Accounting treatment of research and development r d accounting essay

Accounting treatment of research and development (R&D) charges is a controversial issue since the way of taking into account these fees can sometimes be motivated by incentives to handle the final results.

The results of the study are based on a sample of French companies listed and quoted in the financial market: Indeed, this study examines the extent to which the decisions of the companies to capitalize or not the charges of the R&D can be influenced by motivations to manage earnings. The French context presents a good example to check our assumptions, as the PCGR in France offers the ability of choosing between capitalizations and expensing R& D charges.

By using a logistic regression model, we find out that the French quoted companies tend to use the capitalization of the R& D expenditures in order to smooth the results, as well as, to avoid any violation of the debts restrictive clauses.

Keywords: R&D accounting, earnings management, earnings smoothing, debt covenants, French companies.

1 Introduction

The transition from an industrial economy to a knowledge economy has changed the way of taking into account the economic, accounting and stock market valuation of this new field. Intangible assets become the key sources of growth and competitive edge for firms and industries. According to Penman (2009), the success of the best firms in the market is essentially due to its knowledges assets: " Microsoft Corporation", which uses a large

amount of intangible assets and the great " Dell Inc… ", based on a significant organizational capital (Lev et al., 2009) are a few examples to demonstrate it.

Studies show that investment in R & D is considered as an important form of investment in technology-in comparison to other intangible investments (Karl-Heinz, 2005). Companies have invested substantial sums in R & D during the last two decades to generate future economic benefits to different stakeholders in the firm. Indeed, in the context of Europe 2020 strategy, European Commission announced in July 2010, that a sum of 6400 million Euros will be allocated to invest in research and innovation (Eurostat, 2010)1

A firm cannot compete in this new environment unless it becomes more innovative and responds more effectively to consumers needs and preferences. Beyond the economic and financial valuation of investments in R & D, management accounting research has recently focused on understanding particular challenges from an accounting perspective. The complexity of accounting treatment of R & D expenditures and the diversity of opinions on this subject have led to differences in accounting methods in the world.

The majority of studies focused on the relevance side of accounting decision about R&D expenditures, while few ones have focused on the reliability side and more specifically the possibility of using the R&D expenditures as a means of earnings management. Banal and Stadler (2010) have demonstrated significant discretion in the choice of R & D projects and their accounting treatment.

The problem of management discretion and its effect on the investment decisions has probably an important impact on the way the accountants should take into consideration: Indeed, a debate has been raised recently in the convergence project between U. S. GAAP and IAS / IFRS. If our research would be able to prove that the capitalization of R & D is often affected by motivations to manipulate the results, it will support the current position of U. S. GAAP (United States), which takes a stricter approach and requires that all R&D expenditures should be expensed in the current period. Instead, if research indicates that companies dont use R&D accounting treatment for earnings management purposes, it will support the position of IAS/IFRS under which the capitalization of R&D expenditures is authorized under certain conditions.

This paper aims to contribute to the understanding of R & D accounting practices in the French context since French accounting regulation has given managers considerable flexibility regarding the accounting treatment of R&D expenditures: Indeed, each actor try to protect its specific advantages, it will therefore try to use its position to maximize profit (Syed et al., 2009). Hence, managers, holding an informational rent, can enjoy the flexibility of R&D accounting regulation in France.

The paper proceeds as follows, section 2 introduces theoretical foundations of research, section 3 presents the regression model and the research methodology. Finally, section 4 presents the results and section 5 concludes the study.

2 Theoretical foundations

2. 1 R & D accounting treatments

2. 1. 1 The international accounting differences

" Everyone believes that harmonization will happen one day, but apparently no one believes it will happen in his or her lifetime" 2 (Philip R. Lochner, Jr., a former commissioner of the Securities and Exchange Commission in the USA).

The capitalization of R&D expenditures has always been a controversial accounting issue. International Accounting Standards discuss accounting for R&D expenditures in IAS No 38 (IASB, 2004 a, b). Paragraph 54 of this standard states that research expenditures shall be expensed in the income statement. Concerning development expenditures, paragraph 57 states that an intangible asset arising from development, must be included in the balance sheet if some conditions are respected.

However, U. S. GAAP adopts a stricter approach to the issue: Indeed, the Financial Accounting Standards Board (FASB), which authorized a first time activation of R & D expenditures, adopted in October 1974 another approach stipulating that all R & D costs must be immediately expensed according to SFAS No. 23 (FASB, 1974, paragraph12). The only exception to the full expensing rule is stated in SFAS No. 864 which is related to the activation of a software development expenditures (FASB, 1985). The same approach was adopted in 1998 by the Business Accounting Deliberation Council (BADC), obliging all Japanese firms to expense all their R & D expenditures. However, for the case of Italian or French settings, the decision to capitalize or expense R&D expenditures is a management choice. Its national accounting

standards allow the capitalization of R & D expenditures when certain conditions are met5. A similar approach is applied for British and Canadian firms which proceed to the activation of R&D under certain conditions and therefore their depreciation. However, Germany is characterized by the absence of publication of annual financial statements -except in an IPO- doesnt really recognize the concept of intangible assets, particularly the R & D whose activation is prohibited.

2. 1. 2 R&D accounting treatment in France for listed companies

Since 2005, all listed companies in the European Union (EU) countries have been obliged to prepare their annual reports in accordance with international standards (IFRS / IAS). The revised IAS 38 distinguishes between a " research phase" and a " development phase". Expenditures on research should be expensed: IAS 38 (55) considers that during the research phase of a project, a company cannot demonstrate that an intangible asset will generate or not probable future economic benefits.

Assets arising from research (or from the research phase of an internal project) shall be recognized. Expenditure on research (or on the research phase of an internal project) shall be recognized as an expense when it occurs.

An intangible asset arising from development (or from the development phase of an internal project) shall be recognized if and only if an entity can demonstrate all of the following:

(a) The technical feasibility of completing the intangible asset so that it will be available for use or sale.

(b) Its intention to complete the intangible asset and use or sell it.

(c) Its ability to use or sell the intangible asset.

(d) How would theses assets generate probable future economic benefits? Among other things, the entity can demonstrate the existence of a market for the output of the intangible asset or the intangible asset itself or, if it is to be used internally, the usefulness of the intangible asset.

(e) The availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset.

(f) Its ability to measure reliably the expenditure attributable to the intangible asset during its development "(IASB, 2009).

Conditions stated by the French accounting standards are similar to those stated by IAS for development costs. The only difference between French GAAP and IAS/IFRSlies intheobligation ofcapitalization of R&D expenditures, if the conditions stated above are satisfied. Contrary to IAS, French GAAP do not require capitalization of R&D expenditures when these conditions occur, leaving flexibility for the managers.

2. 2 Literature review and research hypotheses

Previous researches have suggested four main incentives for earnings management, derived from the positive of accounting theory. The first

motivation concerns the debt-covenant, the second incentive is to reduce the variability of results by the management to increase or decrease profits in order to minimize the risk taken by investors: we speak in this case about earnings smoothing, the third motivation concerns the reduction of political costs, and finally the bonus plans.

In this study, we focus only on the first three incentives because of the limited disclosure6 of data on the existence and structure of the bonus plans by French companies.

2. 2. 1 Debt-covenant restrictions

The study of debt-covenants as a determinant of accounting choices suggests that managers are encouraged to enjoy the flexibility of standards by adopting the accounting choices that allow them to avoid violating restrictive debt-covenants, more specifically methods that increase results (Garen et al., 2008). This is the case for R & D expenditures since the way that R & D accounting treatment allows flexibility in the choice between capitalizing and expensing. Thats why, more leveraged companies should be more encouraged to activate their R & D costs rather than expensing them (Landy and Callimaci, 2002; Finet et al., 2005). Similarly, according Btriou and Vignolles (1990), activation of R & D decreases the financial leverage, which creates an incentive for highly leveraged companies to choose the activation rather than expensing. Aboody and Lev (1998) also argue that a high level of debt could push a company to capitalize on its R & D expenses, because this choice allows the company to improve its accounting profit and decrease its debt ratio.

In France especially, restrictive debt covenants ratios are calculated from accounting results, level of debt and financial expenses. Therefore, highly leveraged firms may be encouraged to make income-increasing accounting decisions (Shea, 2002). Companies that activate their R & D are more likely to move away from the boundary violation of " debt covenants". Thus, our first hypothesis is formulated as follows:

H1. The probability of capitalizing R & D expenditures is positively related to the leverage ratio.

2. 2. 2 The variability of results

The income-smoothing hypothesis suggests that a managers accounting discretion is led by his desire to reduce the variability of results (Fudenberg and Tirole, 1995). The smoothing process is used to moderate the fluctuations in results from one year to another by transferring the benefits from peak years to less successful periods (Garen et al., 2008). Trueman and Titman (1988) examine the factors that motivate managers to manipulate published results and conclude that managers can improve the market valuation of the company by smoothing the results to reduce the peaks and make variations of results less volatile. These authors prove that firms smooth their income because they want investors to notice that the company shows a good performance and a lower risk, thus resulting in lower cost of capital for the company.

The political costs are also considered as an important motivation for earnings smoothing (Watts and Zimmerman, 1986; Cahan, 1992; Godfrey and Jones, 1999). Earnings smoothing diverts political aims; in fact,

excessively high incomes attract such attention from government and tax services. Such concerns may come from employees concerned about the future employment prospects, suppliers and customers who tend to evaluate the future stability. Another major explanation of earnings smoothing has been linked to the remuneration of a manager and its concerns about job security, Fudenberg and Tirole (1995) predict that earnings smoothing occurs because the manager increases published earnings in difficult periods to increase the probability of keeping their job and tends to decrease published income in good periods.

Smoothing results were seen both as a positive strategy that allows managers to provide information to private investors (Tucker and Zarowin, 2006) and as a manipulative practice which is conducted for opportunistic purposes (Garen et al, 2008).

In this study, we did not intend to defend either of these two views. Our main objective is to test whether the accounting treatment of R & D is used for earnings smoothing. Nelson et al.(2003) showed that the accounting treatment of these costs is one of the most common earnings management strategies. Therefore, we estimate that companies tend to capitalize their R & D expenditures when their operating profitability (before capitalization of R & D) is lower to that of recent years, while they tend to expense the costs of R & D when their operating profitability is higher to that of recent years. Similarly, Garen et al (2008) have shown through their study on 130 Italian companies for the years 2001, 2002 and 2003 that is a negative relationship between variability of changes in income and capitalization of R & D. We formulate the hypothesis as follows:

H2. The positive variability of results reduces the probability of capitalizing R & D expenditures.

2. 2. 3 The political costs

According to Watts and Zimmerman (1986), the political cost hypothesis predicts that large firms are more likely to be supervised than small firms, because of the high results that may be generated.

Agreeing with the positive accounting theory, the political visibility is often correlated with the political costs (Watts and Zimmerman, 1986). The political costs are not based on an explicit contract, but they result from the use of accounting information. According to Dufour and Zemzem (2005), governments and politicians are not the only ones who can react. We must also consider actions that can be carried out by employees, unions, competitors or consumer associations. Indeed, the state can be inferred that the company has a monopoly rent, which falls within antitrust law. Similarly, employees or unions will be motivated to seek a renegotiation of wages.

2. 2. 3. 1 Firmsize

Firm size is usually used as a proxy for the political costs. According to Ben Othman et al.(2006), firms with larger sizes are more susceptible to incur the pressure of political costs than smaller ones and are thus subject to greater transfer of wealth.

In other words, when a company has a larger size, its visibility on the market is larger and it is followed by a larger number of analysts.

Regarding the R & D expenditures, the majority of studies retain size as a " proxy" for political costs: Indeed, the more the company is larger, the more its ability to contribute to the financing of the state is high (and Zemzem Dufour, 2005). Governments are therefore looking more to large firms (Aboody and Lev, 1998). Dumontier and Raffournier (1998) showed that size could also be a determinant of the decision of capitalization of R & D. Indeed, the size plays an important role in many accounting choices. According to Dufour and Zemzem (2005), a company with a large size will aim to further reduce their results than a small company. It follows that large companies should expense their R & D expenditures during the year (Daley and Vigeland, 1983, Percy, 2000).

For large firms, managers choose accounting methods that differ the realization of profits, it means that, they tend to reduce their profits and therefore to expense R & D costs.

H3. 1 The probability of capitalizing R & D costs is negatively related to the size.

2. 2. 3. 2 Personnel costs

Employees are a central element in the system of corporate governance. They are considered by many authors such as Charreaux and Desbrires (1998) as providers of business resources and therefore assign the value created, as well as shareholders, creditors or directors (Nekhili, 2000). The political costs hypothesis predicts that negotiations with employees encourage companies to reduce accounting profits in order to avoid salary demands (Mora and Sabater, 2008): Indeed, for the majority of firms, wages

and social advantages granted to employees are the main cost incurred during an accounting period (Breton and Schatt, 2003). Therefore, managers may be tempted to reduce benefits to avoid the difficult negotiations with employees or unions (Waterhouse et al., 1993). The hypothesis of an accounting manipulation prior to wage negotiations has already been tested in the United States by Liberty and Zimmerman (1986) and by D'Souza et al. (2001).

While Liberty and Zimmerman (1986) dont found any evidence that managers use accounting in order to strengthen their position in negotiations with employees, D'Souza and al.(2001) have demonstrated the use by managers of discretionary accounting choices to influence future negotiations with employees especially when workers are too linked to unions. Accordingly, wages may lead managers to adopt income-decreasing accounting decisions to avoid salary increase requests.

Mora and Sabater (2008) studied a sample of Spanish companies to test the political costs hypothesis, which states that managers tend to reduce accounting profits to avoid wage increases and other requests from the workers. They found that managers in Spain reduce accounting profit in order to avoid potential negotiations with employees. Flexibility in R&D accounting treatment can serve this purpose. We test the following hypothesis:

H3. 2 The probability of capitalizing R & D expenditures is negatively related to the wages costs.

2. 2. 4 The industry

Firm industry can be considered as a relevant variable to explain the accounting practices (Watts and Zimmerman, 1986; Zeghal and Ben Othman, 2006): Indeed, firms belonging to the same sector are subject to the same environment and therefore the same pressures (Givoly and Palmon, 1982; Craswell and Taylor, 1992).

Accounting decision about R&D expenditures differs from one sector to another. The positions occupied by companies that invest in high technology are very fragile and investments in technological innovation are very heavy and varied (Ding et al., 2004). Hence, it is necessary to reassure the market on current and future profitability of the company. Capitalization of R & D is an effective signal about the future profitability of the firm. Companies in traditional sectors often have a constant and stable flow of R & D activity, it is obvious that they expense more their R & D expenditures. The results of the study by Ding et al.(2004) based on logistic regression, applied empirically on a sample of 68 French companies, confirm that companies that capitalize R & D expenses are those that operate in the high technology sector.

H4: The probability of capitalizing R & D expenditures is positively related to its implications in high technology sectors.

2. 2. 5 The quality of audit

The fundamental role of the external auditor is to certify the regularity of company accounts and thus ensure compliance with GAAP. A good quality of audit reflects usually a weaker earnings management (Ben Othmen and al., 2006). However, the impact of audit quality on levels of discretionary

manipulation of managers, particularly in their accounting practices for intangible investments is very important, auditors with high audit quality encourage firms audited by them to communicate their intangible expenditure to preserve their reputation (Bourmont, 2006).

The majority of studies have shown the positive effect of audit quality on the level of voluntary offer of information about the R & D activities (Bourmont, 2006) and the level of capitalization of R & D expenditures. We therefore expect that firms, which auditors have the best quality of audit, are those whose activation levels of R & D expenditures are the highest. In this context, our hypothesis on the quality of audit is formulated as follows:

H5: The probability of capitalizing R & D expenditures is positively related to the quality of the external auditor.

2. 2. 6 Listing on a U. S. market

Some French companies have a dual listing France / USA. American accounting regulations strictly required to expense R & D expenditures. French companies listed in the United States are not required to follow U. S. GAAP. It is enough for them to file a reconciliation of net income and shareholders equity compared to U. S. GAAP (Report 20-F). However, to ensure comparability and consistency of accounting information, the French companies listed on U. S. markets may tend to expense their R & D expenditures, even for their financial statements prepared under French GAAP (Ding et al., 2004). We test accordingly the following hypothesis:

H6: The probability of capitalization of R & D expenditures is likely to be reduced in case of listing on a U. S. market.

2. 2. 7 The stock market performance

The stock market performance of a company was used by Garen et al.(2008) in their study as a control variable for future growth opportunities that influences the choice of accounting the treatment of R & D expenditures. According to Shabou and Taktak (2002), the more the company is engaged in growth opportunities the more it could face more restrictions on its funding policy. The managers will aim by consequence to avoid these restrictions.

H7: The probability of capitalizing R & D expenditures is positively related to the stock market performance of the company

2. 2. 8 The risk (?)

When a company has a higher coefficient risk factor " beta", the market requires a greater rate of return. The company is therefore obliged to show a more attractive accounting result. Contrary to the study of Garen et al. (2008) on a sample of Italian companies that have found no significant effect of the variable " beta" on the probability of capitalizing R & D expenditures, Ding et al.(2004) have demonstrated, through their study of the French context, the existence of a positive and significant relationship between the capitalization of R & D expenditures and the coefficient risk " beta" of the firm.

H8: The probability of capitalizing R & D expenditures is positively related to the beta risk.

3 The regression model and research methodology

3. 1 Presentation of regression model

We use a logistic regression for our analysis:

Yi = ? 0+ ? 1LEVERAGE+ ? 2 ? ROA-2+ ? 3SIZE+ ? 4PC +? 5HI-TECK + ? 6QUAL+ ? 7LIST-U. S +? 8MB+ ? 9Beta + Ui

LEVERAGE: it is the total debt divided by the total of the assets.

? ROA-2: is the change in return on assets over the average of the prior two years.

[(N-1; N-2)]/ (N-1; N-2); ROA= Operating income/Total assets.

SIZE: is the natural logarithm of total assets.

PC: Personnel Costs, it is measured by:

(Wages and salaries + Social security charges) / Number of employees

HI-TECH: is a dummy variable that takes the value of 1 if the firm belongs to a high-technology sector and 0 otherwise.

QUAL: a dummy variable that takes the value of 1 if one of the firm is audited by one of the Big 4 and 0 otherwise.

LIST-US: a dummy variable that takes the value 1 if the company is listed on a U. S. market (NYSE or NASDAQ) and 0 if the company is not listed on a U. S. market.

MB: is the market value of the firm divided by the book value.

BETA: is a sensitivity coefficient of the assets returns to the market returns. It is obtained from data base " Thomson One Banker (TCS)" and corresponds to the relationship between changes of stock prices during a period of 23 to 35 consecutive months and the evolution of a local index:

3. 2 Research Methodology

3. 2. 1 Sample Selection

Our sample is composed of French companies listed on the Euro-next Paris7 observed in the years 2007 and 2008.

To create our sample, we hand-collect as initial population a group of French companies listed on Euro next Paris in 2005-2006-2007-2008. The initial sample contained 125 companies including those ranked among the top 100 in Europe such as: Sanofi Aventis (3), Alcatel Lucent (9), PSA (14), and Renault (15).

The choice of France as the country origin of the sample is not arbitrary; it can be justified by the fact that French policy is more and more increasingly in favor of innovation. According to statistics of the newspaper " Monitor International Trade," France is the 10th member state of the European Union (EU) the most innovative. Total R & D expenditures of French companies in

relation to GDP are in seventh place (1. 31% of GDP) in the EU (Samuel, 2009).

Similarly, the French context is very favorable to study the incentives of capitalization of R & D expenditures. Indeed, the French regulatory environment is very favorable to " earnings management", as it provides some flexibility regarding to the accounting decision of R & D expenditures, since the two accounting treatments are allowed.

Finally, the choice of country of the sample was dictated by practical reasons related to the availability of information and the ability to have and understand annual reports.

3. 2. 2 Collection, purification and detailed description of the data sample

3. 2. 2. 1 Data collection

To achieve this study, accounting data have been collected jointly from annual reports of companies in the sample, information available in the European scoreboard and the database " Thomson One Banker (TCS)8": Information concerning the capitalization of R & D annual reports is gathered fromfirms. Data for the years 2007 and 2008 regarding the market capitalization of these firms, their industries and the number of employees are available on the European scoreboard prepared by the Common Center of Research and directorate-general of European Research Commission(the dashboard of industrial R & D is carried out in 2009, it reports the trends of the firms and reports the top 1000 of companies in Europe, according to their spending on R&D in Europe and the same in the world). Data for the

years 2007 and 2008 concerning total debt, personnel costs, net income and quality of the auditor were collected from annual reports of the firms. This is also the case for data relative to operating profit and total assets for the years 2005-2006-2007-2008 to calculate the variation of ROA2008and ROA2007relative to the average of two previous years. Finally, the information relative to the risk " Beta" is available on the database " Thomson One Banker"

3. 2. 2. 2 Purification of data and description of the sample

We started with a sample of 125 companies. The consultation of their annual reports revealed that 19 of them dont communicate informations about the capitalization of the R&D, and among the 106 remaining firms, we were forced to eliminate 29 ones because there are other missing data (unavailability of annual reports or some other information). Hence, the final sample includes only 77 companies.

To describe our sample according to the activity of the firms, we will take a rigorous classification of the sectors, provided by the British Department of Trade and Industry, which presents a typology of 39 sectors of activities into 3 groups of sectors:

The following table shows the distribution of our samples firms by industry and sector group:

Table 1: Distribution of firms by industry

Industry

The presentation and data analysis will be done at three levels:

* Uni-variate analysis

* Bi-variate analysis

* and a multi-variate analysis

4. 1 Uni-variate analysis

The description of the sample requires the division of the 130

observations9(years-firms) in two groups:

G1: The group G1 is composed of observations that correspond to the

decision of capitalizing R&D costs.

G2: The group G2 is composed of observations that correspond to the

decision of expense R&D costs.

Means and standard deviations corresponding to independent variables like

metric (or continuous ones) and the frequencies of the dichotomous

variables are presented in Tables 2 and 3.

Table 2: Means and standard deviations for continuous independent

variables

Continuous variables

Table 3: Frequency of dichotomous independent variables

Dichotomous

To test differences between means, the normality of the distribution of observations for each metric variable must be checked. The Kolmogorov-Smirnov test (K-S), operated on six variables, showed that only two variables are normally distributed (leverage and risk)10. The test of differences between means for these two variables in the two groups was not significant11.

Two non-parametric tests were performed: The first is the Mann-Whitney test12, operated on four continuous variables, which showed that only the variable " Size" was observed statistically significant at level of 1% (Z =- 3. 007, sig = 0. 003). This result confirms the political costs hypothesis(H3. 1)that states:" the probability of capitalizing R&D costs is negatively related to size."

The second is the Chi-square test13, operated on the dichotomous variables, the three variables used in the model has an important impact on the decision of capitalization of R&D costs.

4. 3 Multi-variate analysis: the method of logistic regression

The multivariate analysis method used in this research is the logistic regression: Indeed, this method allows us to verify the significance of the impact of variables on the probability of choosing one of the two ways: either the capitalization or expensing R&D costs. Some conditions need to be checked for proper application of this method.

4. 3. 1 Conditions of application of the logistic regression

4. 3. 1. 1 Elimination of outliers

From the sample of 154 observations (firms-years) and using the Matlab function" REMOVEOUTLIER", 24 observations were eliminated.

4. 3. 1. 2 The multi-collinearity between variables

The analysis of correlations between the nine variables using the Matlab function" corrcoef" is presented in Table 4 below.

Table 4: Correlation between independent variables

Correlations

*Correlation significant at level of 5%

We note that there is:

-A positive and significant relation at level of 5% between LEVERAGE and SIZE.

We tested the political costs hypothesis by two variables: the SIZE and PC, contrary to the hypothesis of debt-covenant restrictions which was measured by a single variable, which is the debt ratio: So, we choose to eliminate the variable SIZE.

– A positive and significant relation at level of 1% between HITECH and PC. It is clear that the variable PC i