

The results described above suggest that institutional investors use their information advantage to improve corporate investment decisions rather than excessively discourage investment due to their under-diversification. Moreover, it must be noticed that the stake held by institutional investors has a negative and statistically significant impact on the level of over-investment, while, after controlling for under-investment and industry specialization, it has no impact on the optimal level of investment. Thus, institutional investors may care about firms' abnormal levels of investment when these firms become important in their portfolio.

As a matter of fact, expected investment represents a substantial part of the total level of new investment that a firm undertakes every year, and it should be easier, and cheaper, for investors to collect information about these investment projects. Conversely, abnormal investment is harder to identify, and, probably, requires investors to spend more time and resources. Moreover, influencing managers' decisions is also very costly for institutional investors. Whatever the channel they decide to use to intervene,[30] institutional investors will have to pay the cost of their actions, and it is rational to believe that they may be willing to pay this cost only when a firm represents a significant part of their portfolio.

To conclude, the results in this section exclude the possibility that the reduction in the level of firms' capital expenditure is driven by institutional investors' excessive risk-avoidance. On the contrary, it appears that under-diversified long-term institutional investors have even more incentive to monitor and actively intervene to reduce agency conflicts by encouraging investments in projects with positive NPV and discouraging investments with negative NPV. Moreover, this analysis highlights an interesting insight: under-diversified long-term institutional investors curb agency costs because this is in their best interest. In fact, by reducing over-investment and encouraging investments with positive NPV, large long-term institutional investors achieve the maximum benefit from their monitoring activity: firm's risk decreases, since inefficient actions are reduced, and the overall value of their portfolio increases because, as shown in the previous section, their intervention is value enhancing.

### 4.4 Robustness Checks

In the previous sections I have already discussed several alternative methodologies to mitigate enodogeneity issues and exclude the possibility of a clientele effect. Nonetheless, I address the possibility that institutional investors may prefer to invest in firms with certain levels of investment and further study reverse causality. Notice that, for the sake of space, results are un-tabulated.

[30] Directly, large shareholders can elect directors, vote on changes to the corporate structure or charter, or proxy contests and shareholder proposals. Indirectly, they can impact policies through informal negotiations and governance discussions with incumbent management.

I start by investigating if results are driven by institutional investors' preferences for certain levels of investment. Institutional investors' preferences for investment policies are not directly observable, thus, following Sulaeman (2009), I infer these preferences from their actual and past shareholdings. In particular, at the end of each year, I collect information about the level of investment of each firm in the institutional investors' portfolio. Institutions' preferences for corporate investment are measured as the weighted average of the level of investment of each firm in their holdings. For each firm in my sample, I average the individual preference of the five largest institutional investors.

If institutional investors have a preference for firms with a higher level of investment, then the companies in their portfolios should match their preferences, otherwise, institutions may directly try to adjust capital expenditure in those firms that do not have the desired level yet. This argument suggests that investors with preferences for high (low) levels of investments in real assets should invest in firms with large (small) capital expenditure. Moreover, if an increase (decrease) in investment is driven by institutional investors' preferences for higher (lower) levels of investment, then I should find that the institutional investors' average preference for investment is higher (lower) in companies that experienced an increase (decrease) in investment with respect to those that experienced a decrease (increase) in investment.

To test for this possibility, I use a mean comparison test and compare the preferences of institutional investors in companies that had a decrease in capital expenditure, between time t-1 and time t, with the preferences of institutional investors in companies that, over the same period of time, experienced an increase in investment. Figure 3 briefly summarizes the test.

[Insert Figure 3 here]

Assuming that institutional investors' preferences are influencing the change in the levels of capital expenditure, my null hypothesis is that companies that experienced a decrease in investment should have in their ownership structure at time t-1 investors with lower (average) preferences than institutions in companies that had an increase in investment.

To run the test, I distinguish between companies that, from time t-1 and time t, decreased their investment and firms that increased their investment. In these two sub-samples, I find the average investors' preferences for capital expenditure, at time t-1, using the institutional investors' actual and past shareholdings. Finally, I use a mean comparison test to investigate in which sub-sample investors have the largest preference.

If institutional investors' preferences drive the results, then I should find that in companies where investment decreased, the five largest institutions should have an average preference for lower levels of investment than the five largest institutions in firms where investment increased. Instead, I find that in firms in which investment decreased, investors had average preferences for larger levels of investment

than investors in firms in which investment increased. Hence, I conclude that institutional investors' preferences do not seem to be driving the results.

Next, I turn to discuss reverse causality. In Table 4 I already address reverse causality regressing changes in the stake held by institutional investors on changes in the level of investments. Here, I use a firm, industry and year fixed effect panel regression and I control for variables that theories deem important for the investment choice of institutions. First, I control for stock liquidity. Bhide (1994) suggests that the increased liquidity in the U.S. markets and the reduction in trading costs over the last few decades have increased incentives for investors to quickly sell a stock rather than attempt to intervene on the manager. As a proxy for liquidity, I use the stock's turnover[31] (volume divided by the number of shares outstanding). Greater turnover means that the market for shares is deeper, thus I expect turnover to have a negative impact on the stake held by institutional investors. Next, I use for past stock returns to control for firm performance. Furthermore, higher past performance is associated with a deeper market for a firm's stock.[32] I measure past returns using the annualized rate of return and the average return over the S&P 500.[33] As suggested by Ersoy-Bozcuk and Lasfera (2001), when a stock over-performs its benchmark, a professional money manager may eventually want to sell it to realize these gains. This would predict that proxies for past performance could have both positive and negative effects on the stake held by institutional investors.

I also include in the analysis stock returns' volatility to capture the risk inherent in stock ownership, but some authors also use volatility as a proxy for information asymmetries. I include in my model the standard deviation of firms' stock returns and, since institutional investors may be particularly concerned with firm's specific risk, I also employ the standard deviation of the error of a one-year market model regression as a measure a firm's idiosyncratic risk. Capturing returns' volatility also addresses the concern of some authors[34] that institutional investors are likely to choose less-volatile stocks because of the risk that investment in more-volatile securities may be not be viewed (by courts or clients) as "prudent." Given the arguments above, my proxies for risk could have both a positive and negative impact on institutional investors' holdings depending on the level of the institutional investor's risk-aversion. If institutional investors are very "prudent", both proxies for risk should be associated with lower levels of institutional investors' holdings since the higher returns' volatility indicates larger information asymmetry. Yet, avoiding risk investors won't necessarily act in their best interest. Therefore, I expect that institutional investors' holdings may be negatively affected by idiosyncratic risk, since this is

[31] Turnover sometimes is also used as a proxy for differences of opinion or information asymmetries (see, for instance, Dierkens (1991), and Chen *et al.* (2001)).
[32] See Atkins and Dyl (1997).
[33] I control for the return over the S&P 500 because not all sell transactions will be motivated by some information or liquidity issues.
[34]See, for example, Badrinath, Gay, and Kale, "Patterns of Institutional Investment, Prudence, and the Managerial Safety-net Hypothesis."

usually used as a more direct measure of information asymmetries (Helwege *et al.* (2007)), while the proxy for total risk could have both a positive and negative impact on the stake held by institutional investors depending on the level of the institutional investor's risk-aversion and their ability to diversify their portfolio.

Finally, I control for investment opportunities, firm's size and age. I measure investment opportunities using the market-to-book ratio. High market-to-book ratio firms have more intangible assets, so that information asymmetry theories would predict that such firms should have lower institutional ownership. Yet, a high market-to-book ratio could indicate that a firm has high growth opportunities. Thus, I expect this variable to be positively associated with the stake held by institutional investors. Moreover, bigger firms are largely followed by institutional shareholders, analysts, the press, and regulators. Anecdotal evidence documents a positive relation between institutional investors and firms' market capitalization that may result from institutional investors' resistance to riskier (and typically smaller) stocks. I use the logarithm of total assets as a proxy for a firm's size and I expect this variable to be positively associated with the stake held by institutional investors. In conclusion, I use the company's age, measured by the numbers of years from the IPO, to capture stage of firms' life cycle.

I find that investment levels have no impact on the stake held by institutional investors.[35] The control variables I introduce in this analysis have all the expected sign and most of them are statistically significant. First of all, I find that the more liquid a firm's stock, the lower the stake held by institutional investors. This is consistent with the argument suggested by Bhide (1994) that when in liquid markets some institutional investors may prefer to sell their stakes instead that incur in the cost of directly monitoring management. However, as suggested by the literature, walking with their feet institutional investors still exercise an effective form of monitoring. These results are consistent with the idea that high past performance is associated with deeper market for firms' stocks. I find that past returns have a negative impact on the shareholding of institutions. Conversely, institutions appear to buy stocks that have over-performed the S&P500 in the past and stocks with larger volatility, while higher levels of idiosyncratic risk are associated with smaller institutional investors' holdings. Finally, institutional investors' holdings are greater in larger companies and firms with more investment opportunities.

## 5. Conclusions

This paper investigates whether institutional investors influence firms' investment policies. Using a panel dataset of 2,511 U.S. manufacturing firms that went public between 1980 and 2003, I find that the larger the stake held by long-term institutional investors, the lower the capital expenditure. I investigate this result further, and I find that investment is reduced in those firms that suffer mostly from managerial

[35] I also use the difference between the level of firm's investment and the median level in the industry as explanatory variable. Results strongly hold. Tables are available upon request.

agency costs and over-investment. Most importantly, I find that reduction in capital expenditure in these firms leads to improvements in firms' performance in *subsequent* years, confirming that institutional investors' actions aimed at removing over-investment are value-enhancing.

My analysis may suffer from limits due to imperfect proxies for a firm' optimal level of investment; however, the theoretical foundation for the reduced form models I use, and the robustness of the relation between institutional ownership and over-investment reduction to alternative specifications should speak to an economic result and not merely a spurious correlation.

There are many future directions in which to take this research. One potentially important avenue is the impact that institutional owners may have on the allocation of cash flows that companies accumulate by reducing investment in projects with negative NPV. Moreover, a more extensive analysis of the role that institutions have in companies that under-invest could be important to draw more general conclusions on the effect that institutional investors have on investment policies. Furthermore, since not all investors decide to directly monitor (or use their "voice"), and some investors instead "vote with their feet," understanding under what circumstances investors prefer to use their voice instead of trading, and comparing the effectiveness of voice versus exit could help shed more light on their monitoring role,[36] and could help regulators understanding of whether barriers to greater ownership of equity by institutions, as exist in many countries, should be discouraged or enhanced.

[36] A recent theoretical paper by Edmans and Manso (2009) goes in this direction. The authors suggest that when firm's have multiple blockholders, coordination difficulties among them could create free-rider problems and lower the effect of direct monitoring (or "voice"), hence, it could be more effective disciplining the manager through trading (or "exit").

**References**


- Abarbanell, J.S., and Bushee, B.J., 1998, Abnormal Returns to a Fundamental Analysis Strategy, *The Accounting Review*, 73 1, 19-45.

- Admati, A.R., and Pfleiderer, P., 2006, The "Wall Street Walk" as a Form of Shareholder Activism, *Working Paper*.

- Aggarwal, R.K., and Samwich, A., 1999, Empire-builders and shirkers: Investment, Firm Performance, and Managerial Incentives, *Journal of Corporate Finance*, 2006 12, 489-515.

- Aghion, P., Van Reenen, J., and Zingales, L., 2008, Innovation and Institutional Ownership, *Working Paper*.

- Agrawal, A., and Mandelker, G.N., 1990, Large Shareholders and the Monitoring of Managers: The Case of Antitakeover Charter Amendments, *The Journal of Financial and Quantitative Analysis*, 25 2, 143-161.

- Almazan, J., Hartzell, J.C., and Starks, L.T., 2005, Active Institutional Shareholders and Costs of Monitoring: Evidence from Executive Compensation, *Financial Management*, 34 4, 5-34.

- Altman, E.I., 1968, Financial Ratios, Discriminate Analysis and the Prediction of Corporate Bankruptcy, *The Journal of Finance*, 23 4, 589-609.

- Altman, E.I., 2000, Predicting Financial Distress of Companies: Revisiting the Z-Score and Zeta Models, *Working Paper*.

- Baker, M., 2000, Career Concerns and Staged Investment: Evidence from the Venture Capital Industry, *Working Paper*.

- Bandrinath, S.G., Gay, G.D., and Kale, J.R., 1989, Patterns of Institutional Investment, Prudence and the Managerial "Safety-Net" Hypothesis, *The Journal of Risk and Insurance*, 56 4, 605-629.

- Barclay, M.J., and Holderness, C.G., 1991, Negotiated Block Trades and Corporate Control, *The Journal of Finance*, 46 3, 861-878.

- Barro, R.J., 1990, The Stock Market and Investment, *The Review of Financial Studies*, 3 1, 115-131.

- Bates, T.W., 2005, Assets Sales, Investment Opportunities, and the Use of Proceeds, *The Journal of Finance*, 60 1, 105-135.

- Bebchuk, L.A., 1994, Efficient and Inefficient Sales of Corporate Control, *The Quarterly Journal of Economics*, 109 4, 957-993.

- Bebchuk, L.A., and Stole, L.A., 1993, Do Short-Term Objectives Lead to Under- or Over-investment in Long-Term Projects?, *The Journal of Finance*, 48 2, 719-729.

- Bebchuk, L.A., and Roe, M. J., 1999, A Theory of Path Dependence in Corporate Ownership and Governance, *52 Stan. L. Rev. 127*

- Bertrand, M., and Mullainathan, S., 2003, Enjoying the Quiet Life? Corporate Governance and Managerial Preferences, *Journal of Political Economy*, 111 5, 1043-1075.

- Bhide, A., 1994, Efficient Markets, Defiant Governance, *Harvard Business Review*, 128-139.

- Bohren, O., Cooper, I., and Priestley, R., 2007, Corporate Governance and Real Investment Decisions, *Working Paper*.

- Bolton, P., and Scharfstein, D.S., 1990, A Theory of Predation Based on Agency Problems in Financing Constraints, *The American Economic Review*, Vol. 80, No. 1, pp. 93-106

- Booth, J. R., and Chua, L., 1996, Ownership Dispersion, Costly Information, and IPO Underpricing, *Journal of Financial Economics*, 41, 291-310.

- Borokhovich, K.A., Brunarski, K. R., Harman, Y. S., and Parrino, R., 2006, Variation in the Monitoring Incentives of Outside Stockholders, *Journal of Law and Economics* 49.

- Brav, A., Jiang, W., Partnoy, F., and Thomas, R., 2008, Hedged Fund Activism, Corporate Governance, and Firm Performance, *The Journal of Finance*, 63 4, 1729-1775.

- Brickley, J. A., Lease, R. C., and Smith, C. W. Jr., 1988, Ownership Structure and Voting on Antitakeover Amendments, *Journal of Financial Economics* 20, 267-291.

- Burkart, M., Gromb, D., and Panunzi, F., 1997, Large Shareholders, Monitoring, and the Value of the Firm, *The Quarterly Journal of Economics*, 1123, 693-728.

- Burkart, M., Gromb, D., and Panunzi, F., 1998, Why Higher Takeover Premia Protect Minority Shareholders, *Working Paper*.

- Bushee, B.J., 1998, The Influence of Institutional Investors on Myopic *R&D* Investment Behavior, *The Accounting Review,* 73 3, 305-333.

- Carleton, W.T., Nelson, J.M., and Weisbach, M.S., 1998, The Influence of Institutions on Corporate Governance Through Private Negotiations: Evidence from TIAA-CREF, *The Journal of Finance,* 53 4, 1335-1362.

- Chen, X., Harford, J., and Li, K., 2007, Monitoring: Which Institutions Matter?, *Journal of Financial Economics.*

- Cho, M. H., 1998, Ownership Structure, Investment, and the Corporate Value: An Empirical Analysis, *Journal of Financial Economics*, 47, 103-121.

- Coffee Jr., J.C., 1991, Liquidity Versus Control: The Institutional Investor as Corporate Monitor, *The Columbia Law Review*, 91 Colum. L. Rev 1277.

- Cronqvist, H., and Fahlenbrach, R., 2007, Large Shareholders and Corporate Policies, *Working Paper*.

- Denis, D., and Sibilkov, V., 2009, Financial Constraints, Investment, and the Value of Cash Holdings, *The Review of Financial Studies*.

- Dierkens, N., 1991, Information Asymmetry and Equity Issues, *The Journal of Financial and Quantitative Analysis*, 26 2, 181-199.

- Drucker, P.F., 1986, The Changed World Economy, *Foreign Affairs*, 64 4, 768-791.

- Edmans, A., and Manso, G., 2009, Governance Through Exit and Voice: A Theory of Multiple Blockholders, *Working Paper*.

- Eng, L.L., and Shackell, M., 2001, The Implications of Long-Term Performance Plans and Institutional Ownership for Firms' Research and Development *R&D* Investments, *Working Paper*.

- Falkenstein, E.G., 1996, Preferences for Stock Characteristics as Revealed by Mutual Fund Portfolio Holdings, *The Journal of Finance,* 51 1, 111-135.

- Fazzari, S.M., Hubbard, R.G., Petersen, B.C., Blinder, A.S., and Poterba, J.M., 1988, Financing Constraints and Corporate Investment, *Brookings Papers on Economic Activity*, 1988 1, 141-206.
- Fazzari, S.M., Hubbard, R.G., and Petersen, B.C., 2000, Investment-Cash Flow Sensitivities are Useful: A Comment on Kaplan and Zingales, *Working Paper*.
- Gaspar, J. M., Massa, M., and Matos, P., 2005, Shareholder Investment Horizons and the Market for Corporate Control, *Journal of Financial Economics*, 76, 135-165.
- Gillan, S.L., and Starks, L.T., 2007, The Evolution of Shareholder Activism in the United States, *Working Paper.*
- Graves, S.B., and Waddock, S.A., 1990, Institutional Ownership and Control: Implications for Long-Term Corporate Strategy, *The Executive*, 4 1, 75-83.
- Grossman, S. J., and O. D. Hart, 1988**,** One Share-One Vote and the Market for Corporate Control, *Journal of Financial Economics*, 20, 175-202.
- Harris, M., and Raviv, A., 2008, Control of Corporate Decisions: Shareholders vs. Management, *Working Paper*.
- Hartzell, J.C., and Starks, L.T., 2003, Institutional Investors and Executive Compensation, *The Journal of Finance*, 58 6, 2351-2374.
- Harvey, C. R., Lins, K. V., and Roper, A. H., 2003, The Effect of Capital Structure When Expected Agency Costs are Extreme, *Working Paper*.
- Heaton, H.B., 2002, Managerial Optimism and Corporate Finance, *Financial Management*, 31 2, 33-45.
- Helwege, J., Pirinsky, C., and Stulz, R. M., 2005, Why do Firms Become Widely Held? An Analysis of the Dynamics of Corporate Ownership, *Working Paper*.
- Hubbard, R. G., 1998, Capital-Market Imperfections and Investment, *Journal of Economic Literature*, 36 1, 193-225.
- Huberman, G., 2001, Familiarity Breeds Investment, *Working Paper*.
- Huddart, S., 1993, The Effect of a Large Shareholder on Corporate Value, *Management Science*, 39 11, 1407-1421.
- Jensen, M.C., and Meckling, W.H., 1976, Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure, *Working Paper.*
- Jensen, M.C., 1986, Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers, *The American Economic Review*, 76 2, 323-329.
- Jensen, M.C., 1993, The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems, *The Journal of Finance*, 48 3, 831-880.
- Kumar, A., and Goetzmann, W. N., 2002, Equity Portfolio Diversification, *Yale ICF Working Paper*.
- Lamont, O.A., 2000, Investment Plans and Stock Returns, *The Journal of Finance*, 55 6, 2719-2745.
- Lamont, O. A, Polk, C., and Saa-Requejo, J., 2001, Financial Constraints and Stock Returns, *The Review of Financial Studies*, 14 2, 529-554.

- MacKie-Mason, J.K., 1990, Do Taxes Affect Corporate Financing Decisions?, *The Journal of Finance,* 45 5, 1471-1493.
- Malmendier, U., and Tate, G., (2005), CEO Overconfidence and Corporate Investment, The Journal of Finance, 60 (6), 2261-2700.
- March, J.G., and Shapira, Z., 1987, Managerial Perspectives on Risk and Risk Trading, *Management Science,* 33 (11), 1404-1418.
- Massa, M., Gaspar, J., Matos, P., 2005, Shareholder Investment Horizons and the Market for Corporate Control, *Journal of Financial Economics*, Forthcoming.
- Maug, E., 1998, Large Shareholders as Monitors: Is There a Trade-Off Between Liquidity and Control?, *The Journal of Finance*, 53 1, 65-98.
- McCahery, J. A., Sautner, Z., and Starks, L. T., 2009, Behind the Scenes: The Corporate Governance Preferences of Institutional Investors, *Working Paper*.
- Morck, R., Yeung, B., and Yu, W., 2000, The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronous Stock Price Movements?, *Working Paper*.
- Myers, S.C., 1977, Determinants of Corporate Borrowing, *Working Paper*.
- Myers, S.C., and Majluf, N.S., 1984, Corporate Financing and Investment Decisions When Firms Have Information the Investors Do Not Have, *Working Paper*.
- Narayanan, M.P., 1985, Managerial Incentives for Short-Term Results, *The Journal of Finance,* 40 5, 1469-1484.
- Pagano, M., and Roell, A., 1998, The Choice of Stock Ownership Structure: Agency Costs, Monitoring, and the Decision To Go Public, *Working Paper*.
- Pagano, M., Panetta, F., and Zingales, L., 1998, Why Do Companies Go Public? An Empirical Analysis, *The Journal of Finance*, 53 1, 27-64.
- Parrino, R., Sias, R. W., and Starks, L. T., 2003, Voting with Their Feet: Institutional Ownership Changes Around Forced CEO Turnover, *Journal of Economics*, 68, 3-46.
- Porter, M., 1992, Capital Disadvantage: America/s Failing Capital Investment System, *Harvard Business Review,* September-October 1992, 65-82.
- Richardson, S., 2006, Over-Investment of Free Cash Flow, *Review of Accounting Studies,* 11:159-189.
- Roll, R., 1986, The Hubris Hypothesis of Corporate Takeovers, *The Journal of Business*, 59 2, 197-216.
- Shleifer, A., Vishny, R.W., 1986, Large Shareholders and Corporate Control, *Working Paper*.
- Shleifer, A., Vishny, R.W., 1989, Management Entrenchment: The Case of Manager-Specific Investments, *Journal of Financial Economics*, 25 1989, 123-139.
- Shleifer, A., Vishny, R.W., 1990, Equilibrium Short Horizons of Investors and Firms, *The American Economic Review*, 80 2, 148-153.
- Shleifer, A., Vishny, R.W., 1997, A Survey of Corporate Governance, *The Journal of Finance,* 52 2, 737-783.

- Stein, J.C., 1988, Takeover Threats and Managerial Myopia, *The Journal of Political Economy*, 96 1, 61-80.
- Stein, J.C., Froot, K.A., and Scharfstein, D.S., 1993, Risk Management: Coordinating Corporate Investment and Financing Policies, *Journal of Finance*, 485, 1629-1658.
- Stein, J.C., 1989, Efficient Capital Markets, Inefficient Firms: A Model of Myopic Corporate Behavior, *The Quarterly Journal of Economics*, 104 4, 655-669.
- Stein, J. C., 2003, Agency, Information and Corporate Investment, *Harvard Working Paper*.
- Stulz, R. M., 1990, Presidential Managerial Discretion and Optimal Financing Policies, *The Journal of Financial Economics*, 26 1990, 3-27.
- Stulz, R. M., 2005, Presidential Address: The Limits of Financial Globalization, *The Journal of Finance*, 60 4, 1595-1639.
- Sulaeman, J., 2008, Do Shareholder Preferences Affect Corporate Policies?, *Working Paper*.
- Thakor, A.V., 1990, Invesment "Myopia" and the Internal Organization of Capital Allocation Decisions, *Working Paper*.
- Wahal, S., and McConnell, J. J., 2000, Do Institutional Investors Exacerbate Managerial Myopia?, *Journal of Corporate Finance*, 6, 307-329.

**Table 1: Variable Definitions**

This table provides brief definitions of the variables used in this study. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980 -2008. All variables have been winsorized at the 1% level. Panel A describes firms' characteristics. Panel B describes ownership characteristics, Panel C describes institutional investors' portfolio characteristics, and Panel D describes the measures for a firm's optimal level of investment and abnormal investment.

**Panel A. Firm Characteristics**

| | |
|---|---|
| Investment | The sum of all outlays on capital expenditure, acquisitions and *R&D* less receipts from the sale of PP&E and investment to maintain assets in place (depreciation and amortization). Investment is normalized by expenditure in property plants and equipments. All variables are from COMPUSTAT. Capital expenditure is item 128. *R&D* expenditure is item 46. Acquisition expenditure is item 129. Cash receipts from sale of PP&E is item 107. Maintenance is construct using reported depreciation and amortization, item 125. Property, plants and equipments is item 8. |
| Investment Opportunities (Market-to-Book) | The natural logarithm of a firm's market-to-book ratio. Market-to-book is given by the annual average market capitalization divided by the value of total assets. |
| Cash flows | Earning before interest depreciation and amortization divided by total assets. |
| Leverage | The book value of debt to the sum of the book value of debt and the market value of equity. |
| Size | The natural logarithm of total assets. |
| Financial Constraints (Z-score) | (3.3*EBIT + Sales + 1.4* Retained Earnings + 1.2 Working Capital Total)/ Total Assets. |
| Return on Assets | Net income at time *t* divided by total assets at time *t-1*. |
| Stock Liquidity | Stock's volume divided by the number of shares outstanding. |
| Stock Returns | Stock market rate of returns (annualized). |
| Return above S&P500 | The average return over the S&P 500 from CRSP. |
| Return Volatility | The standard deviation of a firm's stock market rate of returns. |
| Idiosyncratic Risk | The standard deviation of the error of a one-year market model regression. |
| Age | The number of years since a firm's IPO. |

**Panel B: Ownership Characteristics**

| | |
|---|---|
| Cash-flow Stake Held by the Largest Investor (TOP_1) | The cash-flow stake held by the single largest institutional investor. |
| Cash-flow Stake Held by the Five Largest Investors (TOP_5) | The cash-flow stake held by the five largest institutional investors. |
| Cash-flow Stake Held by Long-term Investors (TOP_5lt) | In the group of the five largest institutional investors, the cash-flow stake held by institutions that have been in a firm for at least one year. |
| Cash-flow Stake Held by Short-term Investors (TOP_5st) | In the group of the five largest institutional investors, the cash-flow stake held by institutions that have been in a firm for less than one year. |
| Insider Ownership | The cash-flow stake held by insiders. |
| Churn Ratio | The churn rate is a measure of how frequently investors rotate their positions on all the stocks of their portfolio found by following the methodology of Gaspar *et al.* (2005) p. 9. |
| Numbers of years | The average number of year the five largest institutional investors have been invested in a firm. |

**Panel C: Institutional Investors' Portfolio Characteristics**

| | |
|---|---|
| Portfolio's Diversification | The sum of squared portfolio weights. A lower value of portfolio's diversification is indicative of a higher level of diversification. |
| Information Specialization | The percentage of portfolio's wealth that institutional investors invest in a firm's industry. |

**Panel D: Optimal Level of Investment and Abnormal Investment**

| | |
|---|---|
| Optimal Level of Investment | I measure a firm's optimal level of investment as the level of new investments that, each year, a firm should have controlling for its investment opportunities, financial constraints and industry affiliation. This is given by the fitted value of the following regression: $Investment_{it} = \alpha_0+\alpha_1 InsiderOwnership_{it-1}+\alpha_2 Market\text{-}to\text{-}Book_{it-1}+\alpha_3 Cash\ flows_{it-1}+\alpha_4 Leverage_{it-1}+\alpha_5 Size_{it-1}+\alpha_6 Age_{it-1}+\alpha_7 Stock\ Returns_{it-1}+\alpha_8 Investment_{it-1}+\alpha_9 Z\text{-}score_{it-1}+\varepsilon_{it}$ |
| Abnormal Investment | Abnormal investment is measured as the difference between firms' actual levels of investment and its optimal level of investment. |
| Investment Deviation | Investment deviation is the difference between a firm's actual level of investment and its industry median. |

**Table 2: Descriptive Statistics**

This table presents descriptive statistics of the main variables used in this paper. The variables shown in each panel are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. Panel A shows the number of IPOs in my sample each year from 1980 to 2003, excluding unit offerings, rights offerings, reverse LBOs, and spin-offs. Panel B describes firm level characteristics. Panel C describes ownership characteristics.

## Panel A: IPOs distribution

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1980** | 69 | **1986** | 116 | **1992** | 104 | **1998** | 105 |
| **1981** | 92 | **1987** | 93 | **1993** | 180 | **1999** | 153 |
| **1982** | 48 | **1988** | 40 | **1994** | 131 | **2000** | 125 |
| **1983** | 234 | **1989** | 47 | **1995** | 156 | **2001** | 48 |
| **1984** | 63 | **1990** | 23 | **1996** | 246 | **2002** | 38 |
| **1985** | 84 | **1991** | 86 | **1997** | 191 | **2003** | 39 |

**Total: 2,511**

## Panel B: Firm Characteristics

| Variables | Mean | SD | Median | P1 | P99 | N |
|---|---|---|---|---|---|---|
| Investment | 0.265 | 0.248 | 0.220 | 0.000 | 0.908 | 19,244 |
| CAPEX | 0.320 | 0.217 | 0.265 | 0.017 | 0.924 | 18,452 |
| Acquisitions | 0.019 | 0.060 | 0.000 | 0.000 | 0.308 | 19,244 |
| *R&D* | 0.005 | 0.032 | 0.000 | 0.000 | 0.101 | 19,244 |
| Sale of PPE | 0.000 | 0.020 | 0.000 | 0.000 | 0.001 | 19,244 |
| Depreciation & Amortization | 0.056 | 0.078 | 0.043 | 0.000 | 0.265 | 19,244 |
| Investment Opportunities | 6.970 | 0.990 | 6.970 | 4.430 | 9.320 | 19,212 |
| Cash flows | 0.039 | 0.336 | 0.107 | -1.147 | 0.400 | 19,098 |
| Leverage | 0.211 | 0.240 | 0.152 | 0.000 | 0.922 | 19,157 |
| Total Assets | 681.480 | 2,853.790 | 71.850 | 2.290 | 1,3190.960 | 19,213 |
| Z-score | 1.552 | 2.601 | 1.977 | -8.555 | 5.434 | 15,017 |

**Panel C: Ownership Characteristics**

| Variables | Mean | SD | Median | P1 | P99 | N |
|---|---|---|---|---|---|---|
| **Cash-flow Stake and Investment Horizon** | | | | | | |
| TOP_1 | 8.74% | 7.39% | 7.26% | 0.08% | 37.84% | 19,244 |
| TOP_5 | 21.93% | 15.81% | 19.98% | 0.10% | 73.70% | 19,244 |
| TOP_5lt | 21.03% | 15.71% | 19.01% | 0.00% | 71.49% | 19,244 |
| TOP_5st | 0.97% | 3.56% | 0.00% | 0.00% | 13.94% | 19,244 |
| Churn Ratio | 0.2245 | 0.0660 | 0.2147 | 0.107 | 0.4279 | 19,244 |
| Number of Years | 4 | 3 | 3 | < 1 year | 14 | 17,733 |
| Insider Ownership | 12.72% | 18.86% | 3.51% | 0.00% | 82.52% | 17,050 |
| **Risk-aversion** | | | | | | |
| Portfolio's Diversification | 0.0063 | 0.002 | 0.0062 | 0.003 | 0.011 | 15,364 |
| **Information Specialization** | | | | | | |
| Industry Specialization | 0.015 | 0.025 | 0.006 | 0.000 | 0.122 | 13,755 |
| **Other Information** | | | | | | |
| Number of Institutional investors | 67 | 111 | 26 | 1 | 554 | 17,733 |

**Table 3: Firms' Levels of Investment and Institutional Investors Holdings**

This table presents fixed effect panel regressions for the entire dataset. The dependent variable is firms' levels of investment. The dependent variable is measured at time (t), while the independent variables are measured at time (t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | (a) | (b) | (c) | (d) |
|---|---|---|---|---|
| **TOP_5** | **-0.071*** ** | | | |
| | (0.001) | | | |
| **TOP_5lt** | | **-0.081*** ** | | **-0.08*** ** |
| | | (0.000) | | (0.000) |
| **TOP_5st** | | | 0.076 | 0.036 |
| | | | (0.138) | (0.567) |
| **Insider Ownership** | 0.044*** | 0.045*** | 0.011 | 0.046*** |
| | (0.004) | (0.003) | (0.373) | (0.003) |
| **Market-to-Book** | 0.065*** | 0.065*** | 0.064*** | 0.061*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Cash flows** | 0.297*** | 0.297*** | 0.297*** | 0.289*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Leverage** | -0.205*** | -0.205*** | -0.206*** | -0.198*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Size** | -0.041*** | -0.042*** | -0.045*** | -0.045 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Z-score** | 0.008** | 0.008** | 0.007** | 0.008** |
| | (0.030) | (0.030) | (0.047) | (0.031) |
| **Constant** | 0.116 | 0.120 | 0.108** | 0.171** |
| | (0.160) | 0.127 | (0.011) | (0.034) |
| **Firm Fixed Effect** | YES | YES | YES | YES |
| **Industry Dummies** | YES | YES | YES | YES |
| **Year Dummies** | YES | YES | YES | YES |
| **N** | 11,075 | 11,099 | 11, 227 | 11,098 |
| **$R^2$** | 0.1443 | 0.1444 | 0.1526 | 0.1447 |

**Table 4: Firms' Levels of Investment and Institutional Investors Holdings**
**First Difference Regression**

This table presents results using first difference regressions. Column (a) uses as the dependent variable the change in the stake held by the five largest institutional investors between time (t-2) and (t-1). Column (b) uses as the dependent variable the change in investment between time (t-1) and (t). Control variables are measured over the period (t-3)-(t-2) and (t-2)-(t-1). All variables are described in Table 1. The dataset is described in Section 3.1. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | **ΔTOP_5 $_{i,(t-2;t-1)}$** | **ΔInvestment $_{i,(t-1;t)}$** |
|---|---|---|
| | **(a)** | **(b)** |
| **ΔTOP_5 $_{i,(t-2;t-1)}$** | | **-0.080*** ** |
| | | (0.006) |
| **ΔInvestment $_{i,(t-3;t-2)}$** | 0.002 | |
| | (0.743) | |
| **ΔInsider Ownership $_{i,(t-2;t-1)}$** | -0.363*** | -0.045** |
| | (0.000) | (0.014) |
| **ΔMarket-to-Book $_{i,(t-2;t-1)}$** | 0.012*** | 0.038*** |
| | (0.002) | (0.000) |
| **ΔCash flows $_{i,(t-2;t-1)}$** | -0.029 | 0.208*** |
| | (0.244) | (0.000) |
| **ΔLeverage $_{i,(t-2;t-1)}$** | 0.005 | -0.182*** |
| | (0.687) | (0.000) |
| **ΔSize $_{I,(t-2;t-1)}$** | 0.012* | -0.097*** |
| | (0.083) | (0.000) |
| **ΔZ-score $_{i,(t-2;t-1)}$** | 0.008*** | 0.002 |
| | (0.002) | (0.825) |
| **ΔInsider Ownership $_{i,(t-3;t-2)}$** | 0.006 | |
| | (0.498) | |
| **ΔMarket-to-Book $_{i,(t-3;t-2)}$** | 0.005* | |
| | (0.098) | |
| **ΔCash flows $_{i,(t-3;t-2)}$** | -0.019 | |
| | (0.348) | |
| **ΔSize $_{I,(t-3;t-2)}$** | -0.003 | |
| | (0.508) | |
| **ΔZ-score $_{i,(t-3;t-2)}$** | 0.000 | |
| | (0.740) | |
| **Constant** | 0.012 | -0.046 |
| | 0.131 | (0.062) |
| **N** | 6,064 | 8,612 |
| **$R^2$** | 0.3407 | 0.0841 |

**Table 5: Abnormal Investment and Institutional Investors Holdings**

This table presents fixed effect panel regressions for firms that over-invest. The dependent variable in all regressions is (positive levels of) abnormal investment measured as the difference between firms' actual levels of investment and their optimal levels of investment. The dependent variable is measured at time (t), while the independent variables are measured at time (t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | **Firms With Positive Levels of Abnormal Investment** | | | |
|---|---|---|---|---|
| | **(a)** | **(b)** | **(c)** | **(d)** |
| **TOP_5** | **-0.054**** | | | |
| | (0.025) | | | |
| **TOP_5lt** | | **-0.054**** | | **-0.054**** |
| | | (0.029) | | (0.028) |
| **TOP_5st** | | | 0.006 | -0.030 |
| | | | (0.951) | (0.760) |
| **Constant** | 0.301*** | 0.300*** | 0.295*** | 0.300*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Firm Fixed Effect** | YES | YES | YES | YES |
| **Industry Dummies** | YES | YES | YES | YES |
| **Year Dummies** | YES | YES | YES | YES |
| **N** | 4,817 | 4,821 | 4,843 | 4,821 |
| **$R^2$** | 0.0495 | 0.0542 | 0.0584 | 0.0541 |

**Table 6: Investment Deviation from Industry Median and Institutional Investors Holdings**

This table presents fixed effect panel regressions for firms that over-invest with respect to their industry median. The dependent variable is (positive levels of) firms' investment deviations measured as the difference between firms' actual levels of investment and the median level of investment in their industry. The dependent variable is measured at time (t), while the independent variables are measured at time (t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | **Firms that Invest Above Their Industry Peers** | | | |
|---|---|---|---|---|
| | **(a)** | **(b)** | **(c)** | **(d)** |
| **TOP_5** | -0.045 | | | |
| | (0.113) | | | |
| **TOP_5lt** | | **-0.050*** | | **-0.061**** |
| | | (0.080) | | (0.039) |
| **TOP_5st** | | | 0.082 | 0.094 |
| | | | (0.160) | (0.284) |
| **Insider Ownership** | 0.062*** | 0.062*** | 0.024 | 0.074*** |
| | (0.004) | (0.003) | (0.140) | (0.001) |
| **Market-to-Book** | 0.020*** | 0.019*** | 0.018*** | 0.036*** |
| | (0.005) | (0.007) | (0.008) | (0.000) |
| **Cash flows** | 0.123*** | 0.123*** | 0.116*** | 0.132*** |
| | (0.002) | (0.002) | (0.004) | (0.001) |
| **Leverage** | -0.083** | -0.085*** | -0.088** | -0.124*** |
| | (0.022) | (0.018) | (0.014) | (0.001) |
| **Size** | -0.044*** | -0.044*** | -0.047*** | -0.041*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Z-score** | 0.002 | 0.002*** | 0.003 | 0.004 |
| | (0.575) | (0.539) | (0.398) | (0.313) |
| **Constant** | 0.171*** | 0.177*** | 0.185*** | 0.314*** |
| | (0.006) | (0.004) | (0.002) | (0.000) |
| **Firm Fixed Effects** | YES | YES | YES | YES |
| **Industry Dummies** | YES | YES | YES | YES |
| **Year Dummies** | YES | YES | YES | YES |
| **N** | 4,854 | 4,860 | 4,928 | 4,866 |
| **$R^2$** | 0.0684 | 0.0681 | 0.0642 | 0.1955 |

**Table 7: Firms' Levels of Investment, Institutional Investors Holdings, Growth Opportunities and Cash flows**

This table presents fixed effect panel regressions for sub-samples of firms based on firm's investment opportunities and cash flows. At time t-1, using an interaction between cash flows and investment opportunities, measured as market-to-book, I classify all companies in two sub-samples: (i) companies with low investment opportunities and high levels of cash, and (ii) companies with low investment opportunities and low levels of cash. The first four columns summarize results for the first sub-sample of firms, while the last four columns summarize results for the second sub-sample of firms. The dependent variable in all regressions is firms' levels of investment measured at time (t), while the independent variables are measured at time (t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | **Low Investment Opportunities & High Cash flows** | | | | **Low Investment Opportunities & Low Cash flows** | | | |
|---|---|---|---|---|---|---|---|---|
| | **(a)** | **(b)** | **(c)** | **(d)** | **(e)** | **(f)** | **(g)** | **(h)** |
| **TOP_5** | **-0.089*** ** | | | | -0.058 | | | |
| | (0.007) | | | | (0.501) | | | |
| **TOP_5lt** | | **-0.102*** ** | | **-0.098*** ** | | -0.054 | | -0.055 |
| | | (0.002) | | (0.003) | | (0.545) | | (0.539) |
| **TOP_5st** | | | 0.119 | 0.114 | | | 0.021 | 0.013 |
| | | | (0.275) | (0.352) | | | (0.921) | (0.952) |
| **Insider Ownership** | 0.032 | 0.033 | -0.012 | 0.029 | 0.044 | 0.032 | 0.002 | 0.031 |
| | (0.197) | (0.160) | (0.530) | (0.238) | (0.442) | (0.571) | (0.957) | (0.593) |
| **Market-to-Book** | 0.046*** | 0.044*** | -0.042*** | 0.043*** | 0.053 | 0.054*** | 0.054*** | 0.053*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.007) | (0.006) | (0.005) | (0.006) |
| **Cash flows** | 0.403*** | 0.400*** | 0.389*** | 0.398*** | 0.107 | 0.104 | 0.099 | 0.104 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.362) | (0.369) | (0.396) | (0.375) |
| **Leverage** | -0.209*** | -0.207*** | -0.199*** | -0.207*** | -0.136* | -0.138* | -0.136* | -0.139* |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.097) | (0.094) | (0.096) | (0.092) |
| **Size** | -0.029** | -0.029** | -0.036*** | -0.029** | -0.070*** | -0.070*** | -0.074*** | -0.071 |
| | (0.019) | (0.021) | (0.006) | (0.019) | (0.002) | (0.002) | (0.001) | (0.002) |
| **Z-score** | 0.027** | 0.027*** | 0.028** | 0.027** | 0.025*** | 0.025*** | 0.025*** | 0.025*** |
| | (0.020) | (0.023) | (0.017) | (0.022) | (0.008) | (0.006) | (0.006) | (0.006) |
| **Constant** | 0.025 | 0.031 | 0.058 | 0.037 | 0.179 | 0.185 | 0.181 | 0.187 |
| | (0.754) | (0.678) | (0.449) | (0.624) | (0.314) | (0.297) | (0.298) | (0.292) |
| **Firm Fixed Effect** | YES | YES | YES | YES | YES | YES | YES | YES |
| **Industry Dummies** | YES | YES | YES | YES | YES | YES | YES | YES |
| **Year Dummies** | YES | YES | YES | YES | YES | YES | YES | YES |
| **N** | 3,680 | 3,688 | 3,737 | 3,688 | 1,804 | 1,809 | 1,821 | 1,808 |
| **$R^2$** | 0.1351 | 0.1358 | 0.1296 | 0.1360 | 0.0478 | 0.0497 | 0.0494 | 0.0494 |

**Table 8: Investment Deviation from Industry Median,**
**Low Growth Opportunities and Large Availability of Cash**

This table presents fixed effect panel regressions for sub-samples of firms based on industries' levels of investment, firms' growth opportunities and availability of cash. First, using an interaction between cash flows and investment opportunities, measured as market-to-book, I identify companies with low investment opportunities and high levels of cash. Second, using the deviation between firms' levels of investment and their industry peers, I distinguish between companies with positive investment deviation (these firms invest more than their peers) and firms with negative investment deviation (these firms invest less than their peers). The first four columns present results for firms that invest too much with respect to their industry peers, while the last four columns present results for firms that invest less than their industry peers. The dependent variable in all regressions is firms' investment deviations measured as the difference between firms' levels of investment and the median level of investment in their industry. The dependent variable is measured at time (t), while the independent variables are measured at time (t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | **Positive Investment Deviation** | | | | **Negative Investment Deviation** | | | |
|---|---|---|---|---|---|---|---|---|
| | **(a)** | **(b)** | **(c)** | **(d)** | **(e)** | **(f)** | **(g)** | **(h)** |
| **TOP_5** | **-0.175**** | | | | -0.018 | | | |
| | (0.022) | | | | (0725) | | | |
| **TOP_5lt** | | **-0.177**** | | **-0.180**** | | -0.008 | | -0.011 |
| | | (0.019) | | (0.020) | | (0.877) | | (0.831) |
| **TOP_5st** | | | 0.071 | -0.062 | | | -0.182 | -0.216 |
| | | | (0.684) | (0.753) | | | (0.499) | (0.469) |
| **Insider Ownership** | 0.147*** | 0.140*** | 0.0311 | 0.144** | -0.037 | -0.041 | -0.028 | -0.037 |
| | (0.010) | (0.009) | (0.483) | (0.013) | (0.309) | (0.258) | (0.345) | (0.312) |
| **Market-to-Book** | 0.031 | 0.029 | 0.258 | 0.030 | 0.021 | 0.020 | 0.019 | 0.021 |
| | (0.186) | (0.221) | (0.275) | (0.206) | (0.177) | (0.205) | (0.222) | (0.195) |
| **Cash flows** | 0.465** | 0.454** | 0.424** | 0.458** | 0.454*** | 0.462*** | 0.465*** | 0.459*** |
| | (0.018) | (0.021) | (0.034) | (0.021) | (0.002) | (0.002) | (0.002) | (0.002) |
| **Leverage** | -0.160 | -0.161 | -0.180* | -0.161 | -0.174** | -0.174** | -0.181** | -0.176** |
| | (0.110) | (0.109) | (0.073) | (0.109) | (0.029) | (0.029) | (0.023) | (0.028) |
| **Size** | -0.029 | -0.029 | -0.040 | -0.029 | -0.012 | 0.013 | -0.014 | -0.012 |
| | (0.319) | (0.326) | (0.161) | (0.329) | (0.543) | (0.517) | (0.469) | (0.561) |
| **Z-score** | 0.023 | 0.0234 | 0.024 | 0.023 | 0.021 | 0.021 | 0.021 | 0.021 |
| | (0.412) | (0.415) | (0.395) | (0.420) | (0.208) | (0.218) | (0.212) | (0.206) |
| **Constant** | -0.033 | -0.020 | -0.000 | -0.025 | -0.280** | -0.270** | -0.257** | -0.277** |
| | (0.861) | (0.913) | (1.000) | (0.893) | (0.023) | (0.028) | (0.037) | (0.025) |
| **Firm Fixed Effect** | YES | YES | YES | YES | YES | YES | YES | YES |
| **Industry Dummies** | YES | YES | YES | YES | YES | YES | YES | YES |
| **Year Dummies** | YES | YES | YES | YES | YES | YES | YES | YES |
| **N** | 1,623 | 1,625 | 1,652 | 1,625 | 1,993 | 1,998 | 2,018 | 1,998 |
| **$R^2$** | 0.0284 | 0.0290 | 0.0307 | 0.0289 | 0.0228 | 0.023 | 0.0206 | 0.0237 |

**Table 9:Over-investment, Growth Opportunities and Cash flows**
**First Difference Regression**

This table presents regressions for sub-samples of firms based on industries' levels of investment, firms' growth opportunities and availability of cash. The analysis involves firms with high cash and low investment opportunities that over-invested when the five largest institutional investors increased or decreased their shareholding. I find these firms in the following way: First, at time t-2, using the deviation between firms' levels of investment and their industry peers, I identify companies that over-invest with respect to their industry peers. Then, at time t-1, using an interaction between cash flows and investment opportunities, measured as market-to-book, I identify companies with low investment opportunities and high levels of cash. Finally, in this sample, I measure the change in the stake held by the five largest institutional investors, over the period (t-2)-(t-1), and the change in the level of investment and over-investment, over the period (t-1)-(t). Column (a) uses as the dependent variable the change in firms' levels of investment. Column (b) uses as the dependent variable the change in firm's level of investment deviation. Column (c) uses as the dependent variable the change in firm's level of abnormal investment. The change in the stake held by institutional investors is the independent variable. Control variables are also measured over the period (t-2)-(t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | **ΔInvestment** | **ΔInvestment Deviation** | **ΔAbnormal Investment** |
|---|---|---|---|
| | **(a)** | **(b)** | **(c)** |
| **ΔTOP_5** | **-0.1618**** | **-0.145*** | **-0.130**** |
| | (0.026) | (0.054) | (0.040) |
| **ΔInsider Ownership** | -0.0281 | -0.036 | |
| | (0.514) | (0.412) | |
| **ΔMarket-to-Book** | 0.0318* | 0.014 | |
| | (0.061) | (0.398) | |
| **ΔCash flows** | -0.071 | -0.046 | |
| | (0.568) | (0.717) | |
| **ΔLeverage** | -0.009 | -0.005 | |
| | (0.858) | (0.910) | |
| **ΔSize** | -0.143*** | 0.117*** | |
| | (0.000) | (0.000) | |
| **ΔZ-score** | 0.083*** | 0.080*** | |
| | (0.000) | (0.000) | |
| **Constant** | -0.001 | -0.006 | -0.005 |
| | (0.822) | (0.493) | (0.424) |
| **N** | 1,193 | 1,193 | 955 |
| **$R^2$** | 0.0917 | 0.0685 | 0.004 |

**Table 10: Firms' Levels of Investment and Firm's Performance**
**First Difference Regression**

This table presents results using first difference regressions. Column (a) uses as the dependent variable the change in firms' return on assets (ROA) between time (t) and (t+1). Column (b) uses as the dependent variable the change in firm's stock returns (Stock Returns) between time (t) and (t+1). The change in investment is measured over the period (t-1)-(t). Control variables are measured over the period (t-2)-(t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | **ΔROA** | **ΔStock Returns** |
|---|---|---|
| | **(a)** | **(b)** |
| **ΔInvestment** | **-0.033**** | **-0.467***** |
| | (0.034) | (0.000) |
| **ΔMarket-to-Book** | -0.004 | 0.215** |
| | (0.514) | (0.013) |
| **ΔCash flows** | -0.145** | -0.241 |
| | (0.018) | (0.452) |
| **ΔLeverage** | 0.043** | 0.468 |
| | (0.077) | (0.281) |
| **ΔSize** | -0.026** | 0.468 |
| | (0.046) | (0.281) |
| **ΔZ-score** | 0.012 | 0.024* |
| | (0.214) | (0.539) |
| **Constant** | -0.013 | -0.503 |
| | (0.718) | (0.259) |
| **N** | 8,483 | 8,455 |
| **$R^2$** | 0.0078 | 0.0061 |

**Table 11: Firms' Levels of Investment, Institutional Investors Holdings and Profitability**

This table presents fixed effect panel regressions for sub-samples firms classified comparing their performance with the performance of their industry peers. Each year and for each industry I classify all firms with respect to their ROA at end of the year t-1 and I then spilt the sample in two sub-samples. A first group contains firms who concluded the year with a ROA above their industry median, and a second group that contains firms that ended the year with a ROA below the industry median. The first four columns describe results for companies that under-performed their industry's peers. The last four columns describe results for companies that over-performed their industry's peers. The dependent variable is firms' levels of investment measured at time (t), while the independent variables are measured at time (t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

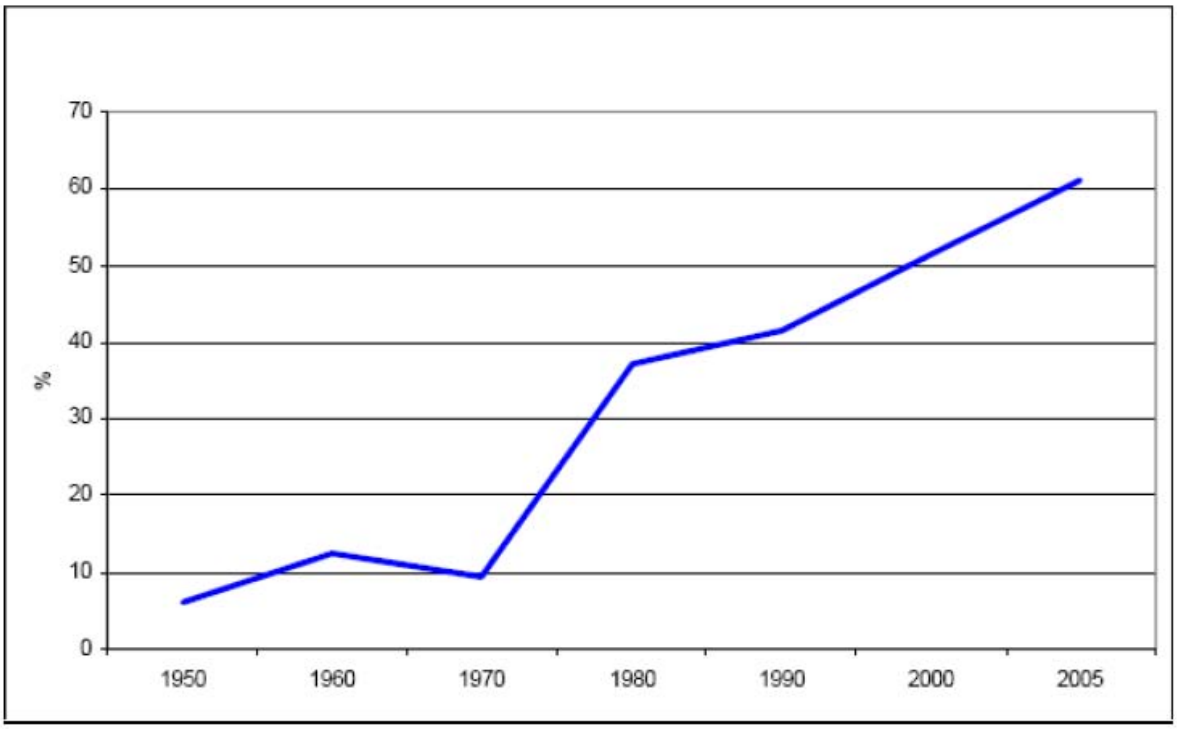
| | **Firms that Under-performed their Industry Benchmark** | | | | **Firms that Over-performed their Industry Benchmark** | | | |
|---|---|---|---|---|---|---|---|---|
| | **(a)** | **(b)** | **(c)** | **(d)** | **(e)** | **(f)** | **(g)** | **(h)** |
| **TOP_5** | **-0.075*** ** | | | | -0.007 | | | |
| | (0.085) | | | | (0.838) | | | |
| **TOP_5lt** | | **-0.086*** ** | | **-0.083*** | | -0.002 | | -0.006 |
| | | (0.005) | | (0.060) | | (0.946) | | (0.858) |
| **TOP_5st** | | | 0.121 | 0.090 | | | -0.074 | -0.132 |
| | | | (0.304) | (0.438) | | | (0.528) | (0.383) |
| **Insider Ownership** | 0.0116 | 0.009 | -0.019 | 0.007 | 0.010 | 0.007 | 0.010 | 0.011 |
| | (0.707) | (0.758) | (0.434) | (0.815) | (0.689) | (0.763) | (0.593) | (0.663) |
| **Market-to-Book** | 0.048*** | 0.047*** | 0.046*** | 0.047*** | 0.037*** | 0.037*** | 0.038*** | 0.037*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| **Cash flows** | 0.278*** | 0.274*** | 0.268*** | 0.273*** | 0.216*** | 0.217*** | 0.219*** | 0.218*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.006) | (0.005) | (0.004) | (0.005) |
| **Leverage** | -0.213*** | -0.212*** | -0.212*** | -0.213*** | -0.165*** | -0.163*** | -0.161*** | -0.162*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| **Size** | -0.061*** | -0.061*** | -0.064*** | -0.061*** | -0.046*** | -0.046*** | -0.047*** | -0.046*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| **Z-score** | 0.007 | 0.007 | 0.007 | 0.007 | 0.0193** | 0.019** | 0.019** | 0.019** |
| | (0.310) | (0.284) | (0.285) | (0.281) | (0.017) | (0.018) | (0.016) | (0.016) |
| **Constant** | 0.217** | 0.223** | 0.228** | 0.226** | 0.184** | 0.180** | 0.177** | 0.177** |
| | (0.020) | (0.016) | (0.014) | (0.015) | (0.020) | (0.011) | (0.011) | (0.012) |
| **Firm Fixed Effect** | YES | YES | YES | YES | YES | YES | YES | YES |
| **Industry Dummies** | YES | YES | YES | YES | YES | YES | YES | YES |
| **Year Dummies** | YES | YES | YES | YES | YES | YES | YES | YES |
| **N** | 3,959 | 3,968 | 4,004 | 3,968 | 4,720 | 4,729 | 4,776 | 4,729 |
| **$R^2$** | 0.0726 | 0.0720 | 0.0748 | 0.0718 | 0.0909 | 0.0915 | 0.0904 | 0.0904 |

**Table 12: Over-investment, Institutional Investors Holdings and Risk-aversion**

This table presents fixed effect panel regressions for firms suffer from over-investment problems. The first three columns use as the dependent variable (positive levels of) abnormal investment measured as the difference between a firm's actual level of investment and its optimal level of investment. The last three columns use as the dependent variables the level of expected investment. The dependent variables are measured at time (t), while the independent variables are measured at time (t-1). All variables are described in Table 1. I obtain ownership data from Thompson Reuters, monthly prices from CRSP, and accounting information from COMPUSTAT for the period 1980-2008. * indicates significance at one percent (***), five percent (**), ten percent (*). P-values are in parenthesis.

| | **Over-investment** | | | **Expected Investment** | | |
|---|---|---|---|---|---|---|
| | **(a)** | **(b)** | **(c)** | **(d)** | **(e)** | **(f)** |
| **TOP_5** | **-0.060**** | **-0.056**** | **-0.056**** | -0.001 | 0.015 | 0.016 |
| | (0.013) | (0.027) | (.026) | (0.910) | (0.286) | (0.263) |
| **Portfolio's Diversification** | -0.516 | | -1.304 | **4.691***** | | **4.503***** |
| | (0.775) | | (0.519) | (0.000) | | (0.000) |
| **Industry Specialization** | | 0.169 | 0.193 | | **0.463***** | **0.420***** |
| | | (0.554) | (0.499) | | (0.000) | (0.001) |
| **Constant** | 0.306*** | 0.321*** | 0.335*** | 0.217*** | -0.202 | -0.060*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.441) | (0.006) |
| **Firm Fixed Effect** | YES | YES | YES | YES | YES | YES |
| **Industry Dummies** | YES | YES | YES | YES | YES | YES |
| **Year Dummies** | YES | YES | YES | YES | YES | YES |
| **N** | 4,396 | 3,553 | 3,549 | 4,396 | 3,553 | 3.549 |
| **$R^2$** | 0.0323 | 0.0274 | 0.0258 | 0.1598 | 0.0620 | 0.0533 |

**Figure 1: Proportion of U.S Market Held by Institutional Investors, 1950-2005**




Source: Federal Reserve Board Flow of Funds Report (various years) and Aghion *et al.* (2008)

**Figure 2: The Evolution of Investment and Institutional Investors Holdings**

Figure 2 shows the evolution over time, from 1980 to 2008, of firms' investment in real assets and institutional investors' holding for the entire sample of 2,511 firms. Each year I calculate the median level of capital expenditure and the median level of the cash-flow stake held by long-term institutional investors including firms that had an IPO that year and firms that had an IPO in the previous years.

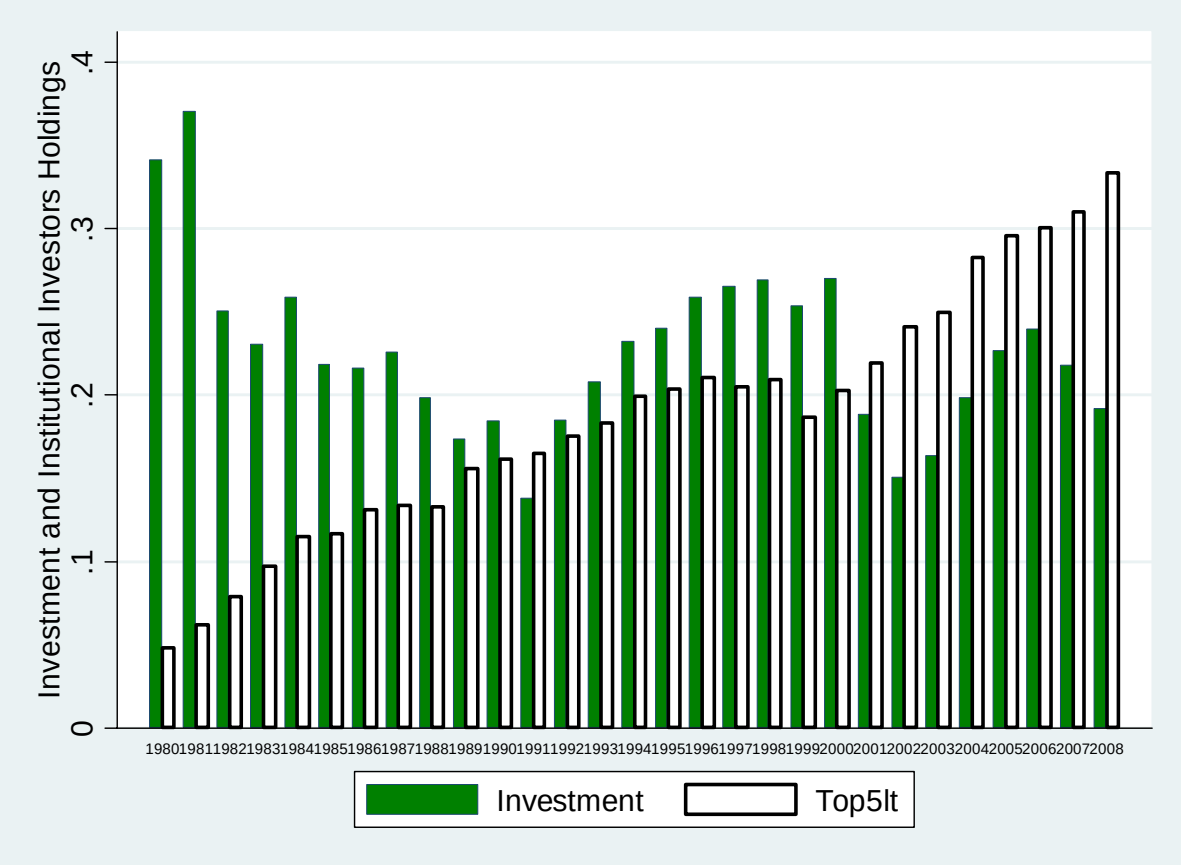


**Figure 3: Institutional Investors' Preferences and Firms' Levels of Investment**

This figure describes the mean comparison test that I use to study if institutional investors have preferences for certain levels on investment. Institutions' preferences for corporate investment are measured as the weighted average of the level of investment of each firm in their holdings. In the figure, A represents the average level of investment in the institutional investors' portfolio at time t-1 in firms that experienced a reduction in investment between time t-1 and time t. B represents the average level of investment in the institutional investors' portfolio at time t-1 in firms that experienced an increase in investment between time t-1 and time t. The test null hypothesis is that companies that experienced a decrease in investment should have in their ownership structure at time t-1 investors with lower (average) preferences than institutions in companies that had an increase in investment.

| Hypothesis | $\Delta$ Investment$_{(t-1;\ t)}$ | | TEST |
|---|---|---|---|
| | Negative | Positive | |
| **Null** | A | B | **A<B** |
| **Alternative** | A | B | **A>B** |