Review Article
Volume 12:1, 2023

Journal of Accounting & Marketing

ISSN: 2168-9601 Open Access

R and D Investment and the Quality of Accruals: The Role of Corporate Governance

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Abstract

This paper emphasizes the importance of the cross-effect of investment in R and D activities, the independence of the board of directors and the presence of institutional investors on the quality of accounting information and more specifically on the quality of discretionary accruals in a broadly diversified context. To empirically verify this subject, we carry out an empirical investigation for a sample composed of 98 French companies listed on the SBF during the period 2009-2015. First, this analysis provides empirical results of the impact of board independence, institutional shareholders and R and D investment on the quality of discretionary accruals for the full sample. We prove that the intensity of R and D investment has a positive and significant effect on earnings management according to both models. In addition, the empirical results also show that according to the two models the independence of the board of directors has a negative and statically significant effect on the quality of the accruals whereas according to the model of Shahrur, et al., the effect negative impact of institutional investors on the quality of accruals is statistically insignificant. Second, in this article we examine the cross effect of governance variables and the intensity of investment in R and D activities on the quality of discretionary accruals. This analysis suggests that the interaction of board independence and R and D investment on the quality of accruals has a negative and significant effect on earnings management determined by the model of Kothari but that it has no significant effect on earnings management according to the model of Shahrur, et al. As for the study of the impact of this association according to the model of Shahrur, et al. we find that the effect of this cross-relationship is statistically insignificant associated with the quality of discretionary accruals.

Keywords: Corporate governance • Information quality • Discretionary accruals • Investment in R and D

Introduction

In terms of accounting information, the result is at the heart of the major concerns of the various partners of the company. This is why this indicator was widely considered to be the first information provided by the financial statements. In this sense, in order to meet the expectations and needs of different stakeholders, the accounting result must be of high quality. Several recent examples of accounting concealments in the United States (Enron, Tyco, WorldCom) and in Europe (Parmalat in Italy, Ahold in the Netherlands), have cast doubt on the quality of financial statements.

While these extreme examples of accounting fraud are rare, they indicate how important accounting information is to business leaders. However, without violating the accounting rules, these managers, by benefiting from the informational asymmetry, have the possibility of influencing the presentation and the content of the financial statements. The managers of the company have, in fact, information superior to that held by the investors. This private information allows these leaders to be in the best position to predict the future flows of the company [1]. In particular, the accounting result is a variable on which the leaders may wish to act. We then speak of accounting manipulation or earnings management [2].

In this context, most studies use discretionary accruals as a measure of the quality of accounting earnings, arguing that it is a direct measure of earnings management and a determinant of the quality outcome [3]. In light of the evolution of the literature on earnings management, several studies suggest that a better quality of information helps to reflect the image of a successful firm [4]. In addition, the firm's financial performance is often linked to its investment policies and especially investment in Research and Development (R and D) activities, deemed necessary for companies to ensure their sustainability, particularly in the high tech technology industry.

On the other hand, the absence of an effective control exerted on the leaders as well as the existence of discretionary spaces and gaps in the accounting rules relating to R and D expenses can reinforce the opportunistic behavior of the managerial attitude. To deal with the existence of these conflicts and for the sake of transparency, shareholders must set up control systems to limit

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Received: 04 November, 2022, Manuscript No. JAMK-22-79001; **Editor assigned:** 07 November, 2022, PreQC No. JAMK-22-79001 (PQ); **Reviewed:** 22 November, 2022, QC No. JAMK-22-79001; **Revised:** 23 January, 2023, Manuscript No. JAMK-22-79001 (R); **Published:** 31 January, 2023, DOI: 10.37421/2168-9601.2023.12.411

opportunistic behavior and control any discretionary spaces in this area.

Literature Review

Investment in research and development and quality of accruals

Given that investment operations constitute important events in the life of the company and are the real sources of performance, it is obvious that their successes are the responsibility of the managers and that the latter most often proceed to a dosage of the level invested according to their own objectives. In other words, the leader as investment manager of the firm, equipped with all types of information, will adopt opportunistic behavior to serve his own interests [5]. Moreover, although the investment in R and D constitutes a factor of creation of value, improvement of competitiveness and the performance of the firm that is to say that it is synonymous with good growth opportunities [6]. It is also a context conducive to accounting manipulation.

In addition, the flexibility of the standards relating to the methods of accounting treatment of R and D costs (in expenses or in assets), allows managers to choose the methods which allow them to maximize their interests and therefore to achieve their objectives and above all to strengthen the managerial attitude in order to maximize the manipulation of results. Indeed, investment in R and D is a decision that can increase information asymmetry and cause agency problems and makes the information communicated incomplete or even biased, following a loss of control leaders.

In this spirit, and for French companies, managers have the choice between the methods of accounting for R and D expenditure as assets or as expenses in a way that they can direct this choice according to their discretionary objectives. According to Breton and Stolowy, in companies that invest in R and D, managers, taking advantage of accounting shortcomings, can choose to act on the cost of R and D expenditure or the way it is accounted for in order to influence behavior investors, and achieve their objective and desired performance. In addition, the study by Berrone, carried out on a sample of Spanish companies, showed that R and D expenditure has a negative but insignificant impact on company performance, which explains why 'they are positively associated with the manipulation of accounting results. This result is compatible with more recent studies which prove that the decision to invest in R and D constitutes a context conducive to accounting manipulation. From the above we postulate that:

H_1: the intensity of investment in R and D activities has an effect on earnings management.

To deal with the existence of these conflicts and in order to increase transparency, shareholders must set up control systems to limit opportunistic behavior and control any discretionary spaces in this area. Governance mechanisms are therefore supposed to attenuate the divergences of interests and reduce the margins of freedom.

The presence of institutional investors and the quality of accruals

According to agency theory, institutional investors can perform the governance missions of controlling, disciplining and influencing corporate managers. With its position on the market and its participation in the capital, institutional ownership is considered as an internal control mechanism exerted on the leaders. Therefore, the study by Healy shows that institutional investors are the most demanding agents in terms of regular financial information published over time. Institutional shareholders, thanks to the importance of their participation in the market, have privileged access to information and benefit from better skills to process it. They will be better able to monitor the management of the company in order to protect their investments by avoiding economic risks in the market.

These various advantages allow them to exercise greater and more effective control, particularly in terms of the production of financial information. The latter can thus limit the opportunistic behavior of managers and therefore dissuade them from resorting to the management of accounting results. The results of the studies show that institutional ownership can deter the use of discretionary accruals [7]. Empirical results investigating the association between institutional investors and earnings management are mixed. As a result, some find no association between the two variables, while others show that institutional investors have the power to mitigate opportunistic earnings management behavior by serving as effective control agents of these activities [8]. From the above, we formulate the following hypothesis:

H_2: Institutional ownership is negatively associated with earnings management.

The independence of the board of directors and the quality of accruals

The effectiveness of the control exercised by institutional ownership over managers can be reinforced with control by another internal mechanism, namely the board of directors. Indeed, this mechanism as a key mechanism in the control of the opportunism of the leaders must include both internal members in order to ensure the ratification of the decisions thanks to their experiences and knowledge of the firm as well as independent external directors to ensure the manager's control.

Indeed, the analysis of the impact of the board of directors focuses essentially on the role of independent external directors whose mission is to control the managers and guarantee performance in order to preserve the interests of shareholders [9]. In short, outside directors are an effective way to reduce agency conflicts since they are less suspected of collusion with the manager than inside directors and this in order to be able to increase their human capital on the market of directors. Similarly, Fama and Jensen consider that the existence of independent external directors increases the effectiveness of the board of directors in the control system and in limiting the opportunistic behavior of managers. Thus, their lack of independence seriously undermines the effectiveness of their control.

In this sense, the work of Dechow, Sloan and Sweeney shows that the presence of external directors tends to attenuate agency conflicts

that include the opportunistic behavior of the manager. Similarly, other studies claim that the presence of outside directors impacts the quality of accounting profits and thus has a positive effect on company performance.

H_3: Board independence has a negative effect o n earnings management.

The effect of institutional investors on the relationship between R and D investment and the quality of accruals

Institutional shareholders, taking advantage of their strong position on the financial market, have all the potential to have privileged and specific information that allows them to better assess investment projects and know which ones maximize the company's performance. In order to improve the value of the firm, it is known that institutional ownership has an incentive to make decisions regarding long-term investments such as R and D investment projects.

Indeed, accounting theories and the literature confirm the role played by this governance mechanism in guiding the behavior of managers in terms of R and D investment [10]. In this context, several previous researches have shown that institutional shareholders, as owners of the shares, have an incentive to set up projects in R and D activities to achieve long-term gains [11]. Consequently, the participation of these investors can influence the quality of R and D investments and even limit the opportunistic managerial attitude.

In this context, the results of research by Kroll carried out on a sample of American companies, showed that institutional investors have a positive and significant impact on the relationship between R and D expenditure and the performance of the company and therefore they are negatively associated with the relationship between R and D investment and earnings management. Contrary to this result, other recent works have shown that the presence of institutional investors in the company's capital has a non-significant positive moderating effect on the association between R and D expenditure and earnings management [12].

Thus, we find that the existence of a positive or negative effect of the shareholding of institutional investors on the association between R and D investments and discretionary accruals, a proxy for earnings management, within the company, is defended by their supporters with as many arguments. Thus, we cannot clearly predict the sign of this effect. We leave it to emerge from the empirical data. From the above we postulate that:

H_4: The presence of institutional investors has an effect on the relationship between R and D investment and earnings management.

The effect of board independence on the relationship between R and D investment and accrual quality

Some recent previous studies have shown that the independence of the board of directors ensures less conflict of interest because of a stricter control and a more effective management, which is likely to limit managers' opportunism. It should be noted that the predominance of the board of directors by outside directors encourages managers to choose R and D activities beneficial to the creation of long-term shareholder wealth. From the above, we can summarize that the effect of R and D expenditure on earnings management will be more signi icant in irms with boards of directors whose proportion of independent outside directors is high.

On the other hand, external board administrations can also indirectly in luence the association between R and D spending and the manipulation of irm results because they can in luence the quality of investment in R and D activities without being directly involved in the process of decision making. Empirically, the study by Yang, carried out in the biotechnology sector, con irms that the independence of board members has a positive effect on the market's assessment of R and D expenditure.

In addition, Dahya, Taeyoung Yoo and Taeyoon Sung claim that the predominance of the board by independent external directors is a factor that could ensure the effectiveness of R and D projects chosen by managers. So we expect that:

H_5: The presence of independent outside directors on the board has a negative effect on the relationship between R and D investment and earnings management.

Sample and methodology

Sample: The sample is made up of French companies listed on the Paris stock exchange for the period covering 2009-2015. From this population, we excluded companies belonging to the financial sector (banks, financial services, insurance companies, etc.) given that they have an atypical financial structure and that they are subject to rules of presentation of information financial specific. Similarly, some companies were removed due to missing data required for our study. Thus, the number of companies forming our final sample is reduced to 89 companies. Regarding the information, we examined the annual reports (or reference documents) of all these companies, to determine which ones invest in R and D activities and which provide the amount of expenditure incurred in these activities during the 2009-2015 period.

Methodology: In order to test the different research hypotheses formulated in the previous section, we used an analysis model formulating the different concepts relevant to the study of the problem. Our model is developed to study the relationship between the internal mechanisms, on the one hand, (independent directors, institutional investors,) and earnings management in French companies, and on the other hand, the intensity of investment in R and D and earnings management. The form of the tested model is as follows:

$$|DA_{it}|=\beta_0+\beta_1 INST_{it}+\beta_2 IND_{it}+\beta_3 RD_{it}+\beta_4 SIZE_{it}+\beta_5 LEV_{it}+\beta_6 ROA_{it}+\varepsilon_{it}$$

|DA|: Quality of discretionary accruals of firm i in year t; $Inst_{it}$: Percentage of shares detains by institutional investors in the firm the year t; IND_{it}: The independence ratio of the board of directors; R and D: Investment in research and development activities; $Size_{it}$: Logarithm of total assets of firm i in year t; LEV_{it}: Debt ratio of firm i in year t; ROA_{it}: Economic profitability ratio of firm i in year t: B_0, β_1, β_2, β_3, β_4, β_5, β_6: The regression coefficients to be estimated; ε: This is the residual of the regression.

In the second regression we are going to test the effect of the interaction of certain governance variables with the intensity of R and D investments on the quality of accruals.

$|DA_{it}|=\beta_0+\beta_1 INST_{it}+\beta_2 IND_{it}+\beta_3 RD_{it}+\beta_4 RD^{*}INST+\beta_5 RD^{*}IND+\beta_6 SIZE_{it}+\beta_7 LEV_{it}+\beta_8 ROA_{it}+\varepsilon_{it}$

Measurement of variables

The quality of the accruals: We will use discretionary adjustments as a measure of earnings management. To determine the discretionary accruals, it is first necessary to calculate for each company "i" and for each year "t" the total of the accruals using the model of Dechow, Sloan, and Sweeney. The indirect approach of this model determines total accruals as the change in non-cash working capital items less amortization and depreciation.

$TA_{ij,t}=(\Delta$ current $assest_{ij,t}$ $-\Delta$ cash and cash $equivalent_{ij,t})-(\Delta$ current $liabilities_{ij,t}-\Delta$ long-term $liabilites_{ij,t})-amortization_{ij,t}-depreciation_{ij,t}$.

This measure consists of first determining the Total Accruals (TA) and then deducting the non-discretionary part of these total accruals.

$DA_t=TA_t-NDA_t$

Having calculated the total accruals for each company, we move on to estimating the non-discretionary accruals which are the part of the adjustments that managers cannot manage and which are compatible with the regular application of accounting principles.

To estimate the discretionary accruals it is first necessary to calculate the total accruals for each company "i" and for each year "t" using the model of Kothari and that of Raman and Shahrur. Indeed, these models develop that of Jones modified by adding the ratio of the performance and the ratio "Book-to-Market". The Modified Jones model appears as follows:

$TA_{it}/A_{it-1}=\alpha_0 (1/A_{it-1}) +\alpha_1 ((\Delta REV_{it-1}-\Delta RECit)/A_{it-1}) +\alpha_2 (PPE_{it}/A_{it}-1) +\varepsilon_{it}$

Where; $TA_{ij,t}$: Total accruals for firm i in industry j in year t; $A_{ij,t-1}$: Total assets of firm i in industry j in year t-1. All variables are standardized by total assets t-1 to reduce the problem of heteroscedasticity; $REV_{ij,t}$: Variation in net sales for firm i in industry j between t and t-1; $REC_{ij,t}$: Variation in net receivables for firm i in industry j between t and t-1; $PPE_{ij,t}$: Property, plant and equipment of firm i in industry j in year t; $\varepsilon_{ij,t}$: Term error of firm i in year t.

Using the estimated coefficients from the model above, we calculate the non-discretionary portion of accrued liabilities (NDA), for each observation to determine the discretionary accruals by the difference between the total accruals and the non-discretionary accruals. The modified Jones model will thus be:

$TA_{it}/A_{it-1}=\alpha_0 (1/A_{it-1}) +\alpha_1 ((\Delta REV_{it-1}-\Delta RECit)/A_{it-1}) +\alpha_2 (PPE_{it}/A_{it-1})$

Where; α_0, α_1 and α_2 represent respectively the estimation of α_0, α_1 and α_2.

The quality of accruals is determined by the absolute value of discretionary accruals calculated through the two valuation models, namely the Kothari model and that of Raman and Shahrur. The higher the absolute value of the AD, the lower the quality of the accruals.

The explanatory variables: Institutional ownership: This variable is measured by the percentage of capital held by institutional investors, which is equal to the following ratio: Number of shares held by institutional investors/total number of shares.

The independence of the board of directors: According to the accounting literature, the independence of the board is determined by the ratio of the number of external directors to the total number of directors. This measure has been adopted by several researchers, including Pathan.

Investment in R and D (RD) activities: R and D investment intensity can be defined as total R and D expenditure divided either by total assets or by the number of employees, or by the total sales of the company R and D intensity [13].

Results and Discussion

Empirical results

Descriptive statistics of explanatory variables: The results of the descriptive analysis of the independent variables, as presented in the table BELOW, show that there is a significant disparity in R and D expenditure illustrated by the existence of a remarkable difference between the minimum (0.001) and the maximum (0.846) recorded for the variable RD. This may be due to the nature of the company's business. In general, it is recognized that firms belonging to high technology sectors spend more on R and D investments than firms in other sectors. On average the companies in the sample spend on R and D activities are 17.27 as a percentage of total sales.

Thus, institutional investors play a decisive role in the management of listed French companies since they hold considerable shares in the capital of these firms. The table below shows that institutional investors (INST) hold on average 54.47% of the capital of the companies studied with, however, a wide dispersion (standard deviation 29.89%). On a sample of 89 listed companies, we note that the presence of institutional investors is not generalized for all the listed companies constituting our sample. This disparity in the percentage of capital held by institutional investors can be explained by the presence of family businesses [14].

The analysis of the role of the composition of the board of directors reveals that on average 49.97% of the members of the board are independent directors within the meaning of the Bouton report.

Reading the table shows that the average of the interaction variables $RD^{*}IND$ and $RD^{*}INST$ varies around 09% with a standard deviation which is equal, successively, to 0.147 and 0.158. Regarding the control variables, the observations show that the average economic profitability of the companies studied is equal to 05.44%. This tells us that the companies in our sample are under performing. In addition, the debt ratio of the companies in our sample is relatively high. It is on average 37% with a minimum of -1.105 and a maximum of 4.081 (Table 1).

Variables	Obs	Mean	Std. dev.	Min	Max
RD	623	0.172748	0.250958	0.001	0.846
IND	623	0.499714	0.157278	0.22	0.93
INST	623	0.544777	0.298941	0.003	0.996
RD*IND	623	0.091313	0.147572	0.002	0.659
RD*INST	623	0.092878	0.158882	0.001	0.724
SIZE	623	6.993583	0.594766	5.512	8.446
ROA	623	0.054442	0.101742	-0.95	0.996
LEV	623	0.371535	0.501647	-1.105	4.081

Note: IND: The independence ratio of the board of directors; R and D: Investment in Research and Development activities; INST: Institutional Investors; LEV: Debt Ratio; ROA: Profitability Ratio

Table 1. Results of Descriptive statistics of explanatory variables.

Panel data test: Several tests must be performed to qualify our panel data, mainly testing the presence of multicollinearity problem, heteroscedasticity problem, and autocorrelation problem.

Multi collinearity test: Multicollinearity is a computational difficulty that arises when two or more independent variables are strongly correlated. From the table, we notice that the coefficients of the explanatory variables (investment in R and D and institutional ownership, investment in R and D and independence of the board of directors and institutional ownership and independence of the board of directors) are strongly correlated with each other since its coefficients exceed the limit value 0.8 which corresponds to the limit from which one generally begins to have serious problems of multi-collinearity (Table 2) [15].

	QAD	RD	INST	IND	RDINST RDINDCA		SIZE	ROA	LEV
QAD	1								
RD	-0.2964	1							
	0								
INST	0.6168	-0.8325	1						
	0	0							
IND	-0.5825	0.8243	-0.9607	1					
	0	0	0						
RDINST	-0.1461	-0.0309	-0.0605	0.0704	1				
	0.0003	0.442	0.1316	0.0792					
RDINDCA	-0.1488	-0.1033	-0.0082	0.0395	0.7939 1.0000				
	0.0002	0.0099	0.8391	0.3246	0				
SIZE	0.0278	-0.0163	-0.0027	0.0214	0.0604	0.0178	1		
	0.4881	0.6849	0.9472	0.5946	0.1322	0.6582			
ROA	-0.0891	0.0349	-0.0743	0.0724	0.0152	-0.0074	-0.0325	1	
	0.0262	0.385	0.064	0.0708	0.7049	0.8542	0.4177		
LEV	-0.0195	-0.0234	0.0173	0.0156	0.1533	0.1468	0.049	-0.0107 1.0000	
	0.6263	0.5606	0.6672	0.6974	0.0001	0.0002	0.2222	0.7897	

Table 2. Pearson correlations.

Heteroscedasticity test: To detect this problem we apply two tests namely the Breusch Pagan test and the White test. According to the table, the results of the tests used made it possible to accept the null hypothesis of heteroscedasticity for the two models (P=0.000) according to the two models of evaluation of the quality of the accruals (Table 3).

Breush-Pagan test	Model 1	Model 2

AD Kothari	Chi^2=1184.40, P=0.0000	Chi^2=1151.06, P=0.0000
AD Raman and Sharur	Chi^2=1787.29, P=0.0000	Chi^2=1798.02, P=0.0000

Table 3. Heteroscedasticity test.

Autocorrelation test: From this table we accept the null hypothesis of autocorrelation of errors since the probability (P<Wald chi^2=0.000) is significantly lower than the significance level (5%) (Tables 4 and 5).

Wald test Chi^2	**Model 1**	**Model 2**
AD Kothari	Wald=67.77, P=0.0000	Wald=121.14, P=0.0000
AD Raman and Sharur	Wald=1334.06, P=0.0000	Wald=1315.31, P=0.0000

Table 4. Autocorrelation test.

$$|DA_{it}|=\beta_0+\beta_1 INST_{it}+\beta_2 IND_{it}+\beta_3 RD_{it}+\beta_4 SIZE_{it}+\beta_5 LEV_{it}+\beta_6 ROA_{it}+\varepsilon_{it}$$

Variables	**Kothari (2005)**	**Shahrur (2008)**
Constante	0.023144	0.117192
	-0.115	0
INST	0.000341	-0.02432
	-0.96	-0.15
IND	-0.04254	-0.16793
	-0.008	0
RD	0.010805	0.026996
	-0.003	0
SIZE	0.000295	-0.00034
	-0.849	-0.812
LEV	0.000684	0.000263
	-0.423	-0.605
ROA	0.000062	-0.00074
	-0.949	-0.267
AR2	-0.99	-1.24
	-0.322	-0.216
Hansen Test	4	13.14
	-0.857	-0.107

Table 5. First regression estimation.

Table 5 presents the results of the regression between certain internal governance mechanisms and the quality of discretionary accruals proxy for the quality of information calculated using the model of Kothari and that of Raman and Shahrur. Examination of the results of the estimation of the determinants of the quality of accruals shows that the decision to invest in R and D activities (RD) and the independence of the board of directors (IND) are the variables that have an effect statistically significant on the quality of the accruals according to the two models. This leads us to confirm the hypotheses relating to these two independent variables. For the R and D variable, this positive and significant impact is compatible with the studies of Yulong Yang, and assumes that companies have more incentives to manage their results upwards when investing in these activities. This explains why the decision to invest in R and D activities constitutes a favorable context for the management of results; this means that companies which invest in R and D manage their results well in a discretionary way [16].

Similarly, the negative effect of board independence on the quality of accruals is consistent with previous results which state that board independence may deter discretionary adjustments this means that the independent directors actively participate in the decision-making process, the control and the ratification of the decisions taken by the

managers. However, the presence of institutional investors (INST) has no significant effect on the dependent variable according to the two models for evaluating accruals.

In line with what is expected and the results of Ajay and Madhumathi, Shuji Rosey Baoa, Krista B. Lewellyn and Tesfaye T. Lemma, the results highlight that institutional investors have an impact negative and not significant on the quality of the accruals determined according to the model of Raman and Shahrur. Regarding the control variables, for both models the debt ratio has a positive effect on the quality of abnormal accruals (Table 6). This allows us to conclude that indebted companies provide poor quality financial information since they seek to overstate their results to ensure the balance of their financial situation and present financial information that is more favorable to investors' decisions [17].

Variables	Kothari (2005)	Shahrur (2008)
Constant	0.178719	0.11863
	-0.178	0
INST	-0.04865	-0.02518
	0	-0.126
IND	0.047074	-0.16883
	-0.302	0
RD	1.078978	0.026807
	0	0
Rd INST	-0.02065	-0.00166
	-0.793	-0.692
Rd*IND	-2.15669	-0.00221
	0	-0.648
SIZE	-0.02702	-0.00037
	-0.181	-0.809
LEV	-0.00165	0.000439
	-0.575	-0.446
ROA	0.473048	-0.00075
	0	-0.279
AR2	-1.03	-1.24
	-0.301	-0.216
Hansen Test	4.13	13.17
	-0.66	-0.106

Table 6. Second regression estimation.

$|DA_{it}|=\beta_0+\beta_1\ INST_{it}+\beta_2\ IND_{it}+\beta_3\ RD_{it}+\beta_4\ Rd^{*}INST+\beta_5\ Rd^{*}IND+\beta_6\ SIZE_{it}+\beta_7\ LEV_t+\beta_8\ ROA_{it}+\varepsilon_{it}$

The Table 6 above presents the results of the initial regression while taking into account the effect of the interaction of governance mechanisms and R and D investment on the quality of accruals. The estimate of the quality of abnormal accruals determined by the Kothari model shows that the presence of institutional investors, the decision to invest in R and D and the moderating effect of the presence of independent administrators on the relationship between investment in R and D activities have a statistically significant impact.

Furthermore, consistent with our hypothesis as well as previous studies, we ind that the participation of these independent directors in the composition of the company's board can limit executive opportunism, orient and better control of the latter's decisions in terms of R and D investment, which leads to a reduction in the value of discretionary adjustments. Independent directors can mitigate the reliance on earnings management through spending on R and D investment. Thus, outside directors tend to discipline the behavior of managers better than inside directors in terms of investment in research and development activities [18].

Also, we found that the relationship between the presence of institutional investors and the quality of accruals is statically negative, which leads us to confirm our hypothesis. This observation implies that they can limit the discretionary space of managers and their manipulation of results through the decision to invest in R and D activities.

On the other hand, the estimation of the determinants of the quality of accruals determined from the model of Raman and Shahrur

shows that all the independent variables have no significant effect on the exogenous variable except the independence of the board of directors. And the intensity of R and D investment, which signi icantly impact the quality of accruals (Table 7).

However, it should be noted that the coefficient relating to R and D is strongly confused with our expectations, which explains why the intensity of R and D investments is positively linked to the value of discretionary accruals, measured by the two models. This significant effect proves the specificity of research and development activities which can reinforce the opportunistic behavior of the managers, which affirms that the investment in the activities in R and D constitutes a favorable context of the abnormal adjustments practiced by the managers of the companies [19,20].

Hypothesis	expected signs	Results			
		Model 1		Model 2	
		K. (2005)	Sh. (2008)	k. (2005)	Sh. (2008)
H_1: The intensity of investment in R and D activities has an effect on earnings management.	+	Confirmed (+)	Confirmed (+)	Confirmed (+)	Confirmed (+)
H_2: Institutional ownership is negatively associated with earnings management.	-	Rejected (+)	Confirmed (-)	Confirmed (-)	Confirmed (-)
H_3: Board independence has a negative effect on earnings management.	-	Confirmed (-)	Confirmed (-)	Rejected (+)	Confirmed (-)
H_4: The presence of institutional investors has an effect on the relationship between R and D investment and earnings management.	+			Rejected (-)	Rejected (-)
H_5: The presence of independent outside directors on the board has a negative effect on the relationship between R and D investment and earnings management.	-			Confirmed (-)	Confirmed (-)

Table 7. Hypotheses results, expected signs and obtained signs.

Conclusion

The objective of this study was to examine the impact of certain internal governance mechanisms and investment in R and D on the practice of earnings management measured by the quality of discretionary accruals. Using data from a sample of listed French companies for the period 2009-2015, we have drawn up a model based on five research hypotheses. In this study, we tested these research hypotheses through multivariate analysis using multiple linear regressions. The empirical results allowed us to conclude that the model is in general explanatory of the studied phenomenon. First, the interpretation of these results allows us to conclude that investments in R and D activities constitute a favorable context for the manager to expand his discretionary space.

However, the independence of the board of directors can limit the opportunistic behavior of the managers, and consequently, contributes to the improvement of the quality of the financial information which means that our hypothesis relating to this means of monitoring is confirmed whatever regardless of the valuation model for discretionary accruals.

In addition, we find that the interaction between board independence and investment in R and D (IND × RD) reveals a negative and significant impact on the quality of discretionary accruals measured by the model of Kothari, et al. So our hypothesis is confirmed for BF120 companies. However, it has no significant effect according to the accrual measurement model of Raman and Shahrur.

Finally, the interaction of the variables (INST × RD) has a non-significant negative effect on the management of the results determined by the two models of (2005) and (2008). We thus find that with the participation of institutional investors, the cross effect of institutional ownership and the intensity of investment in R and D (INST × RD) do not have a significant influence on the quality of discretionary accruals. This goes against our hypothesis.

Although control mechanisms and R and D investment have a simultaneous impact on the quality of accruals proxies the quality of accounting earnings, this impact has been ignored in accounting research. As a result, this article focuses instead on the cross-influence of two supervisory bodies, namely the presence of institutional ownership and the independence of the board of directors on the discretionary power of managers. It examines the impact of the joint implementation of these mechanisms and the decision to invest in R and D on the management of benefits. Our research belongs to empirical research on the theme of results management while avoiding the traditional framework of the relationship between governance mechanisms and results management.

This article contributes to the development of the relationship between monitoring mechanisms and R and D investment decision and the effect of this relationship on earnings management. Indeed, it pushes the company to use the simultaneous influence of governance mechanisms to reduce the discretionary margin practiced by managers through the investment decision.

In addition, this study encourages companies to use the participation of institutional investors or the board of directors in the control system to guarantee the control exercised over managers in making the decision to invest in R and D.

However, like any other study, this research has certain limitations. First, the sample size of our study is reduced to 89 companies due to the unavailability of all the necessary financial and non-financial data for the period from 2009 to 2015. Second, another limitation relating to the absence of other variables in our models that could influence the relationship between R and D investment and earnings management (board size, foreign ownership, managerial ownership, existence of audit committee, etc.).

In addition, if the results of this research allow us to understand the relationship between certain control mechanisms and the quality of proxy accruals of the practice of earnings management, future studies on a larger and larger sample can clarify and better explain this relationship. In addition, another avenue of research consists in introducing the impact of other governance bodies which may be influenced, the effect of the decision to invest in research and development activities on the quality of information or even the quality of accounting profits *via* the quality of discretionary accruals. Finally, we suggest extending the study period in order to perform a more useful pooled analysis study of this interaction relationship.

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How to cite this article: Gharsellaoui, Leila and Anis Jarboui. "R and D Investment and the Quality of Accruals: The Role of Corporate Governance." *J Account Mark* 12 (2023):411.