

Institutional Investors and Earnings Management: The R&D Expenditures Manipulation

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Abstract

This study examines the association between institutional investors' ownership and earnings management practice through R&D spending. 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 the involvement of institutional investors in the firms' capitals exacerbates earnings management 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

1. INTRODUCTION

A common view is that research and development (R & D) investment can improve the future performance of the company and ensure its sustainability. In fact, according to McConnell and Muscarella (1985), the R & D is synonymous to good growth opportunities. Similarly, for Doukas and Sutzter (1992), the announcement of increased R & D spending is a signal sent by managers to inform the market of the degree of their technological activities. Moreover, most empirical studies show that the financial market welcomed the announcement of a new R & D program (Chan et al 1990). Thus, R & D is an intangible element, whose importance is growing for companies. Lev and Sougiannis (1996) show the existence of a positive relationship between R & D and economic growth, future results and gains in business productivity. In this framework, Lev (1999) suggests that R & D is the main assets of the high technology and biotechnology. He claims that R & D contributes significantly to the productivity and value creation and that financial markets reflected this contribution in the stock.

As for Shevlin (1990), he finds a significant relationship between the market value of the firm and the level of R & D. Similarly, in 1999, Deng et al confirm the hypothesis that R & D contribute to the improvement of future stock market performance of companies. Nissim and Thomas (2000) have confirmed the idea that R & D determine future profitability. Moreover, Aboody and Lev (2001) have highlighted the contribution of R & D to growth and future performance of the firm. In addition, Ettlie (1998) notes that investment in R & D is one of the most important investment decisions made by managers of firms. Indeed, the development of new products for example leads to an important competitive advantage and improve productivity.

However, while investment in R & D seems to be a factor for value creation, it can in the absence of effective control on the manager, causes managerial discretion and aggravating earnings management. Barker and Mueller (2002) suggest in this context that the R & D vary significantly with the characteristics of the leader. Indeed, investment in R & D is a risky investment and associated with a high degree of failure. So, managers adjust its level depending on their goals and preferences. Lawrence (1997) believes that the level of expenditure in R & D is determined by the characteristics of the manager such as age, education, work experience and level of participation in the firm capital.

Moreover, a party appears to have a privileged position to cause change: institutional investors. Institutional investors have influenced the strategic decisions of the firms. However, 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?

In this research framework, we try to analyze, using theoretical arguments and empirical evidence, the role of institutional investors in the R & D strategy. The remainder of the paper is organized as follows. The next section gives a literature overview on the role of institutional investors on earnings management through R&D expenditures. Section 3 presents data and variables description. The results are presented in section 4. Section 5 summarizes the empirical findings and concludes.

2. LITERATURE OVERVIEW

Several characteristics of R & D lead managers to reduce expenditure in these investments and thus generate a phenomenon of earnings management. In fact, R & D investments are considered long-term in rapport with their payback. Moreover, some reasons cause a short-term investment horizon of leaders and therefore limiting R & D spending. In fact, according to Narayanan (1985), managers are

encouraged to invest in short-term projects to quickly reveal the performance of these investments. They are also trying to reduce uncertainty about their own value on the work market. In addition, because their horizon is limited to their presence in the firm.

In this context, Bange and De Bondt (1998) show that R & D spending depends generally on the difference between the result achieved and that pursued by financial analysts. In fact, they may be punished by a drop in their pay, usually attached to the results. Similarly, Baber et al (1992) found that U.S managers limit R & D spending to realize a positive result. Perry and Grinaker (1994) showed that managers limit the R & D expenditures when they forecast a decrease in earnings.

In this context, Thurow (1993) shows that managers often resort to a reduction in R & D expenditure to increase short-term results. Therefore, they protect the firm against the threat of takeover, usually associated with a decrease in stock prices. He added that managers of American firms abandon the R & D projects to maintain a sufficient result in recession periods.

In this sense, Laverty (1996) notes that managers use investments of the firm in order to ensure their progress and to defend their reputation. But, the R & D projects are inherently risky and long term. So, it's incompatible with their motivations.

According to the characteristics already presented, R & D investment is a means of earnings management by managers. However, the relationship between the institutional investor's ownership and this type of project is difficult to identify exactly. Some works in the financial literature suggests that institutional investors incite managers to move towards the achievement of short-term goals at the expense of long-term performance (Cofee 1991, Jacobs 1991, Drucker 1986 ...). In fact, for Porter (1992), institutional investors have short term investment horizon. Thus, by the fear that the decline in current results leads institutional investors to liquidate their position, managers are forced to take actions that increase short-term earnings. The most action often cited is to limit R & D expenses. However, other researches report results against to this view. In fact, Bushee (1998), Wahal and Mc Connell (2000) and Aghion, Reenen and Zingales (2007) who establish a positive relationship between investment in R & D and institutional ownership.

Thus, some authors show that institutional investors encourage R & D investment and therefore they prevent the leaders to use these expenses to manage results (Bushee 1998, Wahal and Mc Connell 2000 and Aghion, Reenen and Zingales 2007). Others believe that institutional investors have a short term investment horizon that aggravates managerial myopia and encourages managers to manage results through the limitation of R & D expenses (Cofee 1991, Jacobs 1991, Drucker 1986). In what follows, we develop two theses supporting the relationship between institutional investors and R & D investment.

2.1. Institutional investors limit R&D expenditures

Institutional investors are often seen as short term oriented. For Jacobs (1991), managers do not expect to establish a real dialogue with institutional investors because of their myopia. Graves (1988) suggests in this context that managers neglect the long-term investment to increase current earnings. So, they maximize their remuneration based on the annual earnings.

Drucker (1986), Graves (1988) and Hill, Hitt and Hoskisson (1988) examine the relationship between institutional investors and managerial myopia. They propose an explanation that, fund managers of institutional investors are subject to constraints performance demanded by their superiors (remuneration linked to results achieved in the short term). To protect their jobs and ensure their advancement, fund managers are obliged to encourage managers of firms to avoid long term investments. In particular, R & D projects who require the payment of all expenses at once.

As such, Hansen and Hill (1991) find that institutional investors are willing to sell their holdings after any reduction in current earnings. A process that leads to a dramatic decrease in the stock price. In this sense, the institutions sell their stake at a relatively low premium. Thus, control passes easily to the acquiring firm. The manager risks losing his job. To limit the problem of takeover and to ensure their job security, managers try to avoid any decline in stock prices and thereby forego R & D investment.

Moreover, Kochhar and David (1996) believe that institutional investors do not encourage managers to invest in R & D. They suggest that their behavior is related to difficulties encountered in assessing the long-term performance of the firm due to a lack of relevant information.

In this context, Graves (1988) studied the relationship between institutional participation and R & D investment in computer manufacturing over a period of ten years. He noted that R & D expenditures are lower in firms heavily owned by institutional investors. He notices the impatience of these investors who lead to the low level of competitiveness in the U.S. firms relative to Japanese and German firms.

However, after classified the institutions into three groups according to their degree of pressure on the leaders, Bushee (1998) shows that when the capital of the company is heavily owned by short-term focused institutional investors, the manager would have to limit expenditure on R & D in order to increase short-term results.

Thus, we can predict that the presence of institutional investors who have a short-term investment horizon exacerbate managerial myopia. This situation is associated with a problem of under-investment in R & D to increase the current results.

2.2. Long term oriented institutional investors incite R&D expenditures

A view diametrically opposed to the previous regarding the role of institutional investors in the R & D investment strategy, suggest that institutions are long term oriented. Therefore, they attempt to encourage managers to invest in such projects. The Pioneers to support this view are Jarrell et al (1985) that examined the relationship between institutional ownership and R & D investment in a sample formed by 324 firms and during the period from 1980 to 1983. They regress the level of R & D expenditure to the institutional ownership. They discover that this level increases with the part of capital held by institutions.

Similarly, Baysinger, Kosnit and Turk (1991), studied the effect of ownership structure on the level of R & D expenditure. In particular, the role of institutional investors on a sample of 176 companies. They find that institutions encourage managers of firms to invest in R & D. Indeed, this investment is associated with a high risk and intense variation in earnings in the short term. However, it often leads to significant improvement in future cash flows. An approach usually attractive to institutional investors who can limit the risk of these projects by possessing diversified portfolios. In addition, because their high ownership level in the firm, institutional investors would be prisoners of their position. They could lose huge sums due to the sharp decline in stock prices. To guard against this risk and ensure a satisfactory level of long-term benefit, institutions exert a disciplinary role on the managers. They encourage them to invest in R & D and hence limiting earnings management.

Kochhar and David (1996), think that the sell strategy adopted by institutional investors "*Exit*" causes two main problems. On the one hand, the loss of liquidity due to the dramatic decline of stock prices and, on the other hand, the risk of not finding other profitable investment opportunities. These two problems create motivation among institutional investors to control and to use their voting power "*Voice*" to incite managers to invest in R & D.

Hansen and Hill (1991) studied the relationship between institutional ownership and the level of R & D expenditure in 129 firms during the period 1977-1987. They contradict popular idea that institutional investors exacerbate managerial myopia and establish a positive relationship between the two variables.

In this context, Rajgopal et al (1999) affirm that institutional investors are professionals who have privileges in the acquisition of information. This view was confirmed by some authors including Pound (1988) who believe that institutional investors devote much time for analysis and evaluation of their investment. Lev (1988) finds that the enormous resources available to these investors help them to access to relevant information.

Bushee (1998) notes that institutions have the means to enjoy the services of experienced analysts in the area of assessment and choice of investments. Through an empirical study, the author shows that the high participation of institutional investors in the company capital limit managerial myopia including under-investment in R & D. It puts forward a hypothesis that the high percentage of shares held by institutional investors in the firm diverts managers to limit expenditure in these projects in order to inflate current earnings.

Similarly, Bange and De Bondt (1998) establish an inverse relationship between the institutional investor's ownership and the limitation of R & D expenditures by managers, designed to accomplish desired levels of earnings. In this context, Eng and Shackell (2001) believe that institutional investors encourage managers to invest in R & D and so improve the future performance of the company.

Furthermore, it should be noted that most studies on the role of institutional investors in R & D investing strategy use the property as a synonym for power. They believe that institutions influence such investment by the concentration of ownership. However, David, Hitt and Gimeno (2001) suggest that institutional participation is insufficient by itself when institutional investors are passive. They suggest that activism, which represents all the maneuvers and pressures used by institutions to incite managers to invest in R&D plays an important role in such situations.

In this framework, with a sample formed by 2500 of U.S. companies and during a period from 1988 to 1994, Wahal and Mc Connell (2000) studied the effect of institutional investors on R & D investment. They show that not only they do not cause managerial myopia, but they incite managers to spending more sums in R & D. It should be noted that through this analysis, Wahal and Mc Connell (2000) contradict the idea that the lack of competitiveness of U.S. firms comparing with Japanese and German firms is the ownership structure of the United States. The lack of competitiveness of U.S. firms is often attributed to the short-term orientation of American institutional shareholders who held less than 1% of firm's capital. While the governance of Japanese and German companies based primarily on the concentration of ownership by banks, is considered the source of the competitiveness of these firms. However, today the situation is different because institutional investors hold about 60% of the shares of Americans companies.

Institutional investors seem to be better informed compared to other investors because they spend huge sums in research and treatment of information. A process associated with the limitation of the R & D

expenditures manipulation. Hence we can predict that long term oriented institutional investors limit earnings management through the R & D expenditures.

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 four consecutive years. Our final sample is limited to 123 American firms for the period from 2003 to 2005. The data base is composed of 369 observations.

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 (Hansen and Hill 1991, Bushee 1998, Wahal and Mc Connell 2000, 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. The capital is not the only means of financing R & D investment. 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 (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 by return on 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 Chen and Harford (2004), Nager et al (2000). Several authors show that the firms' ability to innovate depends on the extent of its performance (Hansen and Hill 1991, Kochhar David 1996, Cho 1998, 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 expenditure will be high.

3.2.3. Information environment hypothesis

Hessel and Norman (1992) as well as Cready (1994) show that in opposition to the individual investors, the institutional investors have a preference for the investment in the big businesses. 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, 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 (Zouari and Rebai 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.

4. PANEL REGRESSION RESULTS

4.1. The impact of institutional ownership on the R & D expenditures manipulation

We specify the following econometric equation:

$$RD_{it} = \alpha_0 + \alpha_1 INST_{it} + \alpha_2 INSD_{it} + \alpha_3 DET_{it} + \alpha_4 ROA_{it} + \alpha_5 LTA_{it} + u_{it} \quad (1)$$

With;

- RD: the proportion of R & D expenditure on total company sales;
- INST: institutional 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;
- $\alpha_i, \beta_i, \delta_i, \delta_i$: the model parameters to estimate;
- u, v, w: error terms.

Fisher's test at the bottom of the table (1) raises the following assumptions:

H0: no individual effects

H1: The presence of individual effects

We reject H0 when the calculated amount exceeds the amount tabulated. Moreover, the Hausman test at the bottom of the table (1) raises the following assumptions:

H0: random effects

H1: fixed effects

We reject H0 when the calculated amount exceeds the amount tabulated. Therefore, the regression results of the equation (1) by the method of panel fixed effects are presented in the following table

Table 1: Regression results of equation (1)

Dependent variable: R & D		
<i>Variables Explanatory</i>	<i>Coefficients</i>	<i>(T-Student)</i>
Constant	-0.48	-2.86
INST	-0.0007	-1.81 *
INSD	-0.00186	-2.12 **
DET	-0.107	-1.62
ROA	0.073	1.06
LTA	0.040	3.31 ***
Within R ² = 0.09	Hausman = 22.39	F = 2.82
Between R ² = 0.02	Prob = 0	Prob F = 0
Overall R ² = 0.06		

(T-Student) (*) Indicate significance at the 10%

(**) Indicate significance at the 5%

(***) indicate significance at the 1%

<i>Variable explained</i>	<i>Variables Explanatory</i>	<i>Effect expected</i>	<i>Effect obtained</i>
R & D	INST	+ / -	-
R & D	INSD	+	-
R & D	DET	-	Not sig
R & D	ROA	+	Not sig
R & D	LTA	+	+

4.1.1. Institutional ownership

Our study shows that the link between the institutional ownership and R & D expenditures is negative. We thus confirm the first hypothesis. Therefore, institutional investors incite managers to be short-term oriented and under invest in R & D. In fact, this negative relationship may be explained as follows: most institutional investors follow a strategy of value creation. But the search for performance and maximizing shareholder value in the short term too often respond to limiting long term investments such as R&D.

4.1.2. Managerial ownership

The managerial ownership variable influences 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

4.1.3. Debt

Regarding debt, the variable "DET" does not affect R & D investment. In fact, the decision of R & D investing doesn't appear to be related to leverage of the firm.

4. 1.4. Performance

The company's performance did not influence the level of R & D expenditure. Thus, we invalidates our assumption that the firm' ability to innovate depends on the extent of its performance (Hansen and Hill 1991, David Kochhar 1996, Cho 1998, Bah and Dumontier 2001...). Indeed, the innovative capacity of the firm is unaffected by the level of performance.

4.1.5. Size

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 effect of information environment on the level of R & D expenditures

4.2.1. The firms surveyed belong to the S & P 500 stock index

$$RD_{it} = \beta_0_{it} + \beta_1 INST_{it} + \beta_2 INSD_{it} + \beta_3 DET_{it} + \beta_4 ROA_{it} + \beta_5 LTA_{it} + v_{it} \quad (2)$$

Fisher's test at the bottom of the table (2) indicates the following assumptions:

H0: no individual effects

H1: The presence of individual effects

We reject H0 when the calculated amount exceeds the amount tabulated. Moreover, the Hausman test at the bottom of the table (2) raises the following assumptions:

H0: random effects

H1: fixed effects

We accept H0 when the calculated amount is less than the amount tabulated. Therefore, the regression results of equation (2) by the method of panel random effects are presented in the following table:

Table 2 Regression results of equation (2)

Dependent variable: R & D		
<i>Variables Explanatory</i>	<i>Coefficients</i>	<i>Z</i>
Constant	0.025	0.40
INST	0.001	1.83 *
INSD	0.0003	0.38
DET	-0.004	-0.08
ROA	0.20	2.36 ***
LTA	-0.001	-0.26
Within R ² = 0.08	Hausman = 4.28	F = 1.76
Between R ² = 0.10	Prob = 0.5095	Prob F = 0.0148
Overall R ² = 0.08		

Z (*) Indicate significance at the 10%

(**) Indicate significance at the 5%

(***) indicate significance at the 1%

<i>Variable explained</i>	<i>Variables Explanatory</i>	<i>Effect expected</i>	<i>Effect obtained</i>
R & D	INST	+ / -	+
R & D	INSD	+	Not sig
R & D	DET	-	Not sig
R & D	ROA	+	+
R & D	LTA	+	Not sig

4.2.2. The firms are not belonging to the S & P 500 stock index

$$RD_{it} = \delta_0 + \delta_1 INST_{it} + \delta_2 INSD_{it} + \delta_3 DET_{it} + \delta_4 ROA_{it} + \delta_5 LTA_{it} + w_{it} \quad (3)$$

Fisher's test at the bottom of the table (3) raises the following assumptions:

H0: no individual effects

H1: The presence of individual effects

We reject H0 when the calculated amount exceeds the amount tabulated. Moreover, the Hausman test at the bottom of the table (3) raises the following assumptions:

H0: random effects

H1: fixed effects

We reject H0 when the calculated amount exceeds the amount tabulated. Therefore, the results of the equation (3) regression by the method of panel fixed effects are presented in the following table

Table 3: Regression results of equation (3)

Dependent variable: R & D

<i>Variables Explanatory</i>	<i>Coefficients</i>	<i>(T-Student)</i>
Constant	-0.62	-3.24
INST	0.00064	1.07
INSD	-0.02	-1.84 *
DET	-0.01	-0.11
ROA	0.021	0.25
LTA	0.052	3.58 ***
Within R ² = 0.11	Hausman = 17.91	F = 3.28
Between R ² = 0.06	Prob = 0.0031	Prob F = 0
Overall R ² = 0.03		

(T-Student)

(*) Indicate significance at the 10%

(**) Indicate significance at the 5%

(***) indicate significance at the 1%

<i>Variable explained</i>	<i>Variables Explanatory</i>	<i>Effect expected</i>	<i>Effect obtained</i>
R & D	INST	+ / -	Not sig
R & D	INSD	+	-
R & D	DET	-	Not sig
R & D	ROA	-	Not sig
R & D	LTA	+	+

The estimation of equation (2) testing the impact of institutional ownership on the level of R & D investment in firms belonging to the S & P 500 stock index, shows that institutional investors have a positive impact. However, the estimation of equation (3), where firms are not belonging to S & P 500 stock index, indicates that the relationship between institutional ownership and the level of R & D expenditures is not significant. Thus, institutional investors have a different behavior regarding the earnings management through R & D expenditures by managers, depending on whether the firms belong or not the S & P 500 stock index. Therefore, we confirm our informational hypothesis. For S & P 500 companies, the detected positive result shows that institutional investors are trying to encourage managers to invest in R & D. They consequently have longer term investment horizon. However, for companies that do not belong to the S & P 500 stock index, the passivity of institutional investors seems to be surprising. They prefer to passively enjoy the disciplinary role exercised by other stakeholders.

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 institutional investors incite managers to income increasing. This result supports the hypothesis of institutional myopia. Therefore the institutional investors are eager to seek the immediate return without being aware of the importance of R & D investment as factors of long-term wealth. Thus, while some institutional investors are concerned about the positive influence of R & D expenditures on the firm's survival, this study shows that the majority of the institutional shareholders remains in a logic that sees often in R & D as an obstacle to the value creation. Therefore institutional investors exacerbate managerial myopia and encourage managers to manipulate earnings by limiting R & D spending.

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