

# Institutional Investors Heterogeneity And Earnings Management: The R&D Investment Strategy

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## Abstract

This study examines the association between different institutional investors' ownership and earnings management practice through R&D expenditures. It investigates this relationship for a sample of 123 US firms. We examine also the effect of institutional ownership on earnings management of firms having different information environment (S&P 500 versus non S&P 500). Results show that while investment funds exacerbate earnings management by encouraging managers to limit R & D expenditures, pension funds and banks follow passive behaviors. Moreover, the hypothesis of the relevance of the environment information in the explanation of the institutional investors' behavior seems to be important in our case.

**Keywords:** Institutional Investors, R&D, Earnings Management

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## 1. INTRODUCTION

Focusing on previous studies, we found that discretionary accruals are used as almost the only measure of earnings management. In fact, researches do not take into account the fact that managers often cut R & D expenditures to manage results. Indeed, the R & D investment is considered long-term in report with its payback. In addition it's associated with a high degree of failure. Therefore, managers adjust its level depending on their goals and preferences. In this work, we use the level of R & D expenditures as a measure of earnings management.

However, a party appears to have a privileged position to cause change: institutional investors. These investors have influenced the strategic decisions of the firms. But, what influence do they have in the particular field of R & D? Do they really have the keys to limit the managerial myopia which is associated with earnings management? Nevertheless, most studies of institutional investors treat them as a homogenous group ([45] Wahal and Mc Connell 2000, [16] Gillan and Starks 2000...). Nevertheless, institutional investors are different from each other. Indeed, three main factors may explain their heterogeneity.

First, their investment horizon can vary from short to long term. We often talk about short-term and long term oriented institutional investors ([7] Chen et al 2007). Thus, according to [6] Bushee (1998) and [11] David et al (2001), the investment horizon of pension funds is long term. However, the investment funds have a short term investment horizon ([5] Bhattacharya and Graham 2007, [44] Tihanyi et al 2003).

Then, the structure of the participation of institutional investors in firm's capital. Indeed, [1] Alexander et al (2007) believe that ownership concentration is associated with an active role of institutional investors.

Finally, the business relationships that can attach institutional investors with managers. [7] Chen et al (2007) reveal the case of banks that are able to play a dual role in the company (shareholder and creditor). The fear of the breakdown of their position as a creditor explains their passive role.

Thus, institutional investors have different investment horizons and motivations ([5] Bhattacharya and Graham 2007, [44] Tihanyi et al 2003). Therefore, their influence on the maneuvers of leaders is different.

A major contribution of this study is that it examines how different types of institutional investors, who have different strategies, influence managerial' behaviors. In addition, we think that previous studies neglect the role of the information environment of firms in explaining the behavior of institutional investors. Our study assumed an influential role of the information environment on the behavior of institutional investors. In fact, companies that belong to the S & P 500 stock index are generally of great size, use the services of highly experienced analysts and are subject to effective control by the different stakeholders ([35] Mitra and Cready 2005). Therefore, the behavior of institutional investors appears to be different in these firms ([46] Zouari and Rebaï 2009). The study of the information environment is an important contribution of our research to the existing literature. The remainder of the paper is organized as follows. The next section gives a literature overview on the role of some institutional investors on earnings management through

R&D investment. Section 3 presents data base and variables description. The panel regression results are presented in section 4. Section 5 concludes. Section 6 gives the references.

## 2. LITERATURE OVERVIEW

Although previous researches show the important role of institutional investors in the R & D investment strategy, however they ignore the differences in the characteristics of institutions. Institutional investor's characteristics seem to be crucial in explaining their preferences for this strategy. [6] Bushee (1998) classifies institutional investors into three groups according to their degree of influence on the earnings management by managers. He noted in this context that the pressure for short-term investment is generated by short-term oriented institutional investors. They usually have a small capital in several companies. Thus, the presence of this type of institutional investors is generally associated with the earnings management through R & D expenditures.

Contrary to the short term oriented institutional investors, [6] Bushee 1998 and [40] Porter 1992) show that large institutional investors or "dedicated", which are generally present in Japan and Germany, relieve the pressure for short-term investment. Indeed, they owned large parts of capital in a limited number of companies. The concentration of ownership by large institutional investors limits managerial myopia and therefore earnings management through R & D.

The third group proposed by [6] Bushee (1998) and [40] Porter (1992) is formed by the "quasi-indexers". They represent smaller institutional investors with no influence on managerial decisions. In fact, because of their limited participation, they are unable to access to the information needed to evaluate the long-term performance of the firms in which they invest (high cost of information).

In what follows, we focus on the explanations supporting the hypothesis that institutional investors behavior concerning the R & D expenditures varies with the characteristics and preferences of each institution. We distinguish three types of institutional investors: pension funds, investment funds and banks.

### 2.1. Pension Funds

The investment horizon of pension funds is long term. In fact, according to [17] Gilson and Kraakman (1991), these funds retain their holding in the company for more than one decade. This interest for the long term is justified both by the nature of the compensation of fund managers, generally based on salary (not related to the performance achieved) and the need to ensure the pension payments ([13] Del Guercio and Tkac 2000). In this sense, [4] Bethel and Liebeskind (1993) stipulate that pension funds have an obligation to protect the capital of their customers. To this end, the pension funds are obliged to exercise disciplinary influence on the firm's managers ([6] Bushee, 1998 and [11] David et al 2001).

In this context, [43] Smith (1996) and [12] Davis and Thompson (1994) show that the concentration of ownership by pension funds is positively associated with the innovation strategy of the firm. Similarly, [11] David, et al (2001) suggest that pension funds prefer investing in R & D because they have a long-term investment horizon. [23] Hitt, et al (2001) affirm that pension funds abandon the investment in external innovation (acquisition of technologies already tested). As such, [24] Hoskisson et al (2002) establish a positive relationship between the pension funds ownership and R & D investment. Hence the following hypothesis:

*H1 pension funds limit earnings management through cutting R & D expenditures*

### 2.2. Investment Funds

Investment funds are short term oriented. Their possession is about one year ([17] Gilson and Kraakman 1991). Indeed, contrary to the pension fund managers, managers of investment funds are subject to performance constraints required by their superiors. As such, [2] Badrinath and Wahal (2002) and [25] Khorana (1996) believe that the internal compensation system of these investors is based on the quarterly performance level of their holdings. Thus, fund managers are replaced each time the result reached by the company is inadequate. In addition, clients of investment funds are individual investors, who are based in their investment decisions on short-term information collected from newspapers and magazines ([13] Del Guercio and Tkac 2000). Therefore, the short-term horizon of these investors leads them certainly to restrict R & D investment. Indeed, [24] Hoskisson et al (2002) affirm that when the main objective of the investment fund is to achieve a high level of profitability in the short term, they prefer the acquisition of external innovations. The latter emit a high immediate return because the products are already proven. They limit internal and long term innovation such as R & D. Hence the following hypothesis:

*H2 investment funds incite managers to cut R & D expenditures and so increase earnings management*

### 2.3. Banks

In United States, the Bank Holding Company Act of 1956 prohibited U.S. banks from holding more than 5% of the same company and requires them not to get involved in the firms management. This situation limits both the ability of banks to monitor managers of firms in which they invest ([42] Prowse 1990) and their ability to invest in R & D. However, today the situation is different. Indeed, the U.S. government has

avoided the obstacles placed in the shareholding by banks. As a result, the U.S. banking institutions have become more active. According to [27] Kroszner and Strahan (2001), banks may find it advantageous to limit the risk of the firm because they preserve the interests of the organizations they represent. However, R & D projects are inherently risky and do not seem to be consistent with the objectives of the banks. For [3] Bah and Dumontier (2001), the highly leveraged firms reduce long-term investments such as R & D to ensure their commitments (payment of principal and interest of the debt). Moreover, in the case of risky and specific investments such as R & D, debt financing is associated with higher agency costs. Similarly, [19] Grinblatt and Titman (1998) suggest that high leveraged firms attempt to limit investment in long term projects such as R & D. Hence, the following hypothesis:

*H3 banks increase earnings management through limiting R & D spending*

### **3. DATA BASE AND VARIABLES DESCRIPTION**

#### **3.1. Data**

The sample used in our study is composed of data carrying on firms of the American economy detected from the company's yearly reports distributed by the Security and Exchange Commission. From an initial sample, we eliminated the financial firms and insurance companies as well as firms whose data are missing or the yearly reports are distributed for less than three consecutive years. Our final sample is limited to 123 American firms for the period from 2003 to 2005: 43 firms belonging to the S&P 500 stocks and the others don't belong to the S&P 500 stocks.

#### **3.2. Variables Description**

Our study seeks to link the level of R & D investment to institutional ownership. We inserted four control variables: managerial ownership, debt ratio, performance and firm size.

##### **3.2.1. The Dependent Variable: R & D**

The dependent variable is R & D, defined as a proportion of company sales. This measure is widely used in previous research ([20] Hansen and Hill 1991, [6] Bushee 1998, [45] Wahal and Mc Connell 2000, [24] Hoskisson et al 2002 ...). In contrast to the other measures, the percentage of R & D of the total sales has the advantage of taking into account the effects of inflation.

##### **3.2.2. The Control Variables**

- Managerial ownership is defined as the proportion of capital held by managers. Although investment in R & D seems to be in the interests of shareholders (to improve future results), it is often not optimal from the perspective of managers. However, managerial ownership can align the interests of managers with those of shareholders. We therefore expect a positive relationship between managerial ownership and R & D investment.
- The debt ratio is measured as total debt divided by total assets. In the case of a lack of internal financial resources, the company uses debt. However, most studies in this context conclude that R & D financed by debt creates three major problems. First, the risk of asset substitution increase with the risk of investment projects ([3] Bah and Dumont 2001). Second, highly leveraged firms reduce long-term investments such as R & D to ensure their commitments (payment of principal and interest on the debt). Finally, in the case of risky and specific investments such as R & D, debt financing is associated with higher agency costs. We therefore expect an inverse relationship between leverage and the level of R & D expenditure.
- Performance is measured as earnings before interest and taxes divided by total assets. The main advantage of this measure is that it covers all activities of the company. ROA has been used by many researchers such as [36] Nager et al (2000). Several authors show that the firms' ability to innovate depends on the extent of its performance ([20] Hansen and Hill 1991, [26] Kochhar and David 1996, [9] Cho 1998, [3] Bah and Dumontier 2001...). Therefore, the performance must be positively correlated with R & D investment.
- The size is measured by the logarithm of total assets. Indeed, there is often a category of innovative projects that can be only adopted by large firms because of the huge funds required for these types of investments. Thus, the larger the company, the greater the R & D expenditures will be high.

##### **3.2.3. Information Environment Hypothesis**

[21] Hessel and Norman (1992) as well as [10] Cready (1994) show that in opposition to the individual investors, the institutional investors have a preference for the investment in the big firms. [28] Lang and Mc Nichols (1998) stipulate that the positive relation between the institutional involvement and the size of the firms essentially drifts to the legal constraints and the relatively important transparency level in the big businesses. Nevertheless, these firms are submitted to more of control on behalf of the different taking parts and resort more than the others to financial analyst services. In this order of idea, [34] Mitra (2002)

considers that firms that belong to the S&P 500 stocks have a more elevated stock capitalization and a more important transparency level in contrast with non S&P 500 firms. The informational environment of firms belonging to the S&P 500 stocks is supposed more rigorous in comparison with to the one of the other firms. We think that the influence of the institutional investors on managerial latitude concerning earnings management varies depending on whether the studied firms belong or no to the S&P 500 stocks ([46] Zouari and Rebaï 2009).

**3.3. Estimation Method**

We focus on panel data. The study period is from the year 2003 to 2005. One possible estimation methods is the method of least squares (OLS). This estimate assumes that all parameters are identical. The model would be consistent. However, the risk of sample heterogeneity exists, making biased estimates by OLS. So we adopt an estimation based on panel fixed and random effects.

**4. PANEL REGRESSION RESULTS**

**4.1. The Impact Of Different Institutional Ownership On The R & D Expenditures Manipulation**

We specify the following econometric equation:

$$RD_{it} = \alpha_0 + \alpha_1 INSD_{it} + \alpha_2 PFP_{it} + \alpha_3 PFI_{it} + \alpha_4 PBQ_{it} + \alpha_5 INSD_{it} + \alpha_6 DET_{it} + \alpha_7 ROA_{it} + \alpha_8 LTA_{it} + u_{it} \quad (1)$$

With;

RD: the proportion of R & D expenditures on total company sales;

PFP: the pension funds ownership;

PFI: the investment funds ownership;

PBQ: the banks ownership;

INSD: managerial ownership;

DET: the total debt of total assets;

ROA: earnings before interest and taxes divided by total assets;

LTA: the logarithm of total assets;

$\alpha_i, \beta_i, \delta_i$ : the model parameters to estimate;

u, v, w,: error terms.

The results of the equation (1) regression by the panel fixed effects method are presented in the following table:

**Table 1: Regression results of equation (1)  
Dependent variable: R & D**

Explanatory Variables	Coefficients	(T-Student)
Constant	-0.507	-3.03
PFP	-0.00058	-0.20
PFI	-0.0019	-2.67 ***
PBQ	-0.0013	1.30
INSD	-0.0018	-2.07 **
DET	-0.085	-1.29
ROA	0.076	1.11
LTA	0.041	3.42 ***
Within R <sup>2</sup> = 0.12 Between R <sup>2</sup> = 0.03 Overall R <sup>2</sup> = 0.08	Hausman = 37.50 Prob = 0	F = 2.90 Prob F = 0

(T-Student)

(\*) Indicate significance at the 10%

(\*\*) Indicate significance at the 5%

(\*\*\*) indicate significance at the 1%

#### 4.1.1. Role Of Pension Funds

Despite their activism and their long-term horizon, pension funds do not significantly affect the level of R & D investment. We reject our hypothesis that pension funds are interested in encouraging the managers to invest in R & D. Indeed, fund managers of these institutions find that monitoring costs may be incurred by various stakeholders that have a disciplinary role on managers. So they prefer to follow a passive behavior. Therefore, we invalidate the result found by [11] David et al (2001) which suggest that pension funds prefer investing in R & D because of their long-term horizon and ignore the investment in external innovation. About the effectiveness of the activism of pension funds, we can provide that control by the pension fund may be ineffective because of agency problems between managers of pension funds and other shareholders of the firm. These problems reduce the ability of these funds to exercise effective control. Moreover, the free rider problem can lessen the pension funds incitation to control the firm's managers. Indeed, some pension funds have a small amount of shares but bear all the costs of activism. While all shareholders benefit from this activism.

#### 4.1.2. Role Of Investment Funds

Investment funds have a negative impact on the level of R & D investment. We confirm our hypothesis that investment fund limit R & D expenditures and thereby aggravate earnings management. Indeed, [24] Hoskisson et al (2002) affirm that when the main objective of the investment fund is to achieve a high level of profitability in the short term, they prefer the acquisition of external innovations. The latter emit a high immediate return because the products are already proven. In addition, Investment funds do not establish a business relationship with the firm in which they invest their funds. This independence from the firms, incite them to orient managerial decisions.

#### 4.1.3 Role Of Banks

Like pension funds, banks do not exert a significant influence on the level of R & D expenditures. We reject our hypothesis that banks encourage managers to limit R & D investment and thereby aggravate earnings management. The passivity of these institutions may be the result of collision issues with the firm's managers. Indeed, bankers often try to not oppose managerial decisions in order to not break their position as creditors. So, they are more supportive of management actions. Thus, the dual role of banks (shareholders and creditors) can weaken the effectiveness of their control on managers. Infact, if a bank holding equity is primarily interested in ensuring the service of its outstanding debts, this would conflict with shareholders interest.

#### 4.1.4. The Control Variables Effects

The managerial ownership variable has influenced negatively the level of R & D expenditure. This result shows that managers are short term oriented. They protect themselves against the threat of takeover. Indeed, in order to attract and attach some big investors to the capital of the firm, the manager as shareholder is incited to adopt income increasing behavior. Regarding debt, the variable "DET" doesn't affect R & D investment. In fact, the decision of R & D investing doesn't appear to be related to the leverage of the firm. Similarly, the company's performance did not influence the level of R & D expenditure. Thus, we invalidate our assumption that the firm' ability to innovate depends on the extent of its performance ([20] Hansen and Hill 1991, [26] Kochhar and David 1996, [9] Cho 1998, [3] Bah and Dumontier 2001...). Indeed, the innovative capacity of the firm is unaffected by the level of performance. Concerning the influence of the size on the level of the R & D spending, we confirm our hypothesis. In fact, "SIZE" has a significant positive effect on the level of R & D investment. This result derives primarily from the ability of large companies to cover the costs associated with R & D investment.

### 4.2. The Impact Of The Informational Environment Of Firms On Institutional Investor's Behaviors

#### 4.2.1. The Firms Surveyed Belong To The S & P 500 Sstock Index

We specify the following econometric equation:

$$RD_{it} = \beta_0 + \beta_1 INSD_{it} + \beta_2 DET_{it} + \beta_3 ROA_{it} + \beta_4 LTA_{it} + \beta_5 PFP_{it} + \beta_6 PFI_{it} + \beta_7 PBQ_{it} + v_i \quad (2)$$

The regression results of equation (2) by the panel random effects method are presented in the following table:

**Table 2:** Regression results of equation (2)  
Dependent variable: R & D

Explanatory Variables	Coefficients	Z
Constant	0.044	0.71
PFP	-0.0041	-0.98
PFI	0.0011	1.79 *
PBQ	-0.0017	-0.74
INSD	0.00017	0.24
DET	0.032	0.57
ROA	0.235	2.68 ***
LTA	-0.0024	-0.63
Within R <sup>2</sup> = 0.10 Between R <sup>2</sup> = 0.11 Overall R <sup>2</sup> = 0.10	Hausman = 9.54 Prob = 0.2159	F = 2.04 Prob F = 0.0031

Z

(\*) Indicate significance at the 10%

(\*\*) Indicate significance at the 5%

(\*\*\*) indicate significance at the 1%

#### 4.2.2. The Firms Surveyed Are Not Belonging To The S & P 500 Stock Index

We specify the following econometric equation:

$$RD_{it} = \delta_0 + \delta_1 INSD_{it} + \delta_2 DET_{it} + \delta_3 ROA_{it} + \delta_4 LTA_{it} + \delta_5 PFP_{it} + \delta_6 PFI_{it} + \delta_7 PBQ_{it} + w_{it} \quad (3)$$

The regression results of equation (3) by the panel fixed effects method are presented in the following table:

**Table 3:** Regression results of equation (3)  
Dependent variable: R&D

Explanatory Variables	Coefficients	(T-Student)
Constant	-0.63	-3.33
FPP	0.0069	2.37 ***
PFI	0.0013	1.57
PBQ	-0.0018	-1.73 *
INSD	-0.001	-1.58
DET	-0.009	-0.11
ROA	0.06	0.74
LTA	0.0052	3.65 ***
Within R <sup>2</sup> = 0.16 Between R <sup>2</sup> = 0.07 Overall R <sup>2</sup> = 0.03	Hausman = 28.05 Prob = 0.0002	F = 3.46 Prob = 0

(T-  
(\*)

Student)  
Indicate

significance at the 10%

(\*\*) Indicate significance at the 5%

(\*\*\*) indicates significance at 1%

#### 4.2.3. The Changing Of Informational Environment Results Analysis

The estimation of equation (2), where firms belong to the S & P 500 stock index, shows no significant relationship between the dependent variable "RD" and the participation of pension funds and banks in the firm's capital. However, investment funds have a positive influence. Nevertheless, the estimation of equation (3), for firms that do not belong to the S & P 500 stock index, shows that investment funds do not significantly affect the level of R & D investment. In contrast, pension funds positively affect the R & D investment and banks' influence is negative. Thus, the information environment hypothesis is confirmed in the case of the three institutions studied. For banks, the observed passive behavior can be explained by their generally established business relationship with the managers. Indeed, banks often act as a creditor in addition to their investment relationship with the firm. To protect their position as creditor, they are trying to not oppose managerial decisions. Similarly, for pension funds, their passive behavior appears to be logic for S & P 500 firms. In fact, these institutions prefer to act as a stowaway in firms that belong to the S & P 500 stock index when different stakeholders have control over the managers.

### 5. CONCLUSION

This paper tries to study the relation between institutional ownership and earnings management through R&D expenditures. The evidence on a panel of American firms observed during the period 2003-2005, shows that while investment funds encourage the managers to limit R & D expenditures, pension funds and banks are passive. The results seem to be surprising for the case of pension funds. Indeed, these institutions do not establish business relationships with the managers. For banks, their passive role seems to be the consequence of their business relationship with managers. In addition, we examine the effect of institutional ownership on earnings management of firms having different information environment (S&P 500 versus non S&P 500). The results show that investment funds encourage investment in R & D in the S & P 500 firms. However, they play a passive role in firms that do not belong to this index. Similarly, pension funds and banks have different behaviors on R & D investment strategy for the two categories of firms (S & P 500 and non S & P 500). Thus the informational hypothesis is verified for the three institutions studied.

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