



CENTRE
DE RECHERCHE
RESEARCH CENTER

-DR 03021 -

**Value Relevance of R&D Reporting :
A Signaling Interpretation**

*Anne CAZAVAN-JENY**
&
*Thomas JEANJEAN***

Juillet 2003

* *CAZAVAN-JENY A. ESSEC, Avenue B. Hirsch, BP 105, 95021 Cergy Pontoise Cedex, France.*
** *JEANJEAN T. Groupe HEC, 1, rue de la Libération, 78 351 Jouy-en-Josas Cedex, France*

Value relevance of R&D reporting: a signaling interpretation

Anne CAZAVAN-JENY* and Thomas JEANJEAN**

* Assistant Professor, ESSEC Business School

** Assistant Professor, Groupe HEC

Address for correspondence:

Anne CAZAVAN-JENY, Assistant Professor
ESSEC Business School, Department of Financial & Management Control
Avenue Bernard Hirsch – B.P. 105 – 95021 – Cergy-Pontoise Cedex – France
Tel.: + 33 1 34 43 28 03 – Fax.: + 33 1 34 43 28 11
e-mail: cazavan@essec.fr

Acknowledgements – The present paper was made possible by financial support from the Research Center of the ESSEC Business School, Paris (Centre de recherche). We are grateful to Christophe Danset for research assistance.

Value relevance of R&D reporting: a signaling interpretation

ABSTRACT

Accounting for research and development (R&D) costs is an open issue. *SFAS N°2* mandates that all R&D costs are immediately expensed. International standards prescribe a capitalization of R&D costs if they meet certain criteria (*IAS 38*). Recent research papers (Healy et al., 2002; Lev and Sougiannis, 1996, 1999; Aboody and Lev, 1998, Zhao, 2002) show that capitalization of R&D costs and software development costs is value relevant. However critics can be leveled at previous research because prior empirical tests are based on simulated or partial data.

Our purpose is to test empirically R&D accounting issues on a sample of 95 French firms on a three years period (1998-2000). French context provides an experimental field for studying the value relevance of R&D capitalization, because both accounting treatments of R&D costs (expensing and capitalization) are allowed. We find that capitalized R&D is positively associated with stock returns and stock prices, whereas expensed R&D is negatively related to stock prices and stock returns. R&D accounting reduces the information asymmetry on the successfulness of R&D projects: it acts as a signal to investors.

This paper extends previous literature by using real data on capitalized R&D, instead of estimated data. Moreover, we show not only that capitalized R&D is value relevant but also that expensing of R&D projects conveys a negative signal.

Key words : value relevance, R&D, France, financial reporting, capital markets, accounting choice.

0. INTRODUCTION

This paper deals with the value relevance of research and development (R&D) costs' financial reporting. Accounting for R&D efforts is an open issue. US standard setters mandate that all R&D costs are immediately expensed (*SFAS N°2*), whereas International standards prescribe a capitalization of R&D costs if they meet certain criteria (*IAS 38*).

On one hand, proponents of the cost method argue that expensing is preferable to capitalization because it eliminates the opportunity for managers to capitalize costs of projects that have a low probability of success or to delay writing down impaired R&D assets. On the other hand proponents of the capitalization method argue that R&D outlays generate some of the most prized economic assets in the economy. As Rimerman (1990) notes “intangible, unmeasured assets have great importance in an economy increasingly dependant on expertise, data and technology, an economy in which an expanding service sector does not rely on fixed assets as the primary generator of revenue”. As a consequence accountants refusal to capitalize these expenditures as assets seriously affects the relevance of financial reporting. Lev and Sougiannis (1999) argue that the significant decline in the relevance and the usefulness of financial statements is due to the non recognition of intangible assets in the balance sheet. To summarize, the cost method is perfectly objective and verifiable. The capitalization of R&D costs may be used to convey information but is also less reliable. There is a trade off between reliability and objectivity (Healy et al., 2002).

This trade off is of importance both to market participants and to standard setters. For investors, the financial reporting of research and development outlays has a great impact on the reported net income (if the R&D effort is not constant over time). Moreover, a uniform way to report for R&D expenditures (e.g. cost method) disallows outsiders to properly

evaluate the growth opportunity set in a context of information asymmetry. For standard setters, the accounting of R&D outlays is important as it relates to their conceptual framework. According to both the IASB and the FASB, financial reports should provide useful information to investors. As a consequence, most of the literature (with some exception, e.g. Boone and Raman, 2001) has concentrated on the value relevance of R&D accounting regimes (expensing or capitalizing). An implicit assumption of the value relevance approach is that an accounting rule is preferred if it improves the statistical association of stock prices and/or returns with earnings, book values or other accounting variables. In the case of R&D accounting, under the value relevance criterion, full cost accounting should be adopted only if the value relevance of earnings and book value is higher than under a recognition of R&D outlays as assets.

The empirical challenge for testing the value relevance of R&D regimes rests on the data requirements. Such tests require a set of data with capitalizers and expensers, but most standard setters require the cost method. Researchers developed three answers to this challenge:

- (1) *The use of artificial data*: since capitalization of R&D costs is not allowed in the US, some authors chose to model the amounts of capitalized R&D. For instance, Lev and Sougiannis (1996), Horwitz and Zhao (1997) and Chambers et al. (1998) developed a model to price R&D assets if successful R&D outlays were capitalized instead of being expensed. Healy et al. (2002) go even farther: they use Monte Carlo simulations to generate financial statements of pharmaceutical firms. They were then able to test the association between economic values (ROE, net present value of the firms,...) and the R&D accounting treatment (full cost or successful efforts). Overall, those studies document the value relevance of capitalizing R&D costs.

(2) *The use of real data:* Other authors prefer to use real data to create samples of capitalizers and expensers. For instance Aboody and Lev (1998) studied software development costs' capitalization, which is the only exception in the United States to the full expensing rule of R&D. The disadvantage of this approach is a scope's reduction compared to the previous studies.

(3) *A comparative approach:* Some authors choose to implement a comparative approach. Since some accounting setters require full expensing of R&D expenses and other authorize capitalization, it is possible to carry out value relevance studies on a sample of international firms. For instance, Zhao (2002) notes that the USA or Germany require a full expense of R&D costs, whereas France or the UK allow a capitalization of such costs. Zhao (2002) compares the ability of accounting figures to explain share prices in those countries.

Overall, previous studies conclude to a higher value relevance of capitalized R&D costs if they meet certain criteria of successfulness instead of just expensing them. However, this conclusion is based on studies that can be criticized. The relevance of studies with artificial data is based on the ability of the researcher to compute an economically sound asset of R&D. This ability can be questioned. For instance, Lev and Sougiannis (1996) use polynomial Almon lag method that is highly dependant on the number of observations. The range of the papers on software development costs capitalization are too narrow to be easily generalized. Finally, comparative studies fail to control the many biases that can affects the empirical findings (market microstructure, institutional factors, the functions of accounting across countries,...)

Our goal is to take advantage of a specific feature of the French institutional context. French standard setters allow conditional capitalization of R&D costs or expensing of such R&D costs. French firms have the *option* to choose the expensing or the capitalization of R&D outlays (under conditions). This framework provides a laboratory experiment for an accounting treatment of intangibles that differs from the nearly universal full expensing of intangible assets. Under French GAAP, managers can signal to market participants the expected return of their R&D outlays by capitalizing such costs¹. Since capitalization is an option, managers can also align their practices on international standards and expense their R&D outlays. This design offers a unique opportunity to assess the value relevance of R&D accounting. More precisely, the issues raised by the value relevance of R&D accounting are twofold. First, do market participants value R&D assets? This question is open due to the trade off between relevance and reliability. A positive and significant association provides a strong support to the IASB position. Second, if the recognition in the balance sheet of R&D outlays is relevant, then expensing R&D outlays should provide a negative signal to the market because unsuccessful investments can be expected.

Our research design is based on two value relevance studies (explanation of the cross sectional returns and explanation of the year-end share price). Our sample is composed of 95 French listed firms which disclosed information on R&D on the 1998-2000 period. In France, the income statement usually classifies expenses by nature rather than by function². R&D expenses, like advertising expenses, are therefore not shown in French Group financial statements, in contrast to the situation under US GAAP. The sample size is 254 observations

¹ Only the cost of successful projects can be capitalized. To be capitalized, R&D outlays must meet three criteria: to be specific to an identifiable project, to be related to applied research (fundamental research is not eligible), to have significant chances of commercial success. Given the last condition, only successful projects can be recognized as assets.

² Ding, Stolowy and Tenenhaus (2002) show that only 32 French companies, in the top 100, used the presentation by function in 1998.

due to data limitations. Our empirical findings suggest that capitalization of R&D costs is value relevant. The recognition in the balance sheet of such assets is perceived as a positive signal by the market. On the opposite, an expensing of R&D costs produces lower share prices and lower returns (*ceteris paribus*).

The remainder of the paper is organized as follows. Section 1 describes our theoretical background, section 2 presents our methodology, section 3 our empirical findings and section 4 concludes.

1. THEORETICAL BACKGROUND

1.1. Accounting treatment of Research & Development costs

Research and development reporting in French consolidated statement could follow different GAAP (but R&D reporting must follow French accounting rules in the individual accounts). With the creation of CRC (*Comité de la réglementation comptable, Règlement 99-02*), quoted companies could use either French rules or IAS GAAP or, until the 31st December 2002, international GAAP as US GAAP. As shown in table 1, the accounting treatments of R&D costs are different across standards.

Insert Table 1

French rules state that R&D expenditures are expensed as incurred unless the project satisfies certain conditions. PCG 99 (*Plan comptable général, 1999*) express that: “Exceptionally, applied research and development costs could be capitalized if the projects concerned are clearly identifiable, their respective costs are distinctly evaluated, and each project has a serious chance of technical success and commercial profitability” (Art. 361-2).

Capitalized R&D expenditures must be amortized over a period not exceeding 5 years. There are no clearly established rules concerning the starting date for amortization. In exceptional circumstances, and relating only to particular projects, R&D capitalized expenditures may be

amortized over a longer period not exceeding the useful life of the assets. If R&D costs are expensed as incurred, they shall be disclosed in the management report³.

The capitalization of R&D costs under French rules remains an option for the company if the project satisfy the above criteria. Thus the capitalization of R&D costs is a strategic decision for the group. The literature suggests that when firms make reporting decisions, there is a trade-off between the cost of revealing proprietary information and the resulting benefit (Verrechia, 1983). This trade-off is likely to be very sensitive in the case of R&D reporting because of its highly confidential nature.

On the other hand, no choice of R&D accounting treatment exists under US GAAP. *SFAS N°2* established standards of financial accounting and reporting for research and development (R&D) costs. This statement requires that R&D costs to be expensed when incurred. It also requires the company to disclose in its financial statements the amount of R&D expensed (i.e. there is no optional treatment of R&D costs, but their amount is available). However, separate rules apply to development costs for computer software that is to be sold: capitalization (and amortization) applies once technological feasibility is established. Capitalization ceases when the product is available for general release to customers. Similar rules apply to certain elements of development costs for computer software for internal use (*SFAS N°86*).

In conclusion, US GAAP do not allow capitalization of R&D costs, but require a distinct disclosure of these costs.

³ In France, the income statement presentation usually presents a classification of expenses by nature rather than by function. R&D expenses, like advertising expenses, are not therefore shown in French Group financial statements, in contrast to the situation under US GAAP. All intangible expenditure is distributed between the various operating expenses. For example, software development costs will be divided between personnel costs for the employees who worked on the project, purchases of raw materials for any components, and other relevant items in the same way.

At last, French listed companies could follow the international standards. The objective of *IAS 38* is to prescribe the accounting treatment for intangible assets that are not explicitly covered in another *IAS*⁴. *IAS 38* mandates:

- a full expensing of all research costs (*IAS 38.42*).
- a capitalization of development outlays only if technical and commercial feasibility of the asset for sale or use has been established. This means that the firm must intend and be able to complete the intangible asset and either use it or sell it and be able to demonstrate how the asset will generate future economic benefits (*IAS 38.45*)

An intangible asset (i.e. capitalized R&D) should be amortized over the best estimate of its useful life (*IAS 38.79*). Nevertheless, *IAS 38* does not permit an enterprise to assign an infinite useful life to an intangible asset. It includes a presumption that the useful life of an intangible asset will not exceed 20 years. Impairment (*IAS 36*) applies to intangible assets. There is a compulsory annual test if the amortization period exceeds 20 years or intangible is not ready for use. Finally, additional disclosures are required about the amount of research and development expenditure recognized as an expense in the current period (*IAS 38.115*).

1.2. Value relevance of R&D outlays

French context provides an experimental field for studying the value relevance of R&D capitalization, because both accounting treatment of R&D costs (expensing and capitalization) are allowed.

Zhao (2002) studies the relative value relevance of R&D capitalization in France, the UK, Germany and the USA. He shows that the reporting of total R&D costs increases the

⁴ *IAS 9* (1993), « Research and development costs » was replaced by *IAS 38* in July 1999.

association of equity price with accounting earnings and book-value with complete R&D accounting standards (Germany and the USA). The allocation of R&D costs between capitalization and expense provides incremental information content over the disclosure of the total R&D costs. However, this study presents caveats due to the international comparison. Recent comparative studies indicate that earnings quality is subject to several country specific factors other than legal systems (e.g. Pope and Walker, 1999; Ali and Hwang, 2000). Zhao (2002) follows Francis and Schipper (1999) in examining only the information content of R&D costs level. Lev and Zarowin (1999) find that change in R&D intensity bears significant additional information and that it is necessary to control for industry effect in R&D accounting research because industrial R&D is industry specific by nature (Lev and Sougiannis, 1996).

The relation between the stock returns and investments in R&D has been extensively studied in prior literature. For instance, Hirschey (1982) shows that, on average, advertising expenses and R&D outlays have a positive and significant effect on the share price. Connolly and Hirschey (1984) document the same relation between R&D expenses and share price on a sample of 390 firms representing more than 90% of the R&D expense of the US industrial firms. More recently, Lev and Sougiannis (1996) documented a significant and inter temporal association between a capital of R&D and future stock returns. If R&D costs are relevant, some authors suggest the existence of a systematic mispricing of the intensive R&D firms, or of a compensation with a factor of risk. For instance, Chan et al. (2001) give support to this proposition. They show that R&D intensive firms have low past returns and show signs of mispricing.

Overall, these articles show:

- a positive link between R&D expenses and various market values.

- that market participants' perception of R&D effectiveness is blurred by information asymmetry. As consequence, R&D outlays are mispriced by the market.

These conclusions raise the question of the value relevance of R&D outlays reporting. Standard setters may require that all R&D be expensed immediately or could authorize a capitalization of R&D outlays under conditions. Capitalization (or expensing) of R&D efforts is value relevant if a significant association is found with market values (share price or cross sectional returns for instance).

Our research question is the following: “Is it possible to convey information on R&D by reporting R&D as expenses or as assets”? This question is not trivial due to the trade off between relevance and reliability in the case of R&D capitalization (Healy et al., 2002). As noted by Lev and Sougiannis (1996, 1999), R&D capitalization is probably relevant because it allows to reduce the information asymmetry between the firm and market participants. Nevertheless, capitalizing such costs also creates an opportunity for managers to engage into earnings management. Recognizing R&D as assets may impair financial reports reliability. Our goal in this paper is to take advantage of the French local context:

- Since, French standard setters authorize the recognition of R&D efforts either as an expense or as an asset, we have the opportunity to study the value relevance of each accounting treatment.
- Compared to prior studies, we have an access to real data about capitalized R&D. As a consequence, we do not have to compute an estimated R&D asset as in Lev and Sougiannis (1999) or in Lev et al. (2002).

- We also have the opportunity to control the differences in accounting rules enforcement or in market microstructure that can impair the relevance of comparative studies (as in Zhao, 2002).

Consistent with prior studies, we can state the following hypothesis:

H1: *Recognition of R&D outlays as assets is value relevant.* We expect a positive and significant association between capitalized R&D and market values.

Since French managers have the option to recognize development costs as assets, recognition as expense should signal non profitable or non achieved R&D projects. We can state H2:

H2: *Recognition of R&D outlays as expense conveys a negative information to the market.*

We expect a negative and significant association between expensed R&D and markets values.

2. DATA AND METHODOLOGY

2.1. Sample

To carry out our research, we need to create a sample of expensers and capitalizers among the French listed firms. The main difficulty was to identify capitalizers because most of the databases use a US format of balance sheet, where R&D assets are not identified. For instance, on the Thomson financial database, R&D assets are registered as intangible assets (as with brands, patents, other intangibles). To identify expensers, we use the Thomson financial database (who reports the amount of R&D expensed). To identify capitalizers, we use the DIANE (DISque pour l'Analyse Economique) database, specialized on French firms. Capitalized R&D is reported on a specific line of the balance sheet. Since there are doubts on the reliability of this data base, we cross checked the data gathered from DIANE with the information disclosed in annual reports.

95 large French listed firms compose our sample on a three year period (1998-2000). The total sample size is 254 observations (firm-year), which can appear to be quite small given that 1,404 non financial firms are present on the Thomson Financial database (table 2): our sample represent only 6.77% of the French listed firms.

Insert Table 2

To explain this result, it should be noted that under French regulations, firms do not have to disclose their R&D outlays. As a consequence, our sample is biased towards firms with an incentive to disclose additional information. By comparing our sample with the total population of listed firms, we note that our sample is biased towards high technology, high growth firm, small capitalization (see table 3).

Insert Table 3

Since our sample is mainly compounded of high tech firms, we present the descriptive statistics for each sub sample (high tech versus traditional firms) in table 4. On the whole, this table suggests that high tech firms have higher growth opportunities (Price-Earnings-Ratio is 32.5% versus 15.52% for traditional firms, Price-to-Book ratio is 5.3 versus 2.8), are less leveraged (25% of total assets versus 29.57%, significant at 5%), more risky (β is 1.30 versus 0.62 for traditional firms) and have smaller market capitalization (5.7 billions of euros versus 8.9 billions) than traditional firms.

Surprisingly the average R&D outlays per share (R&D per share) of high tech firms is not statistically different from the average spending of traditional firms (*RDPS*: R&D per share) as shown in table 4. This result is probably due to the sample bias (made of firms who voluntarily disclosed information). However, as table 4 shows, high tech firms clearly choose

to capitalize their R&D outlays. This feature of our sample is consistent with prior studies (Ding and Stolowy, 2003).

Insert Table 4

2.2. Research design

We examine the value relevance of R&D accounting treatment (expensed versus capitalized) using two approaches: associating stock returns with contemporaneous financial data and associating stock prices with financial data.

We control our models by the following variables coming from previous literature.

- *Size*, measured by the market value of equity at the end of fiscal year. Large firms tend to spend a substantial part of research and development costs on basic research, on maintenance and upgrades of their products. These costs, and particularly basic research costs are expensed accordingly to PCG 99, IAS 38 or SFAS N°2. Consequently, large firms are expected to expense a larger part of development costs than smaller firms.
- *Growth*, measured by the annual change of sales. We expect that firms having the higher level of growth are the most engaged in R&D.
- *ROE (Profitability)*, measured by the ratio return on equity per share. Given analysts' scepticism about research and development capitalization, it is widely believed that profitable companies avoid capitalization in order not to taint the perceived quality of their earnings in analysts' eyes.

- *Leverage*, measured by long-term debt divided by total capital⁵. Leverage is a proxy for the restrictiveness of loan covenants as motivators of capitalization; firms closer to loan restrictions may favour capitalization which increases equity and earnings.
- *Systematic risk, or **b***. Basic research more risky than product development. Basic research is also expensed according to French, international or US GAAP, while product development could be capitalized. Thus riskier firms, namely, those devoting a larger share of developments efforts to basic research, can be expected to expense more than less risky companies.
- *Book-to-market ratio*, indicates investors' growth expectations irrespective of when the underlying information reaches the market. This ratio allows to control for performance and risk (Fama and French, 1992). We expect firms with high (low) book-to-market ratio have low (high) R&D intensity.

2.2.1. Stock returns model

First we examine the link between stock returns, annual R&D capitalization and expensed R&D data using a model derived from the Fama and French (1992) and Aboody and Lev (1998) models.

The association between capitalized R&D variable and contemporaneous annual stock returns indicates the extent to which the information conveyed by R&D capitalization is used by investors. Such a test cannot indicate whether investors actually used capitalization data in assessing security values. We estimate the following cross sectional regression:

⁵ Total capital represents the total investment in the company. It is the sum of common equity, preferred stock, minority interest, long-term debt, non-equity reserves and deferred tax liability in untaxed reserves.

$$R_{i,t} = a_0 + a_1 RDES_{i,t} + a_2 RDCapTA_{i,t} + a_3 \ln(Size)_{i,t} + a_4 Growth_{i,t} + a_5 ROE_{i,t} + a_6 Beta_{i,t} + a_7 Lev_{i,t} + a_8 \ln(BTP)_{i,t} + a_9 HT_{i,t} + a_{10} YR_{i,t} + e_{i,t} \quad (1)$$

With,

- R_{it} : annual stock return at the end of year t for firm i .
- $RDES_{it}$: annual amount of expensed R&D costs to sales, for firm i and year t .
- $RDCapTA_{it}$: annual amount of net capitalized R&D costs to total assets, for firm i and year t .
- $\ln(Size_{it})$: logarithm of market value of the firm i at the end of fiscal year t .
- $Growth_{it}$: rate of growth for company i , measured as change in sales between t and $t-1$.
- ROE_{it} : return on equity ratio (earnings / book value) for firm i at the end of year t . It measures the profitability of the firm
- $Beta_{it}$: measure of risk, CAPM-based beta of company i .
- Lev_{it} : leverage ratio for firm i in year t , measured as long term debts on total capital.
- $\ln(BTP_{it})$: logarythm of book value (minus capitalized R&D) per share to price at the end of year t .
- HT_{it} : dummy variable for industry group coded one for high-technology firms and zero for traditional firms.
- YR_{it} : time indicator variable that equals to one if an observation is from fiscal year Y , and zero otherwise.

If the annual capitalized R&D represents value relevant information to investors then a_2 in model (1) should be positive. Since $RDES$ is likely to include R&D expenditures incurred before technical and/or commercial feasibility has been achieved, we predict a_1 to be negative and smaller than a_2 .

We assume that while firms generally undertake positive expected value projects, achieving technological or commercial feasibility (indicated by capitalization) confirms to investors that the project has a positive expected value. Whereas R&D expensed could be seen as non profitable or non achieved R&D projects, which are not considered as vehicle for value creation.

2.2.2. *Stock price Model*

Model (1) deals with the value relevance of the annual capitalized and expensed R&D costs. To study the value relevance, in the association sense, of the R&D asset reported on the balance sheet and the expensed R&D costs, we ran the following regression:

$$P_{i,t} = b_0 + b_1 RDEPS_{i,t} + b_2 RDCapPS_{i,t} + b_3 EPS_{i,t} + b_4 BVPS_{i,t} + b_5 \ln(Size)_{i,t} + b_6 Beta_{i,t} + b_7 HT_{i,t} + b_8 YR_{i,t} + e_{i,t} \quad (2)$$

With,

- $P_{i,t}$: stock price at the end of the fiscal year t for firm i .
- $RDEPS_{i,t}$: annual amount of expensed R&D costs per share.
- $RDCapPS_{i,t}$: annual amount of net capitalized R&D costs per share.
- $EPS_{i,t}$: reported annual earnings per share.
- $BVPS_{i,t}$: book value of equity per share.
- $\ln(Size_{it})$, $Beta_{it}$, HT_{it} and YR_{it} : as defined above.

Model (2) was motivated by recent empirical work on earnings models, in which the market value of the company is regressed on alternative measures of earnings, book value, and other relevant information (Aboody and Lev, 1998, p. 172; Zhao, 2002, p.158).

3. EMPIRICAL FINDINGS

3.1. Univariate tests

First, we carry out a few univariate tests to check the value relevance of R&D accounting methods. Table 5 shows that no significant relation can be found between R&D outlays per share ($RDPS = RDEPS + \text{change in } RDCapPS$) and stock returns, whatever may be their recognition in financial statements (in the income statement or in the balance sheet). However, the positive relation between price and R&D per share is positive and not far from being significant at 5%.

Insert Table 5

As table 5 shows the relation between price (P) and the R&D reporting is contrary to what is expected since $RDCapPS$ (resp. $RDEPS$) is negatively (resp. positively) related to price. The univariate correlation between $RDCapTA$ (net RD costs capitalized) and return is significant and positive as expected, but the correlation between $RDES$ (RD expensed divided by sales) is not significant.

Overall univariate tests indicate that R&D reporting in the financial statements matters to explain the cross sectional variation of returns and the share price. However, the sign of the relation is not clear due to high correlation between the financial reporting of R&D and growth opportunities that have an impact on share price or return. Table 6 and table 7 show that correlations between R&D outlays and various measures of performance (probably related to share price and returns) are significant. Thus, we have to carry out multivariate tests to control for potential opposite effects.

Insert Tables 6 and 7

3.2. Multivariate tests

3.2.1. Value relevance analysis

Table 8 represents the estimates for the stock returns regression, model (1), for the full sample (panel A), for the traditional firms (panel B) and for the high-technology firms (panel C).

Insert Table 8

In panel A (total sample) the coefficient of annual capitalization of R&D (*RDCapTA*) has the expected sign (2.544) and is highly statistically significant ($t = 3.766$). In addition, as reported in panel C, the coefficient of capitalized R&D is positive and significant for high-tech companies and insignificant for traditional firms, as reported in panel B.

In contrast to the large and highly significant coefficient of the capitalized R&D variable, the estimated coefficient of expensed R&D costs (*RDES*) is negative (- 0.651), only significant at 10% (for panels A and C) and insignificant for panel B.

Coefficients for the size control variable, $\ln(\text{Size})$, are positive and significant for the three panels, whereas growth control variable presents a positive association with stock returns only for the full sample and high-tech firms.

Evidence from the stock return analysis indicates that investors distinguish between capitalized and expensed R&D costs; while values of the former are positively associated with stock returns, values of the latter are negatively associated. This result indicates that capitalization of R&D is not a signal of earnings manipulation, but is a relevant information for investors of the firm's value creation capacity.

After having studied the effect of R&D capitalization on stock returns, we examine its influence on stock prices. Table 9 represents estimates of the stock price regression, model (2), for the full sample (panel A), then for the traditional companies (panel B) and the high-technology companies (panel C).

Insert Table 9

Table 9 indicates that the coefficient of capitalized R&D per share (*RDCapPS*) is statistically significant and highly positive for the three samples (full, traditional and high-tech). The coefficients are high relative to book value (26.095 versus 0.886, 40.021 versus 0.462 and 18.497 versus 1.643). On the other hand, as for the stock returns regression, the coefficient of expensed R&D per share (*RDEPS*) is negative and significant for panel A, and negative and insignificant in panels B and C.

In addition, as reported for the full sample, coefficients of earnings per share (*EPS*) and book value per share (*BVPS*) have the expected sign, as for the $\ln(\text{Size})$.

To summarize, our results show for both regressions a positive association between capitalized R&D costs and stock return or stock price and a negative relation between expensed R&D and return or price. The way of reporting R&D costs seems obviously not to be neutral, it carries a signal to investors. These results give support to the capitalization of R&D when the project fulfils certain conditions, as recommended by *IAS 38* and *PCG 99*. Currently, capitalized R&D bears a value relevant and positive information for investors in assessing the value of companies. And if one of the most important objective of financial

accounting is to provide a useful information to investors⁶, then capitalization of R&D should be recommended.

3.2.2. Robustness Tests

Our empirical findings clearly show that the market attributes value to the financial reporting of R&D outlays. However, a systematic association between high levels of R&D outlays and capitalization of such expenditures could impair our results.

To test, for that possibility, we run a logistic regression (3) to explain the determinants of the accounting method for R&D costs. Specifically, we test the following model:

$$RDCap_{i,t} = \mathbf{a} + \mathbf{b}_1 \ln(Size) + \mathbf{b}_2 RDPS + \mathbf{b}_3 \ln(BTP) + \mathbf{b}_4 Beta + \mathbf{b}_5 HT + \mathbf{b}_6 Lev + \mathbf{b}_7 YR00 + \mathbf{b}_8 YR99 + \mathbf{e}_{i,t} \quad (3)$$

RDCap is a dummy variable coded 1 if the firm capitalizes its R&D costs, 0 otherwise. *RDPS* is the amount of R&D outlays per share. We compute *RDPS* as (*RDEPS* + *change in RDCapPS*)⁷. All other variables were previously defined. The assumptions for this model are the following:

- (1) Managers can decide to use accounting for R&D to manage their contractual relations. As a consequence, a significant relation is supposed between leverage, size and the decision to capitalize R&D.
- (2) As noted earlier, capitalization may be preferred by high tech firms because of the importance of their R&D costs. As a consequence, *HT* and $\ln(BTP)$ are supposed to influence the decision to capitalize R&D costs.

⁶ “The objective of financial statements is to provide information about the financial position, performance and changes in financial position of an enterprise that is useful to a wide range of users in making economic decisions”, IAS Framework.

⁷ We tried other scaling variables (total assets, sales). Results (not reported) are qualitatively similar.

- (3) To test the association between the R&D accounting and the level of R&D outlays, the variable *RDPS* is added as an exploratory variable.
- (4) *Beta* and *YR* are control variables (defined above).

We carry out this model over our full sample. Table 10 presents the empirical results. Overall the model is significant (Nagelkerke R^2 is 0.613). The level of R&D per share seems to be highly significant (sig < 0.1%): the more R&D per share, the more likely the capitalization of such costs⁸.

Insert Table 10

As a consequence, our empirical findings of the previous section may only reflect the fact that capitalizers spend more in R&D and have higher returns and higher share prices (all other things being equal). To test for that possibility, we compute again the return regression (resp. stock price regression) substituting *RDPS* to *RDCapTA* and *RDES* (resp. *RDCapPS* and *RDEPS*). Our goal is to check the existence of a systematic effect of R&D on returns and share prices.

Tables 11 and 12 shows our results. Returns (table 11) are not explained by the overall R&D outlays. Since table 8 reports significant association between *RDCapPS* and *RDEPS*, it means that investors attach a different information content on R&D outlays according to their accounting treatment.

Stock price is negatively associated with *RDPS* (research and development per share, see table 12). As a consequence, the positive coefficient found in table 9 on *RDCapPS* is all the more significant and reliable that, on average, R&D outlays have a negative impact on share price.

⁸ The robustness of this result was checked by using different procedures to run the logistic regression: ascending or descending (tables not reported). *RDPS* was always significant.

Insert Tables 11 and 12

Those results suggest that our empirical findings are not driven by a R&D level effect⁹.

4. CONCLUSION AND AVENUES FOR FUTURE RESEARCH

We examined the value relevance of R&D accounting treatment (expensing versus capitalization) on a sample of French listed companies. Our results indicate on one hand that R&D capitalization-related variables (*RDCapTA* and *RDCapPS*) are significantly and positively associated with stock returns and prices. On the other hand, R&D expensed-related variables (*RDES* and *RDEPS*) are negatively or not associated with stock prices and returns.

We conclude that R&D capitalization summarizes relevant information for investors and reflects the profitability of R&D projects.

The negative sign of the association of the R&D costs incurred by expensers and market values (price and returns) could reflect investors' reaction to the absence of compulsory disclosure of information about R&D in France in the financial reports. Especially, two biases exist:

- *Best firms' confidentiality*. Firms with high quality R&D do not desire to disclose their research level, nor their advertising and training expenditures because the disclosure of such costs may provide relevant information to competitors.
- *Worst firms' jamming effect*. Poorly performing firms have an incentive to disclose high level of R&D to signal favourable future prospects to the market. The

⁹ Our results are not driven by other sources of information correlated with the accounting choice concerning R&D because Ding and Stolowy (2003) show no significant association between R&D reporting and the level of voluntary disclosure.

information on R&D is not easily verifiable and managers could disclose information on R&D as to manipulate market participants' beliefs.

In addition to these economic effects, Luft and Shields (2003), using an experimental approach, note that market participants undervalue the future effect of R&D when R&D outlays are expensed. They explain this empirical finding by psychological biases (fixation,...).

Overall, our findings give support to a capitalization of R&D costs under conditions of commercial success. The accounting treatment of R&D carries a signal to investors. This result gives support to the capitalization of R&D when the project fulfil certain conditions, as recommended by *IAS 38* and *PCG 99*. And if providing useful information to investors is one of the most important objective of financial accounting, then capitalization of R&D should be recommended. However, our research suffers from limits and future avenues of research can be suggested.

Our study belongs to the value relevance literature that has been extensively criticized since 2001 (Holthausen and Watts, 2001; Ronen, 2001). Even if some authors disagree with such critics (e.g. Barth, Beaver and Landsman, 2001), it is clear that the information content of financial reporting is not limited to the association of accounting numbers with market values. A first possibility would be a study of the interaction between voluntary disclosure and value relevance of R&D. Such study would allow us to test if the significance of R&D reporting is due to the absence of alternative sources of information or to a signal conveyed by R&D reporting. A possible further investigation of our sample, would be to test the impact of R&D financial reporting on information asymmetry (measured by the bid-ask spread as in Leuz and

Verrechia, 2000). If our interpretation in terms of signal is correct, than we should expect a smaller bid-ask spread for capitalizers than for expensers.

Another possibility to further investigate our results would be to explore the factors that influence the credibility of the signal provided by capitalizers. Since considerable discretion exists to recognize R&D outlays as assets, managers can use opportunistically this accounting choice. Some institutional and corporate governance factors probably influence the choice of capitalizing R&D costs and the credibility of this signal.

REFERENCES

- Aboody, D. and Lev, B. (1998) 'The value relevance of intangibles: The case of Software capitalization', *Journal of Accounting Research*, 36(Supplement): 161-191.
- Ali, A. and Hwang, L. (2000) 'Country-specific factors related to financial reporting and the value-relevance of accounting data', *Journal of Accounting Research*, 38: 1-21.
- Barth, M., Beaver, W. and Landsman, W. (2001) 'The Relevance of the Value Relevance Literature for Financial Accounting Standard Setting: Another View', *Journal of Accounting & Economics*, 31(1-3): 77-104.
- Boone, J.P. and Raman, K.K. (2001) 'Off-balance sheet R&D assets and market liquidity', *Journal of accounting and public policy*, 20: 97-128.
- Chambers, D. Jennings, R. and Thomson II, R.B. (1998) 'Evidence on the usefulness of capitalizing and amortizing R&D costs', Working Paper, University of Illinois.
- Chan, L.K.C., Lakonishok, J. and Sougiannis, T. (2001) 'The stock market valuation of research and development expenditures', *Journal of finance*, 56(6): 2431-2457.
- Comité de réglementation comptable (1999) *Plan comptable général*, 2nd edition.
- Connolly, R.A. and Hirschey, M. (1984) 'R&D, market structure and profits: value based approach', *Review of economics and statistics*, 66: 682-686.
- Ding, Y. and Stolowy, H. (2003) 'Capitalisation des frais de R&D en France: déterminants et pertinence', Bordeaux University.
- Fama, E.F. and French, K.R. (1992) 'The cross-section of expected stock returns', *Journal of Finance*, 47(2): 427-467.
- Financial Accounting Standards Board (1974) *SFAS N°2: Accounting for Research and Development Costs*, Stamford, Conn.: FASB.
- Financial Accounting Standards Board (1985) *SFAS N°86: Accounting for the Costs of Computer Software to be Sold, Leased, or Otherwise Marketed*, vol. 1 and 2, Stamford, Conn.: FASB.
- Francis, J. and Schipper, K. (1999) 'Have financial statements lost their relevance?', *Journal of Accounting Research*, 37: 319-352.
- Healy, P.M., Myers, S. and Howe, C. (2002) 'R&D accounting and the trade-off between relevance and objectivity', *Journal of accounting research*, 40(3): 677-710.
- Hirschey M. (1982) 'Intangibles capital aspects of advertising and R&D expenditures', *Journal of industrial economics*, 30(4): 375-389.
- Holthausen, R. and Watts, R. (2001) 'The relevance of the value relevance literature for financial accounting standard setting', *Journal of accounting and economics*, 31: 3-75.
- Horwitz, B.N. and Zhao, R. (1997) 'The effect of cash flows and security returns of an allocation of R&D costs between capitalization and expense', *Journal of Financial Statement Analysis*, 3: 5-14.
- International Accounting Standard Committee (1998) *Standard N° 38: Intangible Assets*. London: IASC.
- International Accounting Standard Committee (1998) *Standard N°36: Business Combinations*. London: IASC.

- Leuz, C. and Verrechia, R. (2000) 'The economic consequences of increased disclosure', *Journal of Accounting Research*, 38: 91-124.
- Lev, B. and Sougiannis, T. (1996) 'The capitalization, amortization and value relevance of R&D', *Journal of Accounting and Economics*, 21: 107-138.
- Lev, B. and Sougiannis, T. (1999) 'Penetrating the Book-to-Market Black Box: The R&D Effect', *Journal of Business Finance and Accounting*, 26(3/4): 419-460.
- Lev, B. and Zarowin, P. (1999) 'The boundaries of financial reporting and how to extend them', *Journal of Accounting Research*, 37: 353-385.
- Lev, B., Nissim, D. and Thomas, J. (2002) 'On the informational usefulness of R&D capitalization and amortization', Working Paper Columbia Business School.
- Luft, J. and Shields, M. (2003) 'Why Does Fixation Persist? Experimental Evidence on the Judgment Performance Effects of Expensing Intangibles', *Accounting Review*, Forthcoming.
- Pope, P. and Walker, M. (1999) 'International differences in the timeliness, conservatism, and classification of earnings', *Journal of Accounting Research*, 37: 53-87.
- Rimerman, T. (1990) 'The changing significance of financial statements', *Journal of Accountancy*, 169(4): 79-83.
- Ronen, J. (2001) 'On R&D capitalization and value relevance: a commentary', *Journal of Accounting and Public Policy*, 20(3): 241-254.
- Verrechia, R. (1983) 'Discretionary disclosure', *Journal of Accounting and Economics*, December: 179-194.
- Zhao, R. (2002) 'Relative value relevance of R&D reporting: An international comparison', *Journal of International Financial Management and Accounting*, 13(2): 153-174.

Table 1 - R&D Accounting treatments

	Standards	R&D expensed as incurred		R&D capitalized		
		<i>General rule</i>	<i>Disclosed Separately</i>	<i>Allowed</i>	<i>Option</i>	<i>Amortization & Impairment</i>
French GAAP	Art. 361-2, PCG 99	Yes	No	Yes, under conditions	Yes	Amortized over 5 years max
US GAAP	SFAS N°2	Yes	Yes	No		
	SFAS N°86 (software development costs)	Yes	Yes	Yes, if technological feasibility	Yes	Amortized over economic life
International GAAP	IAS 38 & IAS 36	Yes	Yes	Yes, under conditions	No	Amortized over useful life Impairment test if useful life > 20 years

Table 2 - Sample constitution

From Thomson financial database	Number of observations
Firms listed on the French stock exchange	1477
Excluding banks, financial services, insurance	(33)
Total	1404
Number of firms in our sample	95
- % of listed firms	6,77%
Number of potential observations over the 1998-2000 period (95*3)	285
Number of valid observations	254
- % of potential observations	89%

Table 3 - Descriptive statistics for the full sample

	Full sample		All French listed firms		Diff.
	Mean	S.E.	Mean	S.E.	
<i>HT</i>	50%	0.5	4%	0.1981	yes
<i>Beta</i>	0.96	0.92	0.78542	0.9062	yes
<i>Lev</i>	27.37%	17.54	24.14%	57.55	no
<i>Ln(BTP)</i>	4.02	5.62	4.2018	19.98	yes
<i>Ln(Size)</i>	7328.56	18639.03	1632.22	8880.51	yes
<i>Growth</i>	20.19	32.85	31.58	103.21	no
	N=254		N=1,404		

HT is a dummy variable for industry group coded 1 for high-technology firms, 0 otherwise, *Beta* is the CAPM specific risk, *Lev* is the ratio of long term debts to total capital, *ln(BTP)* is the log of the book-to-market ratio, *ln(Size)* is the log of the year-end market value, *Growth* is the annual change of Sales.

Table 4 - Comparison of low tech and high tech sub samples

	<i>Beta</i>		<i>Lev</i>		<i>PER</i>		<i>ln(PTB)</i>		<i>ROE</i>		<i>ln(size)</i>		<i>RDPS</i>		<i>RDEPS</i>		<i>RDCapPS</i>		<i>RDCap</i>	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Low tech firms	0.62	0.53	29.57	15.19	15.52	73.67	1.02	0.92	12.81	14.43	9.10	9.99	194.2	394.85	192.14	393.34	0.07	0.25	0.2	0.4
High tech firms	1.3	1.1	25.14	19.45	32.5	262.6	1.67	2.00	9.2	23.54	8.65	9.59	111.18	179.35	107.86	177.49	0.22	0.41	0.41	0.49
N(low tech/high tech)	126/128		126/128		126/128		126/128		126/128		126/128		97/99		98/102		126/120		126/128	
P - level for T tests													5.90%		5.00%		0.01%		<0.01%	

Beta is the CAPM specific risk, *Lev* is the ratio of long term debts to total capital, *PER* is the price earnings ratio, *ln(BTP)* is the log of the book-to-market ratio, *ROE* is the earnings on equity ratio, *ln(Size)* is the log of the year-end market value, *RDPS* is the R&D costs per share either expensed or capitalized and is computed as $(RDEPS_i + \text{change in } RDCapPS_i)$, $RDEPS_{it}$ is the annual RD costs expensed per share, $RDCapPS_{it}$ is the net capitalized RD costs per share, *RDCap* is a dummy variable coded 1 if the firm capitalizes its R&D costs, 0 otherwise.

Table 5 - Univariate tests: R&D outlays, price and return

	P_{it}	R_{it}
P_{it}	1	
R_{it}	0.134 ^{**}	1
$RDPS$	0.136 [*]	-0.110
$RDEPS$	0.131 ^{**}	-0.103
$RDCapPS$	-0.125 ^{**}	-0.126
$RDES$	0.012	-0.027
$RDCapTA$	-0.106 [*]	0.202 ^{***}

R_{it} is the firm's annual stock return, P_{it} is the firm's stock price at the end of year t, $RDPS$ is the R&D costs per share either expensed or capitalized and is computed as ($RDEPS + \text{change in } RDCapPS$), $RDEPS_{it}$ is the annual RD costs expensed per share, $RDCapPS_{it}$ is the net capitalized RD costs per share, $RDES_{it}$ is the annual RD costs expensed on sales, $RDCapTA_{it}$ is the net capitalized RD costs on Total Assets.

Table 6 - Correlation matrix, Stock returns regression

N = 254 observations

		<i>RDES</i>	<i>RDCapTA</i>	<i>ln(Size)</i>	<i>Growth</i>	<i>ROE</i>	<i>Beta</i>	<i>Lev</i>	<i>ln(BTP)</i>	<i>HT</i>	<i>YR00</i>	<i>YR99</i>
<i>RDES</i>	Pearson's Correlation	1.000										
	Sig.											
<i>RDCapTA</i>	Pearson's Correlation	0.239	1.000									
	Sig.	0.000										
<i>ln(Size)</i>	Pearson's Correlation	0.072	-0.173	1.000								
	Sig.	0.253	0.006									
<i>Growth</i>	Pearson's Correlation	0.022	0.030	0.046	1.000							
	Sig.	0.728	0.640	0.468								
<i>ROE</i>	Pearson's Correlation	-0.202	-0.072	0.187	0.352	1.000						
	Sig.	0.001	0.256	0.003	0.000							
<i>Beta</i>	Pearson's Correlation	0.104	0.165	0.233	0.203	0.183	1.000					
	Sig.	0.099	0.008	0.000	0.001	0.003						
<i>Lev</i>	Pearson's Correlation	-0.042	-0.144	0.056	0.096	-0.138	0.059	1.000				
	Sig.	0.509	0.021	0.378	0.126	0.028	0.346					
<i>ln(BTP)</i>	Pearson's Correlation	-0.170	-0.237	-0.268	-0.125	-0.185	-0.332	-0.001	1.000			
	Sig.	0.007	0.000	0.000	0.046	0.003	0.000	0.988				
<i>HT</i>	Pearson's Correlation	0.172	0.166	-0.225	0.208	-0.092	0.370	-0.126	-0.264	1.000		
	Sig.	0.006	0.008	0.000	0.001	0.142	0.000	0.044	0.000			
<i>YR00</i>	Pearson's Correlation	0.003	0.006	0.031	0.142	-0.046	0.013	0.045	-0.005	0.014	1.000	
	Sig.	0.962	0.928	0.628	0.023	0.469	0.833	0.474	0.942	0.824		
<i>YR99</i>	Pearson's Correlation	0.008	-0.011	0.017	0.026	0.058	0.016	0.002	0.007	0.006	-0.525	1.000
	Sig.	0.896	0.856	0.789	0.683	0.353	0.795	0.976	0.911	0.929	0.000	

RDES_{it} is the annual RD costs expensed on sales, *RDCapTA_{it}* is the net capitalized RD costs on Total Assets, *ln(Size)* is the log of the year-end market value, *Growth* is the annual change of Sales, *ROE* is the earnings on equity ratio, *Beta* is the CAPM specific risk, *Lev* is the ratio of long term debts to total capital, *ln(BTP)* is the log of the book-to-market ratio, *HT* is a dummy variable for industry group coded 1 for high-technology firms, 0 otherwise, and *YR*, is a time indicator variable that equals 1 if the observation is from fiscal year Y, and 0 otherwise.

Table 7 - Correlation Matrix, Stock price regression

		<i>RDEPS</i>	<i>RDCapPS</i>	<i>EPS</i>	<i>BVPS</i>	<i>ln(Size)</i>	<i>Beta</i>	<i>HT</i>	<i>YR00</i>	<i>YR99</i>	
<i>REDPS</i>	Pearson's correlation		1								
	Sig.										
	N		200								
<i>RDCapPS</i>	Pearson's correlation	-0.234		1							
	Sig.	0.001.									
	N	192		246							
<i>EPS</i>	Pearson's correlation	0.129	-0.177		1						
	Sig.	0.075	0.014.								
	N	192	192		192						
<i>BVPS</i>	Pearson's correlation	0.506	-0.247	0.618		1					
	Sig.	0.000	0.001	0.000.							
	N	192	192	192		192					
<i>ln(Size)</i>	Pearson's correlation	0.148	-0.470	0.248	0.155		1				
	Sig.	0.036	0.000	0.001	0.032.						
	N	200	246	192	192		254				
<i>Beta</i>	Pearson's correlation	-0.071	-0.148	-0.150	-0.272	0.233		1			
	Sig.	0.318	0.020	0.037	0.000	0.000.					
	N	200	246	192	192	254		254			
<i>HAT</i>	Pearson's correlation	-0.138	0.211	-0.412	-0.421	-0.225	0.370		1		
	Sig.	0.051	0.001	0.000	0.000	0.000	0.000.				
	N	200	246	192	192	254	254		254		
<i>YR00</i>	Pearson's correlation	0.060	0.057	0.062	0.078	0.031	0.013	0.014		1	
	Sig.	0.401	0.377	0.395	0.283	0.628	0.833	0.824.			
	N	200	246	192	192	254	254	254		254	
<i>YR99</i>	Pearson's correlation	0.035	-0.025	-0.021	0.037	0.017	0.016	0.006	-0.525		1
	Sig.	0.627	0.693	0.777	0.613	0.789	0.795	0.929	0.000.		
	N	200	246	192	192	254	254	254	254		254

$RDEPS_{it}$ is the annual RD costs expensed per share, $RDCapPS_{it}$ is the net capitalized RD costs per share, EPS is the reported earnings per share, $BVPS$ is the book value of equity per share, $ln(Size)$ is the log of the year-end market value, $Beta$ is the CAPM specific risk, HT is a dummy variable for industry group coded 1 for high-technology firms, 0 otherwise, and YR , is a time indicator variable that equals 1 if the observation is from fiscal year Y , and 0 otherwise.

Table 8 - Stock returns regression

$$R_{i,t} = a_0 + a_1 RDES_{i,t} + a_2 RDCapTA_{i,t} + a_3 \ln(Size)_{i,t} + a_4 Growth_{i,t} + a_5 ROE_{i,t} + a_6 Beta_{i,t} + a_7 Lev_{i,t} + a_8 \ln(BTP)_{i,t} + a_9 HT_{i,t} + a_{10} YR_{i,t} + e_{i,t}$$

Panel A: Full sample												
	<i>Constant</i>	<i>RDES</i>	<i>RDCapTA</i>	<i>Ln(Size)</i>	<i>Growth</i>	<i>ROE</i>	<i>Beta</i>	<i>Lev</i>	<i>Ln(BTP)</i>	<i>HT</i>	<i>YR00</i>	<i>YR99</i>
Coef.	-48.075	-.651	2.544	6.981	.549	.026	6.602	-.217	-5.622	4.493	2.423	22.545
T-test	-3.376	-2.389	3.766	4.219	4.251	.115	1.375	-.696	-1.386	.484	.264	2.469
Sig.	.001	.018	.000	.000	.000	.909	.170	.334	.167	.629	.792	.014
R ²	.292											
Adjusted R ²	.260											
F	9.157	Sig.	.000									
Panel B: Traditional industry												
	<i>Constant</i>	<i>RDES</i>	<i>RDCapTA</i>	<i>Ln(Size)</i>	<i>Growth</i>	<i>ROE</i>	<i>Beta</i>	<i>Lev</i>	<i>Ln(BTP)</i>	<i>YR00</i>	<i>YR99</i>	
Coef.	-46.667	-2.160	-.710	6.317	.043	.234	-.059	.366	-3.192	-8.633	30.130	
T-test	-2.564	-1.423	-.175	2.818	.214	.791	-.006	1.259	-.717	-.890	3.166	
Sig.	.012	.157	.861	.006	.831	.430	.995	.211	.475	.375	.002	
R ²	.273											
Adjusted R ²	.211											
F	4.404	Sig.	.000									
Panel C : High-technology industry												
	<i>Constant</i>	<i>RDES</i>	<i>RDCapTA</i>	<i>Ln(Size)</i>	<i>Growth</i>	<i>ROE</i>	<i>Beta</i>	<i>Lev</i>	<i>Ln(BTP)</i>	<i>YR00</i>	<i>YR99</i>	
Coef.	-53.100	-.737	2.499	9.252	.783	-.128	5.518	-.714	-8.816	15.155	17.762	
T-test	-2.787	-2.205	3.009	3.285	4.232	-.370	.879	-2.097	-1.262	.963	1.154	
Sig.	.006	.029	.003	.001	.000	.712	.381	.038	.210	.337	.251	
R ²	.369											
Adjusted R ²	.314											
F	6.722	Sig.	.000									

Regression results are based on 254 firm-years (Panel A), 127 firm-years (Panel B), 125 firm-years (Panel C).

$R_{i,t}$ is the firm's annual stock return, $RDES_{i,t}$ is the annual RD costs expensed on sales, $RDCapTA_{i,t}$ is the net capitalized RD costs on Total Assets, $\ln(Size)$ is the log of the year-end market value, $Growth$ is the annual change of Sales, ROE is the earnings on equity ratio, $Beta$ is the CAPM specific risk, Lev is the ratio of long term debts to total capital, $\ln(BTP)$ is the log of the book-to-market ratio, HT is a dummy variable for industry group coded 1 for high-technology firms, 0 otherwise, and YR , is a time indicator variable that equals 1 if the observation is from fiscal year Y, and 0 otherwise.

Table 9 - Stock price regression

$$P_{i,t} = b_0 + b_1 RDEPS_{i,t} + b_2 RDCapPS_{i,t} + b_3 EPS_{i,t} + b_4 BVPS_{i,t} + b_5 \ln(Size)_{i,t} + b_6 Beta_{i,t} + b_7 HT_{i,t} + b_8 YR_{i,t} + e_{i,t}$$

Panel A: Full sample

	<i>Constant</i>	<i>RDEPS</i>	<i>RDCapPS</i>	<i>EPS</i>	<i>BVPS</i>	<i>Ln(Size)</i>	<i>Beta</i>	<i>YR00</i>	<i>YR99</i>	<i>HT</i>
Coef.	-34.821	-0.015	26.095	2.798	0.886	9.252	-2.086	-2.328	1.811	9.055
T-test	-3.519	-1.875	3.870	3.080	5.039	9.544	-0.809	-0.323	0.248	1.778
Sig.	0.001	0.062	0.000	0.002	0.000	0.000	0.419	0.747	0.804	0.077
R ²	0.547									
Adjusted R ²	0.524									
F	24.376	Sig.	0.000							

Panel B: traditional industry

	<i>Constant</i>	<i>RDEPS</i>	<i>RDCapPS</i>	<i>EPS</i>	<i>BVPS</i>	<i>Ln(Size)</i>	<i>Beta</i>	<i>YR00</i>	<i>YR99</i>	<i>HT</i>
Coef.	-40.473	-0.008	40.021	3.891	0.462	10.758	-12.627	4.628	12.232	
T-test	-2.531	-0.832	2.894	2.825	1.801	5.888	-1.642	0.400	1.060	
Sig.	0.013	0.408	0.005	0.006	0.075	0.000	0.104	0.690	0.292	
R ²	0.471									
Adjusted R ²	0.423									
F	9.702	Sig.	0.000							

Panel C: High technology industry

	<i>Constant</i>	<i>RDEPS</i>	<i>RDCapPS</i>	<i>EPS</i>	<i>BVPS</i>	<i>Ln(Size)</i>	<i>Beta</i>	<i>YR00</i>	<i>YR99</i>	<i>HT</i>
Coef.	-25.203	-0.023	18.497	1.436	1.643	8.472	0.738	-6.448	-7.357	
T-test	-2.366	-1.324	2.644	1.243	6.806	7.42	0.315	-0.789	-0.883	
Sig.	0.020	0.189	0.010	0.217	0.000	0.000	0.753	0.432	0.379	
R ²	0.673									
Adjusted R ²	0.643									
F	22.423	Sig.	0.000							

Regression results are based on 192 firm-years (Panel A), 95 firm-years (Panel B), 95 firm-years (Panel C).

P_{it} is the firm's stock price at the end of year t, $RDEPS_{it}$ is the annual RD costs expensed per share, $RDCapPS_{it}$ is the net capitalized RD costs per share, EPS is the reported earnings per share, $BVPS$ is the book value of equity per share, $\ln(Size)$ is the log of the year-end market value, $Beta$ is the CAPM specific risk, HT is a dummy variable for industry group coded 1 for high-technology firms, 0 otherwise, and YR , is a time indicator variable that equals 1 if the observation is from fiscal year Y, and 0 otherwise.

Table 10 - Accounting choice regression

$$RDCap_{i,t} = a + b_1 \ln(Size) + b_2 RDPS + b_3 \ln(BTP) + b_4 Beta + b_5 HT + b_6 Lev + b_7 YR00 + b_8 YR99 + e_{i,t}$$

Panel A: Full sample

	<i>Constant</i>	<i>Ln(Size)</i>	<i>RDPS</i>	<i>Ln(BTP)</i>	<i>Beta</i>	<i>HT</i>	<i>Lev</i>	<i>YR00</i>	<i>YR99</i>
Wald	16.338	21.916	12.827	8.663	0.227	0.124	0.118	4.694	5.810
Sig.	0.000	0.000	0.000	0.003	0.634	0.725	0.731	0.030	0.016
Cox & Snell R ²	0.449								
Nagelkerke R ²	0.613								

Regression results are based on 196 firm-years (Panel A).

$RDCap_{it}$ is a dummy variable coded 1 if the firm capitalizes its R&D costs, 0 otherwise, $\ln(Size)$ is the log of the year-end market value, $RDPS$ is the total R&D outlays per share, $\ln(BTP)$ is the log of the Book-to-Price ratio, $Beta$ is the CAPM specific risk, HT is a dummy variable for industry group coded 1 for high-technology firms, 0 otherwise, Lev is the leverage ratio of the firm and YR , is a time indicator variable that equals 1 if the observation is from fiscal year Y, and 0 otherwise.

Table 11 - Return regression with R&D outlays per share

$$R_{i,t} = a_0 + a_1 RDPS_{i,t} + a_2 \ln(Size)_{i,t} + a_3 Growth_{i,t} + a_4 ROE_{i,t} + a_5 Beta_{i,t} + a_6 Lev_{i,t} + a_7 \ln(BTP)_{i,t} + a_8 HT_{i,t} + a_9 YR_{i,t} + e_{i,t}$$

Panel A: Full sample

	<i>constant</i>	<i>RDPS</i>	<i>Ln(Size)</i>	<i>Growth</i>	<i>ROE</i>	<i>b</i>	<i>Lev</i>	<i>Ln(BTP)</i>	<i>HT</i>	<i>YR00</i>	<i>YR99</i>
Coef.	-27.977	-0.026	5.963	0.477	0.012	9.693	-0.428	-6.031	1.773	-0.701	18.392
T-test	-1.359	-1.617	2.880	3.044	0.043	1.638	-1.561	-1.273	0.147	-0.043	1.126
Sig.	0.176	0.108	0.004	0.003	0.966	0.103	0.120	0.205	0.883	0.966	0.262
R ²	0.206										
Adjusted R ²	0.163										
F	4.806	Sig.	0.000								

Regression results are based on 254 firm-years (Panel A).

R_{it} is the firm's annual stock return, $RDPS$ is the total R&D outlays per share, $\ln(Size)$ is the log of the year-end market value, $Growth$ is the annual change of Sales, ROE is the earnings on equity ratio, $Beta$ is the CAPM specific risk, Lev is the ratio of long term debts to total capital, $\ln(BTP)$ is the log of the book-to-price ratio, HT is a dummy variable for industry group coded 1 for high-technology firms, 0 otherwise, and YR , is a time indicator variable that equals 1 if the observation is from fiscal year Y, and 0 otherwise.

Table 12 - Stock price regression with R&D outlay

$$P_{i,t} = b_0 + b_1RDPS_{i,t} + b_2EPS_{i,t} + b_3BVPS_{i,t} + b_4\ln(Size)_{i,t} + b_5Beta_{i,t} + b_6HT_{i,t} + b_7YR_{i,t} + e_{i,t}$$

Panel A: Full sample

	<i>Constant</i>	<i>RDPS</i>	<i>EPS</i>	<i>BVPS</i>	<i>Ln(Size)</i>	<i>Beta</i>	<i>HT</i>	<i>YR00</i>	<i>YR99</i>
Coef.	-14.864	-0.018	2.987	0.816	7.700	-3.590	11.675	-6.140	-2.903
T-test	-1.696	-2.154	3.172	4.493	8.407	-1.358	2.230	-0.828	-0.389
Sig.	0.092	0.033	0.002	0.000	0.000	0.176	0.027	0.409	0.698
R ²	0.509								
Adjusted R ²	0.488								
F	23.724		0.000						

Regression results are based on 192 firm-years (Panel A);

P_{it} is the firm's stock price at the end of year t, $RDPS_{it}$ is the annual total R&D outlays per share, EPS is the reported earnings per share, $BVPS$ is the book value of equity per share, $\ln(Size)$ is the log of the year-end market value, $Beta$ is the CAPM specific risk, HT is a dummy variable for industry group coded 1 for high-technology firms, 0 otherwise, and YR , is a time indicator variable that equals 1 if the observation is from fiscal year Y, and 0 otherwise.

LISTE DES DOCUMENTS DE RECHERCHE DU CENTRE DE RECHERCHE DE L'ESSEC
(Pour se procurer ces documents, s'adresser au CENTRE DE RECHERCHE DE L'ESSEC)

LISTE OF ESSEC RESEARCH CENTER WORKING PAPERS
(Contact the ESSEC RESEARCH CENTER for information on how to obtain copies of these papers)

RESEARCH.CENTER@ESSEC.FR

1997

- 97001 BESANCENOT D., VRANCEANU Radu**
Reputation in a Model of Economy-wide Privatization
- 97002 GURVIEZ P.**
The Trust Concept in the Brand-consumers Relationship
- 97003 POTULNY S.**
L'utilitarisme cognitif de John Stuart Mill
- 97004 LONGIN François**
From Value at Risk to Stress Testing: The Extreme Value Approach
- 97005 BIBARD Laurent, PRORIOL G.**
Machiavel : entre pensée du pouvoir et philosophie de la modernité
- 97006 LONGIN François**
Value at Risk: une nouvelle méthode fondée sur la théorie des valeurs extrêmes
- 97007 CONTENSOU François, VRANCEANU Radu**
Effects of Working Time Constraints on Employment: A Two-sector Model
- 97008 BESANCENOT D., VRANCEANU Radu**
Reputation in a Model of Exchange Rate Policy with Incomplete Information
- 97009 AKOKA Jacky, BRIOLAT Dominique, WATTIAU Isabelle**
La reconfiguration des processus inter-organisationnels
- 97010 NGUYEN. P**
Bank Regulation by Capital Adequacy and Cash Reserves Requirements
- 97011 LONGIN François**
Beyond the VaR
- 97012 LONGIN François**
Optimal Margin Level in Futures Markets: A Method Based on Extreme Price Movements
- 97013 GROUT DE BEAUFORT Viviane**
Maastricht II ou la copie à réviser
- 97014 ALBIGOT J.G., GROUT DE BEAUFORT V., BONFILLON P.O., RIEGER B .**
Perspectives communautaires et européennes sur la réduction du temps de travail
- 97015 DEMEESTERE René, LORINO Philippe, MOTTIS Nicolas**
Business Process Management: Case Studies of Different Companies and Hypotheses for Further Research

- 97016 PERETTI Jean-Marie, HOURQUET P.G., ALIS D.**
Hétérogénéité de la perception des déterminants de l'équité dans un contexte international
- 97017 NYECK Simon, ROUX Elyette**
WWW as a Communication Tool for Luxury Brands: Compared Perceptions of Consumers and Managers
- 97018 NAPPI-CHOULET Ingrid**
L'analyse économique du fonctionnement des marchés immobiliers
- 97019 BESANCENOT D., ROCHETEAU G., VRANCEANU Radu**
Effects of Currency Unit Substitution in a Search Equilibrium Model
- 97020 BOUCHIKHI Hamid**
Living with and Building on Complexity: A Constructivist Perspective on Organizations
- 97021 GROUT DE BEAUFORT V., GRENOT S., TIXIER A . TSE K.L**
Essai sur le Parlement Européen
- 97022 BOULIER J.F., DALAUD R., LONGIN François**
Application de la théorie des valeurs extrêmes aux marchés financiers
- 97023 LORINO Philippe**
Théorie stratégique : des approches fondées sur les ressources aux approches fondées sur les processus
- 97024 VRANCEANU Radu**
Investment through Retained Earnings and Employment in Transitional Economies
- 97025 INGHAM M., XUEREB Jean-Marc**
The Evolution of Market Knowledge in New High Technology Firms: An Organizational Learning Perspective
- 97026 KOENING Christian**
Les alliances inter-entreprises et la coopération émergente.
- 97027 LEMPEREUR Alain**
Retour sur la négociation de positions : pourquoi intégrer l'autre dans mon équation personnelle ?
- 97028 GATTO Riccardo**
Hypothesis Testing by Symbolic Computation
- 97029 GATTO Riccardo , JAMMALAMADAKA S. Rao**
A conditional Saddlepoint Approximation for Testing Problems
- 97030 ROSSI (de) F.X., GATTO Riccardo**
High-order Asymptotic Expansions for Robust Tests
- 97031 LEMPEREUR Alain**
Negotiation and Mediation in France: The Challenge of Skill-based Learnings and Interdisciplinary Research in Legal Education
- 97032 LEMPEREUR Alain**
Pédagogie de la négociation : allier théorie et pratique
- 97033 WARIN T.**
Crédibilité des politiques monétaires en économie ouverte
- 97034 FRANCOIS P.**
Bond Evaluation with Default Risk: A Review of the Continuous Time Approach
- 97035 FOURCANS André, VRANCEANU Radu**
Fiscal Coordination in the EMU: A Theoretical and Policy Perspective
- 97036 AKOKA Jacky, WATTIAU Isabelle**
MeRCI: An Expert System for Software Reverse Engineering

97037 MNOOKIN R. (traduit par LEMPEREUR Alain)

Surmonter les obstacles dans la résolution des conflits

97038 LARDINOIT Thierry, DERBAIX D.

An Experimental Study of the Effectiveness of Sport Sponsorship Stimuli

97039 LONGIN François, SOLNIK B.

Dependences Structure of International Equity Markets during Extremely Volatile Periods

97040 LONGIN François

Stress Testing : application de la théorie des valeurs extrêmes aux marchés des changes

1998

98001 TISSOT (de) Olivier

Quelques observations sur les problèmes juridiques posés par la rémunération des artistes interprètes

98002 MOTTIS Nicolas, PONSSARD J.P.

Incitations et création de valeur dans l'entreprise. Faut-il réinventer Taylor ?

98003 LIOUI A., PONCET Patrice

Trading on Interest Rate Derivatives and the Costs of Marking-to-market

98004 DEMEESTERE René

La comptabilité de gestion : une modélisation de l'entreprise ?

98005 TISSOT (de) Olivier

La mise en œuvre du droit à rémunération d'un comédien ayant « doublé » une œuvre audiovisuelle (film cinématographique ou fiction télévisée) avant le 1^{er} janvier 1986

98006 KUESTER Sabine, HOMBURG C., ROBERTSON T.S.

Retaliatory Behavior to New Product Entry

98007 MONTAGUTI E., KUESTER Sabine, ROBERTSON T.S.

Déterminants of « Take-off » Time for Emerging Technologies: A Conceptual Model and Propositional Inventory

98008 KUESTER Sabine, HOMBURG C.

An Economic Model of Organizational Buying Behavior

98009 BOURGUIGNON Annick

Images of Performance: Accounting is not Enough

98010 BESANCENOT D., VRANCEANU Radu

A model of Manager Corruption in Developing Countries with Macroeconomic Implications

98011 VRANCEANU Radu, WARIN T.

Une étude théorique de la coordination budgétaire en union monétaire

98012 BANDYOPADHYAU D. K.

A Multiple Criteria Decision Making Approach for Information System Project Section

98013 NGUYEN P., PORTAIT Roland

Dynamic Mean-variance Efficiency and Strategic Asset Allocation with a Solvency Constraint

98014 CONTENSOU François

Heures supplémentaires et captation du surplus des travailleurs

98015 GOMEZ M.L.

De l'apprentissage organisationnel à la construction de connaissances organisationnelles.

98016 BOUYSSOU Denis

Using DEA as a Tool for MCDM: some Remarks

- 98017 INDJEHAGOPIAN Jean-Pierre, LANTZ F., SIMON V.**
Dynamique des prix sur le marché des fiouls domestiques en Europe
- 98019 PELISSIER-TANON Arnaud**
La division du travail, une affaire de prudence
- 98020 PELISSIER-TANON Arnaud**
Prudence et qualité totale. L'apport de la philosophie morale classique à l'étude du ressort psychologique par lequel les produits satisfont les besoins de leurs utilisateurs
- 98021 BRIOLAT Dominique, AKOKA Jacky, WATTIAU Isabelle**
Le commerce électronique sur Internet. Mythe ou réalité ?
- 98022 DARMON René**
Equitable Pay for the Sales Force
- 98023 CONTENSOU François, VRANCEANU Radu**
Working Time in a Model of Wage-hours Negotiation
- 98024 BIBARD Laurent**
La notion de démocratie
- 98025 BIBARD Laurent**
Recherche et expertise
- 98026 LEMPEREUR Alain**
Les étapes du processus de conciliation
- 98027 INDJEHAGOPIAN Jean-Pierre, LANTZ F., SIMON V.**
Exchange Rate and Medium Distillates Distribution Margins
- 98028 LEMPEREUR Alain**
Dialogue national pour l'Europe. Essai sur l'identité européenne des français
- 98029 TIXIER Maud**
What are the Implications of Differing Perceptions in Western, Central and Eastern Europe for Emerging Management
- 98030 TIXIER Maud**
Internal Communication and Structural Change. The Case of the European Public Service: Privatisation And Deregulation
- 98031 NAPPI-CHOULET Ingrid**
La crise des bureaux : retournement de cycle ou bulle ? Une revue internationale des recherches
- 98032 DEMEESTERE René**
La comptabilité de gestion dans le secteur public en France
- 98033 LIOUI A., PONCET Patrice**
The Minimum Variance Hedge Ratio Revisited with Stochastic Interest Rates
- 98034 LIOUI A., PONCET Patrice**
Is the Bernoulli Speculator always Myopic in a Complete Information Economy?
- 98035 LIOUI A., PONCET Patrice**
More on the Optimal Portfolio Choice under Stochastic Interest Rates
- 98036 FAUCHER Hubert**
The Value of Dependency in Plant Breeding: A Game Theoretic Analysis
- 98037 BOUCHIKHI Hamid, ROND (de) Mark., LEROUX V.**
Alliances as Social Facts: A Constructivist of Inter-Organizational Collaboration
- 98038 BOUCHIKHI Hamid, KIMBERLY John R.**
In Search of Substance: Content and Dynamics of Organizational Identity

- 98039 BRIOLAT Dominique, AKOKA Jacky, COMYN-WATTIAU Isabelle**
Electronic Commerce on the Internet in France. An Explanatory Survey
- 98040 CONTENSOU François, VRANCEANU Radu**
Réduction de la durée du travail et complémentarité des niveaux de qualification
- 98041 TIXIER Daniel**
La globalisation de la relation Producteurs-Distributeurs
- 98042 BOURGUIGNON Annick**
L'évaluation de la performance : un instrument de gestion éclaté
- 98043 BOURGUIGNON Annick**
Benchmarking: from Intentions to Perceptions
- 98044 BOURGUIGNON Annick**
Management Accounting and Value Creation: Value, Yes, but What Value?
- 98045 VRANCEANU Radu**
A Simple Matching Model of Unemployment and Working Time Determination with Policy Implications
- 98046 PORTAIT Roland, BAJEUX-BESNAINOU Isabelle**
Pricing Contingent Claims in Incomplete Markets Using the Numeraire Portfolio
- 98047 TAKAGI Junko**
Changes in Institutional Logics in the US. Health Care Sector: A Discourse Analysis
- 98048 TAKAGI Junko**
Changing Policies and Professionals: A Symbolic Framework Approach to Organizational Effects on Physician Autonomy
- 98049 LORINO Philippe**
L'apprentissage organisationnel bloquée (Groupe Bull 1986-1992) : du signe porteur d'apprentissage au Piège de l'habitude et de la représentation-miroir
- 98050 TAKAGI Junko, ALLES G.**
Uncertainty, Symbolic Frameworks and Worker Discomfort with Change

1999

- 99001 CHOFFRAY Jean-Marie**
Innovation et entrepreneuriat : De l'idée... au Spin-Off
- 99002 TAKAGI Junko**
Physician Mobility and Attitudes across Organizational Work Settings between 1987 and 1991
- 99003 GUYOT Marc, VRANCEANU Radu**
La réduction des budgets de la défense en Europe : économie budgétaire ou concurrence budgétaire ?
- 99004 CONTENSOU François, LEE Janghyuk**
Interactions on the Quality of Services in Franchise Chains: Externalities and Free-riding Incentives
- 99005 LIOUI Abraham, PONCET Patrice**
International Bond Portfolio Diversification
- 99006 GUIOTTO Paolo, RONCORONI Andrea**
Infinite Dimensional HJM Dynamics for the Term Structure of Interest Rates
- 99007 GROUT de BEAUFORT Viviane, BERNET Anne-Cécile**
Les OPA en Allemagne
- 99008 GROUT de BEAUFORT Viviane, GENEST Elodie**
Les OPA aux Pays-Bas

- 99009 GROUT de BEAUFORT Viviane**
Les OPA en Italie
- 99010 GROUT de BEAUFORT Viviane, LEVY M.**
Les OPA au Royaume-Uni
- 99011 GROUT de BEAUFORT Viviane, GENEST Elodie**
Les OPA en Suède
- 99012 BOUCHIKHI Hamid, KIMBERLY John R.**
The Customized Workplace: A New Management Paradigm for the 21st Century
- 99013 BOURGUIGNON Annick**
The Perception of Performance Evaluation Criteria (1): Perception Styles
- 99014 BOURGUIGNON Annick**
Performance et contrôle de gestion.
- 99015 BAJEUX-BESNAINOU Isabelle, JORDAN J., PORTAIT Roland**
Dynamic Asset Allocation for Stocks, Bonds and Cash over Long Horizons
- 99016 BAJEUX-BESNAINOU Isabelle, JORDAN J., PORTAIT Roland**
On the Bonds-stock Asset Allocation Puzzle
- 99017 TIXIER Daniel**
La logistique est-elle l'avenir du Marketing ?
- 99018 FOURCANS André, WARIN Thierry**
Euroland versus USA: A Theoretical Framework for Monetary Strategies
- 99019 GATTO Riccardo, JAMMALAMADAKA S.R.**
Saddlepoint Approximations and Inference for Wrapped α -stable Circular Models
- 99020 MOTTIS Nicolas, PONSSARD Jean-Pierre**
Création de valeur et politique de rémunération. Enjeux et pratiques
- 99021 STOLOWY Nicole**
Les aspects contemporains du droit processuel : règles communes à toutes les juridictions et procédures devant le Tribunal de Grande Instance
- 99022 STOLOWY Nicole**
Les juridictions civiles d'exception et l'étude des processus dans le droit judiciaire privé
- 99023 GATTO Riccardo**
Multivariate Saddlepoint Test for Wrapped Normal Models
- 99024 LORINO Philippe, PEYROLLE Jean-Claude**
Enquête sur le facteur X. L'autonomie de l'activité pour le management des ressources humaines et pour le contrôle de gestion
- 99025 SALLEZ Alain**
Les critères de métropolisation et les éléments de comparaison entre Lyon et d'autres métropoles françaises
- 99026 STOLOWY Nicole**
Réflexions sur l'actualité des procédures pénales et administratives
- 99027 MOTTIS Nicolas, THEVENET Maurice**
Accréditation et Enseignement supérieur : certifier un service comme les autres...
- 99028 CERDIN Jean-Luc**
International Adjustment of French Expatriate Managers
- 99029 BEAUFORT Viviane, CARREY Eric**
L'union européenne et la politique étrangère et de sécurité commune : la difficile voie de la construction d'une identité de défense européenne

- 99030 STOLOWY Nicole**
How French Law Treats Fraudulent Bankruptcy
- 99031 CHEVALIER Anne, LONGIN François**
Coût d'investissement à la bourse de Paris
- 99032 LORINO Philippe**
Les indicateurs de performance dans le pilotage organisationnel
- 99033 LARDINOIT Thierry, QUESTER Pascale**
Prominent vs Non Prominent Bands: Their Respective Effect on Sponsorship Effectiveness
- 99034 CONTENSOU François, VRANCEANU Radu**
Working Time and Unemployment in an Efficiency Wage Model
- 99035 EL OUARDIGHI Fouad**
La théorie statistique de la décision (I)

2000

- 00001 CHAU Minh, LIM Terence**
The Dynamic Response of Stock Prices Under Asymmetric Information and Inventory Costs: Theory and Evidence
- 00002 BIBARD Laurent**
Matérialisme et spiritualité
- 00003 BIBARD Laurent**
La crise du monde moderne ou le divorce de l'occident
- 00004 MATHE Hervé**
Exploring the Role of Space and Architecture in Business Education
- 00005 MATHE Hervé**
Customer Service: Building Highly Innovative Organizations that Deliver Value
- 00006 BEAUFORT (de) Viviane**
L'Union Européenne et la question autrichienne, ses conséquences éventuelles sur le champ de révision de la CIG
- 00007 MOTTIS Nicolas, PONSSARD Jean-Pierre**
Value Creation and Compensation Policy Implications and Practices
- 00009 BOURGUIGNON Annick**
The Perception of Performance Evaluation Criteria (2): Determinants of Perception Styles
- 00010 EL OUARDIGHI Fouad**
The Dynamics of Cooperation
- 00011 CHOFFRAY Jean-Marie**
Innovation et entrepreneuriat : De l'Idée...au Spin-Off. (Version révisée du DR 99001)
- 00012 LE BON Joël**
De l'intelligence économique à la veille marketing et commerciale : vers une nécessaire mise au point conceptuelle et théorique
- 00013 ROND (de) Mark**
Reviewer 198 and Next Generation Theories in Strategy
- 00014 BIBARD Laurent**
Amérique latine : identité, culture et management
- 00016 BIBARD Laurent**
Les sciences de gestion et l'action

- 00017 BEAUFORT (de) V.**
Les OPA au Danemark
- 00018 BEAUFORT (de) V.**
Les OPA en Belgique
- 00019 BEAUFORT (de) V.**
Les OPA en Finlande
- 00020 BEAUFORT (de) V.**
Les OPA en Irlande
- 00021 BEAUFORT (de) V.**
Les OPA au Luxembourg
- 00022 BEAUFORT (de) V.**
Les OPA au Portugal
- 00023 BEAUFORT (de) V.**
Les OPA en Autriche
- 00024 KORCHIA Mickael**
Brand Image and Brand Associations
- 00025 MOTTIS Nicolas, PONSSARD Jean-Pierre**
L'impact des FIE sur les firmes françaises et allemandes : épiphénomène ou influence réelle ?
- 00026 BIBARD Laurent**
Penser la paix entre hommes et femmes
- 00027 BIBARD Laurent**
Sciences et éthique (Notule pour une conférence)
- 00028 MARTEL Jocelyn, C.G. FISHER Timothy**
Empirical Estimates of Filtering Failure in Court-supervised Reorganization
- 00029 MARTEL Jocelyn**
Faillite et réorganisation financière : comparaison internationale et évidence empirique
- 00030 MARTEL Jocelyn, C.G. FISHER Timothy**
The Effect of Bankruptcy Reform on the Number of Reorganization Proposals
- 00031 MARTEL Jocelyn, C.G. FISHER Timothy**
The Bankruptcy Decision: Empirical Evidence from Canada
- 00032 CONTENSOU François**
Profit-sharing Constraints, Efforts Output and Welfare
- 00033 CHARLETY-LEPERS Patricia, SOUAM Saïd**
Analyse économique des fusions horizontales
- 00034 BOUYSSOU Denis, PIRLOT Marc**
A Characterization of Asymmetric Concordance Relations
- 00035 BOUYSSOU Denis, PIRLOT Marc**
Nontransitive Decomposable Conjoint Measurement
- 00036 MARTEL Jocelyn, C.G. FISHER Timothy**
A Comparison of Business Bankruptcies across Industries in Canada, 1981-2000

2001

- 01001 DEMEESTERE René**
Pour une vue pragmatique de la comptabilité
- 01003 EL OUARDIGHI Fouad, GANNON Frédéric**
The Dynamics of Optimal Cooperation
- 01004 DARMON René**
Optimal Salesforce Quota Plans Under Salesperson Job Equity Constraints
- 01005 BOURGUIGNON Annick, MALLERET Véronique, NORREKLIT Hanne**
Balanced Scorecard versus French tableau de bord: Beyond Dispute, a Cultural and Ideological Perspective
- 01006 CERDIN Jean-Luc**
Vers la collecte de données via Internet : Cas d'une recherche sur l'expatriation
- 01012 VRANCEANU Radu**
Globalization and Growth: New Evidence from Central and Eastern Europe
- 01013 BIBARD Laurent**
De quoi s'occupe la sociologie ?
- 01014 BIBARD Laurent**
Introduction aux questions que posent les rapports entre éthique et entreprise
- 01015 BIBARD Laurent**
Quel XXIème siècle pour l'humanité ?
- 01016 MOTTIS Nicolas, PONSSARD Jean-Pierre**
Value-based Management at the Profit Center Level
- 01017 BESANCENOT Damien, KUYNH Kim, VRANCEANU Radu**
Public Debt: From Insolvency to Illiquidity Default
- 01018 BIBARD Laurent**
Ethique de la vie bonne et théorie du sujet : nature et liberté, ou la question du corps
- 01019 INDJEHAGOPIAN Jean-Pierre, JUAN S. LANTZ F., PHILIPPE F.**
La pénétration du Diesel en France : tendances et ruptures
- 01020 BARONI Michel, BARTHELEMY Fabrice, MOKRANE Mahdi**
Physical Real Estates: Risk Factors and Investor Behaviour.
- 01021 AKOKA Jacky, COMYN-WATTIAU Isabelle, PRAT Nicolas**
From UML to ROLAP Multidimensional Databases Using a Pivot Model
- 01022 BESANCENOT Damien, VRANCEANU Radu**
Quality Leaps and Price Distribution in an Equilibrium Search Model
- 01023 BIBARD Laurent**
Gestion et Politique
- 01024 BESANCENOT Damien, VRANCEANU Radu**
Technological Change, Acquisition of Skills and Wages in a search Economy
- 01025 BESANCENOT Damien, VRANCEANU Radu**
Quality Uncertainty and Welfare in a search Economy
- 01026 MOTTIS Nicolas, PONSARD Jean-Pierre,**
L'impact des FIE sur le pilotage de l'entreprise
- 01027 TAPIERO Charles, VALOIS Pierre**
The inverse Range Process in a Random Volatility Random Walk
- 01028 ZARLOWSKI Philippe, MOTTIS Nicolas**

Making Managers into Owners An Experimental Research on the impact of Incentive Schemes on Shareholder Value Creation

- 01029 BESANCENOT Damien, VRANCEANU Radu**
Incertitude, bien-être et distribution des salaires dans un modèle de recherche d'emploi
- 01030 BOUCHICKHI Hamid**
De l'entrepreneur au gestionnaire et du gestionnaire à l'entrepreneur.
- 01031 TAPIERO Charles, SULEM Agnes**
Inventory Control with supply delays, on going orders and emergency supplies
- 01032 ROND (de) Mark, MILLER Alan N.**
The Playground of Academe: The Rhetoric and Reality of Tenure and Terror
- 01033 BIBARD LAURENT**
Décision et écoute
- 01035 NAPPI-CHOLET Ingrid**
The Recent Emergence of Real Estate Education in French Business Schools: The Paradox of The French Experience

2002

- 02001 ROND (de) Mark**
The Evolution of Cooperation in Strategic Alliances: The Legitimacy of Messiness
- 02002 CARLO (de) Laurence**
Reducing Violence in Cergy or Implementing Mediation Processes in Neighborhoods Near Paris
- 02003 CARLO (de) Laurence**
The TGV (Very High Speed Train) Méditerranée Decision Process or the Emergence of Public Consultation Procedures on Important Infrastructure Projects in France
- 02004 CARLO (de) Laurence, TAKAGI Junko**
May 1968: The Role of a Special Historical Event in the Evolution of Management Education in France
- 02005 ALLENBY Greg, FENNELL Geraldine, BEMMAOR Albert, BHARGAVA Vijay, CHRISTEN François, DAWLEY Jackie, DICKSON Peter, EDWARDS Yancy, GARRATT Mark, GINTER Jim, SAWYER Alan, STAELIN Rick, YANG Sha**
Market Segmentation Research: Beyond Within and Across Group Differences
- 02006 BOURGUIGNON Annick**
The perception of Performance Evaluation Criteria: Salience or Consistency?
- 02007 ALFANDARI Laurent, PLATEAU Agnès, TOLLA Pierre**
A Path-relinking Algorithm for the Generalized Assignment Problem
- 02008 FOURCANS André, VRANCEANU Radu**
ECB Monetary Policy Rule: Some Theory and Empirical Evidence
- 02010 EL KAROUI Nicole, JEANBLANC Monique, LACOSTE Vincent**
Optimal Portfolio Management with American Capital Guarantee
- 02011 DECLERCK Francis, CLOUTIER Martin L.**
The Champagne Wine Industry: An Economic Dynamic Model of Production and Consumption
- 02012 MOTTIS Nicolas, PONSSARD Jean-Pierre**
L'influence des investisseurs institutionnels sur le pilotage des entreprises
- 02013 DECLERCK Francis**
Valuation of Mergers and Acquisitions Involving at Least One French Food Company During the 1996-2001 Wave
- 02014 EL OUARDIGHI Fouad, PASIN Frederico**

Advertising and Quality Decisions Over Time

- 02015 LORINO Philippe**
Vers une théorie pragmatique et sémiotique des outils appliquée aux instruments de gestion
- 02016 SOM Ashok**
Role of Organizational Character During Restructuring: A Cross-cultural Study
- 02017 CHOFFRAY Jean-Marie**
Le bon management
- 02018 EL OUARDIGHI Fouad, PASIN Frederico**
Quality Improvement and Goodwill Accumulation in a Dynamic Duopoly
- 02019 LEMPEREUR Alain**
«Doing, Showing and Telling» as a Global Negotiation Teaching Method. Why we Need to Innovate
- 02020 LEMPEREUR Alain, MNOOKIN Robert**
La gestion des tensions dans la négociation
- 02021 LEMPEREUR Alain**
Parallèles de styles entre professeur et dirigeants. Au-delà d'une nouvelle querelle des anciens et des modernes sur le leadership
- 02022 LEMPEREUR Alain**
Innovating in Negotiation Teaching: Toward a Relevant Use of Multimedia Tools
- 02023 DUBOULOY Maryse**
Collective Coaching: A Transitional Space for High-potential Managers
- 02024 EL OUARDIGHI Fouad**
Dynamique des ventes et stratégies publicitaires concurrentielles
- 02025 CHAU Minh**
Dynamic Equilibrium with Small Fixed Transactions Costs

2003

- 03001 MARTEL Jocelyn, MOKRANE Madhi**
Bank Financing Strategies, Diversification and Securitization
- 03002 BARONI Michel, BARTHELEMY Fabrice, MOKRANE Mahdi**
Which Capital Growth Index for the Paris Residential Market?
- 03003 CARLO (de) Laurence**
Teaching «Concertation»: The Acceptance of Conflicts and the Experience of Creativity Using La Francilienne CD-Rom
- 03005 LEMPEREUR Alain**
Identifying Some Obstacles From Intuition to A Successful Mediation Process
- 03006 LEMPEREUR Alain, Mathieu SCODELLARO**
Conflit d'intérêt économique entre avocats et clients : la question des honoraires
- 03007 LEMPEREUR Alain**
A Rhetorical Foundation of International Negotiations. Callières on Peace Politics
- 03008 LEMPEREUR Alain**
Contractualiser le processus en médiation
- 03011 BESANCENOT Damien, VRANCEANU Radu**
Financial Instability Under Floating Exchange Rates