Managerial Myopia: A New Look

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December 6th, 2011

Abstract

This paper focuses on investment policies of myopic managers. Using CEO age as the main proxy for managerial myopia, I provide empirical evidence of managerial myopia by documenting that the investment-Q sensitivity and investment - cash flow sensitivity is lower for myopic managers. I document that faced with one unit increase in growth opportunities; there is a 35.29% drop in the increase in investments when there is one standard deviation increase in CEO age. My results points to significant deviations from optimal investments as CEO become older. This underinvestment problem is more prominent when the corporate governance mechanisms are weak.[1]

[1] I would like to thank Dr Alexei Ovtchinnikov, Dr Dilip Shome, Dr Raman Kumar and all the seminar participants at Department of Finance, Virginia Tech for their helpful comments. I also thank the seminar participants at European FMA conference, Hamburg, 2010 for their suggestions.

Myopia is the tendency of managers with short horizon to invest sub optimally, diverting resources from the long-term value maximizing projects to short-term share price maximizing projects. Myopic managers inflate current earnings and stock price at the expense of long run benefits of the firms. Managerial myopia is a concern for corporations and academics alike.

There is a debate in the corporate finance literature as to whether myopic behavior exists. One camp of academics, like Stein (1988, 1989), Porter (1992), Graham, Harvey and Rajagopal (2005) argue that managerial myopia is a serious issue which leads to investment distortions. Another camp of researchers, notably Jensen (1986), have reasoned that if I believe that the markets are efficient, then the managers cannot systematically fool the market by shifting resources from long-term value enhancing investments to short-term current earnings and current stock price boosting investments. Myopia is an important issue because if myopic behavior is prevalent among the managers, the managers will not invest optimally reducing the long run value of the firms.

In this paper, I look at a specific aspect of managerial myopia namely investment distortions. Ideally a myopic manager should overinvest in short-term projects and under invest in long run projects. Given the difficulty in separating long-term and short-term investments coupled with the difficulty of measuring optimal level of investment, it is difficult to test overinvestment in short-term and underinvestment in long-term projects. Furthermore, looking at the total investments is not a viable way of measuring managerial myopia. This is due to the invisibility of intangible investments and because one does not know what are the projects the managers could have invested in but choose not to invest. I argue that instead of measuring investments at level, looking at the change in investment in the face of incremental growth opportunity and incremental cash flow can

serve as a better method of capturing managerial myopia. Faced with one unit increase in growth opportunity, a myopic manager will increase investment by a lesser magnitude compared to a non myopic manager. Investment Tobin's Q sensitivity will be lower for firms managed by myopic managers. Similarly, when there is one extra dollar of cash flow in the firm, a myopic manager will spend less fraction of that dollar in capital expenditure compared to a non-myopic manager, resulting in lower investment cash flow sensitivity for firms with myopic managers.

First, I identify a variable which can serve as a good proxy for managerial myopia. I demonstrate that age of the CEO is a good proxy for managerial myopia. The idea is that the older the CEO is, lesser is the time she has left in office and shorter is her managerial horizon. Further, theoretical models by Shleifer and Vishney (1989) and Noe and Rebello (1997) have suggested that managerial seasoning is a good proxy for managerial myopia. I document that the older managers on average spend smaller amount on research and development and capital expenditure. The firms with older CEOs have higher retained earnings. One can argue that there is a selection bias and the younger managers tend to manage firms in industries where research and development and capital expenditures should be higher. In order to control for this sample selection problem, I adjust for the industry. I also control for the firm age because the younger managers tend to manage younger firms which spend more in research and development and capital expenditure. After controlling for the industry and the firm age, I still find a strong statistically significant negative correlation between CEO age and research and development, statistically significant negative correlation between CEO age and capital expenditure and statistically significant positive correlation between CEO age and retained earnings. One question which immediately comes to mind is that how the market

is not able to recognize this negative correlation between CEO age and R&D and CEO age and capital expenditure. I document some evidence that this negative correlation between CEO age and research and development is strongest for the firms with least amount of monitoring. This result is intuitive as this indicates that lower monitoring of the firms may be the reason of this negative correlation between CEO age and research and development and CEO age and capital expenditure. These empirical results suggest that CEO age can serve as a good proxy for managerial myopia. One important advantage of using CEO age as a proxy for the manager's myopic behavior is that CEO age is exogenous and does not suffer from the problem of endogenity in a regression set up. The second variable I use as a proxy for myopia is stock holding of the CEO in the company. Because most of the stock a CEO holds cannot be sold right away, more is the stock holding of the CEO, less myopic the CEO becomes.

I investigate these following important questions. First question is that does managerial myopia distort the sensitivity of investment to growth opportunity? More specifically, is it true that the investment sensitivity to growth opportunity is lower for firms with myopic managers? The motivation for asking this question is as follows. It is difficult for the market to find out if the levels of investment are optimal for the firms. The optimal level of investment is known only to the managers. The managers invest in both tangible and intangible assets. A manager can get away with suboptimal investments by diverting resources from intangible assets to boost current earnings. Intangible assets are hard to measure and are “invisible” by nature. Examples of intangible assets include client coverage, employee satisfaction etc. Reducing investment in these assets is difficult to distinguish from reduction in operating costs. As it is difficult to measure the optimal amount of investment and hence underinvestment or overinvestment, I are going to look

at the marginal increase in investment in face of incremental growth opportunities. If the manager is myopic, she will invest less than a non myopic manager when faced with the same increase in growth opportunities. Coefficient of Tobin's Q captures the increase in investments when faced with one unit increase in growth opportunities. My results suggest that when faced with one unit increase in growth opportunities, there is a 35.29% (70.58%) drop in the increase in investments when there is one (two) standard deviation(s) increase in CEO age. This points to significant deviation from optimal investments as CEOs become older. Firms forego as much as 35.29 (70.58%) in investments as there is one (two) standard deviation increase in CEO age which is clearly economically significant.

The second question I look at is if the investment - cash flow sensitivity is lower for firms with myopic managers. Myopic managers will underinvest in capital expenditure. To the extent that the underinvestment problem is manifested in investment cash flow sensitivity coefficient, I expect that the investment cash flow sensitivity should be lower for myopic managers. If there is one extra dollar to be invested, the myopic manager will invest a lesser fraction of that one dollar in capital expenditures compared to a non myopic manager. Therefore, firms managed by myopic managers will witness a reduction of investment cash flow sensitivity. My results indicate that faced with one dollar increase in cash flow, there is a 8.16% (16.32%) drop in the increase in investments when there is one (two) standard deviation(s) increase in CEO age. This drop in the increase in investments indicates that the firms underinvest when CEOs become older. Our empirical result of reduction of investment cash flow sensitivity for firms with myopic managers is weak.

Empirically the growth opportunities are measured by Tobin's Q. There are measurement problems of Tobin's Q. Tobin's Q can have two components, one measures the growth opportunities and the other measures the overvaluation/undervaluation of the firms' equity. The third question I investigate is that after I control for the measurement problems of Tobin's Q, is investment Tobin's Q sensitivity still lower for myopic managers? In order to distinguish between a firm's over/under valuation and its investment opportunity; I use a technique to capture the intrinsic value of the firm's equity. Using the analysts' forecasted earnings per share of a firm, Dong, Hirshleifer and Teoh (2007) developed a measure of the intrinsic value of the firm's equity. I use their technique to estimate the intrinsic value of a firm's equity. A firm's overvaluation is calculated as the ratio of the market value of the firm's equity to the intrinsic value of the firm's equity. Even after controlling for the misvaluation of Tobin's Q, I document that investment Tobin's Q sensitivity decrease for myopic managers.

The next logical question that follows is that how the managers are able get away with myopic behavior. This is the fourth question I address in this paper. I provide evidence that the firms with weak corporate governance have more myopic managers, which explains why the myopic managers are allowed to behave myopically. This has serious policy implications in terms of better corporate governance of the firms.

This paper contributes to three different strands of the literature. First and foremost, it contributes to the managerial myopia literature by providing a theoretical model and empirical evidence of managerial myopia. It shows that CEO age can serve as a good proxy for managerial myopia. The paper documents that firms managed by myopic managers suffer from serious underinvestment problems. It illustrates

theoretically and empirically how firms with myopic managers have lower investment cash flow sensitivity and lower investment Tobin's Q sensitivity.

The second strand of literature where this paper makes a contribution is the ever expanding investment cash flow sensitivity literature. I estimate a regression of investment on cash flow and Tobin's Q and some other standard control variables. I introduce CEO age in that standard regression setup. I show that the two interaction terms CEO age with cash flow and CEO age with Tobin's Q are both negative and significant suggesting that investment Tobin's Q sensitivity and investment cash flow sensitivity are lower for firms with older managers. To my knowledge, no paper have investigated if the investment Tobin's Q sensitivity and investment cash flow sensitivity is lower for firms managed by older CEOs.

The third strand of literature this paper addresses is that of corporate of governance. I demonstrate that the managers are allowed to act myopically because of weaker corporate governance. Firms with myopic managers are firms with weaker corporate governance which calls for better governance mechanisms in these firms.

The paper is organized as follows. In section I, I present a theoretical model and develop my hypothesis. In section II, I briefly describe my data. In section III, I test my hypothesis and document my results. In section IV, I provide some robustness tests. In section V, I conclude the paper.

I. Theoretical model and hypotheses development

In this section, I develop a model of managerial myopia based on the theoretical framework of Q model of investment as summarized by Hubbard (1998). I develop my hypotheses which I test in section III and IV of the paper.

A model of managerial myopia

The value of a firm at time period *t* is given by the present value of all the future profits. The manager chooses investment I_t to maximize the value of the firm at time *t*.

$$V_t(I_t) = E[\sum_{s=0}^{\infty}(c\theta\beta)^s[\pi(K_{t+s-1}) - C(I_{t+s}, K_{t+s-1})] - \sum_{s=0}^{\infty}(c\theta\beta)^{t+s} I_{t+s}] \quad (1)$$

where π is the profit function, β is the discount factor, K_t is the amount of capital accumulated up to time *t*, I_t is the total investment made in period *t*. *C*, the cost of adjustment function, is the costs of installing new capital and is defined by equation 3. The discount factor is $\beta = \frac{1}{R}$ where *R* is the cost of capital. θ is the managerial myopia parameter which I explain in more details in the next paragraph. *c* is the corporate governance parameter which is also explained in details in the next to next paragraph.

Managerial Myopia

I introduce managerial myopia in the model in the form of lower discount factor. A myopic manager will have a lower β compared to a non-myopic manager because one dollar of cash earned tomorrow is less valuable today to a myopic manager as compared to a non myopic manager. Let us assume that the discount factor for a manager is given by $\theta\beta$. θ is the parameter capturing managerial myopia. For a non-myopic manager, $\theta=1$ and the discount factor is β. $\theta<1$ for a myopic manager. More myopic the manager is, lower should be the discount factor for the manager and lower should be the value of θ.

The extreme case is when $\theta=0$, when one dollar of cash tomorrow earned tomorrow has zero value for a myopic manager today.

Corporate Governance:

The myopic manager in my model can act myopically because the discount factor she applies to the future cash flows, $\theta\beta$, is lower than the original discount factor β. Better corporate governance prevents the managers from acting myopically. Keeping things simple, I introduce a parameter c in my model which represents a corporate governance measure. I interact the parameter c with the myopia parameter θ. The myopia parameter reduces the discount factor, whereas the corporate governance parameter nullifies the reduction in the discount factor to some extent. With corporate governance in play, the effective myopia parameter is reduced to $c\theta$, with the value of c ranging from 1 to $1/\theta$. The discount factor applied by the manager is given by $c\theta\beta$. When corporate governance is nonexistent, c is equal to 1 and the manager is allowed to act myopically without any hindrance in the form of corporate governance. The discount factor applied by the manager becomes $\theta\beta$. When the corporate governance is at its best, c is equal to $1/\theta$ and the manager cannot act myopically. The discount factor applied by the manager to the future cash flow is β which is the true discount factor of the firm.

Overvaluation / Undervaluation

Let us assume that the true cost of capital of a firm is given by $\hat{R}$ and correspondingly the true discount factor is given by $\hat{\beta}$. But the cost of capital R and

correspondingly the discount factor β faced by the firm is usually different from the real cost of capital and discount factor respectively.

$R = \hat{R} + u$ and $\beta = \hat{\beta} + e$ where *u* and *e* are the error terms.

$R > \hat{R} \Rightarrow u > 0$ and $\beta < \hat{\beta} \Rightarrow e < 0$. Undervaluation of the firm. The cost of capital (discount factor) is higher (lower) than the true cost of capital (discount factor).

$R < \hat{R} \Rightarrow u < 0$ and $\beta > \hat{\beta} \Rightarrow e > 0$. Overvaluation of the firm. The cost of capital (discount factor) is lower (higher) than the true cost of capital (discount factor).

$R = \hat{R} \Rightarrow u = 0$ and $\beta = \hat{\beta} \Rightarrow e = 0$. Correct valuation of the firm. The cost of capital (discount factor) is equal (equal) to the true cost of capital (discount factor).

Rewriting equation (1) using the true discount factor $\hat{\beta}$ and the error term *e*, I get,

$V_t(I_t) = E[\sum_{s=0}^{\infty}[c\theta(\hat{\beta} + e)]^s[\pi(K_{t+s-1}) - C(I_{t+s}, K_{t+s-1})] - \sum_{s=0}^{\infty}[c\theta(\hat{\beta} + e)]_{t+s}I_{t+s}]$

(2) I use Hubbard (1998)'s cost of adjustment functional form which is linearly homogeneous in investment and capital. It should be noted that in my empirical exercise, I use a proxy for average Q, even though Tobin's neoclassical framework of investment used marginal Q. For linearly homogeneous cost of adjustment functions, marginal Q and average Q are the same. As a result, I can use average Q, in place of marginal Q, in my empirical endeavor. The cost adjustment is given by

$$C(I_t, K_t, d) = \frac{1}{2}\left(\frac{I_t}{K_t} - d\right)^2 K_t \quad (3)$$

where *d* is a functional parameter.

The capital accumulation constraint is given by

$$K_t = (1-\delta)K_{t-1} + I_t \quad (4)$$

where δ is the depreciation.

The wealth from last period W_{t-1} is assumed to be exogenous when making the investment decision in period *t*. The total investment is funded by the internal fund W_{t-1} and borrowing B_t. The burrowing constraint is given by

$$I_t = W_{t-1} + B_t \quad (5)$$

The discount factor β is the inverse of the cost of capital, given by $\beta = \frac{1}{R}$. The opportunity cost of investing W_{t-1} in the firm is given by β_0 . It is assumed that the capital market is imperfect so that the cost of external financing is increasing with the amount burrowed above the level of W_{t-1}. Hence, the discount factor starts decreasing when the amount burrowed is greater than W_{t--1}. The discount factor is given by the following equation.

$$\beta = \beta_0, I_t \leq W_{t-1}$$

$$\beta = \beta_0 - \frac{1}{2}\beta_1 \frac{B_t}{K_t},\ I_t > W_{t-1} \quad (6)$$

where $\beta_0 > 0$ and $\beta_1 > 0$

$\frac{B_t}{K_t}$ is the proportion of the net capital financed by debt.

The problem of the manager is to maximize the firm value given by equation (2) by choosing I_t subject to capital accumulation constraint (4) and borrowing constraint (5).

$max_{I_t} V_t(I_t) = E[\sum_{s=0}^{\infty}[c\theta(\hat{\beta}+e)]^s[\pi(K_{t+s-1}) - C(I_{t+s}, K_{t+s-1})] - \sum_{s=0}^{\infty}[c\theta(\hat{\beta}+e)]t+sIt+s]$

Solving the maximization problem, I get,

$$\frac{I_t}{K_t} = [\sum_{s=1}^{\infty} \frac{(c\theta)^s}{2(1+c\theta\beta_1)} \beta^s (1-\delta)^s \, [\pi_K(K_{t+s-1}) - C_K(I_{t+s}, K_{t+s-1})]$$

$$+ \left[\frac{c\theta\beta_1}{2(1+c\theta\beta_1)}\right] \frac{W_{t-1}}{K_t} + \frac{d+c\theta\beta_0}{2(1+c\theta\beta_1)}$$

$$= A + B\frac{W_{t-1}}{K_t} + C \tag{7}$$

where $A = \sum_{s=1}^{\infty} \frac{c\theta^s}{2(1+c\theta\beta_1)} \beta^s (1-\delta)^s \, [\pi_K(K_{t+s-1}) - C_K(I_{t+s}, K_{t+s-1})]$, $B = \frac{c\theta\beta_1}{2(1+c\theta\beta_1)}$ and $C = \frac{d+c\theta\beta_0}{2(1+c\theta\beta_1)}$

Equation (7) captures the investment cash flow sensitivity and investment Tobin's Q sensitivity. When the effective myopic parameter $c\theta=1$; i.e., when the manager is not myopic and has a discount factor β, equation 7 reduces to

$$\frac{I_t}{K_{t-1}} = \left[\frac{1}{2(1+\beta_1)}\right] Q + \left[\frac{\beta_1}{2(1+\beta_1)}\right] \frac{W_{t-1}}{K_t} + \frac{d+\beta_0}{2(1+\beta_1)}$$

$$= A_1 Q + B_1 \frac{W_{t-1}}{K_t} + C_1 \tag{8}$$

$where\ A_1 = \frac{1}{2(1+\beta_1)}$, $B_1 = \frac{\beta_1}{2(1+\beta_1)}, C = \frac{d+\beta_0}{2(1+\beta_1)}$

$Q = E[\sum_{s=1}^{\infty} \beta^s (1-\delta)^s \, [\pi_K(K_{t+s-1}) - C_K(I_{t+s}, K_{t+s-1})]$ is the familiar expression for marginal Tobin's Q.

Let me investigate how managerial myopia affects the coefficients of Tobin's Q and $\frac{W_{t-1}}{K_t}$ by going back to equation (7). When the manager is myopic and has a discount factor lower than β, i.e., θ is less than 1, each term of A in equation 7 decreases (increases) as θ decreases (increases).

Comparative statics

$$\frac{d}{d\theta}\left[\frac{(c\theta)^s}{2(1+c\theta\beta_1)}\right] > 0 \tag{9}$$

Hence, the coefficient of Q decreases as manager becomes more myopic, i.e., as θ decreases. This leads to my first hypothesis.

Hypothesis 1: The investment-Tobin's Q sensitivity is lower for myopic managers.

Intuition: Tobin's Q captures growth opportunities of a firm. Suppose there be an unit increase in growth opportunities for two identical firms, one managed by a myopic manager (with lower θ) and another with a less myopic manager (with higher θ). The less myopic manager will utilize the increase in growth opportunity to a greater extent than the more myopic manager. As a result, the less myopic manager will invest by a larger margin compared to the more myopic manager. The investment Tobin's Q sensitivity of the firm with the less myopic manager will be higher compared to the investment Tobin's Q sensitivity of the firm managed by the more myopic manager.

Using the graphical framework of Hubbard (1998), I illustrate in figure 1 the reduction of investment Tobin's Q sensitivity for a firm with myopic manager. In figure 1, the inverse capital demand function for a firm with non-myopic manager is D_0D_0 and the inverse capital supply function is $S(W_0)$. $D_{0m}D_{0m}$ is the inverse capital demand function for a firm with myopic manager. The inverse capital demand function will be steeper for a firm with myopic manager compared to a firm with non-myopic manager. If there is a unit decrease in the cost of capital, the increase in capital demand will be less for a firm with myopic manager. A myopic manager discounts the future cash flows at a higher discount rate compared to a non myopic manager. For example, let the cash flow be a constant C for all the future periods. The cost of capital is r. But the myopic manager discounts the future cash flows at a higher rate mr where m is the myopia parameter. m is

greater than 1 for a myopic manager and is equal to 1 for a non myopic manager. Investment demand is given by

$$I = C + \frac{C}{1+mr} + \frac{C}{(1+mr)^2} + \cdots = \frac{C}{mr}$$

$$\frac{dI}{dr} = -\frac{C}{mr^2} < 0 \qquad (10)$$

As $m > 1$ for a myopic manager, the absolute value of the slope of the capital demand function will be lower for a firm with myopic manager. Consequently, the inverse capital demand function for a firm with myopic manager $D_{0m}D_{0m}$ will be steeper compared to the inverse capital demand function for a firm with non-myopic manager D_0D_0.

Suppose there is one unit increase in the growth opportunities for both the firms, one with myopic manager another with non-myopic manager. For the firm managed by a non-myopic manager, the inverse capital demand function will shift outward from D_0D_0 to D_1D_1. This increases the equilibrium amount of capital from K_0 to K_1. For the firm with myopic manager, the capital demand function shift from $D_{0m}D_{0m}$ to $D_{1m}D_{1m}$ which results in an increase of equilibrium level of capital from K_0 to K_2. The investment Tobin's Q sensitivity for a firm with non myopic manager is K_0K_1 whereas that for a firm with myopic manager is K_0K_2. This figure illustrates the reduction of investment Tobin's Q sensitivity for myopic manager, the reduction being given by K_2K_1.

Let me now consider the change in investment cash flow sensitivity when managerial myopia increases. The coefficient of cash flow is given by $B = \frac{c\theta\beta_1}{2(1+c\theta\beta_1)}$.

Comparative statics

$$\frac{d}{d\theta}B > 0 \qquad (11)$$

The coefficient of cash flow decreases as the manager becomes more myopic, i.e., as θ decreases.

Hypothesis 2: The investment-cash flow sensitivity is lower for myopic managers.

Intuition: Cash flow is a proxy for normalized wealth of the firm $\frac{W_{t-1}}{K_{t-1}}$. If there is one extra dollar of cash to be invested, the myopic manager will invest smaller fraction of that one dollar in capital expenditures compared to a non myopic manager.

Suppose the wealth of the firm increases from W_0 to W_1 as shown in figure 2. Following Hubbard (1998) the inverse capital supply function shifts outward from $S(W_0)$ to $S(W_1)$. In case of a firm managed by a non-myopic manager, the capital demand increases from K_0 to K_1 (investment cash flow sensitivity) due to increase of firm's internal funds from W_0 to W_1. In case of a firm with a myopic manager, the capital demand increases from K_0 to K_{1m}. Hence investment cash flow sensitivity of a firm with myopic manager is lower in magnitude compared to that of a firm with non myopic manager, the magnitude of reduction being given by $K_{1m}K_1$.

The firm faces the true cost of capital $\hat{R}$ and the true discount factor $\hat{\beta}$. Hence, it makes sense to use the actual discount factor faced by the firm while deciding on the level of investment. Each term of A in equation 7 can be written as

$$[\frac{(c\theta)^s}{2(1+c\theta\beta_1)}\beta^s(1-\delta)^s\,[\pi_K(K_{t+s-1}) - C_K(I_{t+s}, K_{t+s-1})]$$

$$= [\frac{(c\theta)^s}{2(1+c\theta\beta_1)}(\hat{\beta}+e)^s(1-\delta)^s\,[\pi_K(K_{t+s-1}) - C_K(I_{t+s}, K_{t+s-1})] = [\frac{(c\theta)^s}{2(1+c\theta\beta_1)}(\hat{\beta})^s(1-$$

$$\delta)^s\,[\pi_K(K_{t+s-1}) - C_K(I_{t+s}, K_{t+s-1})] + [\frac{(c\theta)^s}{2(1+c\theta\beta_1)}f(s,e)(1-\delta)^s\,[\pi_K(K_{t+s-1}) -$$

$$C_K(I_{t+s}, K_{t+s-1})]]$$

where f(s, e) = $\binom{s}{1}\hat{\beta}^{s-1}e + \binom{s}{2}\hat{\beta}^{s-2}e^2 + ... + e^s$. Clearly, $f_e(s, e) > 0$.

Rewriting equation 7 in terms of $\hat{\beta}$,

$$\frac{I_t}{K_t} = \left[\sum_{s=1}^{\infty} \frac{c\theta^s}{2(1+c\theta\beta_1)} \hat{\beta}^s (1-\delta)^s \left[\pi_K(K_{t+s-1}) - C_K(I_{t+s}, K_{t+s-1})\right]\right. +$$

$$\sum_{s=1}^{\infty} \frac{c\theta^s}{2(1+c\theta\beta_1)} f(s,e)(1-\delta)^s \left[\pi_K(K_{t+s-1}) - C_K(I_{t+s}, K_{t+s-1})\right] + \left[\frac{c\theta\beta_1}{2(1+c\theta\beta_1)}\right]\frac{W_{t-1}}{K_t} +$$

$$\frac{d+c\theta\beta_0}{2(1+c\theta\beta_1)}$$

$$= A + B\frac{W_{t-1}}{K_t} + C + F(e) \quad (12)$$

where A, B and C are exactly the same as in equation 7, with the discount factor being $\hat{\beta}$ and F'(e) >0. F(e) captures the overvaluation or undervaluation of the firm by the market. In case of overvaluation (undervaluation), *e*>0 (e<0) and the firm over invests (under invests). This theoretical result is in line with Dong, Hirshleifer and Teoh (2007) who show empirically that overvaluation leads to overinvestment by the firm. Equation 12 is similar to equation 7 except the extra term capturing overvaluation/undervaluation. The comparative statics of equation 9 and equation 11 still hold good. Tobin's Q is calculated as the market value of assets to book value of the assets. Tobin's Q can be regarded to be composed of two components, one reflecting the growth opportunities and the other reflecting firm misvaluation. I can think of the portion capturing growth opportunities as fundamental Tobin's Q or the true Tobin's Q. Equation 12 suggests that even after controlling for firm misvaluation, the investment fundamental Q sensitivity is lower for myopic managers.

Hypothesis 3: After controlling for the firm misvaluation, investment fundamental Q sensitivity is lower for myopic managers.

Intuition: Myopic managers should invest less compared to a non myopic manager when faced with a unit increase of growth opportunity. True growth opportunity can only be evaluated after I control for the misvaluation component of Tobin's Q.

The logical question is why the managers are allowed to act myopically? The answer to this question is related to the corporate governance mechanisms of the firms.

I want to determine how this decrease in investment Tobin's Q sensitivity and investment cash flow sensitivity is affected by corporate governance mechanisms. I already demonstrated in equation 9 how every term of A in equation 7 decreases as θ decreases, i.e., as the manager becomes more myopic. Now I show how this decrease in each term of A is less prominent as corporate governance measure improves.

$$\frac{d}{dc}\frac{d}{d\theta}\left[\frac{(c\theta)^S}{2(1+\theta\beta_1)}\right] > 0 \tag{13}$$

$$\frac{d}{dc}\left|\frac{dB}{d\theta}\right| > 0 \tag{14}$$

Equation 13 shows that the reduction in investment Tobin's Q sensitivity due to managerial myopia decreases (increases) as corporate governance becomes stronger (weaker). Similarly, equation 14 illustrates that the decrease in investment cash flow sensitivity is mitigated (enhanced) as corporate governance mechanisms strengthen (weaken). This brings us to my fourth hypothesis.

Hypothesis 4: Myopic behavior of managers is more prevalent in firms with weak corporate governance. Investment Tobin's Q sensitivity and investment cash flow sensitivity is lower for weaker corporate governance firms.

Intuition: Myopic behaviors of managers destroy firm value because the firms do not invest the optimal amount which can affect firms' long term value. Good corporate

governance can prevent managers from being detrimental to firms' long term value creation. Managers will be able to act myopically only when the corporate governance mechanisms are weak. Firms with poor governance have managers who behave myopically because the monitoring mechanisms of those firms are weak. Lowering of investment Q sensitivity and investment cash flow sensitivity should be stronger when the corporate governance mechanisms of the firms weaken.

II. Data

My sample consists of all US firms listed on the NYSE, AMEX or NASDAQ for the period January 1993 – December 2004. The sample begins in 1993 because CEO compensation data is from ExecuComp which starts from 1993. I exclude financial services firms (firms with SIC codes 6000-6999), utility firms (firms with SIC codes 4900-4999), firms with assets less than $10 million, and firms with incomplete information on asset and sales. The firm characteristics data is from COMPUSTAT. I draw the forecasted EPS from the I/B/E/S database. I use CRSP database to calculate the firm beta. The annualized cost of equity is calculated using CAPM. I define industry by the three digits sic code. The percentage of large institutions' shareholding is from Thompson Financial. All variables are defined in Appendix A1.

III. Results

In this section, I test the four hypotheses proposed in section 2 of the paper and document my results. I begin by justifying why CEO age can serve as a reasonable proxy for managerial myopia. I show that the investment cash flow sensitivity and investment

Tobin's Q sensitivity is reduced as the CEO becomes older. The results hold good even after I control for misvaluation in Q. Finally, I provide empirical evidence that this lowering of investment Tobin's Q sensitivity and investment cash flow sensitivity is enhanced when corporate governance is weak.

A. Myopia proxy

I use CEO age as a proxy for managerial myopia. My choice of using CEO age as a proxy for managerial myopia is rooted in theoretical models and subsequent empirical evidence. Theoretical models of Shleifer and Vishney (1989) and Noe and Rebello (1997) suggest that managerial myopia increases with managerial experience and managers' seasoning. Recent empirical evidence suggests that managerial age can be a good proxy for managerial myopia. Lundstrum (2002) has documented that managerial myopia increases with increase in managerial seasoning. More specifically, he reported that the research and development expenses are decreasing with managerial age.

[Insert Table I here]

Table 1 reports various characteristics for firms with CEOs in different age brackets. If older CEOs are myopic, I expect more emphasis on current operating performance at the expense of long-term value maximization. This behavior should manifest in lower investment (especially R&D investment) and low capital expenditure and higher retained earnings.

The results in panel A of table 1 are consistent with the view that older CEOs are more myopic. In panel A of table 1, I divide the firms into different groups based on CEO age. R&D and capital expenditure are items which do not generate revenue immediately. If a manager is more myopic, she will reduce investments in those categories of items which do not generate revenue immediately. The R&D-to-assets ratio declines

monotonically from 0.084 for CEOs under the age of 40 to 0.039 for CEOs older than 65. The correlation coefficient between CEO age and the R&D-to-assets ratio is -0.208, which indicates that older CEOs are associated with lower R&D firms. Similarly, the CAPEX ratio declines monotonically from 0.633 for CEOs under the age of 40 to 0.233 for CEOs older than 65. The correlation coefficient between CEO age and the CAPEX is negative (although lower in magnitude) and significant, which again suggests that older CEOs are associated with lower CAPEX firms. In row 3, firm retained earnings are higher for older CEOs. Retained earnings-to-assets increase monotonically from 0.234 for CEOs under than 40 to 0.326 for CEOs in the 61-65 age brackets. The correlation of CEO age with retained earnings-to-assets is positive and statistically significant, which again indicates that older CEOs are associated with firms with higher earnings.

The obvious concern here is that CEO age correlates with other firm characteristics that are, in turn, correlated with investment and earnings. For example, older, more mature firms may have older CEOs and may be associated with lower investment and higher earnings. Also, older CEOs may systematically self-select to manage firms in certain industries. I control for the industry and report the relationship between the various firm characteristics and CEO age in panel B. All the firm level variables' industry medians are calculated with industry being defined by the three digits SIC code. The industry medians are subtracted from the firm level variables to get industry adjusted firm level variables. After adjusting for the industry, I still find that older managers spend less on research and development and less on capital expenditure and the firms managed by older managers have higher retained earnings.

One should control not only for the industry but also for the firm age. First the industry medians are subtracted from the firm level variables to form the industry

adjusted variables. Second, the firms are divided into deciles based on firm age. The median value of each firm age decile is subtracted from the industry adjusted variables of the firms in that decile to obtain the industry adjusted and firm age adjusted variables. In panel C, I present the results after controlling for both industry and for firm age. The results remain the same. Even after controlling for industry and firm age, the younger managers spend more on research and development and capital expenditure compared to old managers. Further, the firms managed by younger managers tend to have higher retained earnings compared to the older managers. The correlation between CEO age and R&D is negative and significant, the correlation between CEO age and capital expenditure is negative and significant and correlation between CEO age and retained earnings is positive and significant. The results in panel A, B and C suggest that CEO age can be a good proxy for managerial myopia.

One obvious question which comes to mind is that how this negative correlation between CEO age and R&D expenditure and CEO age and capital expenditure is not observed by the market. It may be the case that this negative correlation is more prevalent in those firms with weaker monitoring mechanisms. Institutional investors serve as outside monitors for the firms. Higher is the percentage of institutional investors, greater should be the monitoring activities and lower should be the correlation between CEO age and capital expenditure, R&D and retained earnings. I report the results in panel D. The firms are divided into 5 groups based on the percentage of institutional investors. Group 1 has the firms with lowest percentage of institutional investors and group 5 has the firms with the highest percentage of institutional investors. Correlation between CEO age and industry and firm age adjusted R&D expenditure is -0.115 for group 1, -0.156 for group 2 but is lower for group 4 (-0.042) and group 5(-0.091). Correlation between CEO age and

industry and firm age adjusted capital expenditure is as high as -0.154 for group 1 but goes down to -0.095 for group 5. Correlation between CEO age and industry and firm age adjusted retained earnings is as high as 0.152 for group 1 and falls to 0.095 for group 5. The absolute values of correlations are higher for firms with low percentage of institutional investors but are lower for firms with high percentage of institutional investors. This result supports my intuition that absolute value of correlation between CEO age and R&D, CEO age and capital expenditure and CEO age and retained earnings may be higher for firms with lower monitoring compared to the firms with higher monitoring.

In panel E, dispersion of analyst forecast about EPS is used as a measure of information asymmetry about the firm. Less is the information asymmetry about the firm, lower should be the analyst forecast dispersion and hence it is less likely that negative correlation between CEO age and R&D expenditure and negative correlation between CEO age and capital expenditure will go unnoticed. Firms are divided into 5 groups based on the analyst dispersion measure. Group 1 consists of the firms with lowest two deciles of analyst forecasts. These are the firms with most transparency, most monitoring activity and least asymmetric information problem. I expect that any negative correlation between CEO age and R&D expenditure to be easily detected in this category of firms and rectified quickly. In accordance to my intuition, the negative correlation between R&D expenditure and CEO age is absent in firms of group 1. Group 5 consists of firms with largest analyst dispersion and with highest information asymmetry problem. So it is more likely that the negative correlation between R&D expenditure and CEO age will persist in this category of firms. Supporting this view, the negative correlation between R&D and CEO age is as high as -0.151 and statistically significant in firms of group 5.

The results for capital expenditure are less clear. There is no clear trend of negative correlation between capital expenditure and CEO age across the 5 groups. For retained earnings, again there is no clear trend of increase of positive correlation as one move from group 1 to group 5. But it should be noted that the positive correlation between retained earnings and CEO age is higher for group 5 compared to group 1, which supports my intuition.

The managers invest in both tangible and intangible assets. Edmans (2011) suggests that the outside investors know the level of tangible investments but do not know the level of intangible investments because of the "invisibility" of intangible assets. Some of the intangible assets are hard to measure. I use the data definition from Kaplan and Zingales (1997). Investment is COMPUSTAT item 128, which is capital expenditure. Clearly, I have left out the hard to measure "invisible" investments from my definition of investments because I do not know their values. Myopic managers tend to divert resources from these hard to measure assets to boost current earnings. Hence, by leaving out these intangible assets from the measure of investments, my estimates of the coefficient of the interaction term of myopia and Tobin's Q and the coefficient of the interaction term of myopia and cash flow are conservative in nature. If I could have included the "invisible" investments in my measure of investments, these coefficients of interaction terms would have been much stronger and my results even better than what I report here.

There is a considerable literature on what are the variables that affect investments. Following Hovakimian (2009), I control for sales growth, firm size, firm age, leverage, and asset tangibility, dummy for bond rating, dividend payout and financial slack. I now turn to testing hypotheses 1-4 developed in section 2.

B. Tests of hypothesis 1 and 2:

I have a panel dataset. I estimate a standard panel data regression where firm investment is the dependent variable and Tobin's Q, cash flow and other control variables are the independent variables. I include firm fixed effect and time fixed effect. To test hypothesis 1 and 2, I interact Tobin's Q and cash flow variables with a proxy for managerial myopia. I expect these two interaction terms to be negative and significant. I therefore estimate the following regression.

$$\frac{I_{it}}{K_{it-1}} = \beta_0 + \beta_1 Q_{it} + \beta_2 \frac{CF_{it}}{K_{it-1}} + f(controls) + \theta_{it} Myopia_i * Q_{it} +$$

$$\rho_{it} Myopia_i * \frac{CF_{it}}{K_{it-1}} + \varepsilon_{it} \quad (19)$$

i represents a firm and t represents time. The results are documented in table 2.

[Insert Table II here]

The first column in table 2 is the standard investment regression model used in the literature. All the variables in table 2 are standardized so that mean is 0 and standard deviation is 1. CEO age is my primary proxy for managerial myopia. In the third column, I include interaction terms of CEO age with Tobin's Q and CEO age with cash flow. In the fourth column, I include both the CEO age and the two interaction terms. If hypothesis 1 is correct, I expect the coefficient of interaction of CEO age and Tobin's Q to be negative and statistically significant, which is what I observe. Coefficient of Tobin's Q CEO age interaction term is -0.012 and is statistically significant with a t stat of -5.03. This provides evidence in support of hypothesis 1. If hypothesis 2 is correct, the coefficient of interaction term of CEO age and cash flow will be negative and statistically significant, which is what I document in column 4. Coefficient on CEO age and cash

flow interaction is -0.008 and is statistically significant with a t stat of -3.01 lending support for hypothesis 2.

All the variables are standardized[2]. The coefficient of Tobin's Q in column 4 of table 2 is 0.034. So if there is one standard deviation increase in CEO age, the coefficient of Tobin's Q decreases by 35.29% (-0.012/ 0.034). If the CEO age increases by the magnitude of two standard deviations, the coefficient of Tobin's Q decreases by 70.58% (-0.024/ 0.034). Coefficient of Q captures the increase in investments when faced with one unit increase in growth opportunities. My results suggest that when faced with one unit increase in growth opportunities, there is a 35.29% (70.58%) drop in the increase in investments when there is one(two) standard deviation increase in CEO age. This result clearly has huge economic impact as firms deviate from optimal investments as CEO becomes older. Firms give up as much as 33.33% (66.66%) investments if there is one (two) standard deviation increase in CEO age.

The coefficient of cash flow in column 4 of table 2 is 0.098. So if there is one standard deviation increase in CEO age, the coefficient of cash flow decreases by 8.16% (-0.008/ 0.098). If the CEO age changes by two standard deviations, the coefficient of cash flow decreases by 16.32% (-0.016/ 0.098). My results indicate that faced with one dollar increase in cash flow, there is a 8.16% (16.32%) drop in the increase in investments when there is one(two) standard deviation increase in CEO age. The drop in the increase in investments indicates that the firms deviate from their optimal investments when CEO becomes older.

The second measure of myopia is the negative of the percentage of shares owned by the CEO. Given the fact that most of the stocks owned by the CEOs cannot be sold

[2] I also estimate all my regressions without standardizing the variables. The results are qualitatively similar.

right away, more is the stock ownership of the managers, less is the incentive of the managers to act myopically. NegOwnership is negative of the percentage of shares owned by the manager. Higher is the value of NegOwnership, greater is the tendency of the managers to act myopically. In column 5 of table 2, I report that the coefficient of the interaction term of NegOwnership and Tobin's Q is negative and significant -0.010 (t stat value is -3.22) providing evidence in support of hypothesis 1. If there is one standard deviation increase in NegOwnership, investment Q sensitivity decreases by 30.30% (-0.010/0.33). Using the same logic as above, I argue that this indicates significant deviation from optimal investments, which is also economically significant.

Investment cash flow sensitivity can be regarded as a symptom of underinvestment caused by inflated external cost. Capital market imperfections result in higher cost of borrowing leading to lower amount of investment by the firms. The firms will invest less than what they would have invested if there were no capital market imperfections. Another view is that instead of external funds being too much expensive, the internal fund is too cheap leading the managers to over invest (Jensen 1986). If the managerial stock holding increases, their interests become more aligned with the shareholder's interest. The managers have less incentive to waste cash leading to a lowering of investment cash flow sensitivity. But if one believes in the underinvestment story, as the managerial stock holding increases, the managers will be more reliant on internal funds leading to an increase in the investment cash flow sensitivity. Hadlock (1998) found out that the investment-cash flow sensitivity increases as the managerial stock holding increases. This relationship reverses at higher levels of managerial stock holding. Investment cash flow sensitivity increases, up to a certain level of managerial holding (5 percent of total stock) and when managerial holding is beyond 5 percent,

investment cash flow sensitivity decreases as managerial ownership increases. He provided an agency based explanation of this empirical fact. His result is consistent with the underinvestment story of cash flow sensitivity stated above.

Interaction of NegOwnership and cash flow in column 5 is zero and insignificant seemingly rejecting hypothesis 2. But I have to interpret this rejection in light of overinvestment interpretation and underinvestment interpretation of investment cash flow sensitivity. I find support for Hadlock's results in column 6. NegOwnershipL5 is -min (5, percentage of shares owned by manager). NegOwnershipG5 is -max (0, percentage of shares owned by manager -5). NegOwnershipL5 captures stock holding of CEO up to 5 percent of the total stock. If a CEO owns stocks above 5 percent of total stock, NegOwnershipL5 will be -5. NegOwnershipG5 will capture the magnitude of stock holding above 5 percent. Interaction term of cash flow and NegOwnershipL5 is negative -0.015 and significant whereas the coefficient of the interaction term of cash flow and NegOwnershipG5 is positive 0.005 and significant. This is consistent with Hadlock's results. Coefficient of the NegOwnershipL5 and cash flow is negative and significant supporting hypothesis 2. It can be interpreted as long as the stock holding of the CEOs are below 5 percent, the CEO act myopically and investment cash flow sensitivity falls supporting hypothesis 2. But the reader should be aware that there can be some agency based explanation of this result as has been pointed out by Hadlock (1998). Similarly, the coefficient of the interaction term of cash flow and NegOwnershipG5 is positive and significant which is consistent with Hadlock's results but does not support hypothesis 2. It may be the case that if the managers hold significant percentage of company shares (more than 5%), any change in stock holding of the managers may not reflect upon the myopic behavior by the managers.

The overall inference I draw from table 2 suggest that there is evidence that myopia leads to lowering of investment cash flow sensitivity and lowering of investment Tobin's Q sensitivity.

C. Tests of hypothesis 3

C.1 Investors' irrationality

Until now, I have assumed that the managers and investors are rational. In other words, I have assumed that the stock price reflects the true value of the stock and there is no problem of mispricing. But this assumption is a bit farfetched as the literature has provided evidence suggesting that the stock price is often over valued or undervalued. One problem with table II is that I have assumed that Tobin's captures the true growth opportunities of the firm. It may be the case that Tobin's Q not only captures the growth opportunity but also the misvaluation of the firm's equity. In that case, even if the coefficient of interaction term between myopia with Tobin's Q is negative and significant, one cannot reliably infer that it is truly capturing the lowering of investment sensitivity with respect to the firm's growth opportunities. I use a new measure of misvaluation based on residual income model as used by Dong, Hirshleifer, Teoh (2007) which is discussed in Appendix A2. Introduction of this new term as an independent variable will control for the misvaluation of the firm. I will be able to disentangle the effect of misvaluation from Tobin's Q.

My new regression setup will be given by

$$\frac{I_{it}}{K_{it-1}} = \beta_0 + \beta_1 Q_{it} + \beta_2 \frac{CF_{it}}{K_{it-1}} + \beta_3 MisValuation + f(controls) + \theta_{it} Myopia_i * Q_{it}$$

$$+\rho_{it} Myopia_i \frac{CF_{it}}{K_{it-1}} + \varepsilon_{it} \quad (20)$$

If Hypothesis 3 is true, θ_{it} will be negative and significant. After I have controlled for misvaluation, I can assume that Tobin's Q captures true growth opportunities. Hence, I can infer that if θ_{it} is negative and significant, investment sensitivity to true growth opportunities is lower for firms with myopic managers.

[Insert Table III]

Table 3 reports the results of the regression setup of equation 20. The results with CEO age as the proxy for managerial myopia are reported in column 4 of table 3. After I include the misvaluation term, the interaction term of Tobin's Q and CEO age is still negative and significant supporting hypothesis 3. CEO age is the main proxy for managerial myopia. The decrease in investment Q sensitivity is also economically significant. If the CEO age increases in the magnitude of one standard deviation, the coefficient of Tobin's Q decreases 40.54%(-0.015/ 0.037). If the CEO age increases in the magnitude of two standard deviations, the coefficient of Tobin's Q decreases by 81.08% (-0.030/ 0.037). My results suggest that after controlling for mispricing in Q, when faced with one unit increase in growth opportunities, there is a 40.54%(81.08%) drop in the increase in investments if there is one(two) standard deviation increase in CEO age. This point to huge deviation from optimal investments as CEO becomes older. But the interaction term of cash flow with CEO age is positive but insignificant, which is contrary to what to hypothesis 2 suggests. Further, there is evidence that investment cash flow sensitivity is lower for myopic managers when negative of shares owned is used as a proxy for myopia (column 5, 6 and 7). Coefficient of Tobin's Q x NegOwnershipL5 is -0.013(-0.012) and statistically significant in column 5(6). Coefficient of the interaction term of cash flow x NegOwnsershipL5 is also negative and significant (columns 6 and 7).

The results reported in table 3 strongly support hypothesis 3 even though the results are mixed for hypothesis 2.

Results in this table depend crucially on the measure of mispricing. It may be possible the mispricing measure is not capturing the true mispricing of the firm. As a result, I test hypothesis 3 using another measure of mispricing which depends not on investor irrationality but on managerial irrationality.

C.2 Managerial irrationality

Still now, I have assumed that the managers are rational. But it may be the case that the managers are irrational. It may be the case that the managers perceive that the stocks are overvalued or undervalued, may be the managers are too optimistic about their firms. In table IV, I incorporate a measure of managerial optimism in my regression setup. I define managerial optimism as inmonex/optionVal, where inmonex is the value of unexercised exercisable options of the managers and optionVal is the total value of the options. I explain this measure of managerial optimism in Appendix A3. The reasoning behind this measure is that if the managers are optimistic about their firms' stock and believe that the stock is under priced, then the managers will not exercise their own stock options even though the options are in the money and exercisable. Hence, this measure of managerial optimism captures the managerial perception that their stock is undervalued.

$$\frac{\tilde{I}_{it}}{K_{it-1}} = \beta_0 + \beta_1 Q_{it} + \beta_2 \frac{CF_{it}}{K_{it-1}} + \beta_3 Optimism + f(controls) + \theta_{it} Myopia_i * Q_{it}$$

$$+\rho_{it} Myopia_i \frac{CF_{it}}{K_{it-1}} + \varepsilon_{it} \qquad (21)$$

If Hypothesis 3 is true, θ_{it} will be negative and significant.

[Insert Table IV here]

Table IV reports the results of regression setup of equation 21. In the second column, I use CEO age which is my primary measure of managerial myopia. In columns 3 and 4, the coefficient of the interaction term, CEO age with Tobin's Q, is negative and significant supporting hypothesis 3. Further, the interaction term of CEO age and cash flow is negative and significant providing evidence for hypothesis 2. When I use negative of shares owned by the manager as another measure of myopia (column 5,6 and 7 of table 4), the interaction of Tobin's Q and NegOwnership is negative and significant, supporting hypothesis 3.

The coefficients of the interaction terms of CEO age and Tobin's Q and interaction term between CEO age and cash flow are negative and significant, even after controlling for mispricing using two different measures of mispricing. The results in tables III and IV suggest that even after I control for misvaluation in Q, there is strong evidence of lowering of investment Tobin's Q sensitivity and investment cash flow sensitivity.

D. Tests of hypothesis 4: corporate governance

Given that empirical evidence suggests that the managers can act myopically, the next logical question is why the managers are allowed to act myopically. I report that myopic behavior is more prevalent in those firms where the corporate governance mechanisms are weak. I use two corporate governance measures namely, stock holding by institutional investors and pay performance sensitivity of managerial compensation.

I use a measure of corporate governance, namely percentage of shares held by the institutional investors. Higher is the percentage of shares held by the institutional investors, better should be the monitoring mechanism of the managers and hence it would

be more difficult for the managers to act myopically. For each industry, I calculate the industry median percentage of institutional shareholding, industry being defined by the three digits SIC code. If a firm's percentage of institutional shareholding is greater (lower) than the industry median, the firm is a high (low) institutional holding firm.

[Insert Table V here]

I document the results in table V. Column 1 documents the lowering of investment Tobin's Q and investment cash flow sensitivity for all the firms. Both the interaction terms, interaction of CEO age with Tobin's Q and CEO age with cash flow are negative and both economically and statistically significant. In column 2, I report the results for the high institutional investors firms. These firms have better monitoring mechanisms and the managers would not be able to get away with myopic behavior. This is what I document. The coefficient of cash flow with CEO age is not statistically significant. Further, the interaction term of Tobin's Q with CEO age is barely significant at 10 percent level. In column 3, the results for the low institutional investors holding firms are reported. These firms have lower monitoring mechanism giving the opportunity to the managers to act myopically. The interaction terms of Tobin's Q with CEO age and cash flow with CEO age are both negative and statistically significant. Comparing column 2 and 3, the absolute values of the interaction terms of Tobin's Q with CEO age and cash flow with CEO age are lower for the high institutional investors firms as compared to the low institutional investors firms. This suggests that the managers of the high institutional investors holding firms are less myopic compared to the managers of low institutional investors holding firms, which is in line with hypothesis 4. In column 4, I introduce two interaction terms, Tobin's Q with CEO age with percentage of shareholding of the institutional shareholders, and cash flow with CEO age with percentage of shareholding

of the institutional investors. The interaction term of Tobin's Q with CEO age with percentage of shareholding of institutional shareholders is positive (0.005) and significant suggesting that the lowering of investment Tobin's Q sensitivity is mitigated as the percentage of shareholding by institutional investors increase. As the percentage of shareholding of the institutional investors increase, the propensity of the managers to behave myopically reduces. Evidence of table V seems to support hypothesis 4 and confirm my intuition that the managers of firms with weaker corporate governance mechanisms are able to act more myopically compared to managers of firms with stronger corporate governance mechanisms.

Finally, I use pay performance sensitivity as a measure of corporate governance to test if better corporate governance reduces managerial myopia and report the results in table VI.

[Insert Table VI]

Higher the pay performance sensitivity more is the incentive for the managers to inflate stock prices of the firms and act myopically. Hence, managers of firms with high pay performance sensitivity should act more myopically compared to the firms with lower pay performance sensitivity. Firms are divided into deciles based on pay performance sensitivity. I use Aggarwal and Samwick (1999) to calculate the pay performance sensitivity. See Appendix A2 for more details. I divide firms into top 3 and bottom 3 deciles based on pay performance sensitivity. As reported in column 1 of table VI, firms in top three deciles based on pay performance sensitivity act myopically given that the coefficients of the interaction term of Tobin's Q and CEO age and the interaction term of cash flow and CEO age are both negative and statistically significant. As documented in column 2, the coefficient for the interaction term of Tobin's Q and CEO age for the

bottom three deciles firms based on pay performance sensitivity is zero and statistically insignificant suggesting that CEOs of these firms do not behave myopically. But the interaction term of cash flow and CEO age is negative and statistically significant for the firms with lower pay performance sensitivity. In order to investigate if the interaction terms of Tobin's Q with CEO age and cash flow with CEO age increase in magnitude with increase in pay performance sensitivity, I introduce the interaction term of Tobin's Q with CEO age with pay performance sensitivity and the interaction term of cash flow with CEO age with pay performance sensitivity (column 3). It is documented that both these interaction terms are negative and statistically significant providing evidence that as pay performance sensitivity of CEO compensation increases, the CEOs act more myopically, supporting hypothesis 4. This call into question how good is pay performance sensitivity as a measure of corporate governance as higher pay performance sensitivity induces managers to act more myopically.

Based on measures like percentage of shareholding by institutional investors and pay performance sensitivity, I conclude that there is sufficient evidence to suggest that managerial myopic behavior is prevalent in those firms with weaker governance mechanisms thereby providing support for hypothesis 4.

IV. Robustness tests

As a part of the robustness check, I perform a number of robustness tests. First, I deflate investment and cash flow by assets. The results are presented in table VII.

[Insert Table VII]

The interaction terms of Q and CEO age is negative and significant even though the interaction term of cash flow and CEO age is not. Lowering of investment Tobin's Q

sensitivity and investment cash flow sensitivity holds true if I use NegOwnership as a proxy for myopia.

I further use a different measure of investment. Investment is defined as the sum of capital expenditure and research and development expenditure. Both investment and cash flow is deflated by PP&E, at the beginning of the fiscal year. I report the results in table VIII.

[Insert Table VIII here]

Again, the interaction term of Tobin's Q and CEO age is negative and significant even though the interaction term of cash flow and CEO age is not negative and significant. If I use NegOwnership as a measure of managerial myopia, there is support for both lowering of investment Tobin's Q sensitivity and investment cash flow sensitivity[3].

I can infer that my results of lowering of investment Tobin's Q sensitivity and lowering of investment cash flow sensitivity due to myopia are not applicable only to some specific definition of investment and cash flow. I obtain similar results when I define investment differently and when I deflate investment and cash flow by asset, instead of PP&E. The results in tables VII and VIII serve as robustness checks for my main results documented in table II. Overall, there is strong support for hypothesis 1 even though the results for hypothesis 2 are somewhat mixed.

V. Conclusion

In this paper, I provide an alternative methodology for testing managerial myopia. A myopic manager is expected to invest sub optimally, diverting resources from the long-

[3] If I use a new definition of investment, investment being the sum of COMPUSTAT item 260 plus item 261 plus item 263 plus item 264 plus item 265 plus item 266, the results hold good. I do not report the results with this new definition of investment and are available upon request.

term value maximizing projects to short-term share price maximizing projects. Given the difficulty in separating long-term and short-term investments and measuring the optimal level of investment, it is difficult to test overinvestment in short-term and underinvestment in long-term projects. Further, looking at the total investment level is not a viable way of measuring managerial myopia because one does not observe where the managers could have invested and did not invest. Also, there is the problem of invisibility of intangible investments. I argue that instead of measuring investments at level, looking at the change in the investment in face of incremental growth opportunity and incremental cash flow can serve as a better method of capturing managerial myopia. I provide theoretical justification of lowering of investment cash flow sensitivity and lowering of investment Tobin's Q sensitivity due to managerial myopia. I show empirically that investment cash flow sensitivity and investment Tobin's Q sensitivity is indeed reduced in presence of managerial myopia. My main proxy for managerial myopia is CEO age. My results indicate that when faced with one unit increase in growth opportunities, there is a 35.29% (70.58%) drop in the increase in investments when there is one (two) standard deviation increase in CEO age. I show that when faced with one dollar increase in cash flow, there is a 8.16% (16.32%) drop in the increase in investments when there is one(two) standard deviation increase in CEO age. Thus, I document evidence that firms with myopic managers divert from optimal investments. Further, I report that the managers can get away with suboptimal investment due to weaker corporate governance. Myopic behavior is more prevalent in firms with weaker corporate governance mechanisms. This calls for better governance of firms as managerial myopia result in suboptimal investment strategies which are detrimental to the long-term value maximization of the firms.

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Appendix A1

The various data definitions are as follows:

Sales are Data 12 from COMPUTSTAT. Research and Development is Data 46 in COMPUSTAT and it is normalized by either sales or assets (Data 6). PPE (Plant Property and Equipment) is defined as Data 30 which is annual capital expenditure to PPE divided by Total PPE at year t-1. Capex is defined as Capital Expenditure Data 128 divided by assets at year t-1. ROE is calculated as the ratio of net income (data172) in year t by book value (data60) in year t-1. ROA is calculated as the net income in year t divided by asset (data6) in year t-1. Data 58 is earnings per share. The EPS is data58. Retained Earnings is data36. Retained earnings ratio here is the ratio of data36 to data6.

For the investment cash flow Tobin's regression, I use the data definition from Kaplan and Zingales 1997. Investment is COMPUSTAT 128. Cash flow is the sum of earnings before extraordinary items, item 14, and depreciation, item 18. Both investment and cash flow is deflated by capital, which is net property, plant and equipment, item 8, at the beginning of the fiscal year. Tobin's Q is the market value of asset divided by the book value of asset. Market Value of asset is the sum of the book value of asset and market value of equity minus the sum of the book value of common equity item 60 and balance sheet deferred taxes item 74. Market value of equity is the product of data25 and data199. Asset tangibility is defined as the book value of a firm's net fixed capital (item 8) divided by the total assets (item 6). A dummy variable is used for bond ratings. If a firm has a rating of BBB- or higher by the Standard and Poor's, the dummy is set to one. Leverage may also affect firm investment. Low leverage increases the firm's ability to raise more external financing. Leverage is defined as the sum of long term debt (item 9) and short term debt (item 34) divided by the total assets (item 6). Dividend payout has been a

common proxy for financial constraint. Further, low dividend paying firms may be those firms who have higher growth opportunities and may want to invest more. Dividend payout ratio is defined as the cash dividend paid (item 127) to net income (item 172). Slack is defined as the sum of (data item 1 + 0.7*data item2 + 0.5*data item 3 – data item 44) divided by lag PP&E.

I use CRSP database to calculate the firm beta. The annualized cost of equity is calculated using CAPM. I define industry by the three digit industry code.

I use RiskMetrics database (formerly IRRC) for corporate governance measures. I use three corporate governance measures, Gompers, Metrick, Ishii corporate governance index and the percentage of shareholding by institution investors, pay performance sensitivity of CEO compensation and managerial Ownership

I get executive compensation data from ExecuComp. Main myopia variable is CEO age. NegOwnership is - percentage of shares owned by CEO. NegOwnershipL5 is -min (5, percentage of shares owned by manager). NegOwnershipG5 is -max (0, percentage of shares owned by manager -5). Myopia1 and NegOwnership are without winsorising. Percentage of shares owned by executives is defined as shrown divided by shrsout divided by 10. Shrsout is the common shares outstanding. Shrown is the shares owned by the executive. I get forecasted EPS from the I/B/E/S database. Using the methodology defined in the above section, I calculate the intrinsic value of the firm and the over valuation of the firm. Managerial Optimism is defined as inmonex divided by optionVal. Inmonex is the unexercised exercisable options. optionVal is the total value of options in managerial compensation. The basic intuition is that if the manager is optimistic about his company, then he is not going to exercise his option. Holding in-the-money options is a good proxy for managerial optimism as introduced in the literature by Malmendier and

Tate (2004). I calculate the value of old options as the sum of INMONEX and INMONUN. INMONEX is the value of the unexercised exercisable options. INMONUN is the value of unexercised unexercisable options. The new options are defined as BLK-VALU, which the value of new options granted in ExecuComp. Total option value is the sum of old options and new options.

Following Agarwal and Samwick (1999), CEO compensation is composed of three components : flow compensation, the change in the value of stock holding and the change in the value of stock options. Flow compensation is easily calculated as TDC1, which is available from ExecuComp. TDC1 is composed of salary, bonus, and total value of stock options, long-term incentive payouts, other annual compensation and all other, as is defined in ExecuComp manual. The change in the value of stock holding is defined as the percentage of stocks held by the CEO at the beginning of the fiscal year multiplied by shareholder dollar return. Total returns to shareholders are reported in ExecuComp in percentages. The dollar return is defined as the percentage total return multiplied by the market value of the firm at the beginning of the fiscal year. Once I have the dollar return to shareholder, I can calculate the change in the value of stock holding. The change in the value of stock options is a bit difficult to calculate. I calculate the value of old options as the sum of INMONEX and INMONUN. INMONEX is the value of the unexercised exercisable options. INMONUN is the value of unexercised unexercisable options. The new options are defined as BLK-VALU, which the value of new options granted in ExecuComp. Total option value is the sum of old options and new options. Change in the option value is the value of the option in year t minus the value of the option in year t-1. The total value of CEO's compensation package is defined as the sum of the flow compensation, the change in the value of stock holding and the change in the value of

stock options. The variance of preceding five years stock returns is termed as variance and is used a proxy for stock's risk. I calculate CEO tenure using BECAMECEO from ExecuComp, which gives us the date an individual has become the CEO. CEO tenure acts a proxy for her abilities when I run pay performance sensitivity regressions.

Appendix A2

Estimation of Misvaluation and Investor Irrationality:

I use the Residual Income Model to calculate the intrinsic value of a firm's equity. This procedure has been used in Lee, Myers and Swaminathan (1999) and more recently by Dong, Hirshleifer and Teoh (2007). The intrinsic value of the firm's equity can be expressed as the summation of the book value and the discounted value of an infinite sum of expected residual incomes.

$$V(t) = B(t) + \sum_{i=1}^{\infty} \frac{E_t[[ROE(t+i) - r_e(t)]B(t+i-1)]}{(1+r_e(t))^t}$$

where *B(t)* is the book value of equity at time *t*, $r_e(t)$ is the firm's annualized cost of equity capital and *ROE(t+i)* is the return on equity for period *t+i*.

I use a three-period forecast horizon:

$$V(t) = B(t) + \frac{[f^{ROE}(t+1) - r_e(t)]B(t)}{1+r_e(t)} + \frac{[f^{ROE}(t+2) - r_e(t)]B(t+1)}{(1+r_e(t))^2} + \frac{[f^{ROE}(t+3) - r_e(t)]B(t+2)}{(1+r_e(t))^2 r_e(t)}$$

where I assume that the forecasted value for year 3 continues in perpetuity. This is the exact procedure by Dong, Hirshleifer and Teoh (2007) to calculate the intrinsic value of the firm's equity.

The forecasted ROE are computed from the forecasted EPS, using the formula below.

$$f^{ROE}(t+i) = \frac{f^{EPS}(t+i)}{\bar{B}(t+i-1)}$$

where I calculate $\bar{B}(t+i-1)$ as

$$\bar{B}(t+i-1) = \frac{B(t+i-1) + B(t+i-2)}{2}$$

Further, *B(t+ i)* is calculated as follows

$$B(t+i) = B(t+i-1) + (1-k)f^{EPS}(t+i)$$

where *k* is the dividend payout ratio given by

$$k = \frac{D(t)}{EPS(t)}$$

with *D (t)* being the dividend at period *t* and *EPS (t)* being the Earnings per Share in period *t*.

I calculate beta using CAPM and using the CAPM beta, I calculate the annualized cost of equity$r_e(t)$. Having calculated the intrinsic value of the firm's equity, I get a measure of misvaluation by dividing the market value of the equity of the firm by the intrinsic value of the equity of the firm.

$$Misvaluation = \frac{E}{V}$$

where *E* is the market value of equity and *V* is the intrinsic value of the firm's equity calculated above.

Appendix A3

Estimation of Misvaluation and Managerial Irrationality

In the previous subsection, the firms are not correctly priced because of irrational investors. Now I introduce irrational managers. I build a measure of managerial optimism. The idea is that the manager is more optimistic about her firm if she thinks that the firm is undervalued. Hence managerial optimism is a measure of undervaluation as perceived by the manager.

$$Optimism = \frac{inmonex}{optionVal * 100}$$

where inmonex is unexercised exercisable options. Inmonex is a variable in the ExecuComp database. OptionVal is the total value of options in managerial compensation. If the manager perceives that the stock is undervalued, the manager will not exercise her exercisable stock options believing that the stock is underpriced. In this case, the variable optimism is a proxy for managerial perception of undervaluation of the firm.

Table I
Descriptive statistics of mean firm level variables and correlation with CEO age

Research and development is data46 in COMPUSTAT. Sales are data12 and assets are data6. R&D is normalized by assets. Industry adjusted R&D by assets is defined as R&D by assets minus industry median R&D by assets, where industry is defined by three digits SIC code. Capital expenditure ratio is data30 at year t divided by book value of PP&E at year t-1. Industry adjusted capital expenditure ratio is capital expenditure ratio minus industry median capital expenditure ratio. Retained earnings are data36, which is normalized by assets. In panel A, B and C, the second entry below the firm level variables is the number of firms in that group. In panel A, B and C, correlation 1 is the correlation between the CEO age and the corresponding firm level variables. The second entry below correlation 1 is the corresponding p value. I are testing the difference of the firm characteristics variables between the firms managed by old CEOs, characterized by CEO above age of 65 and the firms managed by young CEO, age less than 40. t stat 1 is the t statistics for testing if the mean of the firm characteristics of firms managed by old CEOs is greater than mean of the firm characteristics of firms managed by young CEO. The second entry below t stat 1 is the corresponding p value. In panel C, D and E, I use industry and firm age adjusted firm characteristics variables. First the industry median is subtracted from the respective variables to obtain the industry adjusted variables. Second, the firms are divided into deciles based on firm age. Median value of each firm age decile is subtracted from the respective industry adjusted variables to create industry and firm age adjusted variables. In panel D (E), the firms are divided into 5 groups, based on the percentage of institutional investors (dispersion of analyst forecast of EPS). Group 1 has the lowest two deciles and group 5 has the highest two deciles. Group 1 in panel D (E) has the firms with lowest percentage of institutional investors (dispersion of analyst forecast of EPS). Group 5 in panel D (E) has the firms with highest percentage of institutional investors (dispersion of analyst forecast of EPS). In panels D and E, the first entry is the correlation between CEO age and industry and firm age adjusted performance variables. The second entry is the p value for testing if the corresponding correlation is 0 and the third entry is the number of firms.

		Ceo age							
	Full sample	Under 40	41- 50	51 - 60	61 - 65	66 - 70	Above 70	Correlation 1	t stat 1
Panel A: Raw characteristics									
R&D / Assets	0.048	0.084	0.061	0.046	0.037	0.039	0.039	-0.208	-6.74
	4 ,300	94	815	2 ,327	761	188	115	0	0
CAPEX / Assets	0.291	0.633	0.361	0.271	0.253	0.233	0.224	-0.119	-10.97
	6 ,914	138	1443	3 ,683	1 ,204	291	155	0	0
Retained Earnings / Assets	0.305	0.234	0.263	0.313	0.326	0.288	0.402	0.102	2.900
	4130	91	780	2240	729	180	110	0	0.0042
Panel B: Industry-adjusted characteristics									
R&D / Assets	0.006	0.015	0.011	0.005	0.002	-0.002	0	-0.114	-4.12
	4 ,300	94	815	2 ,327	761	188	115	0	0
CAPEX / Assets	-0.021	0.218	0.023	-0.036	-0.038	-0.07	-0.077	-0.077	-7.68
	6 ,914	138	1443	3 ,683	1 ,204	291	155	0	0
Retained Earnings / Assets	0.074	0.030	0.043	0.076	0.092	0.057	0.187	0.088	2.220
	4130	91	780	2240	729	180	110	0	0.028
Panel C: Industry and firm age adjusted characteristics									
R&D / Assets	0.005	0.014	0.010	0.005	0.001	-0.003	-0.001	-0.114	-2.93
	4 ,300	94	815	2 ,327	761	188	115	0	0.004
CAPEX / Assets	0.058	0.319	0.108	0.041	0.035	-0.289	0.006	-0.088	-4.92
	6902	138	1443	3674	1201	291	155	0	0
Retained Earnings / Assets	0.009	-0.021	-0.016	0.011	0.022	-0.012	0.116	0.071	1.99
	4130	91	780	2240	729	180	110	0	0.048

Table I(continued)

Panel D: 5 Groups based on percentage of institutional investor. Group 1 has the lowest two deciles .Group 5 has the highest 2 deciles.					
Correlation between Ceo age and	Group 1	Group 2	Group 3	Group 4	Group 5
Indus and firm age adjusted R&D/ Assets	-0.115	-0.156	-0.109	-0.042	-0.091
	0.000	0.000	0.001	0.190	0.005
	960	961	961	961	961
Indus and firm age adjusted CAPEX ./Assets	-0.154	-0.096	-0.068	-0.108	-0.095
	0.000	0.000	0.009	0.000	0.000
	1466	1467	1467	1467	1466
Indus. And firm age adjusted Retained Earnings/Assets	0.152	0.053	0.099	0.063	0.095
	0.000	0.103	0.002	0.051	0.003
	948	948	949	948	948
Panel E: 5 Groups based on dispersion of analyst forecast of EPS .Group 1 has the lowest two deciles while group 5 has the highest 2 deciles					
Correlation between Ceo age and	Group 1	Group 2	Group 3	Group 4	Group 5
Indus and firm age adjusted R&D /Assets	-0.052	-0.132	-0.078	-0.159	-0.151
	0.132	0.000	0.033	0.000	0.000
	854	818	755	772	656
Indus and firm age adjusted CAPEX/Assets	-0.136	-0.099	-0.127	-0.120	-0.081
	0.000	0.001	0.000	0.000	0.006
	1182	1177	1177	1180	1167
Indus. And firm age adjusted Retained Earnings /Assets	0.061	0.129	0.036	0.074	0.078
	0.037	0.000	0.217	0.010	0.007
	1188	1190	1190	1189	1189

Table II
Regression of investment on cash flow and Tobin's Q

The sample covers firms from COMPUSTAT from 1993 to 2004. Dependent variable is investment. Investment is capital expenditure. Cash flow is the sum of earnings before extraordinary items and depreciation. Both investment and cash flow are deflated by capital, which is net property, plant and equipment, at the beginning of the fiscal year. Tobin's Q is the market value of asset divided by the book value of asset. Market Value of asset is the sum of the book value of asset and market value of equity minus the sum of the book value of common equity and balance sheet deferred taxes. Market value of equity is the product of number of shares outstanding and price of the share at the fiscal year end. NegOwnership is - percentage of shares owned by CEO. NegOwnershipL5 is -min (5, percentage of shares owned by manager). NegOwnershipG5 is - max(0,percentage of shares owned by manager -5). Size is logarithm of the total assets Asset tangibility is defined as the book value of a firm's net fixed capital (item 8) divided by the total assets (item 6). A dummy variable is used for bond ratings. If a firm has a rating of BBB- or higher by the Standard and Poor's, the dummy is set to one. Leverage is defined as the sum of long term debt (item 9) and short term debt (item 34) divided by the total assets (item 6). Dividend payout ratio is defined as the cash dividend paid (item 127) to net income (item 172). Slack is defined as the sum of (data item 1 + 0.7*data item2 + 0.5*data item 3 – data item 44) divided by lag PP&E.
The data definition is from Kaplan and Zingales 1997. I control for firm age, firm size, asset tangibility, sales growth, and leverage, dummy for bond rating, dividend payout and financial slack. Regressions are estimated with firm fixed effects and time effects. The second entry is the corresponding t statistics. All the variables are standardized.

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Tobin's Q	0.036	0.036	0.034	0.034	0.033	0.033	0.035
	(11.41)	(11.39)	(10.94)	(10.91)	(10.43)	(10.55)	(10.90)
Cash flow	0.100	0.100	0.098	0.098	0.101	0.101	0.100
	(27.89)	(27.87)	(27.03)	(27.01)	(27.62)	(27.62)	(27.80)
Ceo age		-0.006		-0.006			
		(-1.82)		(-1.92)			
Tobin's Q × Ceo age			-0.012	-0.012			
			(-5.03)	(-5.05)			
Cash flow × Ceo age			-0.008	-0.008			
			(-3.01)	(-3.02)			
NegOwnership					-0.008	-0.009	
					(-1.53)	(-1.69)	
NegOwnershipL5							-0.009
							(-2.06)
NegOwnershipG5							0.001
							(0.16)
Tobin's Q × NegOwnership					-0.010	-0.009	
					(-3.22)	(-2.93)	
Tobin's Q × NegOwnershipL5							-0.005
							(-1.62)
Tobin's Q × NegOwnershipG5							-0.005
							(-1.48)
Cash flow × NegOwnership					0.000		
					(-0.12)		
Cash flow × NegOwnershipL5						-0.015	-0.008
						(-4.29)	(-2.62)
Cash flow × NegOwnershipG5						0.005	0.003
						(2.33)	(1.33)
Size	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	(2.06)	(2.24)	(2.32)	(2.52)	(2.49)	(2.49)	(2.38)
Firm age	-0.17	-0.17	-0.17	-0.18	-0.17	-0.17	-0.17
	(-8.64)	(-8.74)	(-8.76)	(-8.88)	(-8.54)	(-8.45)	(-8.46)
Bond rating	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	(-1.86)	(-1.92)	(-1.83)	(-1.9)	(-1.89)	(-1.95)	(-2.05)
Slack	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
	(-9.59)	(-9.57)	(-9.21)	(-9.18)	(-9.64)	(-9.5)	(-9.38)
Leverage	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(3.03)	(2.94)	(2.83)	(2.73)	(2.77)	(2.9)	(3.06)
Asset tangibility	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	(5.84)	(5.85)	(6.02)	(6.03)	(6.19)	(6.34)	(6.02)
Dividend payout ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(-0.09)	(-0.12)	(-0.08)	(-0.11)	(-0.1)	(-0.13)	(0.10)
Sales growth	0.03	0.03	0.03	0.03	0.04	0.04	0.03
	(12.30)	(12.24)	(12.34)	(12.28)	(12.71)	(12.73)	(12.08)
N	6846	6846	6846	6846	6767	6767	6846
R^2	0.629	0.630	0.633	0.633	0.633	0.635	0.631

Table III
Regression of investment on cash flow and Tobin's Q and misvaluation

The sample covers firms from COMPUSTAT from 1993 to 2004. Dependent variable is investment. Investment is capital expenditure. Cash flow is the sum of earnings before extraordinary items and depreciation. Both investment and cash flow are deflated by capital, which is net property, plant and equipment, at the beginning of the fiscal year. Tobin's Q is the market value of asset divided by the book value of asset. Market Value of asset is the sum of the book value of asset and market value of equity minus the sum of the book value of common equity and balance sheet deferred taxes. Market value of equity is the product of number of shares outstanding and price of the share at the fiscal year end. NegOwnership is - percentage of shares owned by CEO. NegOwnership is -percentage of shares owned by CEO. NegOwnershipL5 is -min (5, percentage of shares owned by manager). NegOwnershipG5 is - max (0, percentage of shares owned by manager -5). Size is logarithm of the total assets Asset tangibility is defined as the book value of a firm's net fixed capital (item 8) divided by the total assets (item 6). A dummy variable is used for bond ratings. If a firm has a rating of BBB- or higher by the Standard and Poor's, the dummy is set to one. Leverage is defined as the sum of long term debt (item 9) and short term debt (item 34) divided by the total assets (item 6). Dividend payout ratio is defined as the cash dividend paid (item 127) to net income (item 172). Slack is defined as the sum of (data item 1 + 0.7*data item2 + 0.5*data item 3 – data item 44) divided by lag PP&E.
The data definition is from Kaplan and Zingales 1997. Misvaluation measure is defined as the ratio of market value of equity to the intrinsic value of equity. I control for firm age, firm size, asset tangibility, sales growth, and leverage, dummy for bond rating, dividend payout and financial slack. Regressions are estimated with firm fixed effects and time effects. The second entry is the corresponding t statistics. All the variables are standardized.

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Tobin's Q	0.037	0.037	0.034	0.034	0.037	0.038	0.039
	(9.14)	(9.11)	(8.37)	(8.33)	(8.48)	(8.70)	(8.76)
Cash flow	0.118	0.118	0.117	0.117	0.128	0.132	0.132
	(23.26)	(23.24)	(23.12)	(23.10)	(22.12)	(22.45)	(22.45)
Misvaluation	0.015	0.015	0.014	0.014	0.014	0.014	0.014
	(4.76)	(4.76)	(4.50)	(4.50)	(3.81)	(3.97)	(3.97)
Ceo age		-0.006		-0.006			
		(-1.35)		(-1.45)			
Tobin's Q x Ceo age			-0.015	-0.015			
			(-4.51)	(-4.55)			
Cash flow x Ceo age			-0.004	-0.004			
			(-1.19)	(-1.16)			
NegOwnership					-0.006	-0.008	
					(-0.78)	(-0.98)	
NegOwnershipL5							-0.012
							(-1.51)
NegOwnershipG5							0.000
							(0.04)
Tobin's Q xNegOwnership					-0.013	-0.012	
					(-3.12)	(-2.86)	
Tobin's Q x NegOwnershipL5							-0.008
							(-1.65)
Tobin's Q x NegOwnershipG5							-0.006
							(-1.20)
Cash flow x NegOwnership					0.004		
					(1.19)		
Cash flow x NegOwnershipL5						-0.020	-0.018
						(-3.41)	(-3.08)
Cash flow x NegOwnershipG5						0.010	0.009
						(3.00)	(2.52)
Size	0.02	0.02	0.02	0.03	0.03	0.03	0.03
	(1.98)	(2.10)	(2.09)	(2.21)	(2.41)	(2.46)	(2.50)
Firm age	-0.14	-0.14	-0.14	-0.14	-0.17	-0.17	-0.16
	(-6.66)	(-6.81)	(-6.87)	(-6.91)	(-5.88)	(-5.83)	(-5.62)
Bond rating	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01
	(-0.33)	(-0.38)	(-0.31)	(-0.37)	(-1.22)	(-1.29)	(-1.37)
Slack	-0.05	-0.05	-0.04	-0.04	-0.05	-0.05	-0.05
	(-8.22)	(-8.21)	(-7.83)	(-7.81)	(-7.64)	(-7.39)	(-7.24)
Leverage	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(2.49)	(2.45)	(2.45)	(2.41)	(2.62)	(2.72)	(2.77)
Asset tangibility	0.04	0.04	0.04	0.04	0.05	0.05	0.05
	(6.02)	(6.02)	(6.26)	(6.26)	(6.31)	(6.45)	(6.47)
Dividend payout ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(-0.17)	(-0.2)	(-0.15)	(-0.18)	(-0.14)	(-0.13)	(-0.13)
Sales growth	0.03	0.03	0.03	0.03	0.04	0.04	0.04
	(10.35)	(10.34)	(10.31)	(10.3)	(9.84)	(9.9)	(9.88)
N	4863	4863	4863	4863	4295	4295	4295
R^2	0.636	0.636	0.638	0.639	0.652	0.653	0.654

Table IV
Regression of investment on cash flow and Tobin's Q and optimism

The sample covers firms from COMPUSTAT from 1993 to 2004. Dependent variable is investment. Investment is capital expenditure. Cash flow is the sum of earnings before extraordinary items and depreciation. Both investment and cash flow are deflated by capital, which is net property, plant and equipment, at the beginning of the fiscal year. Tobin's Q is the market value of asset divided by the book value of asset. Market Value of asset is the sum of the book value of asset and market value of equity minus the sum of the book value of common equity and balance sheet deferred taxes. Market value of equity is the product of number of shares outstanding and price of the share at the fiscal year end. NegOwnership is - percentage of shares owned by CEO. NegOwnership is -percentage of shares owned by CEO. NegOwnershipL5 is -min (5, percentage of shares owned by manager). NegOwnershipG5 is - max (0, percentage of shares owned by manager -5). Size is logarithm of the total assets Asset tangibility is defined as the book value of a firm's net fixed capital (item 8) divided by the total assets (item 6). A dummy variable is used for bond ratings. If a firm has a rating of BBB- or higher by the Standard and Poor's, the dummy is set to one. Leverage is defined as the sum of long term debt (item 9) and short term debt (item 34) divided by the total assets (item 6). Dividend payout ratio is defined as the cash dividend paid (item 127) to net income (item 172). Slack is defined as the sum of (data item 1 + 0.7*data item2 + 0.5*data item 3 – data item 44) divided by lag PP&E.
The data definition is from Kaplan and Zingales 1997. Optimism is defined as the ratio of inmonex to optionVal. Inmonex is unexercised exercisable options and optionVal is the total value of options in managerial compensation. Managerial optimism is a measure of undervaluation as perceived by the manager. I control for firm age, firm size, asset tangibility, sales growth, leverage, dummy for bond rating, dividend payout and financial slack. Regressions are estimated with firm fixed effects and time effects. The second entry is the corresponding t statistics.

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Tobin's Q	0.036	0.036	0.035	0.035	0.036	0.036	0.037
	(10.83)	(10.80)	(10.46)	(10.42)	(10.56)	(10.64)	(10.75)
Cash flow	0.097	0.097	0.095	0.095	0.097	0.097	0.097
	(26.04)	(26.03)	(25.33)	(25.33)	(25.70)	(25.72)	(25.63)
Optimism x 10^{-1}	-0.010	-0.004	-0.005	0.001	-0.013	-0.014	-0.016
	(-0.41)	(-0.16)	(-0.22)	(0.05)	(-0.50)	(-0.54)	(-0.65)
Ceo age		-0.005		-0.005			
		(-1.46)		(-1.57)			
Tobin's Q x Ceo age			-0.013	-0.013			
			(-5.16)	(-5.19)			
Cash flow x Ceo age			-0.007	-0.007			
			(-2.68)	(-2.68)			
NegOwnership					-0.012	-0.012	
					(-1.65)	(-1.78)	
NegOwnershipL5							-0.014
							(-2.47)
NegOwnershipG5							0.001
							(0.09)
Tobin's Q x NegOwnership					-0.016	-0.015	
					(-3.66)	(-3.38)	
Tobin's Q x NegOwnershipL5							0.002
							(0.60)
Tobin's Q x NegOwnershipG5							-0.020
							(-3.49)
Cash flow x NegOwnership					0.003		
					(1.30)		
Cash flow x NegOwnershipL5						-0.011	-0.012
						(-3.14)	(-3.32)
Cash flow x NegOwnershipG5						0.007	0.008
						(2.82)	(3.01)
Size	0.018	0.020	0.020	0.022	0.022	0.02	0.02
	(1.84)	(1.98)	(2.02)	(2.18)	(2.16)	(2.14)	(2.25)
Firm age	-0.170	-0.172	-0.170	-0.172	-0.167	-0.17	-0.16
	(-8.36)	(-8.43)	(-8.39)	(-8.47)	(-8.2)	(-8.12)	(-8.03)
Bond rating	-0.006	-0.006	-0.006	-0.006	-0.006	-0.01	-0.01
	(-1.71)	(-1.76)	(-1.73)	(-1.78)	(-1.71)	(-1.75)	(-1.77)
Slack	-0.039	-0.039	-0.037	-0.037	-0.039	-0.04	-0.04
	(-8.94)	(-8.92)	(-8.45)	(-8.43)	(-8.87)	(-8.72)	(-8.83)
Leverage	0.013	0.013	0.013	0.013	0.013	0.01	0.01
	(3.65)	(3.6)	(3.56)	(3.51)	(3.48)	(3.52)	(3.46)
Asset tangibility	0.030	0.030	0.031	0.031	0.032	0.03	0.03
	(5.82)	(5.85)	(6.06)	(6.09)	(6.21)	(6.3)	(6.4)
Dividend payout ratio	0.000	0.000	0.000	0.000	0.000	0.00	0.00
	(-0.07)	(-0.08)	(-0.09)	(-0.1)	(-0.06)	(-0.09)	(-0.13)
Sales growth	0.032	0.032	0.032	0.032	0.036	0.04	0.04
	(11.90)	(11.84)	(11.87)	(11.81)	(12.23)	(12.28)	(12.27)
N	6262	6262	6262	6262	6200	6200	6200
R^2	0.638	0.638	0.642	0.642	0.642	0.643	0.644

Table V
Effect of corporate governance on myopia. Corporate governance measure is percentage of stock holding by institutional investors

The variable Inst_Holdings is the percentage of stock holdings by the institutional investors. Higher is the institutional holding, better is the corporate governance. I divide my sample of firms into lower Inst_Holdings firms and higher Inst_Holdings firms. I define industry by 2 digits SIC code. For each firm, I calculate the median Inst_Holdings for that industry. If a firm is above (below) the median industry Inst_Holdings, I call the firm high (low) Inst_Holdings firm. Higher Inst_Holdings firms have greater monitoring and hence have stronger corporate governance.

Dependent variable is investment. Investment is capital expenditure. Cash flow is the sum of earnings before extraordinary items and depreciation. Both investment and cash flow are deflated by capital, which is net property, plant and equipment, at the beginning of the fiscal year. Tobin's Q is the market value of asset divided by the book value of asset. Market Value of asset is the sum of the book value of asset and market value of equity minus the sum of the book value of common equity and balance sheet deferred taxes. Market value of equity is the product of number of shares outstanding and price of the share at the fiscal year end. Size is logarithm of the total assets Asset tangibility is defined as the book value of a firm's net fixed capital (item 8) divided by the total assets (item 6). A dummy variable is used for bond ratings. If a firm has a rating of BBB- or higher by the Standard and Poor's, the dummy is set to one. Leverage is defined as the sum of long term debt (item 9) and short term debt (item 34) divided by the total assets (item 6). Dividend payout ratio is defined as the cash dividend paid (item 127) to net income (item 172). Slack is defined as the sum of (data item 1 + 0.7*data item2 + 0.5*data item 3 – data item 44) divided by lag PP&E.

The data definition is from Kaplan and Zingales 1997. I control for firm age, firm size, asset tangibility, sales growth, leverage, dummy for bond rating, dividend payout and financial slack. Regressions are estimated with firm fixed effects and time effects. The second entry is the corresponding t statistics.

Variables	All Firms	High Inst Holding Firms	Low Inst Holding Firms	All Firms
Tobin's Q	0.040	0.027	0.058	0.041
	(10.80)	(5.04)	(10.05)	(10.90)
Cash flow	0.126	0.160	0.118	0.126
	(28.79)	(21.59)	(15.87)	(28.70)
Ceo age	-0.009	-0.007	-0.013	-0.009
	(-2.87)	(-1.67)	(-2.70)	(-2.97)
Tobin's Q x Ceo age	-0.009	-0.007	-0.012	-0.009
	(-3.45)	(-1.78)	(-2.80)	(-3.22)
Cash flow x Ceo age	-0.012	-0.001	-0.017	-0.012
	(-4.22)	(-0.14)	(-4.07)	(-4.21)
Tobin's Q x Ceo age x Inst_Holdings				0.005
				(2.75)
Cash flow x Ceo age x Inst_Holdings				0.003
				(1.01)
Size	0.019	0.009	0.068	0.018
	(1.68)	(0.57)	(3.51)	(1.61)
Firm age	-0.173	-0.169	-0.205	-0.172
	(-11.16)	(-7.65)	(-7.83)	(-11.06)
Bond rating	-0.006	0.001	-0.007	-0.005
	(1.50)	(0.20)	(1.00)	(-1.45)
Slack	-0.040	-0.059	-0.070	-0.040
	(-8.56)	(-8.23)	(-6.97)	(-8.5)
Leverage	0.012	0.024	0.004	0.011
	(2.94)	(4.39)	(0.6)	(2.91)
Asset tangibility	0.069	0.067	0.081	0.068
	(7.73)	(4.99)	(5.92)	(7.65)
Dividend payout ratio	0.000	0.000	0.000	0.000
	(-0.21)	(-0.07)	(-0.02)	(-0.20)
Sales growth	0.028	0.018	0.030	0.028
	(10.73)	(3.87)	(8.13)	(10.76)
N	6503	3239	3243	6503
R^2	0.713	0.778	0.772	0.713

Table VI
Effect of corporate governance on myopia. Pay performance sensitivity is the proxy for corporate governance

CEO compensation is composed of three components: flow compensation, the change in the value of stock holding and the change in the value of stock options. Flow compensation is easily calculated as TDC1, which is available from ExecuComp. TDC1 is composed of salary, bonus, and total value of stock options, long-term incentive payouts, other annual compensation and all other, as is defined in ExecuComp manual. The change in the value of stock holding is defined as the percentage of stocks held by the CEO at the beginning of the fiscal year multiplied by shareholder dollar return. Total return to shareholders is reported in ExecuComp in percentages. The dollar return is defined as the percentage total return multiplied by the market value of the firm at the beginning of the fiscal year. Once I have the dollar return to shareholder, I can calculate the change in the value of stock holding. The change in the value of stock options is a bit difficult to calculate. I calculate the value of old options as the sum of INMONEX and INMONUN. INMONEX is the value of the unexercised exercisable options. INMONUN is the value of unexercised unexercisable options. The new options are defined as BLK-VALU, which the value of new options granted in ExecuComp. Total option value is the sum of old options and new options. Change in the option value is the value of the option in year t minus the value of the option in year t-1. The total value of CEO's compensation package is defined as the sum of the flow compensation, the change in the value of stock holding and the change in the value of stock options. The variance of preceding five years stock returns is termed as variance and is used a proxy for stock's risk. I calculate CEO tenure using BECAMECEO from ExecuComp, which gives us the date an individual has become the CEO. CEO tenure acts a proxy for her abilities when I run pay performance sensitivity regressions.
The baseline regression, from Aggrawal and Samwick (1999) is

$$CeoComp = \beta_1 Ret + \beta_2 Ret * Tenure + \beta_3 Var + \beta_4 Size + \varepsilon$$

Ret is the total dollar return to the share holder. Variance is the variance of the preceding 5 year stock return of the firm. Variance captures the risk of the stock. Tenure is proxy for CEO's ability. Size is defined as log of assets, data6. Size captures the size effect, which is common in CEO compensation regression. The coefficient beta1 is the pay performance sensitivity of CEO compensation. Higher is the pay performance sensitivity, greater is the incentive to the CEO to boost the current share price and act myopically. Firms are divided into deciles based on pay performance sensitivity.

Dependent variable is investment. Investment is capital expenditure. Cash flow is the sum of earnings before extraordinary items and depreciation. Both investment and cash flow are deflated by capital, which is net property, plant and equipment, at the beginning of the fiscal year. Tobin's Q is the market value of asset divided by the book value of asset. Market Value of asset is the sum of the book value of asset and market value of equity minus the sum of the book value of common equity and balance sheet deferred taxes. Market value of equity is the product of number of shares outstanding and price of the share at the fiscal year end. Size is logarithm of the total assets Asset tangibility is defined as the book value of a firm's net fixed capital (item 8) divided by the total assets (item 6). A dummy variable is used for bond ratings. If a firm has a rating of BBB- or higher by the Standard and Poor's, the dummy is set to one. Leverage is defined as the sum of long term debt (item 9) and short term debt (item 34) divided by the total assets (item 6). Dividend payout ratio is defined as the cash dividend paid (item 127) to net income (item 172). Slack is defined as the sum of (data item 1 + 0.7*data item2 + 0.5*data item 3 – data item 44) divided by lag PP&E.

The data definition is from Kaplan and Zingales 1997. I control for firm age, firm size, asset tangibility, sales growth, leverage, dummy for bond rating, dividend payout and financial slack. Regressions are estimated with firm fixed effects and time effects. The second entry is the corresponding t statistics.

Variables	Top 3 deciles	Bottom 3 deciles	All Firms
Tobin's Q	0.027	0.044	0.032
	(4.66)	(5.15)	(9.66)
Cash flow	0.052	0.081	0.056
	(10.29)	(8.46)	(17.13)
Ceoage	0.004	-0.012	0.000
	(0.87)	(-2.16)	(0.10)
Tobin's Q x Ceoage	-0.014	0.001	-0.004
	(-3.11)	(0.27)	(-1.57)
Cash flow x Ceoage	-0.008	-0.013	-0.007
	(-2.20)	(-2.07)	(-2.61)
Tobin's Q x Ceoage x PayPeform			-0.008
			(-2.11)
Cash flow x Ceoage x PayPerform			-0.01
			(-4.35)
Size	-0.039	0.092	0.014
	(-2.39)	(4.15)	(1.43)
Firm age	-0.105	-0.213	-0.137
	(-3.41)	(-6.24)	(-7.93)
Bond rating	0.010	0.012	0.007
	(1.81)	(1.75)	(2.01)
Slack	-0.058	-0.035	-0.032
	(-4.47)	(-2.57)	(-7.35)
Leverage	-0.005	-0.005	0.000
	(-0.80)	(-0.95)	(0.05)
Asset tangibility	0.001	0.029	0.009
	(0.04)	(1.69)	(1.07)
Dividend payout ratio	-0.001	0.005	0.000
	(-0.25)	(1.19)	(0.04)
Sales growth	0.013	0.012	0.014
	(2.70)	(2.35)	(6.41)
N	837	837	2706
R^2	0.599	0.591	0.614

Table VII
Regression of investment on cash flow and Tobin's Q where investment and cash flow are deflated by asset

The sample covers firms from COMPUSTAT from 1993 to 2004. Dependent variable is investment. Investment is capital expenditure. Cash flow is the sum of earnings before extraordinary items and depreciation. Both investment and cash flow are deflated by assets. Tobin's Q is the market value of asset divided by the book value of asset. Market Value of asset is the sum of the book value of asset and market value of equity minus the sum of the book value of common equity and balance sheet deferred taxes. Market value of equity is the product of number of shares outstanding and price of the share at the fiscal year end. NegOwnership is - percentage of shares owned by CEO. NegOwnershipL5 is -min (5, percentage of shares owned by manager). NegOwnershipG5 is - max(0,percentage of shares owned by manager -5). Size is logarithm of the total assets Asset tangibility is defined as the book value of a firm's net fixed capital (item 8) divided by the total assets (item 6). A dummy variable is used for bond ratings. If a firm has a rating of BBB- or higher by the Standard and Poor's, the dummy is set to one. Leverage is defined as the sum of long term debt (item 9) and short term debt (item 34) divided by the total assets (item 6). Dividend payout ratio is defined as the cash dividend paid (item 127) to net income (item 172). Slack is defined as the sum of (data item 1 + 0.7*data item2 + 0.5*data item 3 – data item 44) divided by lag PP&E.
The data definition is from Kaplan and Zingales 1997. I control for firm age, firm size, asset tangibility, sales growth, and leverage, dummy for bond rating, dividend payout and financial slack. Regressions are estimated with firm fixed effects and time effects. The second entry is the corresponding t statistics. All the variables are standardized.

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Tobin's Q	0.011	0.011	0.010	0.010	0.010	0.010	0.010
	(11.64)	(11.63)	(11.12)	(11.11)	(10.85)	(10.84)	(10.87)
Cash flow	0.014	0.014	0.014	0.014	0.015	0.014	0.014
	(15.33)	(15.32)	(15.40)	(15.39)	(15.68)	(15.55)	(15.46)
Ceo age		-0.001		-0.001			
		(-0.79)		(-0.85)			
Tobin's Q x Ceo age			-0.003	-0.003			
			(-4.33)	(-4.33)			
Cash flow x Ceo age			0.000	0.000			
			(-0.53)	(-0.55)			
NegOwnership					-0.003	-0.003	
					(-1.97)	(-1.87)	
NegOwnershipL5							-0.003
							(-2.54)
NegOwnershipG5							0.000
							(0.01)
Tobin's Q x NegOwnership					-0.002	-0.002	
					(-2.44)	(-2.48)	
Tobin's Q x NegOwnershipL5							-0.002
							(-1.86)
Tobin's Q x NegOwnershipG5							-0.001
							(-0.82)
Cash flow x NegOwnership					-0.002		
					(-2.09)		
Cash flow x NegOwnershipL5						-0.003	-0.002
						(-3.66)	(-2.40)
Cash flow x NegOwnershipG5						0.001	0.000
						(0.67)	(0.05)
Size	0.004	0.004	0.005	0.005	0.006	0.01	0.01
	(1.53)	(1.61)	(1.79)	(1.88)	(2.26)	(2.34)	(2.16)
Firm age	-0.054	-0.054	-0.054	-0.054	-0.054	-0.05	-0.05
	(-9.67)	(-9.7)	(-9.76)	(-9.79)	(-9.69)	(-9.72)	(-9.56)
Bond rating	-0.002	-0.002	-0.002	-0.002	-0.002	0.00	0.00
	(-1.75)	(-1.78)	(-1.77)	(-1.8)	(-1.87)	(-1.87)	(-1.91)
Slack	-0.005	-0.005	-0.054	-0.005	-0.005	0.00	0.00
	(-3.08)	(-3.08)	(-9.76)	(-3.06)	(-3.17)	(-3.24)	(-3.15)
Leverage	0.004	0.004	0.003	0.003	0.003	0.00	0.00
	(3.86)	(3.81)	(3.77)	(3.72)	(3.68)	(3.83)	(3.94)
Asset tangibility	0.018	0.018	0.019	0.019	0.019	0.02	0.02
	(13.77)	(13.78)	(13.92)	(13.92)	(13.97)	(14)	(14.04)
Dividend payout ratio	0.000	0.000	0.000	0.000	0.000	0.00	0.00
	(0.20)	(0.19)	(0.21)	(0.19)	(0.20)	(0.10)	(0.16)
Sales growth	0.008	0.008	0.008	-0.054	0.008	0.01	0.01
	(9.87)	(9.85)	(9.73)	(-9.79)	(8.66)	(8.6)	(9.54)
N	6813	6813	6813	6813	6737	6737	6813
R^2	0.635	0.635	0.636	0.637	0.637	0.638	0.637

Table VIII
Regression of investment on cash flow and Tobin's Q where investment is the sum of capital expenditure and research and development expenditure

The sample covers firms from COMPUSTAT from 1993 to 2004. Dependent variable is investment. Investment is Investment is capital expenditure plus research and expenditure. Cash flow is the sum of earnings before extraordinary items and depreciation. Both investment and cash flow are deflated by assets. Tobin's Q is the market value of asset divided by the book value of asset. Market Value of asset is the sum of the book value of asset and market value of equity minus the sum of the book value of common equity and balance sheet deferred taxes. Market value of equity is the product of number of shares outstanding and price of the share at the fiscal year end. NegOwnership is - percentage of shares owned by CEO. NegOwnershipL5 is -min (5, percentage of shares owned by manager). NegOwnershipG5 is - max(0,percentage of shares owned by manager -5). Size is logarithm of the total assets Asset tangibility is defined as the book value of a firm's net fixed capital (item 8) divided by the total assets (item 6). A dummy variable is used for bond ratings. If a firm has a rating of BBB- or higher by the Standard and Poor's, the dummy is set to one. Leverage is defined as the sum of long term debt (item 9) and short term debt (item 34) divided by the total assets (item 6). Dividend payout ratio is defined as the cash dividend paid (item 127) to net income (item 172). Slack is defined as the sum of (data item 1 + 0.7*data item2 + 0.5*data item 3 – data item 44) divided by lag PP&E.
The data definition is from Kaplan and Zingales 1997. I control for firm age, firm size, asset tangibility, sales growth, and leverage, dummy for bond rating, dividend payout and financial slack. Regressions are estimated with firm fixed effects and time effects. The second entry is the corresponding t statistics. All the variables are standardized.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Tobin's Q	0.041	0.041	0.037	0.037	0.039	0.039	0.040
	(6.19)	(6.17)	(5.52)	(5.51)	(5.81)	(5.81)	(5.87)
Cash flow	0.234	0.234	0.234	0.234	0.239	0.239	0.237
	(31.38)	(31.39)	(30.82)	(30.80)	(31.54)	(31.54)	(31.57)
Ceo age		-0.013		-0.013			
		(-1.84)		(-1.86)			
Tobin's Q x Ceo age			-0.027	-0.027			
			(-5.35)	(-5.33)			
Cash flow x Ceo age			0.001	0.000			
			(0.14)	(0.06)			
NegOwnership					-0.002	-0.002	
					(-0.16)	(-0.13)	
NegOwnershipL5							0.001
							(0.06)
NegOwnershipG5							0.000
							(-0.01)
Tobin's Q x NegOwnership					-0.001	-0.001	
					(-0.17)	(-0.23)	
Tobin's Q x NegOwnershipL5							-0.006
							(-0.97)
Tobin's Q x NegOwnershipG5							0.001
							(0.19)
Cash flow x NegOwnership					0.010		
					(2.41)		
Cash flow x NegOwnershipL5						0.006	0.017
						(0.96)	(2.84)
Cash flow x NegOwnershipG5						0.007	0.003
						(1.71)	(0.74)
Size	-0.0146	-0.0091	-0.0068	-0.0013	-0.0121	-0.01	-0.01
	(-0.66)	(-0.41)	(-0.31)	(-0.06)	(-0.53)	(-0.53)	(-0.52)
Firm age	-0.1559	-0.1636	-0.1588	-0.1666	-0.1565	-0.16	-0.16
	(-3.54)	(-3.7)	(-3.62)	(-3.78)	(-3.52)	(-3.52)	(-3.53)
Bond rating	-0.0102	-0.0112	-0.0093	-0.0103	-0.0089	-0.01	-0.01
	(-1.37)	(-1.5)	(-1.26)	(-1.38)	(-1.19)	(-1.19)	(-1.17)
Slack	-0.0729	-0.0727	-0.0704	-0.0702	-0.0706	-0.07	-0.07
	(-8.25)	(-8.22)	(-7.98)	(-7.96)	(-7.88)	(-7.88)	(-7.9)
Leverage	0.0235	0.0225	0.0216	0.0205	0.0272	0.03	0.03
	(3.35)	(3.19)	(3.08)	(2.92)	(3.72)	(3.72)	(3.69)
Asset tangibility	0.0277	0.0285	0.0297	0.0304	0.0313	0.03	0.03
	(2.56)	(2.64)	(2.75)	(2.82)	(2.85)	(2.85)	(2.82)
Dividend payout ratio	0.0001	0.0000	-0.0002	-0.0002	0.0001	0.00	0.00
	(0.02)	(0.01)	(-0.04)	(-0.05)	(0.03)	(0.03)	(0.03)
Sales growth	0.0629	0.0625	0.0632	0.0628	0.0633	0.06	0.06
	(9.65)	(9.58)	(9.74)	(9.67)	(9.64)	(9.64)	(9.63)
N	4282	4282	4282	4282	4230	4230	4282
R^2	0.864	0.865	0.866	0.866	0.865	0.865	0.865

Figure 1
Investment Tobin's Q sensitivity

The inverse capital demand function for a firm with myopic manager $D_{0m}D_{0m}$ will be steeper than the inverse capital demand function for a firm with non-myopic manager D_0D_0. Suppose there is one unit increase in the growth opportunities. For the firm with non myopic manager, the capital demand function will shift outward from D_0D_0 to D_1D_1. This leads to an increase in equilibrium capital demanded from K_0 to K_1. For the firm with myopic manager, the capital demand function shift from $D_{0m}D_{0m}$ to $D_{1m}D_{1m}$. Equilibrium capital demanded increases from K_0 to K_2. The investment Tobin's Q sensitivity for the firm with non-myopic manager is $K_0\ K_1$ whereas the investment Tobin's Q sensitivity for the firm with myopic manager is $K_0\ K_2$. This figure illustrates the reduction in investment Tobin's Q sensitivity for the firm with myopic manager, the reduction given by $K_2\ K_1$.

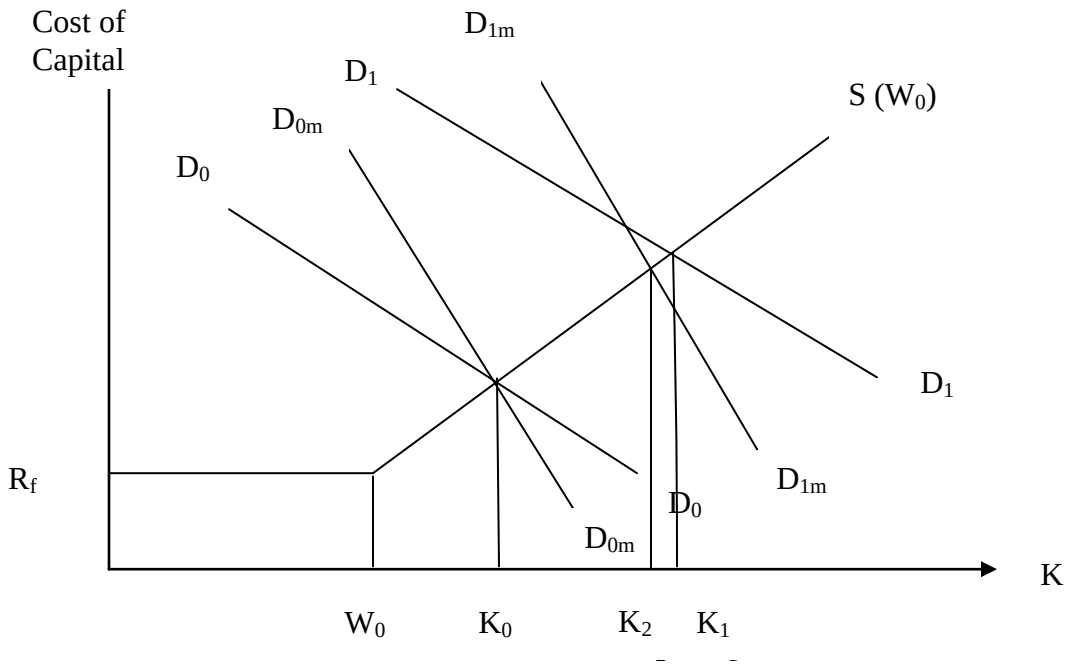

Figure 2
Investment cash flow sensitivity

Suppose the wealth of the firm increases from W_0 to W_1. Following Hubbard (1998) the inverse capital supply function shifts outward from $S(W_0)$ to $S(W_1)$. In case of a firm with non myopic manager, the capital demand increases from K_0 to K_1 (investment cash flow sensitivity) due to increase of firm's internal funds from W_0 to W_1. In case of a firm with myopic manager, the capital demand increases from K_0 to K_{1m}. Hence investment cash flow sensitivity of a firm with myopic manager is lower in magnitude compared to that of a firm with non myopic manager, the magnitude of reduction being K_{1m} K_1.