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## **Seasoned Equity Offerings and their Impact on the Firm Value**

Thèse

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par

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Monsieur Pierre Jeanneret est autorisé à imprimer sa thèse de doctorat ès sciences économiques intitulée :

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Il assume seul la responsabilité des opinions énoncées.

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Doyen de la faculté de droit  
et des sciences économiques

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## Introduction

Capital structure has received much attention since half of a century. However, the debate about it is still one of major interests in corporate finance. The reason is that no theory has succeeded in explaining what financing decisions should be taken and when. Both academicians and practitioners devote time and resources to try to answer these questions. From a theoretical standpoint, two streams of thought are in competition. According to the first stream, any form of capital structure cannot inflate the firm value. Only new profitable investments are able to. Based on theories of optimal capital structure, defenders of the second stream of thought argue that the firm can maximise its value by managing the capital structure appropriately.

Yet, among the theories of optimal capital structure, a distinction can be made between those that are developed in a static perspective and others that advocate to adjust each marginal capital structure choice to the current situation. In the static perspective, a trade-off is made between the financing sources in order to maximise the cash flow returned to investors. The underlying idea is that firms manage the optimal allocation between basic securities while financial intermediaries provide the market with sophisticated combinations of these basic securities. When marginal changes in the capital structure are considered, the financing solution is designed, by the managers, specifically to fulfil the needs of investors at that given time. It is also adapted to the investment project it finances. Theories of that kind explain the proliferation of financial instruments issued directly by corporations and they associate the financing policy with the investment policy. This last observation is a strong characteristic of marginal financing decision models.

Despite the abundant literature, no theoretical model, which can be falsified empirically, relates the capital structure choices to the firm value. Thus, a plethora of empirical studies have been dedicated to that subject. Not only they give no clear evidence about the explanatory power of a given theory but they also produce contradictive results about the variables used to proxy the various theoretical influences. On one hand, tests of the static trade-off between financing sources may outline some determinants of the capital structure. Though, they fail to estimate their impact on the firm value. On the other hand, tests of marginal financing decisions specifically detect the valuation effect of a given capital structure choice. They allow to examine under what circumstances a financing solution has a significant influence on the firm value. The optimal capital structure, if it exists, is not

assumed to be constant over time. The stock price reaction may depend on the motives that drive the financing decisions and these tests can take this fact into account. However, the empirical evidence remains inconclusive about the relation between the determinants of capital structure and the firm value.

Practitioners do not seem to care about capital structure in the same way as academicians. The relation between financing choices and firm value is not their centre of interest. Instead, they focus on the preservation of the financing capacity. In a sense, they consider the cost of foregoing an investment opportunity as being more important than the cost of capital to finance it. For a majority of them, the financing decision is optimal if it does not prevent the firm to pursue its investment policy in the future. When the academics assume a direct link between the investment project and its financing, practitioners tend to consider them separately or, at least, as not irreparably related. Again, the question about the link between both investment and financing policies is still unanswered.

The multitude of interrogations that subsists about capital structure choices justifies the additional research this dissertation aims to develop. The objective consists in examining the impact of capital structure determinants on the firm market value. Seasoned Equity Offerings are chosen as the representation of capital structure choices. The contributions are declined relative to six points. First, theories of capital structure and the empirical evidence are summarised in order to develop a set of testable hypotheses and to select appropriate explanatory variables. The numerous studies propose a wide variety of variables that are potentially able to influence both the marginal financing decision and its valuation effect. A detailed review of the theoretical and empirical literature is a necessary process to position the two empirical researches involved in the dissertation among the existing evidence.

The second point addresses to the experiment framework . Since most theoretical models are developed for the US environment, testing their predictions on a different setting constitutes an interesting challenge for their universality. The institutional setting is stated to differ from the US context in many ways such as the legal system, the reliance to public financing, the corporate governance structure as well as the main flotation method. Firms from continental Europe are well suited for that purpose. The French market is selected given its market capitalisation and information availability.

The stock price reaction to equity issue announcements is examined through the intended use of the offering proceeds. Operations realised to finance a specific investment project are

separated from those dedicated to pure capital structure motives. The third contribution consists in the introduction of this typology. It allows to differentiate the offerings according to their average impact on the firm value. Moreover, it proposes a framework that let capital structure irrelevancy co-exists with information asymmetry, agency and timing. In a further analysis of information asymmetry, the informational content of equity issue announcements is tested to be related to future earnings. The revision of financial analysts' earnings forecasts around the announcement is the variable used to capture the part of information that concerns future earnings.

As a fourth point, a conditional methodology is implemented to correct for the selection bias involved in the standard analysis of a voluntary-decided corporate event. It takes into account the fact that equity issues could be anticipated by investors. It verifies that relevant information is still released at the equity issue announcement. One originality of that conditional methodology is the formation of a "Non-Event" sample based on the non realisation of the equity issue while the managers have received the legal authorisation to do it.

Corporations that finance a specific investment project with equity are found to select this financing source deliberately. Their choice is opposed to marginal financing theories predictions. This observation, associated with the risk characteristics of investment project, justify the examination of the financing decision impact on the stock performance over longer horizons, which is the fifth point. The long-term event study about French equity issuers involves a large variety of abnormal performance measures, from matching firm to more sophisticated beta pricing models. In addition, the explanatory power of three competing theories (timing, irrational investors and model uncertainty) are tested on the 3-year abnormal performance following equity issues.

The sixth contribution addresses to one of the hypothesis explaining the long-term abnormal performance. A measure of the learning effect is developed to proxy for potential model uncertainty implications. It is based on the revision of financial analysts' earnings forecast over the analysis horizon of the abnormal performance. It appears as an inefficient use of the offering proceeds. Its valuation effect cannot be entirely integrated into the stock price at the announcement because of the uncertainty about the project valuation model. Investors are assumed to learn about the investment net contribution to firm value from the work of financial analysts.

The interpretation of the results should clarify the relation between the determinants of capital structure and the firm value. It should reconcile the concern of practitioners about preserving the financial flexibility and the academic predictions about the interactions between capital structure choices and firm value. It should outline that the joint announcement of an equity issue with a specific investment project has implications on the firm value that are different from those of pure capital structure operations.

The dissertation is organised in four chapters. Theories of capital structure are reviewed in Chapter 1. They are ranked in three wide groups. The first one addresses to the capital structure irrelevancy. It describes the “perfect” conditions for which the firm value is independent from capital structure choices. The second category includes static trade-off models that relates the fact that cash flow cannot be returned entirely and costlessly to investors to the existence of an optimal allocation between debt and equity. Bankruptcy costs, taxes and the output market are the determinants concerned with that theoretical branch. To outline the diversity among the models, contradictive outcomes are observed. In spite of the presence of market imperfections, some models still conclude to the capital structure irrelevancy. Other models result in the existence of an optimal capital structure at the firm level or at the industry level. The third group entails models of marginal financing decisions. They are based on market imperfections that prevent investors and financial intermediaries to costlessly and efficiently recombine basic securities to replicate any particular payoff structure. These imperfections include information asymmetry, agency and transaction costs. Consequently, it is devoted to the firm to issue the appropriate securities so that the costs induced by market imperfections may be minimised. The last part of Chapter 1 synthesizes the theoretical implications of capital structure choices on the firm value. In particular, its potential explanatory variables and their links them to the corresponding theories are presented

In Chapter 2, the empirical literature about the valuation effect of capital structure choices is reviewed. Far from being exhaustive, this synthesis aims at reflecting the main streams of research in this area although the focus is put on equity financing. It starts with an overview of the influence of the institutional setting on equity financing. Major financial markets are compared and the results suggest that equity financing is not as different as predicted by the recent literature about the legal determinants of outside financing. The overview of the literature about the stock price reaction to external financing announcements covers the valuation effect at the announcement of direct cash equity issues, equity offerings with rights

and issues of other securities. The US evidence is compared to the results of international studies in order to determine what explanatory variables have the greatest explanatory power. Since information asymmetry appears as one relevant factor influencing the market reaction to marginal financing decisions, the informational content of securities issues announcements is addressed in more detailed. Evidence is given to the earnings-oriented explanation of the informational content. The examination of the impact on the discount factor is inconclusive. Financial analysts' activity could contribute to reduce information asymmetry but it is subject to conflicts of interest with the investment banking activities. Marginal financing decisions occur at different points in time that may not be independent from the level of information asymmetry and agency costs. The fact that the degree of information asymmetry and the quantity and quality of growth opportunities may be time-varying influences both the marginal financing decision and its valuation effect. The synthesis of what is learned about the capital structure, in terms of its static determinants of the factors that influence the equity vs. debt financing decision and of the opinion of practitioners is discussed in the last part of Chapter 2. The review of the empirical work allows to put forward the hypotheses and the explanatory variables that are the most relevant in a test of the stock price reaction to equity issues announcements.

Chapter 3 presents the analysis of the stock price reaction to equity issue announcement on the French market between 1984 and 2000. After describing the issuers' characteristics and the Seasoned Equity Offering market, a standard event study is performed to detect the announcement valuation effect. The explanatory power of static trade-off, information asymmetry, agency and timing is tested according to the intended use of the offering proceeds. The influence of information asymmetry is deepened with the inclusion of variables measuring the revision in earnings forecasts around the announcement and the earnings forecasts dispersion. The relevancy of the information release at the equity issue announcement is verified with a conditional methodology that takes into account investors' anticipations of the event. A discussion about the implications of the capital structure determinants on the stock price reaction concludes the short-term empirical research and introduces some interrogations about longer-term influences on the stock performance.

The long-term implications of financing decisions on the firm value are examined in Chapter 4. In order to outline the intensity of the debates about the long-term abnormal stock performance following financing decisions, the review of the literature is addressed in a chronological perspective. It starts with the empirical evidence about the "New Issue Puzzle"

and continues with its contradictors who attribute long-term anomalies in stock returns to measurement and mispricing problems. Abnormal returns that persist during several years after an event lead to reject the Efficient Market Hypothesis. Alternative theories are developed to explain the long-term anomalies through investors' irrational behaviour subject to cognitive biases when they process new information about the stock prices. Supporters of market efficiency criticise the lack of credible alternative hypothesis in behavioural models and refute them as theories. They propose model uncertainty as a theory based on investors' rationality and that explain long-term anomalies. Irrational investors, model uncertainty and timing are tested on the sample of French equity issuers in a long-term event study. The 3-year abnormal stock performance after the offering is computed relative to several pricing models. The results outline the role of model uncertainty proxied by a learning effect process to explain the under-performance of one issuers' type in particular.

The main findings are summarised in the conclusion. They are exposed in a way that suggests further developments in this research area.

## **Chapter 1 : Capital structure theories and firm value**

The relation between capital structure and firm value has been a centre of interest in corporate finance since the seminal work of Modigliani and Miller (1958). In a frictionless framework, they show that firm market value depends exclusively on the capacity of the firm assets to generate cash flows. It is independent from any capital structure decisions. By introducing different market frictions, academic research proposes a wide variety of models that explain the impacts of the financing policy on firm value. The aims of this chapter are to present a selection of those models, to show how they position themselves relative to the frictionless framework and to outline their main implications on empirical tests of the capital structure – firm value relation.

The chapter is organised as follows : Section 1 presents the foundations of capital structure theories and the capital structure irrelevancy argument. It starts with the different definitions of capital structure. Then, the Modigliani and Miller (1958) propositions are exposed. The section ends with a discussion on how market imperfections can be classified to create two fields of research : static trade-off models and marginal financing decision models. Section 2 is dedicated to static trade-off models. Their goal is to define an optimal capital structure which maximises firm value. Taxes, bankruptcy costs and product market characteristics are the determinants that influence capital structure choices in this context. Static trade-off models imply the existence of target debt ratio but they are not conclusive about its determination. Section 3 addresses to the alternative field of research : the marginal financing decision models. Capital structure choices are analysed in a dynamic perspective. Market frictions such as information asymmetry, agency costs and corporate governance considerations create among investors a need for specific and specialised financing instrument. These models analyse the expected effect on firm value caused by a given marginal financing decision. At the same time, they relate investment policy to financing decisions. Section 4 concludes the chapter by, first, justifying why tests of the static trade-off theories are limited and then, summarising the main theoretical predictions of marginal financing decision models.

## ***1.1 Capital structure irrelevancy***

### **1.1.1 Capital structure definitions**

The notion of capital structure includes two embedded aspects. First, capital structure is a representation of the firm financing policy at a given moment in time. In other words, it constitutes the summary of all past financing decisions involving all funds for investment. Second, it implies a given ordination of these funds based on their characteristics in terms of claims onto the payoffs, control rights and maturity. This preliminary definition excludes from capital structure all kinds of supplier credit, deferred and payable taxes and other non financial liabilities.

Funds for investment are obtained by selling different types of claims on the firm cash flows. The way these claims are ordered characterises the capital structure. On one hand, debt is a contract that pay out fixed schedules of interests and principal in exchange of investors' cash. It involves bank loans, bonds or leases<sup>1</sup>. Debt can be from private or public sources with the modalities of the contract being private or public. Debt holders do not obtain direct control on the investment decisions. On the other hand, equity gives its holder rights to residual earnings and to participate to the investment decision through a voting right at the shareholders' meetings. A share of equity is a title deed. Its holder owns a fraction of the capital and has a limited liability up to the amount of cash invested in the firm. Debt is a senior claim relative to equity which makes the latter a riskier security. The allocation between debt and equity is the most commonly used definition of capital structure. It has for advantage to be easily observable. In book values, it comes out directly from the balance sheet. Both categories of claims are well differentiated. The main drawback lies in the difficulty to compute the market value of debt. If public debt is traded on a regulated market, private debt such as bank loans is not. Most of theoretical capital structure models require market values, which raise problems when book values of debt are used in their tests.

Separation between ownership and control constitutes an alternative perspective to express capital structure. Control rights are in the hands of existing shareholders<sup>2</sup>. When new investments can be financed by internal funds – existing shareholders do not recover all

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<sup>1</sup> Prevalent accounting standards consider lease contracts as financial debt : International Accounting Standard rule 17 and Financial Accounting Standards Board rule 13.

<sup>2</sup> Existing shareholders are those already holding equity at the time a marginal financing decision is taken. They are opposed to new shareholders who will buy the newly issued shares. New shareholders (outsiders) are

residual earnings but keep them inside the firm as a financing source directly available to the manager -, control of existing shareholders remain unchanged. However, if external funds are needed, the appearance of new shareholders rebalance the control rights between new and existing shareholders. The agency theory formalised by Jensen and Meckling (1976) addresses to the problem of a manager/owner that loose part or all of his control by opening the firm capital to outside shareholders. The outcome is a conflict of interest between managers and shareholders that results in a cost (agency cost of equity) and in a decrease in the firm total market value. In the agency theory, debt has a twofold role. First, it mitigates the problem related to the separation of control and ownership as it constitutes an alternative financing sources that do not involve new (outside) shareholders. Second, debt financing introduces another conflict of interest between shareholders and debt holders that is emphasised when leverage becomes important. This conflict also generates costs that reduce the firm total market value. In a broader perspective, considering capital structure in terms of allocation between debt and equity does not prevent to take problems related to the separation of control and ownership into account. Marginal financing decisions in terms of debt or equity could also denote of agency considerations. This will be further developed in Section 1.3 of this chapter.

In a third perspective, capital structure can be analysed through the maturity of the financing solutions. Equity implies no repayment and thus no maturity. Hence, it is considered as a long-term financing. The maturity of debt is specified in the contract. It can range from short-term (one year or less) to long-term (ten years or more). On one hand, a shorter maturity allows to negotiate a new contract more quickly. The interest rate can be adjusted at shorter time intervals to correspond to the risk level of the investment throughout its lifetime. On the other hand, longer maturities may respond to a need for stability in the financing costs<sup>3</sup>. The main drawback of this capital structure definition is the difficulty to observe the maturities of private debt and those of assets in place. Thus, the relation between the firm value and maturity matching remains impossible to test for most companies.

In summary, the allocation between debt and equity comes out to be the most adequate variable to test capital structure. Throughout the dissertation, capital structure will refer either to the debt-to-equity ratio or to the leverage ratio (debt over total assets). The leverage ratio

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assumed to be different from existing ones (insiders) in most models. Otherwise, the separation of ownership and control is not problematic.

<sup>3</sup> See Myers (1977) to understand how matching debt and assets maturities could mitigate under-investment.

often serves to position the firm capital structure relative to a “optimal” or “target” value. When not else specified, components of the capital structure are market values.

### 1.1.2 Independence between financing choices and firm value

Modigliani and Miller (1958) – hereafter MM (1958) - are the first to formalise the relation between firm value, cost of capital and capital structure. They develop a model under a set of restrictive assumptions that does not represent a realistic environment for the firm. The outcome of their model depends strongly on these assumptions. However, their work provides a framework in which the manager can focus on the factors supposed to be the main determinants of optimal capital structure choices. The set of MM (1958) assumptions is summarised in Table 1.1. Inspired by Titman (2002), the total set of assumptions is split into two groups : one dealing with the independence of total cash flow toward capital structure choices; the other one presenting financial markets as complete and frictionless.

According to the first group of assumptions, firms are assumed to be ordered in different business risk classes. Firms within the same business risk class have perfectly correlated corporate profits. Given that, total market value of firm  $i$ ,  $V_i$ , corresponds to the expected corporate profit by unit of time,  $E(X_i)$ <sup>4</sup>, divided by the cost of capital associated with business risk class  $k$ ,  $r_k$  :

$$V_i = \frac{E(X_i)}{r_k}, \quad (1.1)$$

The cost of capital,  $r_k$ , can be viewed as the expected return on assets required by investors for firms in the business risk class,  $k$ . It is similar for all firms in class  $k$ . MM (1958) make further assumptions so that earnings used in the computation of firm value may not be affected by capital structure choices. Corporate profits and investors are not subject to any kind of taxes. The risk to go bankrupt exists but it assumed not to have a cost. Corporations evolve in perfectly competitive input and output markets. This last assumption prevents the actions of one firm to modify the cash flow stream of its competitors.

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<sup>4</sup> Assets of firm,  $i$ , generate a perpetual stream of profits :  $X_{i,1}, X_{i,2}, X_{i,3}, \dots, X_{i,\infty}$ .  $X_i$  represents the profit per unit of time to the perpetuity, defined as :  $X_i = \lim_{T \rightarrow \infty} \frac{1}{T} \sum_{t=1}^T X_{i,t}$ .

**Table 1.1: The set of hypotheses underlying Modigliani and Miller (1958)**

<b>Assumption</b>		<b>Implication</b>
<i>Total cash flows are exogenous from capital structure choices</i>		
A1.1	Firms are ordered according to risk classes. Firms among the same risk class have perfectly correlated cash flows	Return on assets required by the market is constant for all firms in the same risk class.
A1.2	No taxes of any kind	Corporate profit, personal income and capital gains are not taxed. Profit can be allocated between the different types of investors without affecting the value of the securities.
A1.3	No bankruptcy costs	The firm value is not affected by the risk of bankruptcy.
A1.4	Firms evolve in perfectly competitive markets	The prices of firm inputs and outputs are given. The actions of one competitor cannot influence the others competitors.
<i>Financial market is complete and frictionless</i>		
A1.5	Corporations issue common stocks or straight bonds that are priced on perfectly competitive markets	Bonds earn their holder a fixed amount of the corporate profit while common stocks give right to an uncertain payoff.
A1.6	No transaction costs	Tractability of the return patterns.
A1.7	Similar lending and borrowing interest rate available indifferently to private investors and corporations	Investors can privately and costlessly replicate any financial structure chosen by a given corporation.
A1.8	Infinite elasticity of the demand and supply of financial assets	No price pressure in case of security issues.
A1.9	Managers and investors have symmetric information about the firm quality and the stream of cash flows	Managers and investors have identical expectations about the firm value and about the security prices.
A1.10	Managers act to maximise the wealth of shareholders	No conflicts of interest between managers and shareholders that affect the firm value.

The second group of assumptions ensures that the financial market is complete and frictionless. Financing choices of corporations are restricted to straight bonds for debt and common stocks for equity. Holders of both securities have a claim on the firm cash flows. The bonds give right to a fixed component of the cash flow. The rest is distributed to the shareholders and it is uncertain. Securities are priced on perfectly competitive markets with no transaction costs, infinite elasticity of the demand and supply for financial assets and similar lending and borrowing interest rate available indifferently to private investors and corporations. According to that, investors are able to costlessly and privately replicate the payoff to any combination of debt and equity proposed by corporations. By issuing new securities, firms cannot offer investors patterns of return that they cannot obtain otherwise and prices cannot be pushed down by downward sloping demand curve.

Managers and investors have access to symmetric information about the value of assets in place and of new investment projects so that they may have similar expectations about security prices issued by corporations. Besides, investors act rationally using all their information to maximise their wealth. In addition, managers are assumed to always work in the interest of shareholders by maximising the market value of equity. They are not left the opportunity to retain a fraction of the firm profit to maximise their own utility, causing the market value of equity to decrease.

In the specific framework designed by these assumptions, proposition I in MM (1958; p. 268) defines the cost of capital of any firm within a given business risk class as independent from its capital structure and equal to the cost of capital appropriate to a pure equity stream of its business risk class. Proposition II in MM (1958; p. 271) relates the cost of equity of a levered firm to its business risk class cost of capital. The expected yield of a share of “levered” stock is equal to its business risk class cost of capital plus a premium linked to the financial risk of the firm. The financial risk is measured by the debt-to-equity ratio expressed in market values. The premium per unit of financial risk corresponds to the difference between the cost of capital and the cost of debt.

$$r_{E_i} = r_k + (r_k - r_{D_i}) \frac{D_i}{E_i}, \quad (1.2)$$

where  $r_{E_i}$  is the cost of equity of the levered firm  $i$ ,

$r_{D_i}$  is the cost of debt associated to firm  $i$ ,

$r_k$  is the cost of capital appropriate to a pure equity stream of business risk class  $k$ .

$D_i$  and  $E_i$  are, respectively, the market values of debt and equity.

The model of MM (1958) states that a firm cannot increase its value by adding more debt in its capital structure although the cost of debt is inferior to the cost of equity. The increased leverage brought by the additional debt causes the equity holders to face a higher level of financial risk. In turn, they will demand to be compensated for this increase in risk. The compensation takes the form of a higher required rate of return on equity. The adjustment of the cost of capital is regulated by an arbitrage process that leaves it unaffected by changes in capital structure.

The main implication of MM (1958) is that managers should focus on implementing investment opportunities that increase the economic value of the firm instead of re-

engineering the capital structure. In that sense, the cost of capital,  $r_k$ , is important in the investment decision as it constitutes a marginal hurdle rate to value new investment projects.

### **1.1.3 Two perspectives on MM (1958) propositions**

Revisiting the Modigliani and Miller Theorem, Titman (2002) articulates the stream of research on capital structure according to two perspectives. First, from the point of view of capital demanders, the breakdown of the exogenous cash flow hypothesis makes cash flows, and thus firm value, dependent from capital structure choices. This situation leads managers to optimise the allocation between debt and equity in order to maximise the firm value. Research in this area includes the impact of taxes, bankruptcy costs and input and output markets on the static trade-off between debt and equity. The second perspective considers the point of view of suppliers of capital when the hypothesis about complete and frictionless markets no longer holds. Financial intermediaries or investors are then inefficient in re-designing securities. Consequently, firms are forced to directly issue securities matching the investors' needs otherwise they will not get external financings. Marginal financing decisions become more important than capital structure as a static instrument to maximise firm value.

#### Breakdown of the exogenous total cash flow hypothesis

When cash flows are no longer independent from capital structure choices, firms may increase their market value by optimising the allocation between sources of funds. In this case, demanders of capital determine unilaterally the amounts of debt and equity in their capital structure. Corporations make no effort to take into account the investors' preferences in terms of financing sources. In fact, financial intermediaries are assumed to be more efficient than corporations in re-designing securities to meet investors' criteria. Financial intermediaries buy the "basic" securities issued by corporations and combine them to sell "new products" that fulfil investors' specific expectations in terms of payoffs or risk.

The breakdown of the total cash flow independence hypothesis is at the origin of a stream of research based on the interaction between the static trade-off of debt and equity and firm value. These theories give rise to the notion of optimal capital structure which represents the allocation between debt and equity that maximises the firm value. Capital structure irrelevancy is challenged but not always refuted. Static trade-off models do not agree on the level at which a potential optimal capital structure exists. Is it at the individual firm level or at the industry level or only at the level of the whole economy ?

## Breakdown of perfect “market conditions”

Market frictions such as transaction costs, information asymmetry between managers and investors or conflicts of interest between managers and shareholders break down the arbitrage process of undoing costlessly any corporation capital structure. All marginal financing decisions are subject to a careful examination from investors who adjust their expectations about firm value accordingly. Specifically, this behaviour from investors affect the cost of financing. Corporations are no longer free to decide which type of securities to issue. For a given security, the rate of return required by investors is prohibitive and forces managers to forego investment opportunities unless they chose another financing source.

Theoretical models in this area of research examine the impact of marginal financing decisions on the firm value and on the investment policy. Implications include either a hierarchy in the sources of funds, under or over-investment or the use of combined financing instruments. The latter element is easily observable. Beside common stock and public bonds, firms issue various securities associated to either equity, debt or a mixture of both. Registered shares, participation certificates, or preferred stocks constitute alternative equity-oriented securities. For debt, long-term and short-term bank loans, treasury bills, lease contracts complete straight public bonds. More sophisticated instruments includes an optional second-stage financing such as units (warrant associated with either common stock or straight bond) and convertible bonds. The existence of these various types of securities outline the importance of market frictions in marginal financing decisions. It also denotes the awareness of corporation in responding to the investors’ demand.

### ***1.2 Static trade-off theories and optimal capital structure***

The static trade-off between debt and equity concerns two main theories of capital structure. First, taxes and bankruptcy costs affect corporate profit in a manner that do not contribute to increase firm value. Remember that firm total market value is computed by summing the discounted corporate profit that should be returned to providers of funds. In the MM (1958) framework, corporate profit is fully returned to bond and stockholders. Corporate taxes and bankruptcy costs reduce the part of corporate profit promised to investors. Hence, minimising their importance maximises the total market value of the firm. The models presented in sub-section 1.2.1 show how the allocation between debt and equity affects corporate profit after taxes and bankruptcy costs.

Second, when firms evolve in imperfect input and output markets, an action of one competitor may induce a reaction from other corporations in the industry. Although cash flow of a given firm is not directly affected by a competitor's action, capital structure, if not optimal, may prevent any adequate reaction resulting in a decrease in market value or, in the worst case, in liquidation. Sub-section 1.2.2 briefly reviews selected models examining the interactions between capital structure and characteristics of input and output markets.

### **1.2.1 Taxes and bankruptcy costs**

Taxes affect firms at different levels. Corporate profit is subject to a corporate tax rate that is equal, in most developed countries<sup>5</sup>, to a fixed percentage of earnings before tax but after interests. Tax rates range from 30 % to 45 %<sup>6</sup> depending on the country and on the fact that profit is distributed or not. In case of corporate loss, firms are not refunded but they may carry forward the losses over a period varying across countries. Individual investors are also subject to taxation when they hold securities. Interests and dividends are taxed at the individual level. Some countries mitigate the effects of dividend double taxation (Germany for instance) while others do not (Switzerland). Income on financial assets are taxed at a progressive rate increasing with the income level of the individual. According to that, key elements in considering the influence of taxed on capital structure choices are marginal tax rates and not effective rates. Capital gains on securities are also taxed differently across countries. Overall, the tax rate applied on capital gains is inferior to the income tax rate.

If leverage presents a corporate tax advantage, it also contains a drawback in terms of cash flows. The more levered is the firm, the greater becomes the risk of bankruptcy. Costs are associated with bankruptcy such as trustee or legal fees and costs of reorganisation. Like tax payments, these costs are taken from the profit intended to be returned to investors. They contribute to make firm value dependent of the allocation between debt and equity.

#### *1.2.1.1 Models with corporate taxes*

As corporate taxes are computed on earnings after interests, increasing debt financing reduces the fraction of corporate profit dedicated to tax payments. Corporate tax deductibility of debt interests creates a tax shield that increases the total market value of the firm, other

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<sup>5</sup> Switzerland was an exception with a progressive corporate tax rate based on capital intensity (ratio of equity over total assets). However, since 2001, corporate profit is taxed at a fixed rate ranging from 14 % to 29 % depending on the Canton.

<sup>6</sup> Source : Corporate taxes 2000 worldwide summaries published by PriceWaterhouseCoopers.

things equal. Considering exclusively corporate taxes, the value maximising capital structure is the one that includes enough debt to eliminate the corporate tax liabilities. Modigliani and Miller (1963) correct their 1958 model by allowing corporate taxes. It has for effect to prevent the arbitrage process that causes capital structure irrelevancy. The after-tax profit distributions of two firms in the same risk class are no longer proportional if their capital structures differ. Furthermore, given the corporate tax advantage of debt, the total market value of any levered firm,  $V_L$ , is always greater than that of the unlevered firm,  $V_U$ , within the same business risk class.

$$V_U = \frac{(1-\tau_c)E(X)}{r_k^\tau} < V_L = \frac{(1-\tau_c)E(X)}{r_k^\tau} + \tau_c D = V_U + \tau_c D \quad (1.3)$$

where  $r_k^\tau$  is the cost of capital for business risk class,  $k$ , adjusted for the corporate taxes,  $\tau_c$  is the marginal corporate tax rate.

The difference in value between levered and unlevered firms corresponds to the market value of corporate tax savings,  $\tau_c D$ , which is the present value of all future tax savings related to interest payments. Corporate tax savings are considered to be certain, thus they are discounted at the risk free rate. Then, firm value is given by a monotonic increasing function of leverage, which is not realistic. In the presence of non-debt tax shields such as depreciation, this would no longer be the case.

Brennan and Schwartz (1978) extend the Modigliani and Miller (1963) model. They consider corporate taxes, risky debt and positive bankruptcy costs. The corporate tax advantage of debt is counterbalanced by the two negative effects when leverage increases. The fact that debt is risky introduces the probability that the firm default and goes bankrupt. The probability of default increases with the leverage ratio. At the same time, the probability that security holders will have positive residual claims decreases causing a negative impact on the firm value. Risky debt has another implication. It makes corporate tax savings risky. In case of default, the corporate tax advantage of debt disappears. Thus, the present value of corporate tax savings decreases when the leverage ratio increases. Bankruptcy costs have also a negative effect on firm value that increases with indebtedness. In fact, bankruptcy costs accentuate the negative effect of high leverage on firm value. The outcome of all these positive and negative effects on firm value is the appearance of an optimal capital structure at the individual firm level. When the leverage ratio is low, the corporate advantage of debt

dominates. Firm value increases with leverage up to the optimal debt level where negative effects of leverage exactly offset the corporate tax advantage. From this point on, increasing leverage would reduce firm value.

Brennan and Schwartz (1984) introduce the investment policy (growth rate of assets) and the financing policy (growth rate of the face value of debt) as variables explaining the payoff of securities in the capital structure. From the set of feasible investment and financing policies, the manager will select the policies that maximise the market value of the outstanding stocks. The variations in market values of bonds and stocks are described by a system of differential equations. The aim of the research is to observe the impact of investment and financing policies on both capital structure and firm value.

Unlike most of other capital structure models, leverage ratio is expressed in book values. It is given by the face value of issued debt divided by the total assets. This has for advantage to use a directly observable variable as a proxy for capital structure. The model shows that the optimal capital structure depends not only on the current profitability but also on the pre-existing capital structure. Furthermore, under the optimal financing policy, the current capital structure depends on the past history of the firm profitability. The consequence is that even if two firms are currently and apparently similar, they will not have necessarily identical capital structures. If they have different histories, their optimal capital structures will differ. This finding outlines the limit of a static approach to determine the optimal capital structure. Moreover, even in the presence of corporate taxes, the value of the firm may not increase with leverage. In fact, firm scheduled values appear to be flat over a large range of capital structures. This finding supports the capital structure irrelevancy argument of Modigliani and Miller (1958). The reason brought up by Brennan and Schwartz (1984) is the combination of manager's optimal behaviour (working in the interest of the shareholders) and investors' rational expectations. If the firm market value is increasing with leverage, the manager finds it optimal to issue more debt immediately. However, investors have already integrated this action into their expectations of the firm value. Hence, the firm value cannot slope upward when leverage is increased. This result casts some doubt on the corporate tax savings effect or, at least, on the ability of the capital structure – firm value relation to detect it.

#### *1.2.1.2 Models involving personal and corporate taxes*

The limiting role of bankruptcy costs to leverage is not as important in practice as specified in the theory. This observation is made by Miller (1977; p. 262) or Warner (1977; p. 337) who

underline that the expected bankruptcy costs can be estimated at 1 % of the firm market value before bankruptcy. In counterpart, corporate taxes represent about 50 % of the net operating earnings. Following this rationale, bankruptcy costs are not able to explain the fact that some companies adopt a low levered capital structure. Investors' personal taxes on bond and equity income may induce a personal tax disadvantage to debt. The inclusion of personal taxes in the theory of capital structure can mitigate and even offset the corporate tax advantage of debt.

Some investors (i.e. pension funds) are not subject to taxation. Then, they are indifferent to the kind of remuneration they receive on their investments (interests, dividends or capital gains). However, because of corporate taxes, the fraction of the cash flow they receive from a levered firm is greater than the one from an unlevered firm. Thus, tax-exempt investors will prefer highly levered firms. Investors who are subject to personal taxation would rather hold securities for which tax payments are the lowest. Consequently, investors in high tax brackets will prefer securities with income in form of capital gains. First, they can defer their tax payments by not realising the gains and second, the tax rate applied to capital gains may be more advantageous than the one applied to other securities incomes.

Miller (1977) addresses to the interaction between debt and taxes on firm value. He considers that corporate profit is taxed at a constant marginal rate,  $\tau_C$ . Stockholders are taxed on dividends and capital gains at a marginal rate,  $\tau_E$  while bondholders are taxed on interests at a marginal rate,  $\tau_D$ . The market value of a levered firm can be re-written as :

$$V_L = V_U + D \left[ 1 - \frac{(1 - \tau_C)(1 - \tau_E)}{1 - \tau_D} \right] = V_U + G_L \quad (1.4)$$

where  $G_L$  is the gain in value associated to leverage involving corporate and personal taxes.

As indicated by equation 1.4, the tax gain is no longer strictly non-negative. Its sign depends on the trade-off between the corporate tax advantage of debt and the personal tax disadvantage of it. Marginal personal tax rates are assumed to be progressive. Under this condition, there exists a personal tax rates level where the personal tax disadvantage of debt exactly offsets the corporate tax advantage :

$$(1 - \tau_D) = (1 - \tau_C)(1 - \tau_E). \quad (1.5)$$

At the aggregate level of the whole economy, debt is issued until the marginal tax rates reaches the Equation 1.5 equality. If more debt would be issued, some firms would consider

that debt financing is value decreasing and the equilibrium no longer holds. At the individual firm level, managers are indifferent between having debt or equity in their capital structure. All investors pay the same total amount in taxes (directly in the form of personal taxes or indirectly in corporate taxes) on every pre-tax unit of earnings. This is true whether earnings are distributed as interests on bonds or as dividends/capital gains on stocks. Under these circumstances, investors should also be indifferent about the capital structure choice. Like in MM (1958), the total market value of individual firms is exclusively determined by their operating activities and does not depend on their capital structure.

The outcome of the model developed by DeAngelo and Masulis (1980) contradicts that of Miller (1977). By allowing the presence of non-debt corporate tax shields such as depreciation and investment tax credit and by fixing a statutory upper limit to tax deductions, the model of DeAngelo and Masulis (1980) states that for each individual firm, an optimal capital structure exists, which maximises the firm market value. The full utilisation of the debt tax shield becomes uncertain because of the presence of non-debt substitutes. This has for consequences to affect the effective marginal corporate tax rate, which becomes firm-specific and not constant as in Miller (1977). Simultaneously, equity financing becomes more attractive for firms that are the most sensitive to the risk of not fully using their debt tax shield. In fact, some firms that were indifferent about using debt or equity in the Miller (1977) framework, will prefer equity because of the uncertain interests tax deduction. Although it has an opposite outcome, the model of DeAngelo and Masulis (1980) is a generalisation of Miller (1977). With non-debt tax shields equal to zero and no statutory limit about tax credit, both models lead to similar conclusions about capital structure irrelevancy at the individual firm level.

Further theoretical models analyse the impact of corporate and personal taxes on the capital structure. They are developed upon the work of Miller (1977) and DeAngelo and Masulis (1980). Their goal is to reconcile the empirical evidence with the theoretical predictions. If the net tax effect of debt is positive to the firm market value, the theory predicts that every firm will be levered. However, it is observed that many firms have adopted a zero debt capital structure. In their model, Kane, Marcus and McDonald (1984) include personal and corporate taxes, bankruptcy costs and a probability that the firm assets value falls to zero. First, they observe that the differences in bankruptcy costs across firms cannot explain the wide range of existing capital structure. Second, they show that if the net tax advantage of debt is small, firms deviating from the optimal capital structure will not suffer

from a significant loss in value. It means that as long as the gain in value associated with the optimal leverage ratio is small, firms are indifferent about their capital structure. This outcome fits with the conclusions of Miller (1977) and of Brennan and Schwartz (1984).

When the net tax advantage of debt is equal to zero  $\left(1 - \tau_C = \frac{1 - \tau_E}{1 - \tau_D}\right)$ , the possibility that assets value falls down to zero discourages an unlevered firm to issue any debt. In that sense, the model of Kane, Marcus and McDonald (1984) explains the fact that some firms do not have debt in their capital structure. Moreover, assuming that the net tax advantage of debt is small let other determinants of the capital structure play a more important role than taxes.

Taggart (1980) extends the model of Miller (1977) by considering an incomplete capital market and special costs associated with corporate debt. The introduction of debt costs such as fees to negotiate the debt contracts can lead to systematic differences in capital structure across industries or across specific firm types. Under these conditions, firms are no longer indifferent about their capital structure choices. In addition, incomplete markets imply that investors cannot be categorised in exclusive and exhaustive tax brackets. In other words, investors do not have unanimous preferences relative to optimal capital structures. Even if the determination of an optimal capital structure involves the trade-off between tax savings and bankruptcy costs, additional features have to be taken into account which complicate the optimisation process. Consistent with Kane, Marcus and McDonald (1984), the model of Taggart (1980) has for consequence to reduce the importance of the tax savings and to give a rationale to the existence of unlevered firms. It also introduces the fact that there could exist an optimal (or thought as optimal) capital structure common to all firms in specific industries.

All in all, the influence of taxes on capital structure choices is not straightforward. Some models maintain capital structure irrelevancy even in the presence of taxes. Other models predict the existence of firm-specific optimal allocation between debt and equity that maximises firm value. Finally, Taggart (1980) puts forward the hypothesis that optimal capital structure can be derived at the industry level.

### **1.2.2 Influence of the product market**

In the previous models, capital structure has been analysed in a single firm framework with exogenous incidences on cash flows. When the hypothesis about perfectly competitive input and output market is relaxed, actions undertaken by one given firm could affect other firms, in terms of cost of financing or profitability. Hence, capital structure choices that may be

optimal to solve problems inside an individual firm are not automatically optimal when the whole industry is considered. Setting a debt level or choosing an investment project may not be independent of the strategic decisions taken by other firms in the same industry. This area of the literature outlines the importance of industry in capital structure choices. The degree of competition in the output market, product characteristics or production technologies are the capital structure main determinants at the industry level.

#### *1.2.2.1 Capital structure in a competitive imperfect market*

In oligopolies, changes in the output level of a given firm are assumed to affect output levels of competitors. If one firm decides to produce more, it is at the expense of the other firms in the industry. With a high leverage ratio, a firm must dedicate a higher fraction of its cash flow to pay interests. According to Brander and Lewis (1986), debt financing increases the level of risk the shareholders are ready to take in new activities or investments. A more levered firm is expected to adopt an aggressive output policy in order to generate more cash to pay the larger fixed interest payments. In that sense, capital structure has an impact on the output policy. The consequences for rival firms imply a reduction in their output which leads to lower profit. So, competitors commit to pursue more aggressive strategies by having more debt outstanding. In equilibrium, the outcome is that firms are worse off with leverage than without because they produce more than the optimal "all equity" equilibrium quantities. However, the competitive environment urges them to have more debt than firms in situation of monopoly. On the long-run, this situation is not sustainable. Excessive production leads to larger inventories, lower operating profit and bankruptcy for the weakest competitors.

In order to prevent these long-term consequences of competition, firms in oligopolies are tempted by tacit collusion. Output levels and prices are set so that each competitor may survive. Maksimovic (1988) analyses what happens when tacit collusion is broken down and competitors engage themselves in a war price. His model shows that firms with less debt in their capital structure are better off because they have lower fixed cash payouts. Leverage is expected to decrease when the competition level increases. Thus, firms in oligopolies should have less debt outstanding than in other forms of competition. This outcome may appear opposed to Brander and Lewis (1986) but the relation between both models is not so straightforward. Brander and Lewis (1986) argue that leverage exacerbates competition (predation argument) which in turn, could have a negative effect on firm viability if tacit collusion is not reached. On the other hand, Maksimovic (1988) predicts that the level of

competition affects capital structure choices and that having more debt has also a negative effect on firm viability when tacit collusion is broken (survival argument).

Bolton and Scharfstein (1990) model the predation argument of Brander and Lewis (1986) and the survival argument of Maksimovic (1988) in a multiple-period framework. A firm with financial contracting problem may suffer from a competitor's aggressive output policy. Consider a firm, A, which financing strongly depends on its annual profit and another one, B, with no such concern. Firm B may have an incentive to produce more than its optimal level. Such a behaviour should have a negative impact on firm A profit (predation argument). In the next period, firm A may not be able to get financed (survival argument). As a consequence, firm B would be the only actor left on the market and could benefit from monopoly rents. In terms of capital structure, the less levered is firm A, the greater chance it has to survive the competition. This model also outlines the risk of leverage in case of strong competition. However, it makes no prediction about an optimal capital structure common to all firms within the industry. Capital structure choices are rather related to profitability and to financial flexibility.

#### *1.2.2.2 Product characteristics and the leverage ratio*

The level of debt also interacts with the product or service specification of quality. Titman (1984) argues that firms producing durable or unique goods have less debt because, in case of liquidation, the cost to customers is higher. If durable goods producers can enter in a credible contractual agreement with the customers about after-sales services, they can benefit from higher price for their products. In case of bankruptcy, the new owner is not compelled to fulfil the previous manager's obligations. Therefore, a low debt level implies a lower probability of bankruptcy and gives a credible signal that the firm will be able to fulfil its contractual obligations. Firms with a high degree of product sophistication employ specialised and highly qualified human capital. In case of liquidation, this type of human capital cannot be transferred easily to another firm. In this case too, a lower debt level represents a positive signal that the firm cares about its longevity. It reduces the risk of unemployment for its specialised workers.

Product sophistication and specialisation create implicit contracts between the firm and its customers, suppliers or rivals such as higher sale price, priority in parts and furniture supply or tacit collusion. Reneging on these contracts cannot lead the firm to be legally penalised but it could bear punishment costs. Maksimovic and Titman (1991) show that implicit contracts

benefit with priority to shareholders. Therefore, the more levered is the firm, the lower are the costs of reneging incurred by shareholders. The degree of product quality and/or specification induces firms to have less debt in their capital structure to let shareholders benefit from implicit contracts rents. Capital structure choices could be considered as a message to firm partners about the owners engagement to honour implicit contracts.

If Titman (1984) implications of product characteristics on capital structure are valid for all firms within an industry, those of Maksimovic and Titman (1991) are restricted to higher quality producers. Inside a given industry, different levels of product quality could be found. According to that, capital structures may vary from one firm to another depending on the targeted degree of quality.

### *1.2.2.3 Product market and industry-specific capital structure*

If the optimal capital structure problem is analysed in an industry framework characterised by multiple production technologies, the capital structure of an individual firm becomes irrelevant as shown by Maksimovic and Zechner (1991). The risk related to investment project cash flows is endogenously determined within the industry by the number of firms that choose a given project (the project includes the production technology). Numerous firms that select similar projects have lower production costs (low production technology) and are better hedged against variations in the costs of production. Conversely, investment projects with higher costs of production (high production technology) are chosen by fewer firms which have, hence, riskier cash flows. Debt provides incentives for assets substitution between creditors and owners. In equilibrium, firms with high leverage ratios choose to invest in risky projects (high technology) and those with low debt levels prefer safer projects (low technology). The aggregate amount of debt in the industry adjusts to the repartition between risky and safe projects and induces the investment decision so that the values of risky and safe projects may be equal. As a result, the financial structure of an individual firm influences the investment decision but not the value of the firm. The outcome of Maksimovic and Zechner (1991) contradicts the general trend in capital structure theories about input and output markets that firms in the same industry should have similar debt-to-equity ratios. Instead, Maksimovic and Zechner (1991) support capital structure irrelevancy advanced by Modigliani and Miller (1958) on a perfect market and by Miller (1977) in the presence of corporate and personal taxes.

### 1.2.3 Optimal capital structure in summary

In this section, the two main streams of static trade-off models result in three different outcomes in terms of relation between capital structure and firm market value. First, consistent with MM (1958), capital structure choices do not impact firm value in spite of taxes or/and input and output market imperfections. Models entering this category are summarised in Panel A of Table 1.2. The second possible outcome is that breakdowns of total cash flow independence lead to the existence of an optimal allocation between debt and equity for each individual firm. Capital structure models that maximise individual firm value are recapped in Panel B of Table 1.2. The third outcome relates capital structure to industry. Firms within the same industry are predicted to have similar allocations between debt and equity. Models with such outcome are shown in Panel C of Table 1.2. They mostly belong to the input/output market imperfection category, which is not surprising as industry classification is the criteria to order firms production activities.

**Table 1.2 : Implication of capital structure on firm value in static trade-off models**

Authors	Capital structure determinants	Implication on firm value
<i>Panel A : Capital structure irrelevancy</i>		
Brennan and Schwartz (1984)	Corporate taxes, bond indenture, active investment and financing policies	None
Miller (1977)	Corporate and personal taxes	None
Kane, Marcus and McDonald (1984)	Corporate and personal taxes, probability that assets value falls to zero	Not large enough to adjust the capital structure
Maksimovic and Zechner (1991)	Industry with multiple production technologies	None
<i>Panels B : Optimal capital structure at individual firm level</i>		
Modigliani and Miller (1963)	Corporate taxes	Levered firms are worth more than unlevered firms for similar business risk
Brennan and Schwartz (1978)	Corporate taxes, risky debt and bankruptcy costs	Optimal leverage ratio that maximises firm value
DeAngelo and Masulis (1980)	Corporate and personal taxes, non-debt tax shields and statutory upper limit to tax credit	Optimal leverage ratio that maximises firm value
Bolton and Scharfstein (1990)	Predation and survivorship arguments in competitive output markets	Leverage ratio increases with profitability and internal financing capacity
Maksimovic and Titman (1991)	Quality reputation and gains in long-term partnerships with customers, suppliers and competitors	Leverage ratio decreases for firms willing to show they care about maintaining high quality standards

**Table 1.2 : continued**

<b>Authors</b>	<b>Capital structure determinants</b>	<b>Implication on firm value</b>
<i>Panel C : Industry-specific capital structure</i>		
Taggart (1980)	Corporate and personal taxes, negotiation fees for debt contract	The importance of tax savings could be mitigated by industry-specific debt contract fees
Brander and Lewis (1986)	Competition in oligopolies, risk of predation	Firms tend to have more debt in competitive oligopolies
Maksimovic (1988)	Competition in oligopolies, conditions to survive a war price	Firms tend to have less debt if the risk of war price is important in the industry
Titman (1984)	Product and production characteristics, collateral value of assets	Leverage is less important in industries with specific product and specialised assets

Static trade-off theories do not outline a clear relation between capital structure and firm value. An explanation could be that the relation between financing and firm value should not be considered in a static perspective but in a dynamic one. Capital structure at one moment in time corresponds to the sum of all past financing decisions taken by a firm. Needs for financing are recurrent and the environment of the firm changes with time. Under these circumstances, firm value may rather depends on marginal financing decisions. Furthermore, if optimal capital structure varies through time, costs are generated each time the allocation between debt and equity is modified. These costs may offset the gain in value given by sticking to the optimal capital structure. This rationale is not contradicted by the models of Brennan and Schwartz (1984) and Kane, Marcus and McDonald (1984). The first one relates capital structure to past capital structure choices and the second one outlines the costs of re-balancing capital structure as an element preventing to stick continuously to an optimal allocation between debt and equity.

### ***1.3 Marginal financing decision models***

Marginal financing decision models describe the impact of a given financing choice on firm value and especially on market value of equity. Shareholders' wealth becomes the centre of interest managers are focusing their efforts on. An optimal financing decision is the one that has a positive impact on equity market value. The models are based on frictions on financial markets that, roughly speaking, prevent investors and financial intermediaries to re-design basic securities issued by corporations into products that satisfy investors' needs. It becomes more attractive for corporations themselves to directly design and issue specific securities.

The first category of market frictions includes transaction costs, different lending and borrowing interest rates or finite elasticity of demand and supply for securities. These frictions break the arbitrage process by generating a costly procedure for investors to undo corporations capital structure choices. The second market frictions is information asymmetry between firm insiders (managers, existing shareholders) and outsiders (potential providers of funds). This asymmetry creates an incentive for corporations to select their source of marginal financing according to the expected reaction of providers of funds. Information asymmetry framework is presented in sub-section 1.3.1. A third market friction occurs when managers use or are expected to use funds in a way that causes a prejudice to their providers. Sub-section 1.3.2 deals with the influence of conflicts of interest and transaction cost economy on financing choices. These last two sub-sections involve theoretical models based on the breakdown of assumptions A1.9 and A1.10 in Table 1.1. In these contexts, marginal financing decisions are directly related to investment opportunities. Marginal financing models build on the need to finance investment projects. According to that, impacts on the firm value could come either from the financing decision or from the investment project.

Sub-section 1.3.3 analyses the influence of corporate governance on external financing choices. Corporate governance defines the legal boundaries inside which market participants can organise and protect themselves against the risk of expropriation. Depending on how they feel protected, investors will prefer one security type to another or to concentrate themselves in large blocks. Corporate governance affects not only financing choices but also the ownership structure.

### **1.3.1 Information asymmetry models**

According to the strong definition of efficiency, market prices are assumed to incorporate all the relevant information. If the set of information is common to all market participants, none of them is able to earn systematic abnormal profits. Information asymmetry appears when some agents acquire private information (not known by other market participants) allowing them to value assets more accurately. This superior information gives them an advantage when they trade and allow them to earn systematic profits. In the presence of asymmetric information, market prices are assumed to reflect all public information (semi-strong definition of efficiency). Private information is revealed by the actions of better informed agents. Less informed market participants adjust their valuation of assets letting market prices integrate the newly released information.

To highlight the importance of information asymmetry for economic sciences in general and for corporate finance in particular, the attention should be drawn to the 2001 laureates of the Nobel Prize in Economic Sciences : Professors Akerlof, Spence and Stiglitz, “for their analyses of markets with asymmetric information”. George Akerlof initiated the research on such markets by pointing out the importance and implications that sellers are often better informed about product quality than buyers. Michael Spence analyses the conditions for better informed agents to truthfully and credibly transmit their superior information to less informed market participants. Finally, Joseph Stiglitz examines the position of less informed agents and how they can improve their situation.

Information asymmetry has a cost. It lowers the number of trades and depresses market prices. Akerlof (1970) illustrates this cost in his description of the market for “lemons”. The quality of used cars is the source of information asymmetry. The “true” quality (good or bad) is only known by sellers. Buyers must purchase the car to learn it. The market price for used cars is unique and lower than the intrinsic value of good quality cars. The first consequence is that sellers are not willing to sell undervalued good quality cars. “Lemons” drive good cars out of the market, reducing the number of trades. The second consequence comes from the impossibility to differentiate used car prices according to quality. Potential buyers pressure the market price down because of the presence of “lemons”. The decision of sellers to take good cars out of the market is based on a mechanism of adverse selection : a good action made for the bad reason. They could sell good quality cars but at an undervalued price. Consequently, sellers are better off abandoning their best products than bearing the cost of information asymmetry. In corporate financing theory, adverse selection has for consequence that managers (or existing shareholders) prefer foregoing profitable investment opportunities rather than selling under-priced securities.

In order to avoid under-investment, managers have to communicate their private information. A credible signal associated to the investment/financing decision will reduce information asymmetry and allow fair financing costs. Corporations have at their disposal a large variety of signals that often correspond to discriminating financing combinations. In that sense, an efficient signal is a financing solution, which is optimal only for firms of a given quality. Through the selected financing solution, investors identify the firm quality and financing costs are adjusted consequently. Signalling models justify the existence of mixed securities, certification process and alternative flotation methods as tools for corporations to obtain a fair financing.

### 1.3.1.1 Information asymmetry creates a hierarchy in the financing sources

According to Myers (1984), firms finance their investment projects according to a well defined hierarchy : self-financing (internal cash flow), risk-free debt, risky debt and, as a last resort, equity. This hierarchy of financing sources is known as the pecking order. Financing sources differ from each other by their sensitivity to information asymmetry. Managers possess private information that enable them to know the “true” value of securities that are to be issued to finance a profitable investment project. They work to maximise existing shareholders’ utility. Investors know the current market value of those securities, estimated relative to public information only. The difference between managers and investors’ value represent the cost of information asymmetry :

$$V(I) - I = c \quad (1.6)$$

where  $V(I)$  is the “true” value of the securities to be issued (managers’ value),

$I$  is the investment initial expense that corresponds to the market value of the securities to be issued (investors’ value),

$c$  is the cost of information asymmetry.

The cost of information asymmetry is particular in the sense that it could be either positive or negative. If private information is unfavourable, the cost of information asymmetry is negative. It means that securities are currently overvalued. Selling them is profitable to existing shareholders. In that situation, managers always issue the overpriced securities and undertake the investment project. If private information is favourable, the cost of information asymmetry is positive and securities are currently undervalued. Furthermore, the cost of information asymmetry could be greater than the net present value of the investment project. In this case, existing shareholders are better off if managers forego the investment opportunity.

When investment projects are internally financed, outside investors are not needed. Information asymmetry is not a relevant problem. Every profitable investment opportunity that can be internally financed should be undertaken as it contributes positively to firm market value. For that reason, internal financing is systematically preferred to any other financing sources. Information asymmetry matters when an external financing deficit occurs. The sensitivity of security market value to the release of private information increases with its risk. Senior claim paying fixed interest as debt is less concerned about information asymmetry

problem than equity. The consequence is that debt financing is always preferred to equity financing. For debt, information asymmetry influences the perception of the probability to default, which in turn, alters the valuation process. Risky debt is then more subject to information asymmetry problems than risk-free debt and thus, risk-free debt is strictly preferred to risky debt. In terms of information asymmetry costs, risk-free debt could be considered as equivalent to internal financing.

#### Adverse selection model

The adverse selection model of Myers and Majluf (1984) integrates the pecking order theory in a financing/investment decision model and outlines one of information asymmetry worst consequence : under-investment. High quality firms will reject profitable investment projects if they have to finance them by selling overpriced securities. In presence of information asymmetry, the market value of the firm is lower than it should be with symmetric information, other things equal. The model also predicts that announcements of equity financing decisions should lead the market to revise downwardly its expectations about the stock price. Market reactions to debt financing decisions are expected to be of lower magnitude.

Myers and Majluf (1984) make four specific assumptions about information asymmetry and its consequences. First, managers have superior information about the value of assets in place and about the value of investment opportunities. This superior information allows them to know the “true” value of securities especially when it is not reflected in current market prices. Second, investment projects with negative net present value are ruled out. This assumption ensures that investment policy is profitable to all shareholders on a long-term horizon. Therefore, short-term implications of information asymmetry between existing and new shareholders are emphasised. Third, managers act in the interest of existing shareholders. In fact, they work to maximise the short-term utility of existing shareholders. The latter are assumed to be passive. They do not adjust their holdings in the firm capital after equity issues. They do not finance new investment projects. In that sense, managers maximise the intrinsic value of existing shares. Existing shareholders and managers are insiders of the firm and cannot be differentiated. Finally, financial slack (cash and marketable securities) is fixed and are common knowledge to managers and investors. However, it does not cover the initial investment and external funds must be raised to undertake the project.

Because of information asymmetry, securities are not priced by the market at their “true” value. It means that new investors never pay the exact price for their claims on firm value. If securities are undervalued, new investors acquire a fraction of the claim on assets in place and financial slacks dedicated to existing shareholders. On the other hand, the sale of overvalued securities will expropriate new investors from a fraction of their claim. The firm value dedicated to existing shareholders is a function of the “true” values of assets in place,  $a$ , and investment net present value,  $g$ , and of the required amount of external financing at current market price. Managers issue the securities and undertake the project if, and only if, the incremental value obtained by existing shareholders is greater than the fraction of assets in place and financial slacks going to new investors :

$$\alpha(F + a) = (1 - \alpha)(E + g) \equiv \text{issue-invest condition} \quad (1.7)$$

where  $\alpha$  is the fraction of equity held by new investors,

$F$  is the amount of financial slacks,

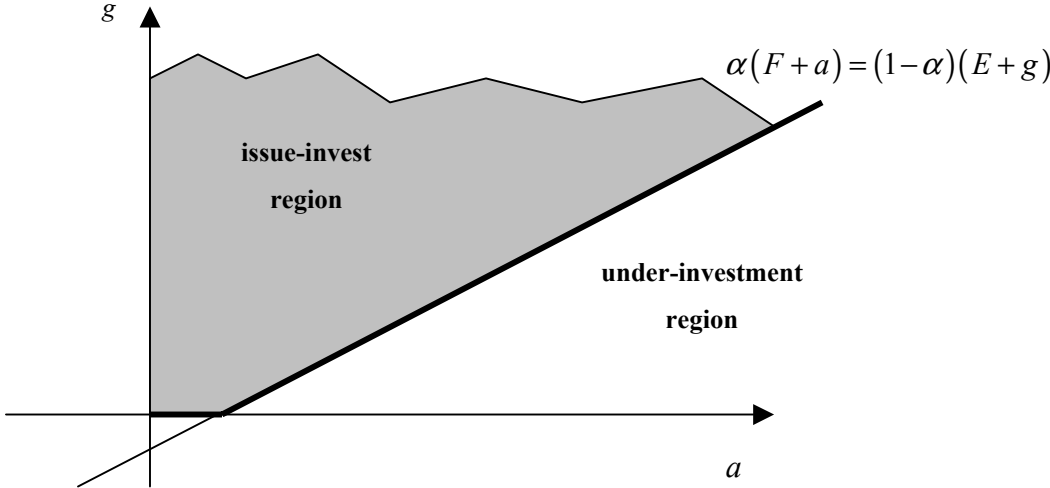
$E$  is the amount of external financing required by the investment project at current market price.

The issue-invest decision is illustrated in Figure 1.1. The horizontal axis represents the “true” value of assets in place and the vertical axis the “true” net present value of investment. The grey region (issue-invest) corresponds to the pairs of  $a$  and  $g$  for which the issue-invest condition holds. The “under-investment” region involves the pairs of  $a$  and  $g$  for which existing shareholders are better off foregoing the investment project. In this case, all profitable investment opportunities are not undertaken. The firm finds itself in situation of under-investment.

Managers are more likely to undertake projects when  $g$  is high and  $a$  is low. In other words, the attractiveness of an investment opportunity depends on its relative value to the assets in place. Other things equal, firms with high growth opportunities have more incentives to be externally financed. Furthermore, the issue-invest decision signals to the market that “true” values of  $a$  and  $g$  are above the issue-invest condition line. Securities are sold at a price that guarantee a gain for existing shareholders. Investors take this overvaluation into account when they revise downwardly the after-issue security price. The decrease in the market price of securities constitutes the cost of information asymmetry. According to the pecking order, this cost is lower for debt than for equity. Therefore, when external financing is needed, debt is always preferred to equity. If the cost of information asymmetry associated

with debt financing is too high, the investment opportunity is foregone. Under these circumstances, firms are not expected to rely on marginal equity financing on a regular basis during their lifetime. Their deficit in external financing should be highly correlated with their net use of debt financing.

**Figure 1.1 : The issue-invest decision in Myers and Majluf (1984)**



The economic rationale of the model can be summarised as follows. Firms hold financial slacks or unused borrowing capacity to pursue valuable investment opportunities without being forced to issue equity when it is undervalued by the market. Holding slacks or unused borrowing capacity have value to the firm because, without them, the firm could bypass profitable investments. Issuing equity reveals private information to the market. Investors infer from the equity financing decision that stocks are overvalued, especially if other financing solutions are available. Disclosure of private information is costly to existing shareholders as it generates a negative reaction on the market value of equity. Otherwise, a marginal financing decision not followed by a market reaction is considered as uninformative.

**Extensions of the model**

Krasker (1986) extends the adverse selection model of the issue-invest decision by letting the manager decide on the amount of external funds to be raised. External financing choice is restricted to equity. The equity issue proceeds could be greater than the effective need to finance the investment project. The cash in excess is kept inside the firm as financial slack or paid out as dividends. Managers find it optimal to issue equity as long as the extra dollar of proceeds contributes to increase existing shareholders' wealth. They select the optimal proceeds according to their private information. The more equity is overpriced, the larger the

issue will be. Investors are aware of managers' behaviour. They participate to the issue to learn the size of the proceeds that they consider as a good proxy for private information. In counterpart, the greater the issue size, the more pronounced is their downward revision of the stock price.

Narayanan (1988) analyses the firm financing decision when information asymmetry is restricted to the value of investment projects. He also relaxes the hypothesis that firms always select positive net present value projects. The main outcome is that firms with unprofitable investment opportunities may survive in the presence of information asymmetry because they may be overvalued. Their survivorship is limited to their capacity to sell overpriced securities. The existence of overvalued bad quality firms has for consequence to downgrade the overall firm value, higher quality firms being undervalued. In other words, information asymmetry let unprofitable firms survive and the presence of such firms prevents private information to be fully released. In Narayanan (1988) framework, the pecking order holds and constitutes one way to limit the number of unprofitable firms. These firms cannot finance themselves internally or with risk-free debt – these sources of financing cannot be overvalued. When reliance to internal and risk-free financing is important in the economy, it becomes more difficult for unprofitable firms to remain unidentified. Better quality firms are the ones avoiding external risky financing. Investors are inclined to penalise firms issuing equity or risky debt to eliminate unprofitable firms that hide among them.

The pecking order theory is restrictive in the sense that it does not authorise any financing flexibility. However, it is developed for the case where the financing policy is directly related to the investment policy. The need for financing is assumed to completely dependent of the investment project. The adverse selection models do not consider the rationale for an alternation of the financing sources in order to maintain a flexible financing capacity. In addition, the pecking order theory does not address the possibility of signalling costlessly the true value of the firm. It does not allow the firm to use a non-unique financing solution. Furthermore, for the pecking order to be valid, all firms must have access to any financing source. Young, high growth firms have no internal financing capacity and they cannot find investors ready to lend them cash. Because of high bankruptcy risk associated to high expected profits, investors are better off taking directly a stake in the capital. Equity constitutes the only financing source available to firms such as start-ups. Therefore, analysing their financing decisions relative to the pecking order is a nonsense. According to that, one could argue that the pecking order applies only to large mature firms and thus, it can be

refuted as a general theory. It must be noticed that the adverse selection model of Myers and Majluf (1984) predicts that small high growth firms are more likely to be financed with equity. However, it does not differentiate the valuation effect of those firms financing decisions from any other issuers.

#### Contradictors to the pecking order

Contradictors to the pecking order propose models where the pecking order financing hierarchy could be broken down in specific situations. Cooney and Kalay (1993) extend the adverse selection model of Myers and Majluf (1984) by allowing negative net present value investment projects to be considered. The existence of negative net present value investment opportunities, even if they are not undertaken, causes some announcement effects to be positive. The issue-invest decision is taken when the cost of information asymmetry is inferior to the incremental value of investment. Managers work in the interest of existing shareholders. So, they will consider first projects with the highest incremental value. Investors cannot observe the “true” incremental value because of information asymmetry. Therefore, they should reward insiders to select the best projects instead of unprofitable ones. In that sense, the issue-invest decision convey a positive signal in terms of investment policy that could offset the negative signal about securities overvaluation. To put it another way, the predicted stock price reaction to equity issue announcements depends on the nature of the information asymmetry. When the expected value of new investment opportunities is important relative to the value of assets in place, the stock price reaction could become positive. Equity financing is no longer considered as the least advantageous source of fund and the pecking order is broken down. On the other hand, when the expected value of investment opportunity is small relative to that of assets in place, managers could find optimal to issue overpriced securities to finance slightly negative present value projects.

When two subsequent investment projects have to be financed, Viswanath (1993) shows that it could be optimal for a firm to finance the first project with equity and to preserve its internal financing capacity for the second project. This financing policy contradicts the pecking order but it guarantees the undertaking of both projects. Managers could act that way because they expect prohibitive adverse selection costs if the second project would have to be financed with equity. They consider that the best interest of existing shareholders is in the realisation of both projects. The gain obtained by internally financing the first project and abandoning the second is smaller than the incremental value of both investment less the

information asymmetry cost due to equity financing of the first one. Implicitly, managers are assumed to lengthen the horizon over which they maximise existing shareholders' utility. The model of Viswanath (1993) fits perfectly in a context of financing alternation. Sometimes, it could be optimal for the firm to issue risky securities to finance going concern investments and to preserve the cumulated retained earnings to finance future investment opportunities. This is especially true when the information about the assets in places is expected to increase in the future. In that sense, Viswanath (1993) introduces the notion of timing and of time-varying information asymmetry. His model shows that deviating from the pecking order could be optimal under specific circumstances. However, the hierarchy of financing sources is not rejected in all the cases.

Noe (1988) assumes that insiders have private information about the firm cash flow but which is not accurate enough to determine their "true" value. This residual uncertainty affects the valuation of risky debt. Debt value is equal to a fixed payment component plus an option to default on the debt contract. The value of the default option is higher for low quality firms. Consequently, some low quality firms should have incentives to issue mispriced debt pretending they are of better quality. If, at the same time, higher quality firms renounce to issue equity, the pecking order is broken down. The high quality firms prefer to forego the investment project instead of being pooled with other firm types. Assuming that insiders are not perfectly informed seems to be acceptable. For industries where cash flow depends on exogenous parameters, managers may not have a superior information than investors and the Noe (1988) argument could hold.

#### *1.3.1.2 Signalling the firm quality through a combined financing*

If better informed agents could credibly communicate private information to the market, the cost of information asymmetry would be reduced. To illustrate this argument, Ross (1977) proposes the level of debt in capital structure as a signal of firm quality. The manager is assumed to know the true distribution of returns but investors do not. He is also compensated according to the firm's securities valuation and penalised when the firm goes bankrupt. Higher quality firms earn higher profits and can bear larger interest payments than lower quality firms. Investors infer from higher leverage ratios that firms are more profitable and value them more than less levered firms. In order to maximise their compensation, managers set the leverage ratio at its highest level without going bankrupt. Heinkel (1982) relates firm value to credit risk and firm quality to the risk of debt. High quality firms have lower profit volatility

and have a large proportion of safer debt in their capital structure. Both models are examples of how reducing information asymmetry by signalling could increase firm value. However, they are based on the static trade-off between debt and equity and their implications cannot be easily differentiated from those predicted by other static trade-off theories.

More sophisticated signalling models are developed to address the under-investment problem. Under-investment comes from the impossibility of the firm to credibly signal its quality or value to investors before the issue-invest decision. However, the model of Myers and Majluf (1984) and its extensions do not consider combined financing solutions. Brennan and Kraus (1987) propose that under-investment can be costlessly overcome if firms choose an appropriate financing strategy. Financing is considered as a communication device to let the investors know about the manager's private information. The definition of financing refers to the complete set of financial decisions announced by a firm at one point in time. Financing can be a combination of new security issues with debt retirement or stock repurchase, one condition being that the net claim for cash must be positive. Managers have private information about the "true" value of different securities already outstanding or that can be issued. They work to maximise the "true" value of the securities held by existing shareholders. To reveal their private information, they select the financing solution for which the net proceeds equals the "true" value of the securities, the condition being that the net claim on cash equals the investment initial expense. The net payoff on the financing solution must be related to the issuer's future earnings. Otherwise, the financing combination would not be informative. Investors infer from the financing solution the exact firm type and adjust their anticipations about securities prices accordingly. Misrepresenting would lead investors to infer an erroneous firm quality and thus they would misevaluate individual securities. The cost of this misevaluation would be borne by existing shareholders. Therefore, managers have no incentive to misrepresent. The value-revealing financing solution is not unique and may depend on the pre-existing capital structure. It can involve debt repurchase with equity issue or other more complex financial instruments such as warrants, or convertible debt coupled with equity issues. A firm with higher expected returns should include more debt repurchase in its optimal financing solution while lower quality firms would only issue equity.

Constantinides and Grundy (1989) also propose a signalling model that ensures the undertaking of every profitable investment opportunity at a fair cost. As in Brennan and Kraus (1987), the optimal financing solution includes a security issue (stock, straight bond, convertible bond or a combination of them). The cash raised in excess of the investment

initial expense is spent in a stock repurchase. The signal involves the amount of investment and the mode of financing. Managers are assumed to have a stake in the firm equity and not to participate in the financing solution or the stock repurchase. Misrepresentation also implies a misevaluation of the securities by investors that will affect managers through their equity holdings. In fact, if issued securities are overvalued, the stocks are also overvalued when repurchased. If issued securities are undervalued, existing shareholders' capital including that of managers are diluted to new investors. The costless optimal financing solution is the one for which the size of the stock repurchase completely offsets the information asymmetry costs of the securities issue.

The conclusions of Constantinides and Grundy (1989) and Brennan and Kraus (1987) define the role of mixed securities such as convertible debt or units in reducing information asymmetry costs. They also support the idea that each security type has its own informative content embodied in its characteristics in terms of payoffs, conversion, exercise or repayment conditions. The variety of securities that can be directly issued by corporations helps investors to integrate insiders' private information. This signalling method is endogenous to the firm and it is assumed to be costless. However, this last assumption does not hold in every situation. When it is not the case, signalling is still possible but it should involve a third party, namely a financial intermediary.

#### The certification role of the underwriter

To reduce information asymmetry costs and under-investment problem, firms can search for external certification about their quality. This signalling device has a cost for existing shareholders but it still could be an efficient solution to maximise the value of their shares. Chemmanur and Fulghieri (1994) develop a model about certification involving three parties : managers, the investment banks and the investors. To undertake an investment project, managers have to rely on external financing – equity in this case. They have private information about the value of their firm. Investment banks are able to produce a noisy evaluation of the investment project, that is to acquire a fraction of managers' private information. Investors have no access to private information before buying the shares. Managers can issue the shares directly to investors or sell them to the investment bank at a given fee. The investment bank becomes the underwriter only if managers agree on their noisy evaluation of the investment project. Investors consider the underwriter's reputation as the signal of the firm quality. High reputation underwriters have more facility to sell new

stocks than low reputation banks. On one hand, this gives them incentives to build a good reputation by spending money investigating managers' private information. On the other hand, investment banks get more underwriting contracts from issuers if they accept to sell overvalued securities. In this case, investment banks generate short-term profit by sparing investigation costs but lose the long-term benefit of good reputation. According to this game, investors trust more highly reputed underwriters. High quality firms searching for good certification will contact good reputation underwriters. The consequence is that information asymmetry costs are reduced when equity issues are underwritten by highly reputed investment banks. Information costs are then maximised for firms issuing equity directly to investors because only low quality firms have the incentive to do so.

In the same line of thought, Giammarino and Lewis (1989) propose a model based on negotiations between the issuer and the underwriter in a market with asymmetric information. During the negotiation process, managers have to disclose at least part of their private information if they want to obtain a higher issuing price. The information revealing power of the negotiation process comes from the possibility given to the underwriter to refuse the issuing price proposed by the issuer. In most information asymmetry models, the issuing price is set by an auction mechanism. Giammarino and Lewis (1989) refutes the fact that the issuer faces an atomistic population of investors. In most cases, the issuer negotiates an underwriting contract with an investment bank. This situation gives more power to the "buyer" of stocks in forcing the issuer to reveal part of the private information before the deal is agreed. The issuing price is the signal of firm quality. The closer it is to the market price, the higher the quality of the issuer is expected to be.

#### The subscription rights flotation method

In previous models, existing shareholders are assumed to be passive. This hypothesis hints that the flotation method favours outside investors in accessing new securities and new equity in particular. Direct cash flotation method seems, therefore, the most adequate to fit in with the models assumptions. Not surprisingly, this flotation method is predominant in the United States where capital structure theories have been developed. Heinkel and Schwartz (1986) develop a model where they consider the flotation method as a signal of firm quality. Three flotation methods are confronted : underwritten public offerings, uninsured rights offerings and standby rights offerings. The model shows that low quality firms pool in the underwritten public offerings category avoiding the additional costs of signalling and failure. On the other

hand, highest quality firms find it optimal to differentiate from intermediate quality firms. They choose the standby rights flotation method. For a fee, an underwriter commits to purchase the issue even if the stock price falls below the issuing price at the expiration of the rights. In order to correctly price the standby agreement, the underwriter must know the firm quality. Thus, it runs costly investigations to acquire the private information. This cost is passed on to the firm, which restricts this flotation method to firms that can bear it. In the eyes of investors, the standby rights issuing process grants the issuer with a high certification. Intermediate quality firms use uninsured rights as their issuing process. They bear the risk of failure if the stock price falls below the market price before the expiration date of subscription rights, which differentiates them from low quality firms. In addition, by setting the issuing price closer to the market price, they can send a more accurate signal to investors about their “true” quality. The model of Heinkel and Schwartz (1986) suggests that market reaction following standby rights offerings should be less severe than the reaction after, respectively uninsured rights offerings and underwritten public offerings.

If existing shareholders’ take up is important, the buyers of securities become insiders. Managers maximising insiders’ wealth can no longer penalise providers of funds by selling overvalued securities. According to that, the issuing price can no longer be considered as a signal of quality. In Europe, subscription price in rights offerings equals, on average, 40-50 % of the market price while it reaches 91.7 % in the US<sup>7</sup>. However, nothing tends to prove that European rights offerings are riskier than their US counterparts in the sense of Heinkel and Schwartz (1986). Moreover, rights offerings are predominant in Europe and they are only marginal in the US. All in all, if the flotation method could play a role in reducing information asymmetry problems, information asymmetry cannot explain the differences between the US and Europe.

### *1.3.1.3 An alternative information asymmetry model*

In models gravitating around Myers and Majluf (1984), managers act to maximise the short-term value of existing shareholders’ claim by either selling overvalued securities or by signalling the firm quality to avoid under-investment. Managers’ financing decisions may be taken according to longer-term considerations even if it is still to maximise existing

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<sup>7</sup> See Bigelli (1998) for a review of European subscription rights and Eckbo and Masulis (1992) for the US figure.

shareholders' wealth. Miller and Rock (1985) base their information asymmetry model on the investment/financing constraint :

$$\tilde{X}_t - I_t = d_t - E_t \quad (1.8)$$

where  $\tilde{X}_t$  is the random profit from operations in period  $t$ ,

$I_t$  is the investment made in  $t$ ,

$d_t$  is the dividend paid in  $t$ ,

$E_t$  is the external financing in  $t$ .

Extrapolating from that constraint, external financing is needed only when expected future cash flows are inferior to the funds required by the investment policy. Miller and Rock (1985) assume that managers have private information about the expected value of future cash flow at the time they set the net financing policy (either to pay dividends or to raise external funds). Investors have less accurate information about the expected profit. They use the net financing policy as a signal about the future profitability of the firm. Managers are more inclined to raise external funds when they anticipate a downturn in the firm profitability. Any external financing decision is negatively perceived by investors. Opposite to the pecking order, no distinction is made between debt and equity financing.

The signalling effect of the net financing policy is not completely dissipative. It reduces the information asymmetry but it does not fully reveal the managers' private information. Managers have the opportunity to cheat by not using the entirety of the cash flow to invest but they could save a fraction of it to pay higher dividend. The market infers high current earnings and good prospects. Investors revise upwardly their expectations about the firm value. The managers' misrepresentation leads to a momentary overpricing of the firm securities. Overvaluation is expected to last until the next earnings disclosure. This outcome of Miller and Rock (1985) suggests two important implications of information asymmetry. First, information asymmetry may be time-varying. For instance, it could increase with the time separating two earnings disclosures. This emphasises the notion of timing. Managers have the opportunity to time external financing decisions and equity issues in particular whether to benefit from a momentary overpricing of securities or to minimise information asymmetry costs. The second implication lies in the fact that external financing decisions are not fully revealing private information. If private information diffuses slowly, its abnormal effect on firm value could last longer than a couple of days. The initial revision in investors' expectation about firm value would not be sufficient to match the "true" value. The valuation

effects of timing external financing decisions is discussed in Section 3 of Chapter 2 and long-term implications of external financing decisions is presented and tested in Chapter 4.

Dividend policy has a consistent role in reducing information asymmetry in Miller and Rock (1985). Firms paying dividends transmit a positive signal to investors. However, as the signal is not dissipating the entire information asymmetry, higher dividend payout ratios are accompanied by the abandon of profitable investment projects. In other words, firms have to sacrifice a fraction of their internal financing capacity to pay dividends and to signal their quality when external funds are needed. Building on the work of Miller and Rock (1985), John and Williams (1985) and Ambarish, John and Williams (1987) propose signalling models with dividends.

For John and Williams (1985), dividends are a credible signal of firm quality because it is costly, in the sense that investors are taxed on dividends. When they raise external funds to finance profitable investment, firms expose their existing shareholders to capital dilution problems (wealth losses and reduction in their control rights). Eliminating this twofold dilution is more valuable to firms with favourable prospects and thus, they have an incentive to signal their quality to the market. Therefore, acting in the interests of the existing shareholders, managers of higher quality firms would distribute taxable dividends and simultaneously raise new funds if outsiders could identify the dilution-related signal. Paying out dividends lead the outsiders to upwardly adjust their firm value expectations and to buy the issued securities at a higher price. The argument of costly dividend signalling should be emphasised in countries where dividends are doubly taxed (at the corporation level and at the individual level) and mitigated in countries that prevent dividends double taxation.

Ambarish, John and Williams (1987) extend the model by increasing the number of signals. Dividends, investment level, equity issues or stock repurchases are signals subject to specific dissipative costs. However, managers can minimise the signalling cost by selecting a combination of individual signals and, at the same time, reveal a fraction of their private information. Again, the signal is noisy so that the investment level chosen by managers may not be optimal. It could be either under the symmetric information level or over it. In the latter case, managers could find optimal for existing shareholders to invest in negative net present value projects. When the nature of information asymmetry concerns mainly the value of assets in place, under-investment is predominant. The undertaking of unprofitable investments is more likely to occur when information asymmetry is about the value of investment projects.

The dividend signalling argument is mitigated by the observation of Fama and French (2001) that dividends payments has decreased over the past decades. In addition, the number of firms that do not pay dividends but that are still growing keeps on increasing. Such firms may not need external financing but a more plausible explanation would be that they use more efficient or less costly signals such as share repurchase, warrants, units or convertible bonds.

### **1.3.2 Agency costs and transaction costs economics**

According to Coase (1937), the bounds of the firm (or of any organisation) are all the exchanges over which the market system is suppressed and replaced by an authority to administrate them. Including an activity within the organisation has an economic sense as long as the costs of direct authority are lower than the transaction costs on the market. Contractual relations are the essence of the organisation. They govern the relationships across the stakeholders of the organisation, which are subject to conflicting interests and opportunistic behaviours.

Following this definition of the firm, the present sub-section addresses to the implications of incomplete contracting on the financing/investment decision. Incomplete contracting gives rise to two theories of the firm. In the agency theory, stakeholders have conflicting interests and incomplete contracting cannot prevent opportunistic behaviours – actions made by one stakeholder that expropriate other stakeholders from a fraction of their claim. It corresponds to the relaxing of assumption A.1.10 in Table 1.1. The most common conflict of interest is between managers and shareholders. It comes from the separation between ownership and control. Transaction costs economy presents debt and equity as governance structures that have different attributions in terms of monitoring managerial actions. Debt is more like a market governance where creditors are not implicated in the managerial decisions. They sanction default on interest payments by overtaking control on the firm assets. Transaction costs implied by this governance structure are low. Conversely, equity constitutes a relational governance structure that is more flexible than debt. Shareholders are directly implicated in monitoring managerial decisions. Such a governance structure demands more competence and commitment from providers of funds. It is more adequate for firms with intensive and specific production technologies or/and that are fast growing. Transaction costs induced by efficient debt contracting would be prohibitive. The optimal governance structure is the one that

minimises transaction costs and it depends on the degree of specificity of assets and production technologies.

Agency theory and transaction costs economy compete in influencing marginal financing decisions. However, they agree on two points. First, both the resolution of conflict of interests and the implementation of a governance structure have a cost to the firm and this cost is borne by existing shareholders. Second, both theories do not leave investors indifferent to the type of securities that managers select to issue to finance investment projects. For that reason, they are presented through the dynamic perspective of marginal financing decisions.

#### *1.3.2.1 The agency theory and its implication on the capital structure choices*

In the eyes of Jensen and Meckling (1976, p. 87), organisations are "legal fictions that serve as a nexus for a set of contracting relationships among individuals". The firm constitutes only one form of legal fiction among others (public administration, State government, non-profit organisation, public utilities, etc.). One characteristic of the firm is the existence of divisible residual claims on the assets and on the future cash flows generated by its activities. These claims can generally be sold on the sole behalf of its owner. The firm is considered as a group of individuals that interact. This notion of individuals in relation with each other is the foundation of the agency theory. Individuals have conflicting objectives and the essence of the firm is to provide a framework of contractual relations that put these objectives in equilibrium.

The agency theory explains how conflicts of interests between stakeholders of the firm generate costs and reduce the firm market value. Furthermore, solutions to these conflicts of interests are costly and not able to eliminate completely the loss in value. Jensen and Meckling (1976) address two types of conflicts, between managers and shareholders (agency costs of equity) and between shareholders and debt holders (agency costs of debt).

When the manager abandons his ownership to outside shareholders, his objective diverges from maximising the equity market value of existing shareholders. The manager adopts an opportunistic behaviour that diverts resources dedicated to shareholders to the satisfaction of his own needs. In other words, as the manager's interests are not fully aligned with those of shareholders, maximising his utility is no longer equivalent to maximising the utility of shareholders. The manager consumes perquisites that have a positive marginal effect on his utility but a negative net present value to the firm. Manager's opportunistic behaviour results in reducing the absolute total market value of the firm. To counterbalance this effect,

providers of funds spend money in monitoring actions to realign the manager's interests with theirs. Monitoring is efficient as long as the gain in firm value compensate the costs they generate. The sum of the loss in firm value and monitoring costs constitutes the agency costs of equity.

A compensation schedule based on the manager's performance mitigates his incentive to consume perquisites. In this case, his utility increases with his performance as a manager. He engages more resources in value-increasing activities and less in non-pecuniary perquisites. In addition, competition across managers limits the costs of obtaining managerial services. It reduces the cost of replacing a manager and thus, more pressure is put on him. The degree of business specialisation has an opposite role on agency costs. It favours manager's entrenchment, allowing him to increase his private consumption, other things equal. In this case, the control of the manager's work is more costly to implement as it requires a higher level of expertise.

Capital structure choices also impact agency costs of equity. Fixed claims on debt contract force the manager to undertake profitable investment in order not to default. In case of default, the manager would be replaced and this solution does not maximise his utility. Debt financing reduces the resources under the manager's control and in turn, it reduces his consumption of value destroying perquisites. In the perspective of agency costs of equity, debt is viewed as a value increasing financing solution. According to Harris and Raviv (1990) debt give creditors the opportunity to perform a more accurate control of the liquidation decision. Liquidation is optimal when the value of the assets is greater outside the firm than contributing to its operating activities. For Stulz (1990), managers are reluctant to use debt financing because it limits their discretionary power over the firm internal resources. The shareholders may have incentives to force the managers to issue debt to limit their consumption of perquisites. Williams (1995) confront the positive effect of debt as a monitoring device and its negative effect in terms of bankruptcy risk. He suggests that firms using capital-intensive technologies are more inclined to use debt than firms using labour-intensive technologies. All in all, the monitoring role of debt outlines the relevance of capital structure choices between debt and equity even when referring to the separation of ownership and control framework.

The conflict of interests between shareholders and debt holders rises from a potential wealth transfer from debt holders to shareholders. Shareholders have control over investment decisions. The smaller is their participation in the firm capital structure, the greater is their

interest to undertake high-risk investment project. Debt holders have a fixed claim on the payoffs. If the project succeeds, they let shareholders benefit from the profits in excess of their fixed claim. In case of failure, they bear the costs because they do not get their money back. In presence of several investment projects with different risk levels, shareholders are able to increase the market value of equity by convincing creditors to finance a less risky project and then shifting to a riskier one. Debt becomes riskier. Its market value decreases and a fraction of it is transferred to shareholders as the market value of equity increases. The wealth transfer is not perfect and the total market value of the firm is reduced. In order to avoid the wealth transfer, creditors increase the cost of debt up to the risk level of the most risky investment project. Debt holders have the opportunity to include costly covenants in the financing contracts that prevent risk shifting. The sum of the loss in market value and monitoring costs constitute the agency costs of debt. These costs are increasing with the leverage ratio.

Building a good reputation as borrower reduces the agency costs of debt and overall, it lowers the cost of debt. Diamond (1989) show that, to build their good reputation, borrowers undertake a stream of safer projects which guarantee them not to default. The longer the period without defaulting, the lower would be the cost of debt financing. Mature firms are expected to consider reputation as valuable. Younger, fast-growing firms would face a higher cost of debt and turn themselves to equity financing. In fact, fast-growing firms often need a second financing while the outcome of the first one is still unknown. Then, reputation building is more hazardous and less valuable. Hirshleifer and Thakor (1992) develop a model where managers care about building their own reputation of selecting investment projects that do not default. Managers are compensated according to their reputation. Their interests align with those of creditors as they benefit from choosing safer investment projects. As long as their investment decisions reduce the agency costs of debt, shareholders are satisfied as the market value of the firm is increased.

### *1.3.2.2 The agency costs of free cash flow and external financing decisions*

According to Jensen (1986), managers have incentives to let firms grow beyond their optimal size. By doing so, they increase the resources under their control and can maximise their overall compensation. This rationale is based on the agency costs of equity. However, the free cash flow approach deals with flows instead of stocks. Managers are sensitive to the monitoring of capital markets when new funds are raised. They have a greater discretionary

power over internal funds that should be returned to investors. Free cash flow is the cash left in the hands of managers when all profitable investments have been undertaken. It allows managers to satisfy their private consumption needs and may be considered as one variable favouring over-investment. In that sense, the use of free cash flow is the source of a conflict of interest between managers and shareholders. Managers want to keep them inside the firm under their control while shareholders want them to be taken out of the managers' hands. Over-investment has a value-destroying effect to shareholders. That loss of value represents the agency costs of free cash flow. The creation of free cash flow depends on the firm activities or type. Jensen (1986, p. 659) argues that "product and factor market disciplinary forces are often weaker in new activities and activities that involve substantial economic rents or quasi rents". Free cash flow is a crucial problem for mature value firms. The lack of growing opportunities associated with high profitability make that these firms often have economic rents and over long periods of time. Shareholders have incentives to implement monitoring devices that force managers to disgorge cash from the firm. Opposed to the pecking order, financial slacks have a negative connotation in this agency context.

External financing policy has direct impacts on the incidence of free cash flow. Securities involve various payout contractual obligations that differentiate them in the eyes of investors. A relevant choice in marginal financing solution reduce the importance of free cash flow and mitigates the over-investment problem. Easterbrook (1984) advances dividends as a twofold instrument to monitor agency costs. Dividends are direct payments to shareholders that disgorge excessive cash out of the managers' hands. On the other hand, not paying dividends implicitly lowers the leverage ratio. Risk shifting becomes more costly to shareholders and the firm should benefit from advantageous debt financing conditions. By diminishing the internal financing capacity, dividends compel firms to come back periodically to the market to get financed. The monitoring performed by new investors at the time of securities issues is assumed to be more efficient than the one of exiting shareholders. Besides, dividends involve several drawbacks. First, they are taxed at the individual level while they are not tax deductible at the corporation level. Second, the increase in external financing generates additional floating costs. Third, shareholders may not credibly compel managers to pay high dividend ratios over a long period of time. At any time, managers have the opportunity to cut off or reduce dividend payouts and then, increase the free cash flow. Furthermore, according to information asymmetry theory a decrease in dividend payments would be interpreted as a

bad signal about future profitability. Bajaj and Vijh (1990) and Denis, Denis and Sarin (1994) document that firms reducing their dividend payouts incur a penalty.

For sporadic direct payments to shareholders, a share repurchase could be a more appropriate instrument. It does not induce changes in the dividend policy and especially the negative effect of a dividend payout reduction. Moreover, it could be more attractive in terms of personal taxation. For instance, the capital gains it could generate are less taxed than dividends in the US, Japan, Switzerland and France. A share repurchase also has implication on the ownership structure of the firm. Brown and Ryngaert (1991) and Bagwell (1991) notice that shareholders selling back their stocks are not the ones in for control purposes. A share repurchase tends to concentrate the ownership structure giving more monitoring power to remaining shareholders. Dittmar (2000) and Vermaelen (1981) show that stock repurchases convey a signal about a temporary under-valuation of equity market value and are therefore well perceived by the market. Beside disgorging cash from the firm, a stock repurchase has a positive effect on remaining shareholders' wealth.

According to Jensen (1986), the most efficient way to take free cash flow out of managers' hands over long periods of time is debt financing. Debt is more restrictive in the sense that managers have contractual obligations to pay fixed interests to creditors. To reach that objective, they have to restrict their investment policy to profitable projects that generate enough cash to pay back interests and principal. Creditors' monitoring power comes from the fact that, in case of default, they will overtake control of the firm assets and fire managers. Depending on the ownership structure, shareholders may not have this power or could not exercise it as efficiently as in a bankruptcy procedure. Interests on debt are deductible from corporate taxes which give them another advantage relative to dividend payments.

The efficiency of debt in reducing the agency costs of free cash flow is limited by the agency costs of debt and their consequences on both the investment policy and the cost of capital. Nevertheless, Jensen (1986) argues that, in the presence of free cash flow, more importance should be given to debt as a monitoring device than as a generator of agency costs. In that sense, the quality and the quantity of the growth opportunities have an direct influence on the agency costs of free cash flow. On one hand, fast growing firms have better and larger investment projects. For such firms, the risk of over-investment is less important than the risk of bankruptcy and equity financing should be considered as the best financing solution. On the other hand, for mature firms, free cash flow or unused borrowing capacity often lead to diversification in low-benefit activities. Therefore, takeovers and mergers in a

diversification strategy should rather be financed with debt to urge managers to produce their best efforts.

Optional equity financing constitutes an alternative monitoring device. By compelling managers to use recurrent financing, units or warrants give their holders the opportunity to opt out. If they are not satisfied with managers' actions, they may refuse to participate to the second-stage financing. In other words, the second-stage financing is conditioned by the stock performance. If performance is insufficient, warrants are not exercised and managers are not able to pursue their investment policy. The signal transmitted by the no-exercise of warrants prevents any alternative financing solution. In the case of convertible bonds, their optional clause protect investors against a change in the issuer's risk. If risk shifting is a success, convertible bondholders, by exercising their option, will be able to claim the return in excess of interest payments. Shareholders will be forced to share their remuneration when their strategy becomes profitable. According to Green (1984) and Burlacu (2000), convertible bonds have a specific monitoring ability that is not related to the fact that they are hybrid, between debt and equity, but because they represent fully qualified financing instruments. These findings are opposed to the common idea that convertible bonds issues are disguised equity offerings (see Eckbo, 1986; among others).

### *1.3.2.3 The contribution of institutional economics*

“The new institutional economics is preoccupied with the origins, incidences and ramifications of transaction costs. Indeed, if transaction costs are negligible, the organisation of economic activity is irrelevant since any advantage one mode of organisation appears to hold over another will simply be eliminated by costless contracting”. These sentences taken from Williamson (1979, p. 233) relate to the starting point of institutional economics : market failure. In case of market failure, participants to an economic activity are not able to implement costless complete contractual agreements that would prevent each party to adopt an opportunistic behaviour at any time during the agreement period. A corporate governance structure has to be designed to enforce the contractual agreement. This corporate governance structure is costly. Organisations become effective when their internal hierarchy allows to implement a corporate governance structure at a lower cost than in the open market.

In transaction cost economics, individuals are assumed to be subject to bounded rationality and to be given to opportunism (Williamson, 1988; p. 569). Bounded rationality means that individuals are intended to be rational but in a limited way. In addition, when they are

permitted to adopt an opportunistic behaviour, they will do so and seek to satisfy their own interests first. Incomplete contracting is a consequence of bounded rationality and contractual hazards is a consequence of opportunism.

Williamson (1988) explains the capital structure choices by the transaction cost economics rationale. Investment projects are characterised by their assets specificity. On one hand, an investment is said to be asset-specific when it is not easily transferable to a competitor, when it serves to produce unique goods or services or when it is located remotely. On the other hand, a general purpose investment is considered as a non-specific transaction. Debt and equity are defined as governance structure. Debt is the market-oriented governance structure. As long as borrowers do not default, creditors are not supposed to interfere in managerial decisions. Borrowers are sanctioned when they do not meet their financial obligations. Debt holders overtake control and the firm is liquidated. In that sense, debt is unforgiving and not flexible. Creditors are not informed about the business evolution unless default occurs. They cannot force the manager to adjust his actions before the situation irreversibly deteriorates. Debt governance structure is more appropriate to low-specificity assets or general purpose investments. As creditors realise various recovery in the degree to which the assets are re-deployable, the value of their pre-emptive claims declines when the assets specificity increases. There exists an adverse relation between debt financing and assets specificity. The firm may sacrifice some value-enhancing specialised investments in favour of a greater facility of re-deployment. Investors bear an opportunity costs as the highest possible market value is not reached.

When assets specificity becomes too high and investment projects too risky, debt fails as a governance structure. Investors' monitoring must be more flexible and more implicated into managerial decisions. Equity represents a relational governance structure in which shareholders through the board of directors exercise an active control onto managers' activities. Collecting information about the investment projects situation, enforcing changes in the management, adjusting projects to current environment conditions are actions available to equity holders or to their representatives. Opposite to debt financing, providers of funds are not supposed to wait for the investment project outcome to take the decision to quit or to pursue the firm activities. Continuous monitoring actions can be undertaken. To be efficient, the costs of implementing a relational corporate governance must be inferior to the opportunity costs generated by other less flexible corporate governance structures.

Convertible debt constitutes a specific governance structure that involves both characteristics of market and relational governance systems. In the transaction costs perspective, convertible debt is optimal when the risk related assets specificity becomes significant only in the future. Suppose an investment project that is specialised but the demand for the product is relatively safe for the next 5 years. Afterwards the demand will be subject to the evolution of the technology (the mobile phone industry in the late 90's). Convertible bonds ensure that market rules apply in a first phase when management opportunism must be sanctioned instead of adapted. During the second phase, converting debt into equity makes it possible to adopt an intrusive supervision of the managerial decisions in order to perform the adaptations required by the unanticipated disturbances.

When uncertainty is concentrated in the implementation and development phase of the investment project like in the pharmaceuticals industry, a relational governance structure is better appropriate and equity financing is optimal. As the uncertainty about the outcome vanishes, assets are more easily re-deployable and market-like rules become more adequate. Investors do not have to spend additional costs in supervising the managerial decisions. The threat of default suffices. One financing solution could be a share repurchase financed with debt.

#### *1.3.2.4 Agency problems or transaction costs ?*

The fact that individuals are expected to adopt opportunistic behaviours implicitly relates transaction costs economics and the agency theory. However, their approaches differ both in a conceptual way and in their predictions about capital structure choices. First, in the agency theory, managerial discretion results in a conflict of interests between managers and shareholders. The unit of analysis is the individual. An optimal contract is the one that aligns the interests of managers with those of shareholders. All in all, shareholders bear a large part of the total agency costs<sup>8</sup>. Assuming that financial markets are efficient, they have incentives to issue specific securities that minimise the ex-ante agency costs. In other words, capital structure choices are determined before any opportunistic behaviour is noticed and securities to be issued should integrate its expected impact into their prices. Transaction cost economics has the transaction as the unit of analysis. Because of bounded rationality, incomplete ex-ante contracts cannot prevent opportunistic behaviours. In this rationale, market fails to eliminate

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<sup>8</sup> Moral hazard has a negative impact on the overall level of managers' compensation. In that sense, managers also bear a fraction of the total agency costs.

the likelihood of uninsurable opportunism. Thus, the focus is put on selecting the governance structure that minimises the costs due to unanticipated disturbances throughout the life of the transaction. These costs are determined ex-post. Since market may fail, they cannot be anticipated and integrated ex-ante in the security prices.

The implications of agency theory and transaction cost economics on the capital structure choice are compared in Kochhar (1996; p. 719, Table 1). On one side, free cash flow is the asset under governance (agency theory). On the other side, all firm resources are under governance (transaction cost economics). According to the agency theory, debt has the governance ability to solved conflicts of interests about the use of free cash flow. Firm market value is hence preserved at its optimal. Transaction costs economics relates the governance structure to assets and investment specificity. Free cash flow only counts for a fraction of the assets under governance and may not be the predominant matter in marginal financing decisions. In that sense, “it [transaction cost economics] may provide a more complete picture” (Kochhar, 1996; p. 719).

In terms of investment strategies, transaction cost economics predicts that specialised assets favour related diversification and equity financing. Synergies can be found with the specific governance structure. Transaction costs are minimised and diversification in related business has a positive incremental market value. Conversely, unrelated diversification creates a natural hedge for cash flow. This phenomenon is emphasised when assets specificity is low and easily transferable across businesses. Market failure is less likely to occur. Thus, market governance of debt is more appropriate in terms of transaction costs. Strategic considerations in terms of investment comes from the degree of assets specificity and implies, ex-post, the most accurate governance structure through the financing solution.

The agency theory of free cash flow suggests that debt financing should prevent managers to diversify in activities where their level of expertise is low. The cash disgoring effect of debt incurs diversification in related activities to maintain profitability. Managers fear to undertake value-decreasing investments such as acquisitions in unrelated businesses. By relying on debt financing, managers bond themselves to a specific investment strategy. Potential agency costs of free cash flow determine ex-ante a financing solution that, in turn, constrain managers’ action. According to Gibbs (1993), an increase in the leverage ratio should be associated with an increase in the degree of related diversification. This prediction is opposed to that of transaction cost economics.

Transaction cost economics and agency theory deal with governance structures and investors' monitoring power. Both are sensitive to the securities holders' ability to plainly exercise their rights. Debt holders must be able to overtake control on firm assets in case of default or to take part in a restructuring process. Shareholders must have their rights protected against the risk of expropriation by managers. Members of the board of directors must represent the interests of all the shareholders. They also must be able to force managers to disclose all the pertinent information and to distribute earnings according to each claimant's rights.

### **1.3.3 Corporate governance and external financing**

Corporate governance includes all measures available to stakeholders to protect their rights onto their claims in the firm. Two main concepts are widely diffused : shareholder value and stakeholder society. The concept of shareholder value deals with the protection of investors' rights and more specifically with the protection of shareholders' rights in order to maximise the market value of equity. It represents the Anglo-Saxon view of corporate governance. Shleifer and Vishny (1997) survey and describe the main mechanisms that protect investors' rights. They distinguish internal from external mechanisms. The first internal corporate governance device is an incentive-based compensation scheme for managers. When the interests of managers are aligned on those of shareholders, managerial decisions are more likely to maximise shareholder value. For that mechanism to be efficient, the performance measure the compensation scheme is developed upon must be highly correlated with the quality of managerial decisions. Managers receive a remuneration that is variable for a large part. They may find it optimal to manipulate financial data of the firm in order to smooth their performance over time. Shareholders must pay attention to managers' opportunism and exercise their monitoring by selecting independent auditors and additional external financial expertises. Shareholders' monitoring power is concentrated in their voting rights. By electing the members of the board of director, they choose their representatives, the ones who defend their interests against the risk of expropriation from managers. Takeover threat backs up the monitoring power of shareholders. Unsatisfied shareholders can sell their stocks to bidders who, when they acquire the majority of control rights can replace the inefficient management team.

External corporate governance involves the legal mechanisms that protect investors. Legal protections of the shareholders' rights<sup>9</sup> include a one share one vote restriction, the authorization of proxy voting, voting by mail or the constraint to use pre-emptive rights in equity issues. Cumulative voting or proportional representation for the election of the board constitute additional shareholders' protection. In the US, minority shareholders are given more power as they can undertake class actions or as they can force the manager to repurchase their shares when they object one of his decisions. Even more important than the variety of legal protections is the quality of their enforcement. Actually, legal procedures could be long, expensive or even in some countries forbidden to foreign investors. A legal protection that is written in the books but not applicable is not different from no protection at all. LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997; 1998) argue that the degree of shareholders' legal protection varies across countries according to the legal system origin. This difference explains why Anglo-Saxon common law countries use more equity financing than German or French civil law countries. When their sample is restricted to most developed countries, differences in external financing choices become less noticeable. These countries belong to various legal families but they are all characterised by a high quality of law enforcement.

If the degree of legal protection has a controversial role in explaining external financing of private firms, it could affect the ownership structure. When legal protection is dedicated to the rights of minority shareholders, ownership structure may be more diffused. On the other hand, shareholders tend to concentrate themselves into large blocks if they feel less protected by the legal system. Concentration increases the pressure they can exercise onto managers. The attractiveness of one financing source is defined by the trade-off between the costs induced to exercise an efficient monitoring and the gain in value generated by the improved controlling. In that sense, a high degree of shareholders' legal protection could lower the overall cost of equity and make this source of financing more attractive to investors.

The option given to creditors to overtake control over the assets in case of default also needs to be enforced by legal protections. Default is an easy verifiable violation of the debt contract. Courts have an objective situation to base their decision on. In that sense, the legal protection of creditors is often more effective than the one of shareholders. However, the bankruptcy process may be long and expensive for the creditors who, sometimes, prefer to

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<sup>9</sup> For detailed explanations of shareholders' legal protections see LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1998)

renegotiate outside of the legal actions. Their negotiation power is enhanced, the harder the bankruptcy law is to the defaulting firm. Nevertheless, once the bankruptcy has been pronounced, the allocation of the assets between the different creditors is subject to further conflicts of interests. In other words, it may be easier for a creditor to sue a corporation but receiving what he thinks deserving is fastidious, expensive and uncertain. Consequently, the creditors' rights are costly and sometimes inefficiently enforced. A simplification of the bankruptcy procedure could improve its efficiency. Large creditors like banks have their monitoring power strengthened as for large shareholders. At the extent, they may be able to take advantage of their increased control rights. They may earn rents from their control over industrial firms. They are able to force the firm into repeated transactions that let them generate high amounts of fees. The debt structure of the firm is subject to similar implications of the legal system as for the ownership structure of equity. First, better overall legal protection of creditors increases the attractiveness of debt financing. Second, legal protection also affects the concentration of creditors.

In a shareholder value perspective, an efficient governance structure is the one that allows providers of funds to obtain the return on investment they deserve according to the risk they bear. It should prevent managers or any single group of investors to expropriate the other providers of funds. The optimal governance structure is expected to minimise the costs of opportunistic behaviours which in turn maximises the market value of the firm through optimal capital structure choices.

Tirole (2001, p. 2) criticises the traditional view about corporate governance reflected in Shleifer and Vishny (1997). He argues that: "For most economists and legal scholars, the debate is more about how to implement the shareholder value than about its legitimacy". Corporate governance is often restricted to the set of instruments implemented to assure suppliers of finance, and especially shareholders, to get the return on their investment. Much less attention is given to other stakeholders such as employees, customers, suppliers, the local community, and so forth. Continental Europe countries and Japan are more sensitive to a stakeholder society concept. The aim of the firm is larger than just profit maximisation. Thus, governance structures must extend to take into account the interest of all the stakeholders. Managers have to spend their effort optimising stakeholders' general welfare that includes shareholder value but is not restricted to it.

To compare both shareholder value and stakeholder society approaches, consider the optimal incentive-based compensation scheme for managers. According to shareholder value,

stock or operating performance may constitute appropriate benchmark for shareholders' interests. With stakeholder society, the compensation scheme must be based on performance measure that involve heterogeneous interests of various stakeholder groups. Furthermore, the interests of given shareholders such as local community or employees are not easily measurable. Therefore, implementing a compensation scheme that aligns managers' interest with those of all stakeholders and that measures the contribution of managers' action to each stakeholder welfare appears to be an impossible challenge. The most convincing solution would be a flat remuneration. In fact, in continental Europe, the fixed component of managers' remuneration is more important than in the US. The drawback of flat remuneration is that it favours the private consumption of managers.

The main problem with stakeholder society governance structure is the allocation of control rights. Because of the large numbers of parties, control rights should be diffused across stakeholders. Shareholders can no longer be a counterpart to managers discretionary power. In other words, control rights can be unified in the hand of managers or diffused across groups with opposite interests. When control rights are given to managers, the decision process works but its outcome is more likely to privilege managers' own satisfaction at the expenses of all stakeholders. Diffused control rights often induce deadlocks in the decision making process. No party has enough power to win the decision but altogether, stakeholders can prevent any decision to be taken. This situation is worst collectively than any kind of expropriation by one stakeholder. In the shareholder value context, control rights are given either to managers or to shareholders. The cases that lead to decision process deadlocks are less numerous than with more stakeholder groups. For firms less subject to agency problems or with non-specific assets, any stakeholder, including shareholders, is better off with control rights in the hands of managers. Market governance structure is appropriate. On the other hand, fast growing firms or firms with specialised assets will need a relational corporate governance structure. These firms are better off with control rights unified in the hand of shareholders, which is less likely to occur in a stakeholder society framework. Furthermore, during economic downturns, the decision process needs to be fast and efficient. Suppliers of finance are the most appropriate stakeholders to exercise the control rights. In times of economic prosperity, deadlocks in the decision making process are also damageable but stakeholders incur less risk of expropriation if they let control rights in the hands of managers.

Both Tirole (2001) and Shleifer and Vishny (1997) underline the importance of the firm general environment and corporate governance system when corporate decisions are analysed

in an agency context. The nature and the magnitude of interest conflicts depend on who has the control rights and how efficient is the legal protection of the stakeholders. Shleifer and Vishny (1997) describe the actors susceptible to perform a corporate governance and what are the instruments at their disposal. They try to rely on objective factors and implicitly restrict corporate governance to the concept of investor (shareholder) value. Tirole (2001) extends corporate governance to the stakeholder society and shows its limits in term of efficient decision making process. The optimal governance structure has to take the positive aspects of shareholder value such as efficient control over managers' action and the long-term benefit of satisfying all stakeholders.

La Porta et al. (1998) advocate the supremacy of US governance structure that favours equity financing by better protecting shareholders against expropriation. They legitimate their argument by relating the development of equity markets to the origin of the legal system. In that perspective, Anglo-Saxon common law countries offer a better protection of shareholders rights than other legal systems based on civil law. However, proclaiming that shareholder is king in the world of shareholder value does not make any sense. Furthermore, recent bookkeeping scandals in the US (Enron, WorldCom or Xerox for instances) raise some doubts about the supremacy of the US shareholders' legal protection system. The announced and self-acclaimed transparency of balance sheets and P&L statements, the most severe accounting standards or the constraining public disclosure requirements have not prevented the pre-cited companies to manipulate billions of USD<sup>10</sup>, to inflate their profit or to cover their over-indebtedness. They show instead that aligning managers' interests exclusively on those of shareholders may lead to a perverted game in which shareholders loose. On the other hand, bookkeeping scandals are not restricted to the US. The Swissair "crash" in Switzerland (2001) or the Crédit Lyonnais scandal in France (1992-1993) illustrate that such collapses occur whatever the origin of the legal system.

Differences across institutional contexts exist and they constitute a challenge for capital structure models. A model developed to explain external financing decisions relative to the US institutional setting may not be valid in another contexts. Therefore, tests of capital structure choices on any market outside the US is worth some interests and contribute to the better understanding of the interactions between capital structure determinants and firm value.

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<sup>10</sup> WorldCom has overstated its earnings of 3.8 billion USD, over five quarters from January 2001. Enron has understated its debt of several hundreds of million USD. Xerox has to restate 6.4 billion USD of revenues because they immediately booked revenues from long-term leases of copiers (Sources : Time Magazine editions of December 10, 2001 and July 8, 2002).

## ***1.4 Theoretical implications of capital structure choices on the firm value***

### **1.4.1 Limitations to test static trade-off theories**

Static trade-off theories relate the allocation between debt and equity at one given moment in time to the market value of the firm. Because it is static, direct tests of this relation are impossible to perform. Instead, the fact that firms adopt their value maximising leverage ratio is postulated. Then, the influence of capital structure determinants on the leverage ratio is tested across firms. In other words, tests of static trade-off theories may indicate which determinants better explain capital structure choices but they cannot measure their contribution to increase market value.

Both streams of static trade-off theories are based on the general conditions of the firm environment. Corporations cannot influence the tax system they are subject to. Production technologies, assets specificity or competition degree in the output market are matters of long-term strategic decisions that may evolve but that would not be drastically and frequently modified. According to that, optimal capital structure choices concerning these theories are more likely to stable as long as the environment conditions do not change. To put it another way, as long as no tax reform occurs, optimal capital structure choices have no reasons to be deeply altered. Unless the firm completely re-deploy its activities, the degree of assets specificity or the level of competition have only few chances to incur deep disruptions leading to significant re-allocations of financing sources.

Tax reforms allow to isolate the impact of taxes on capital structure choices. Givoly, Hayn, Ofer, and Sarig (1992) study the firms response to the Tax Reform Act of 1986 in the US. They observe that firms modify their capital structure in accordance with DeAngelo and Masulis (1980) predictions. In addition, they show that capital structure changes in years not concerned by the tax reform are not related to tax considerations. The importance of taxes as a determinant of capital structure is emphasised by the work of Scholes, Wilson and Wolfson (1990) on tax reform affecting the US commercial banks industry, that of Rajan and Zingales (1995) on the G-7 countries and that of Vanthienen and Vermaelen (1986; 1987) on tax reforms in Belgium. Outside periods surrounding tax reforms, the influence of taxes seems to be overwhelmed by other determinants<sup>11</sup>, which is consistent with the predictions of Brennan and Schwartz (1984) and Kane, Marcus and McDonald (1984). All other things

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<sup>11</sup> See Bradley, Jarrell and Kim (1984) or Titman and Wessels (1988). To their discharge, the focus in these studies is not put on taxes but the tax variable is added to take into account potential marginal effects.

equal, the net effect of taxes on the capital structure appears to be small and the Miller (1977) relation could hold. Nevertheless, when a tax reform modifies the Miller (1977) relation, firms adapt their capital structure according to new marginal tax rates. Graham (2000) estimates that the corporate tax benefits of debt for US firms are worth about 10 % of the firm value. This proportion reduces to 4.3 % when personal taxes are taken into account. However, the most interesting finding is that, on average, firms do not use their full tax benefits of debt. In fact, by issuing the optimal quantity of debt (until marginal tax benefits start to decrease), they could increase their value through the doubling of their tax benefits. These results reinforce the idea that tax effect optimisation may not be the priority of firms when they undertake marginal capital structure choices.

If corporate tax systems in developed countries tend to be harmonised, strong differences still exist in the way to compute the profit subject to taxes. Each country seems willing to maintain specific tax deductions, different cases of tax exoneration, or to allow various accounting manipulations<sup>12</sup>. Beside standard State corporate taxes, several countries adopt additional local and/or specific taxes that could strongly impact the overall corporate tax rate. The outcome is that tax system implications on profit determination may induce serious biases in international comparisons of capital structure based on tax considerations.

Tax reform is an easily identifiable event which characteristics are observable. In the case of input/output markets theories, comparable events would be a modification in anti-trust laws, inclusion or suppression of monetary or non-monetary barriers to enter a market or an innovation in production technologies. However, if these events could isolate and thus, analyse the effects of static trade-off theories, they are not able to measure their impacts on the firm value.

#### **1.4.2 On the existence of a target debt ratio**

One way to take into account the history of the financing decision is to control for the existence of a target debt ratio. Brennan and Schwartz (1984) suggest that the pre-existing capital structure has an influence on the financing policy and on the current optimal capital structure. Their argument supports the idea of an historical target debt ratio. A target debt ratio can be defined as an optimal capital structure that takes into account the time dimension. The target is not meant to be reached exactly but constitutes a long term trend. A modification of

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<sup>12</sup> See Corporate Taxes 2000 Worldwide Summaries published by PriceWaterhouseCoopers for a detailed international review of corporate taxes and accounting practices.

the capital structure is costly. Thus, it should be undertaken only when it is necessary in terms of impact on the firm value and when the amounts engaged are consequent.

The dynamic process of sticking to the target debt ratio can be described as follow. Given a starting capital structure, the investment policy will be as much as possible internally financed, which decreases the leverage ratio (accumulation of retained earnings). When the leverage ratio is too low (i.e. to fully benefit from the corporate tax advantage of debt), debt is issued either to finance a large investment project or to buy back some equity (pure capital structure change). A third possibility could be that the debt issued is used to finance going concern investments that are usually internally financed. In this case too, the financing purpose is only a matter of capital structure. Debt financing can consist either in large issue of bonds or in smaller amounts of bank loans (short- or long-term). Banks generally allow credit lines to industrial firms. When firms reach the upward limit of their credit line, they can issue equity. It will lower the leverage ratio and in turn, it could increase the credit limit.

The alternation in the financing sources available to the firm is one way to stick to a target debt ratio. According to the static trade-off models that support the existence of an optimal capital structure, the closer to its target ratio the firm is, the more valued it should be. On the other hand, alternating the financing sources could simply represent a way to guarantee a financial flexibility in case of urgent need of cash. If this explanation is true, pure capital structure changes should have no impact on the firm value.

If a target debt ratio exists, should it be firm-specific or industry-specific ? The answer is twofold according to the purpose of the target ratio. First, if the target debt ratio proxies the optimal capital structure, the target should be firm-specific in the sense that the underlying static model leads to a unique optimal allocation between debt and equity (i.e. in DeAngelo and Masulis, 1980). The firm specificity of the target debt ratio comes from the definition of the marginal corporate tax rate and from the non-debt tax shields that are endogenous to the firm. Sticking to its own target debt ratio allows the firm to stay close to its maximum market value. Otherwise, if the target ratio is considered as the allocation between debt and equity that guarantees financial flexibility, it can be industry-specific. Outsiders to the firm (e.g. banks) will consider industry specific target ratios as norms of the financial health of the firm. The models of Taggart (1980) or Titman (1984) are not rejecting the existence of an industry-specific optimal capital structure.

Maintaining a target debt ratio implies that incremental financing choices should be analysed instead of the levels of debt. An incremental financing choice is the discrete choice of one source of financing. The financing policy is no longer studied in terms of levels that include all the financial history of the firm but in terms of marginal decisions that only concerns the present situation. Furthermore, investors react to the marginal financing decisions and adjust their expectations about the security prices. Therefore, the incremental approach to analyse the capital structure choices allows direct tests of the impact of the financing policy on the firm market value. The method consists in measuring the abnormal stock price reaction to the announcement of the marginal financing decision.

Hull (1999) investigates stock-for-debt transactions in the US using a target debt ratio to distinguish operations that get closer to the target from those to move away from it. The target debt ratio is an industry norm. It consists in the median leverage ratio of firms in the same industry. Hull (1999) shows that firms moving toward their target debt ratio exhibit less negative stock price reaction than firms that move away from it. These findings give evidence to the existence of a target debt ratio and they are consistent with the optimal capital structure theory. They also support the fact that industry matters when it comes to optimal capital structure.

Almazan and Molina (2000) confront the capital structure theories related to competition and output market. They use the dispersion of capital structures in an industry as the independent variable. Industry technological heterogeneity is negatively correlated with the dispersion of capital structures which contradicts the prediction of Maksimovic and Zechner (1991). Higher industry concentration is associated with higher financial dispersion which is opposed to the predictions of Brander and Lewis (1986), Maksimovic (1988) and Bolton and Scharfstein (1990). The only branch of the theory that is empirically supported is the liquidation hypothesis of Titman (1984). Technical heterogeneity among firms in an industry reduces the transferability of the production devices. Thus, capital structure homogeneity inside an industry is positively associated with higher liquidation value.

#### **1.4.3 Marginal financing decisions and firm value in summary**

Academic literature about marginal financing decisions does not dissociate financing decisions from investment decisions. A marginal financing decision is a relevant matter in terms of impact on firm value only if it serves to finance an investment opportunity. Otherwise, capital structure irrelevancy as in MM (1958) applies. All in all, the introduction

of market frictions results in a loss to firm market value. This loss can be “materialised” by a sub-optimal investment decision : foregoing profitable projects or/and undertaking value-decreasing projects. It can also affect market prices through the adjustment of the rate of return required by investors. Marginal financing decisions can be viewed as solutions to minimise or eliminate the potential loss in firm value. They are more like value-preserving actions than value-enhancing ones. Table 1.3 summarises the models presented in this section.

**Table 1.3 : Theoretical implications of marginal financing decisions**

Authors	Models rationale	Models predictions
<i>Panels A : Information asymmetry – Pecking order</i>		
Myer and Majluf (1984)	Information asymmetry – adverse selection	Under-investment Sales of overpriced securities Equity issue announcement should be followed by a stock price decrease Debt financing is less subject to adverse selection costs than equity issues
Krasker (1986)	Information asymmetry – creation of financial slacks	The size of the financing proceeds increases with the degree of information asymmetry The valuation effect following equity issues should increase with the size of the offering
Naranayan (1988)	Information asymmetry restricted to the value of investment projects	Sales of overpriced securities allow unprofitable firms to survive Ascending in the pecking order increases the risk of financing unprofitable investments
Cooney and Kalay (1993)	Inclusion of unprofitable investment projects and the positive selection argument	A high expected value of investment projects relative to the value of assets in place reduces the adverse selection costs and may break down the pecking order Some equity issues could have a positive valuation effect on stock prices
Viswanath (1993)	Pecking order in a recurrent financing scheme	Depending on the nature of information asymmetry, breaking down the pecking order could avoid under-investment when subsequent projects are considered Valuation effect of equity issues are expected to be less pronounced when firms announce recurrent investments
Noe (1988)	Private information is noisy	Firms of lower quality may issue risky debt while in the same situation higher quality firms refuse to issue equity and under-invest.

**Table 1.3 : continued**

<b>Authors</b>	<b>Models rationale</b>	<b>Models predictions</b>
<i>Panel B : Information asymmetry – Signalling</i>		
Ross (1977)	Information asymmetry and managers' compensation scheme	Debt is a signal of firm quality The more levered, the more valued the firm is
Heinkel (1982)	Information asymmetry, credit risk and firm value	Firm quality is related to the risk of debt Higher quality firms have more and safer debt
Brennan and Kraus (1987)	Financing combinations are costless signal of firm quality	Firms avoid under-investment by selecting discriminative financing solution unavailable to lower quality firms.
Constantinides and Grundy (1989)	Mixed financing solutions that balance the effects of sale repurchase of mispriced securities	Firms undertake every profitable investment project and finance them with a net issue of securities that is neutral to firm value
Chemmanur and Fulghieri (1994)	Underwriter's certification as signal of firm quality	The fairness of equity issue pricing is related to the underwriter's reputation
Giammarino and Lewis (1989)	Negotiated price in equity issues between issuers and underwriters	Underwriters acquire private information to negotiate a fair issuing price
Heinkel and Schwartz (1986)	Flotation method in equity issues to signal firm quality	Highest quality firms choose standby rights offerings. Intermediate quality firms choose uninsured rights offerings and differentiate from each other by setting the highest issuing price they can bear Lowest quality firms choose underwritten public offerings
Miller and Rock (1985)	Information asymmetry is about the ability of the firm to sustain its investment policy with internal funds	External financing decisions are bad news about the firm future profitability. In addition, they are not fully revealing private information. Only future earnings disclosures will do it.
John and Williams (1985)	Dividend signalling model about firms future profitability	Dividend is a credible signal because it is costly. Firms raising external funds while paying dividends convey a positive signal about their future financial situation Trade-off between the positive effect of dividends as a signal and the negative effect of sacrificing internal financing capacity
Ambarish, John and Williams (1987)	Multiple signals	Dividend, investment level, equity issues and stock repurchase are signals. Managers combine them in order to minimise the signalling costs

**Table 1.3 : continued**

<b>Authors</b>	<b>Models rationale</b>	<b>Models predictions</b>
<i>Panel C : Agency costs</i>		
Jensen and Meckling (1976)	Conflicts of interests between managers, shareholders and creditors affecting investment choices and increasing the cost of financing	Outside equity financing increases the agency costs of equity. Debt financing favour a wealth transfer from creditors to shareholders.  Solving these conflicts is costly and reduce the market value of equity
Harris and Raviv (1990)	Creditors exercise a more accurate monitoring as they can force liquidation or restructuring better than shareholders	High liquidation value and level of assets tangibility favour debt financing  Highly-levered firms promise higher yields on their financial assets
Stulz (1990)	Shareholders minimise the agency costs of equity by forcing managers to issue debt	Numerous and high quality growth opportunities favour equity financing  The costs of managerial discretion is positively correlated with the volatility of cash flow. Actions that reduce the volatility of cash flow is expected to be value enhancing
Williams (1995)	Opposite effects of debt toward firm value : positive as reducing agency costs of equity, negative as increasing bankruptcy costs	Capital intensive production technologies favour debt financing while labour intensive production technologies favour equity
Diamond (1989)	A good reputation as borrower reduces the agency costs of debt and implies the undertaking of safer investment projects	Mature firms are expected to have more debt and young firm more equity
Hirshleifer and Thakor (1992)	Managers can optimise their position inside the firm by building a reputation of not defaulting which will satisfy both shareholders and creditors if total agency costs are minimised	Firms with a product long certification or development process should have more debt
Jensen (1986)	Agency costs of free cash flow  Free cash flow favours over-investment	Debt financing is the most efficient way to disgorge cash over long periods  Mature value firms are expected to be financed with debt  Rapidly growing firms are expected to be equity-financed
Easterbrook (1984)	Dividends favour equity financing in a context of agency costs of free cash flow	A high dividend policy favours equity financing  Repeated equity issues should be better perceived by the market

**Table 1.3 : continued**

<b>Authors</b>	<b>Models rationale</b>	<b>Models predictions</b>
<i>Panel C : continued</i>		
Green (1984)	Convertible debt is a financial instrument with specific characteristics that could mitigate agency costs	Issues of convertible debt are expected to have a positive effect on firm value
Burlacu (2000)	Convertible debt can have equity-like, debt-like or specific optional characteristics. Only the latter is expected to have specific effect on agency costs	Convertible bond with a strong optional characteristic is expected to have a positive effect on firm value
<i>Panel D : Transaction costs</i>		
Williamson (1988)	Debt represent a market-like corporate governance structure while equity is a relational corporate governance structure	Firms are expected to finance non-specific assets with debt and specific assets with equity
Kochhar (1996)	Transaction cost economics is a wider concept than agency costs of equity	The leverage ratio is negatively correlated to the degree of diversification relatedness

Unlike the determinants of static trade-off theories, market frictions conditioning marginal financing decisions evolve continuously within and outside the firm. While taxes and input/output markets conditions do not lead them to constantly adjust their leverage ratio by doing debt-for-equity or equity-for-debt swaps, information asymmetry and agency costs problems oblige corporations to manage and adapt each marginal financing decision in order to optimise their investment policy and in turn, their value-creating process. Firms could simultaneously stick to a mid or long-term target debt ratio and deviate from it on the short-run to select the financing solution with the lowest cost. When short-term deviations move the debt ratio too far from its target, firms re-balance their capital structure. In a short-cut vision, all capital structure choices predicted by theories can be categorised between pure capital structure matters to adjust for breakdowns in the exogenous cash flow hypothesis and marginal investment/financing co-decision matters to take financial market frictions into account.

## **Chapter 2 : Valuation effects of external financing decisions**

In this chapter, I review the empirical evidence about the impact of external financing decisions on the firm market value. Four major questions are addressed. Are the financing decisions taken according to the existence of a target debt ratio ? Are valuation effects of securities issue announcements explained by information asymmetry or by agency costs ? Because information asymmetry as well as the intensity of conflict of interests may be time varying, do managers time their financing decisions ? Do they try to take advantage of windows of opportunity or do they consider global economic conditions and growth opportunities when they issue securities ? Finally, is the institutional setting a key factor to explain the stock price reaction to external financing decision announcements ? More precisely, I am interested in understanding whether firms rely on specific flotation methods or sell particular financial assets because of the institutional context.

Among external financing decisions, equity issues come out as the most convenient operations to observe and to analyse. First, they have to be approved by the shareholders' meeting and, in some countries like France, by an extraordinary shareholders' meeting. Second, managers are often given the authorisation to issue equity over a several-year period. They are able to time the operation, that is to decide exactly when and at what conditions the operation has to be realised. Third, several flotation methods may be used but any issuing process is well defined by legal and/or supervision authorities. Standardised information concerning the operation modalities has to be publicly disclosed. This implies that important dates such as the official announcement date or the realisation date are easily identifiable relative to other financing decisions like bank loans or alternative private financings. Fourth, equity issues are available to every type of firms unlike straight bonds or convertible bonds that may be restricted to larger corporations. In that sense, they allow comparisons between a wide range of firms so that they may offer a better test of capital structure theories. Fifth, most countries oblige corporations to announce the use of the equity issue proceeds, which allows to differentiate pure capital structure operations from those to finance a new investment project. With debt financing, this distinction is less obvious to perform. Actually, because of the finite maturity, an important fraction of new debt issue is dedicated to rolling over previous borrowings that are at maturity. These operations could not be considered as new capital structure choices. They only reflect decisions taken in the past. These reasons motivate the fact that the review of empirical studies about capital structure choices is focused

on equity issues. Other financing decisions are addressed as points of reference. Moreover, equity issues seem more appropriate to compare information asymmetry and agency costs implications as well as the timing argument.

Section 1 overviews national practices of raising equity on the major financial markets and the importance of equity markets as a financing source. The aim is to outline the role of potential institutional characteristics in explaining differences in capital structure choices across countries as predicted by LaPorta et al. (1997; 1998). Financial markets are getting integrated over the last two decades. This shows through their organisations that tend to be more and more alike. Two examples would be the adoption of two major segments - one for larger and more established companies, the other for smaller, fast-growing firms that want to be listed to benefit from a larger panel of investors – and the standardisation of listing requirements and of supervision authorities. Financial markets integration has for effect to eliminate differences coming, for instance, from the origin of national legal systems.

Section 2 surveys the impact of securities issue announcements on stock prices and confronts the explanatory power of capital structure theories. For equity issues, a distinction is made according to the flotation method : straight cash offerings predominant in the US vs. offerings with subscription rights most commonly used in Europe. Average stock price reactions to common equity issue announcements in the US are negative, about  $-2\%$  to  $-3\%$  on a two-days interval. The evidence is mixed on European or Japanese markets. The results may vary according to the flotation method or to the nature of the issue. The reaction to the announcement of other securities issues (units, convertible bonds and straight bonds) may also differ depending on the market.

Information asymmetry is assumed to be one major cause of external financing decision valuation effect. Empirical evidence about the informational content of security issue announcements is reviewed in Section 3. Managers' private information gives them a better knowledge of the firm value and of security prices. In that sense, information could be about the stream of future cash flow or about the discount factor that is to apply. If equity issue announcements are informative, price changes they generate should be explained by variations either in post-issue earnings or in systematic risk. The section concludes by addressing two questions about information asymmetry. Do financial analysts earnings forecasts contribute to reduce information asymmetry and explain the valuation effect ? Or, are investors able to anticipate the financing decision and its impact on stock prices ?

In Section 4, the timing argument of external financing decisions is addressed. Timing may not be considered as a stand-alone theory of capital structure choices. It naturally comes from information asymmetry and agency costs models when external financing decisions are analysed according to a time dimension. When information asymmetry is time-varying, it creates windows of opportunity for managers to issue equity or debt. Windows of opportunity could be viewed as periods during which security prices are overvalued but it could also be defined as periods of lower information asymmetry. According to the first definition, managers maximise the short-term value of existing shareholders' equity while with the second definition, they favour the undertaking of every profitable investment projects. The agency implication on timing is related to quantity and quality of growth opportunities available to the firm. Over-investment is exacerbated when the level of growth opportunities is low. Equity issues are subject to higher agency costs. Conversely, when economic conditions are better, managers are faced with more profitable investment projects and are less incited to consume perks. The main consequence of timing is that capital structure is more likely to represent the cumulating of external financing decisions than a deliberate allocation of debt and equity. In other words, past marginal external financing decisions based on timing considerations could better explain capital structure than current determinants.

Section 5 is dedicated to three aspects that represent external visions on capital structure choices. First, I review a selection of studies that analyse the simultaneous influence of various determinants on capital structure in either a single institutional setting framework or in international comparisons. Second, the focus is put on determinants of marginal financing decisions. What factors do favour equity issues rather than debt issues? Third, practitioners' point of view is considered. It is interesting to notice that practitioners' major preoccupations are not systematically in lines with those of academicians. In particular, practitioners appear to be concerned about financial flexibility and indirectly about the survivorship of their firms in a proportion that cannot be translated by any theoretical model. This observation gives some hints about managers' time horizon being not as short as assumed by the theory.

The last section of the chapter summarises the empirical evidence. The effort is put on outlining the main hypotheses, the most appropriate explanatory variables and the commonly approved interpretations of the results. Beside synthesising the current state of empirical research on capital structure, this approach justifies the foundations of the two empirical studies presented in the next chapters.

## ***2.1 Influence of the institutional setting on equity financing***

According to the degree of shareholders' legal protection, LaPorta et al. (1997; 1998) shows that equity markets are more developed in countries with legal systems based on common law. This section addresses to the question of equity financing but through three different perspectives. First, the institutional setting defines equity issue procedures and regulates the access to public capital. Different rules may also explain potential differences in equity markets development. Second, aggregate financing sources are examined across countries with the largest equity market capitalisations at the end of year 2000<sup>13</sup>. These countries are, respectively, the US, Japan, the UK, France, Germany and Switzerland. Although they appear in the top five, France and Germany are considered to have less-developed equity markets (see LaPorta et al., 1997). Third, the institutional context may create country-specific factors that influence the decision to issue equity. The goal of equity issues could no longer be matters of capital structure choices or investment financing decisions. Those country-specific factors do not enter in the measures of shareholders' legal protection implemented by LaPorta et al. (1998).

### **2.1.1 How do firms raise equity in most developed countries ?**

Once a firm is listed, its access to further equity financing is partly conditioned by the Seasoned Equity Offering [hereafter SEO] process. In order to protect them against capital and ownership dilution, existing shareholders are granted pre-emptive rights that allow them to subscribe with priority to new equity issues. Pre-emptive rights take the form of short-lived warrants that their holders can exercise and subscribe to the SEO or they can sell them on the market to new investors. Issuers generally sign an underwriting contract with an investment bank or with a syndicate of investment banks. Three types of contract are available. In the uninsured rights offering process, the underwriter place the new shares in the public but it has no contractual obligation to place all of them. The offer may not be completed or only partially completed. The standby rights agreement bonds the underwriter to buy the shares that have not been placed at the end of the subscription period. With the fully underwritten rights offering process, the underwriter buys all the shares from the issuer at a discount price and places them to the existing or new shareholders. The underwriter bears all the risk if the stock price falls below the issuing price. Rights offerings constitute chronologically and

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<sup>13</sup> Source : <http://www.swx.com>

legally the common flotation method throughout the world. However, it has remained predominant only in European countries.

Rights offerings protect existing shareholders but they could limit the capital access to a smaller investors' base. Direct cash offerings or public offerings were introduced to improve and accelerate the equity issuance process. The pre-emptive rights of existing shareholders are waived and the new shares can be sold directly to new investors or to other firm participants such as employees. Direct cash flotation methods involve private placement, best effort agreement and firm commitment contract. In a private placement, the issuer sell the new shares directly to specific investors or individuals. With the alternative methods, the issuer signs a contract with an underwriter. A best effort agreement is the pendant of an uninsured rights offering contract. The underwriter does its best to place the shares but has no obligation on the remaining stocks. With a firm commitment contract, the underwriter buys all the shares and sell them afterwards to the public like in a fully underwritten rights offering contract. Although direct cash flotation methods are available in all countries with a developed equity market, they overtake the predominant position only in the US and in Japan.

Administrative procedures to issue equity do not vary much across major equity markets. The issuer must receive the authorisation to raise new equity from the Shareholders' Meeting. The authorisation runs over a 5-year period in Germany and France for rights offerings. This period is reduced to two years for public offerings in France. Two years is also the authorisation period in Switzerland for any flotation method. The authorisation includes the maximum number of share to be issued, the type of securities and whether the pre-emptive rights have been waived or not. While the authorisation is running, the board of directors is free to realise the operation at any time. For that, a registration form containing the issue modalities must be filed to the competent supervision organ (SEC in the US, FSA in the UK, COB in France<sup>14</sup>; Germany and Switzerland have auto-regulated stock exchanges). Once the issue modalities have been accepted, the firm publishes an issuing prospectus and the equity issue has to be publicly and officially announced in newspapers (television or radio broadcasts as well, in the US).

According to the US Security Act of 1933, the registration form must entail the issuer's description, the underwriter's name, the type and quantity of new shares, the intended use of the proceeds, the issuing price or its formula, the expected gross and net proceeds, recently

audited balance sheet and P&L statements and names and holdings of large existing shareholders. These requirements can be found in almost all legislations. Only differences will be presented. The UK requirements are similar to the US ones. German legislation is less intrusive especially about the use of the proceeds and large existing shareholders' blocks. Germany presents two characteristics worth mentioning. First, the bank system is based on universal banks. This has for consequence that each German firm develops a privileged relationship with one given bank, its "Hausbank". The "Hausbank" is, simultaneously, the main creditor, an important shareholder and the principal financial adviser. Naturally, the "Hausbank" takes the lead of the underwriting syndicate. This close relationship between the bank and the issuer implies a positive effect as the bank has a deep knowledge of its client's financial situation and management strategy. However, it also generates a negative effect. The issuer becomes dependent from its "Hausbank" for its financial decisions. This situation prevents competition between potential underwriters and it could lead the "Hausbank" to increase its fees<sup>15</sup>. The second German characteristics lies in the stock exchange organisation. Standard requirements apply only to a segment of the German stock exchange, the Official Market. On the other segments, legal requirements, if they exist, are vague. Information about the issuer and about the shares to be issued must be the ones necessary to enable the public to make proper assessments about the issuer financial situation and securities<sup>16</sup>. Consequently, major German firms are listed on the Official Market and are subject to standard requirements as other international firms. Minor firms such as family-owned companies remain on the other segments and avoid disclosing financial information. The Swiss legislation is close to the German one, especially relative to legal requirements, which are similar to those of the German Official Market.

French equity issuing process is more constraining than in Anglo-Saxon countries. The authorisation to issue is given by the Extraordinary Shareholders' Meeting at the qualified majority of two thirds. Once the operation has been approved by the COB, an official announcement is made in the "Bulletin des Annonces Légales Officielles" (BALO) and an issuing prospectus which includes standard legal requirements is published.

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<sup>14</sup> SEC is for Security Exchange Commission, FSA for Financial Services Authority and COB for Commission des Opérations de Bourse.

<sup>15</sup> Bühner and Kaserer (2002) find no evidence of an economy of scale in the underwriting business in Germany. Though, large universal banks should bear less risk in underwriting a SEO because of the greater monitoring power and the reduced information asymmetry. The lack of difference in their underwriting fees relative to smaller investment banks supports the "Hausbank" premium hypothesis.

<sup>16</sup> Stock Exchange Act, section 73, paragraph 2; Law on the Prospectus for Securities Offered for Sale, section 7, paragraph 2

Rights flotation method implies a longer issuing process because of the subscription rights trading period. This period is legally defined, from at least ten business days in France up to twenty-one days in the UK. Standby agreement is the most commonly used contract in Europe. However, 29 % of French rights offerings are uninsured<sup>17</sup> according to the French law which is restrictive concerning the companies authorised to deliver the legal standby guaranty. When a non-legally approved firm commits itself to purchase the remaining shares, the operation is officially declared uninsured, which should mitigate the high proportion of uninsured offerings.

In direct cash offerings, existing shareholders are subject to capital dilution. The issuing price has to be set lower but as close as possible to the market price to reduce the wealth transfer. This implies that the procedure should be short in order to avoid that the market price falls below the issuing price, which causes the automatic cancellation of the offering. In the US, public issues take place within twenty-four hours after the issuing price setting. UK procedure states that the issuing price in public offerings should not be inferior to 90 % of the middle market price at the announcement date. In Germany, the issuing discount is not bounded but practitioners consider that a discount between 3 % and 5 % is acceptable. However, the size of the public offer is limited to 10 % of the existing capital. Bühner and Kaserer (2002) observe that, for firm commitment offerings, the period between the board decision to issue equity and the date when the firm cashes the money lasts about 20 days, which is not much shorter than with rights offerings (between 30 and 50 days). In addition, they find that the average discount in firm commitment offerings reaches 9 % instead of the expected 5 %. These observations may explain why German firms have not abandoned rights offerings in favour of firm commitment cash offerings<sup>18</sup>.

In France, even if existing shareholders waive their subscription rights, they may subscribe to the offering with priority during a pre-defined period. In a public cash offering, the issuing price is set as being at least equal to 95 % of the average of 10 successive daily market prices among the 20 business days preceding the start of the subscription period. The firm commitment agreement obliges the underwriter to support the stock price over the subscription period. According to Gajewski and Ginglinger (2002), the average issuing price of French public offerings corresponds to 98 % of the prevailing stock price (for rights

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<sup>17</sup> See Gajewski and Ginglinger (2002, p. 296, Table I), 57 uninsured rights offerings over a total of 197 rights offerings.

<sup>18</sup> Bühner and Kaserer (2002) observe that among 120 offerings made on the Official Market between 1993 and 1998, only 5 are firm commitment cash offerings.

offerings the average issuing price equals 78 % of the market price). This rigidity in the setting of the issuing price makes public cash offerings risky relative to rights offering.

### **2.1.2 Importance of equity markets in the economy**

The main financing sources are internal funds (retained earnings), private debt such as bank loans (short- and long-term), public debt such as bonds and public equity. Table 2.1 presents the contribution of each financing source to total financing for five major economies (US, UK, Japan, Germany and France) during a 12-year period (1984 to 1995). Figures are given in percent of the aggregate financing of non-financial corporations<sup>19</sup>. The last column shows the 12-year average.

Internal financing is the main source of financing for all countries in Table 2.1. On average, it covers more than half of the corporations financing needs. US firms have the greatest use of internal financing with 61.1 % of their total financial resources. German firms turn out second with 55.5 % and the other countries have about 50 % of their financing coming from internal funds. In the US, internal financing is more important than external financing in eleven of the twelve years. For German firms, it is the case in nine years. The UK, Japan and France present different pattern. External financing exceeds internal financing at least in half of the years (eight years in France, seven in Japan and six in the UK). However, for these countries, internal financing predominates during the 90's. These findings deserve one comment. Contradicting LaPorta et al. (1997; 1998), Anglo-Saxon firms rely strongly on internal financing although their legal system should favour external financing. France and Japan, until the 90's, made a greater use of external financing, which is also opposed to LaPorta et al. (1998) predictions.

Bank loans constitute the second financing source in every country except the US where public debt is more important. This may be explained by the fact that the reliance of US firms to bank loans decreases from 1990 on and is several times negative (repayments exceed borrowings). However, the pattern is similar in European countries and Japan. Net bond issues are the third financing source of corporations in Japan, Germany and France. They are the lowest in the UK where the government bond market is very active. In exception of the US market, the reliance to bonds financing seem to fluctuate over time. It tends to decrease in

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<sup>19</sup> Data are taken from the Monthly Financial Statistics and Financial Statements of Non-Financial Enterprises publications of the OECD; in exception of the equity issues proceeds for France which are taken from the SBF publication : L'Année Boursière. This period corresponds to the sample period used in chapters 3 and 4.

the UK, Japan and France while it increases in Germany. Overall, debt (private and public) represents the second important source of financing in all five countries.

**Table 2.1 : Financing sources of a sample of large economies between 1984 and 1995**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Average
<i>Panel A : United States</i>													
Internal financing (%)	52.6	53.4	43.7	52.7	53.3	59.0	71.2	84.4	73.6	68.1	63.3	58.3	61.1
Bank loan (%)	31.8	22.6	24.3	16.1	18.8	18.8	11.4	-24.4	-9.6	-4.5	11.2	16.5	11.1
Public bond (%)	12.1	18.6	24.2	23.5	22.5	17.1	12.9	25.8	21.8	19.9	17.5	17.4	19.4
Equity financing (%)	3.5	5.4	7.8	7.6	5.4	5.1	4.5	14.1	14.2	16.5	8.0	7.8	8.3
<i>Panel B : United Kingdom</i>													
Internal financing (%)	63.6	40.9	38.6	29.9	26.4	25.6	41.0	57.7	80.9	72.6	75.2	63.7	51.4
Bank loan (%)	24.8	39.4	40.4	39.6	63.1	62.9	53.8	22.1	4.9	1.6	7.5	29.3	32.4
Public bond (%)	2.1	3.3	3.1	2.0	2.6	3.9	-0.4	0.9	0.9	0.3	-1.8	-2.2	1.2
Equity financing (%)	9.6	16.4	18.0	28.5	7.9	7.6	5.5	19.3	13.2	25.4	19.1	9.1	15.0
<i>Panel C : Japan</i>													
Internal financing (%)	39.9	45.6	35.2	37.6	40.1	35.7	40.1	50.5	52.2	59.0	88.9	85.4	50.9
Bank loan (%)	33.8	34.7	31.8	29.2	31.5	35.3	38.1	33.1	26.7	24.9	12.2	-1.5	27.5
Public bond (%)	22.4	16.2	30.1	26.7	20.6	17.1	16.6	14.8	20.4	14.3	-4.3	14.1	17.4
Equity financing (%)	3.8	3.5	3.0	6.5	7.8	11.9	5.2	1.6	0.7	1.8	3.2	2.0	4.2
<i>Panel D : Germany</i>													
Internal financing (%)	58.3	53.2	60.0	65.4	69.4	48.6	55.2	48.6	57.3	51.6	57.4	40.5	55.5
Bank loan (%)	24.3	26.1	16.3	14.0	29.9	32.3	19.3	28.6	22.0	14.3	9.7	23.6	21.7
Public bond (%)	14.9	16.2	16.4	15.9	-2.6	13.9	21.4	20.9	18.6	31.7	28.9	31.3	19.0
Equity financing (%)	2.6	4.5	7.3	4.7	3.3	5.2	4.1	1.8	2.2	2.4	4.0	4.6	3.9
<i>Panel E : France</i>													
Internal financing (%)	20.8	21.5	35.4	39.2	38.9	30.4	32.8	36.6	61.9	80.8	94.8	98.4	49.3
Bank loan (%)	48.5	28.8	-4.7	27.3	35.3	48.6	46.4	42.0	16.9	-7.3	-1.6	-1.1	23.3
Public bond (%)	28.6	45.0	40.7	28.5	24.0	18.7	16.5	17.1	17.0	16.1	-2.7	0.3	20.8
Equity financing (%)	2.1	4.7	28.6	5.0	1.8	2.3	4.3	4.2	4.1	10.4	9.6	2.4	6.6

Data are taken from the OECD publications : Monthly Financial Statistics and Financial Statements of Non-Financial Enterprises. Equity issues proceeds data for France are taken from the annual publication of the SBF : L'Année Boursière. *Internal financing* is the percentage of the aggregate self-financing capacity over all non-financial firms to total financing. *Bank loan* represents the percentage of private debt financing to total financing. Flows of private debt are measured by the net annual flows on short-term and long-term bank loans taken from the aggregate flow of funds statement of non-financial firms. *Public bond* is the percentage of public debt to total financing. Flow of public debt correspond to the net flows on corporate bonds (issues less repayments). *Equity financing* is the percentage of equity issue proceeds to total financing. Net flows are considered for debt because of the roll-over on bank credits and bonds. On the other hand, no such roll-over exists on outside equity or internal financing (no maturity on these funds).

Outside equity is the least employed financing source relative to both total financing or external financing. The UK and the US have the highest percentages as expected by the origin

of their legal system. Nevertheless, France with 6.6 % does not come far behind the US (8.3 %). France is recognised by LaPorta et al. (1998) for having the lowest degree of shareholders' legal protection. Japan and Germany are last with only 4.2 % and 3.9 % of their financing coming from equity issues. When only external funds are considered, the difference due to legal systems are more pronounced. Equity financing represents about 30 % of external financing in the UK and 22 % in the US. Again, the score of France is honourable with 13 % but it falls to about half of the US figure. Over the period 1993 to 1995, equity financing is even the main external financing source. This last finding shows that France may be filling the gap relative to Anglo-Saxon countries. Although they belong to legal system with greater investors' protection than France, Japan and Germany exhibit a proportion of equity financing which is less than 9 % of their external financing. Moreover, equity financing is not gaining from other external financing sources during the last years.

Overall, figures in Table 2.1 are supportive of the pecking order. Internal financing is preferred, respectively, to debt (private before public) and to outside equity. In other words, firms rely more on financing sources which are less subject to information asymmetries. Differences in the breadth of external financing markets due to the origin of legal systems are not given much credit when only the largest economies are considered. It may come from the high degree of legal enforcement found in these countries<sup>20</sup>, which mitigates differences in the level of investors' legal protection.

### **2.1.3 Country-specific vs. common factors to explain equity financing**

Capital structure choices are decisions taken at the individual firm level. Theories of capital structure suggest that bankruptcy costs, taxes, information asymmetry, agency conflicts, transaction costs and input/output markets characteristics play a prominent role in determining the optimal investment/financing strategies. These determinants are common to all firms. Nonetheless, the institutional setting may also modify the managers' decision process and diverts financing operations from their primary role. Country-specific factors could hence lead managers to misrepresent capital structure choices. I review examples of country-specific institutional characteristics that influence the decision to issue new equity.

The primary role of an equity public issue is to whether raise funds to finance investment projects or to re-balance the capital structure. Under given circumstances, the neutrality of subscription rights towards both capital and ownership dilution allows the alteration of the

motives to offer equity. Specificities of the tax system in Germany and Switzerland caused managers to conduct equity issues for tax-motivated reasons instead of financial reasons. Legal restrictions about the minimum face value of shares in Italy and Switzerland induce firms to offer additional stocks at a low issuing price to perform quasi-splits. The necessary condition for these country-specific operations to occur is the existence of pre-emptive rights granted to existing shareholders. Effectively, the motives to realise such operations are to satisfy the existing shareholders and not to increase the firm performance.

Germany introduced a tax reform that becomes effective in the fiscal year 2002. Before that, the taxation of distributed earnings presented two characteristics that could have influenced the decision to issue new equity. First, distributed earnings (dividends) were taxed at the firm level but at a preferred rate relative to retained earnings (30 % vs. 40 %). Second, in order to avoid the double taxation of corporate earnings, a full imputation system was in place at the shareholder's level. The shareholders benefit from a tax credit equal to the entire corporate tax amount, which results in no individual taxation of dividends<sup>21</sup>. This particular tax system could have induced German companies to distribute a large part of their earnings, which, sometimes, could prevent these firms to maintain a sufficient internal financing capacity. Thus, they were forced to issue new equity in order to refund part of the cash distributed through dividends. According to Miller and Rock (1985), a public offerings of equity signals that the internal financing capacity is not sufficient to support the investment policy. The theory predicts a negative impact of equity financing on the firm market value unless the firm pay out large dividends. In the case of Germany, the firm realises the equity issue because it has previously paid out large amounts of dividends. The dividend payment – equity refund operation is then optimal in terms of corporate taxes because of the preferred tax rate applied to distributed earnings. If a seasoned equity offering is conducted for these tax motives, the effect should be non-negative on the firm market value. Nonetheless, the equity issue decision is not based on financing motivations. The 2002 tax reform abandons the use of differentiated tax rates on corporate earnings. The full imputation system is replaced by a half-income system. Half of the dividends received by the shareholders are considered as an income and thus taxed. This introduces a double taxation on half of the dividends. However, the new system makes cross-border investment within the European Community members

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<sup>20</sup> See LaPorta et al. (1998 ; p. 1142, Table 5).

<sup>21</sup> See Rivier (1994, p. 134) for detailed explanations of the full imputation tax system.

more attractive<sup>22</sup>. The fact that distributed earnings are taxed at the same rate as retained earnings eliminates the incentive for German firms to realise dividend payment – equity refund transactions.

The Swiss tax system was reformed in July 1992 although its main concept remained unchanged. A classical tax system applies, which generates a double taxation of distributed earnings. First, corporate earnings are taxed at the firm level. Then, dividends are taxed again at the individual level at a 35 % withholding rate. In the mean time, capital gains are free of taxes for individuals. Thus, Swiss companies are inclined to either retain earnings or distribute stock dividends to avoid the double taxation of corporate earnings. Before its reform, the Swiss tax system presented characteristics that could have influenced the frequency at which firms issued equity. Actually, stock dividends were not considered as a capital gain but as an income. They were subject to the withholding tax. In order to provide their shareholders with a substitute for stock dividends, Swiss companies offered new stocks at a low issuing price<sup>23</sup>. Existing shareholders had the opportunity to either subscribe to the offering and sell the stock later or to directly sell their subscription rights. In both cases, the capital gain was not taxed. Since the tax reform, stock dividends have been taxed on the face value instead of on the market value, which has eliminated the need for a substitute.

A second feature of the Swiss institutional framework, which was valid for Italy also was the high minimum face value of the stocks. The benefits of stock splits were limited because the minimum face value was rapidly reached. Under these circumstances, an equity offer with a low issuing price relative to the market price has a quasi-split effect<sup>24</sup>. The market reaction to such financial operations is not driven by investment/financing considerations but by liquidity or dividend yield effects. Apart from lowering the market price, a quasi-split could generate an increase in the dividend yield if the dividend per share is maintained at its pre-issue level.

The rigidity of the issuing price setting in French public cash offerings can be foregone by issuing units instead of common stocks. Units are offered as one unique financial instrument but the shares and the warrants are traded separately once the shares are listed. As the unit issuing price includes the price of the warrant, it is more difficult to value or, in other words,

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<sup>22</sup> The argument is taken from a publication of the Bundesministerium der Finanzen (2001).

<sup>23</sup> The average issuing price to market price ratio for Swiss SEOs equals 40 % (Loderer and Zimmermann, 1988).

<sup>24</sup> The average issuing price to market price ratio for Italian SEOs equals 42 % (Bigelli ; 1998). By comparison, the ratio for French SEOs is 78 %. France has no such high minimum face value.

easier to undervalue. The inclusion of the warrant assures the completion of public cash equity offers (Chollet and Ginglinger, 2001).

Country-specific factors may also account to explain why the predominant flotation method has remained rights offering in the UK, France and Germany where changes in their legislation should have favoured public cash offerings. In the US, firms have almost abandoned the rights offering process. In Japan, rights offerings diminish in favour of cash public offerings. However, the most important difference in the external financing practices of Japanese firms is their strong reliance to convertible debt issues.

All in all, differences in institutional setting across countries with the most developed equity markets tend to be attenuated over time. Nevertheless, country-specific factors may still influence financing choices or the motives behind a given security issue. Most of empirical tests about the valuation effect of marginal financing decisions have been performed on the US market. Replicating these tests on another market could be useful and it could improve the validation of one model instead of another. The French market offers an appropriate alternative experimentation framework. First, France has a civil-law legal system, which is said to be the most different from the US system in terms of shareholders legal protection. Second, equity financing decisions are not polluted by tax system specificities like in Germany or Switzerland. Third, the number of equity issues is large enough to allow the formation of specific sub-samples in order to confront capital structure theories.

## ***2.2 Stock price reaction to external financing announcements***

Market abnormal reaction to security issue announcement measures the valuation effect of a marginal change in the capital structure. Most empirical studies use the classical event-study methodology introduced by Fama, Fisher, Jensen and Roll (1969). At the announcement date, the realised return is compared to a benchmark (market return or market model return). According to the Efficient Market Hypothesis, information should be integrated into stock prices instantaneously. Thus, the valuation effect is generally computed over a week (or less) around the announcement date. Daily abnormal returns are cumulated over this interval to form the total stock price reaction that could be imputed to the marginal financing decision. The most commonly used computation interval is a 2-day cumulative abnormal return (2-day *CAR*) starting at the announcement date. This measure of the valuation effect is retained throughout the section. When the sample average *CAR* is statistically significant from zero, the stock price is said to react abnormally to the event. In other words, the marginal change in

capital structure has a statistically significant impact on the firm market value. The next step consists in explaining the valuation effect. For that, 2-day *CAR* are cross-sectionally regressed on a set of explanatory variables according to the theories to be tested.

### **2.2.1 Valuation effect of equity issues**

Stock price reactions to equity issue announcements are examined according to, first, the flotation method and then, to the institutional setting (US vs. Japan and Europe). This process has for goal to isolate the explanatory power of any given theory. It will then be possible to compare its relevance across institutional settings and flotation methods. For each flotation method, a table summarises the main findings of the reviewed studies.

#### *2.2.1.1 Public direct cash offerings*

A negative stock price reaction to announcements of public cash equity offerings is documented by Asquith and Mullins (1986), -3.00 %; Masulis and Korwar (1986), -3.25 %; and Mikkelsen and Partch (1986), -3.56 %<sup>25</sup>. This negative announcement effect is confirmed in all empirical investigations on the US market (see Table 2.2 for a selected review). Asquith and Mullins (1986) attribute the negative market reaction to both a negative signal about the firm future prospects and a downward sloping demand for the shares. The downward sloping argument is well accepted by practitioners. As Asquith and Mullins (1986, p. 61) put it : “Financial executives, investment bankers and many regulators argue that selling equity causes a firm’s stock price to fall. Their view, labelled by Scholes (1972) as the price pressure hypothesis, contends that an increase in the supply of shares causes a decline in a firm’s stock price because the demand curve for shares is downward sloping”. The price pressure hypothesis is also supported by the findings of Diltz, Lockwood and Min (1992).

Barclay and Litzenberger (1988) propose an alternative technical explanation to the negative stock price reaction. They observe the intra-day stock price reaction at the exact time when the equity issue announcement is released. The 15-minute post-announcement average return is equal to -1.34 % and the stock price decline over the 3 hours surrounding the announcement is equal to -2.44 %. The stock price recovers a large part of its decline during the 20 days following the issue date. This finding is consistent with the hypothesis that the stock price is temporarily lowered to allow investors to integrate the change in their portfolio

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<sup>25</sup> See Smith (1986) for a survey of the empirical evidence.

holdings implied by the issue at a lower cost. The transaction costs do not penalise investors if the stock price is lowered.

The overall negative valuation effect to equity offering announcements is consistent with information asymmetry predictions. According to Myers and Majluf (1984), equity offerings are expected to follow a period of good stock performance. The stock return momentum (or stock price run-up) at the time of the announcement is negatively related to the valuation effect in Masulis and Korwar (1986), Bayless and Chaplinsky (1991), Choe, Masulis and Nanda (1993) and Denis (1994). Investors interpret the pre-SEO stock return momentum as a proxy of managers' private information about the value of the firm. The higher the stock price run-up, the greater is the probability that the issue is overpriced. This finding is in favour of the pecking order theory which is also given empirical support by the results of Mikkelsen and Partch (1986). The latter observe that the stock price reaction to announcements of equity and convertible debt issues are more negative than the one of straight debt offerings.

In line with Krasker (1986) information asymmetry model, Asquith and Mullins (1986), Masulis and Korwar (1986), Dilz et al. (1992) and Choe et al. (1993) observe a negative relation between the size of the issue and the valuation effect. However, this finding is also consistent with the price pressure hypothesis. Kalay and Shimrat (1987) confront both explanations (information asymmetry and price pressure) by examining the impact of equity issue announcements on stock and bond price simultaneously. The valuation effect is negative for both securities, which supports information asymmetry hypothesis. Actually, price pressure would be neutral to bond prices.

Residual variance of the stock returns could constitute an alternative measure of information asymmetry about the firm market value. Dierkens (1991, p. 186) relates that the market-explained fluctuations of the stock price are the only information shared by managers and market participants about the firm value. Thus, the residual variance is expected to denote the magnitude of managers' private information. However, she outlines the fact that the residual variance may include further kind of uncertainty shared by the managers and the market, such as industry-specific developments. A negative relation between this variable and the stock price reaction is found by Dierkens (1991) and Denis (1994). The standard deviation of stock returns or their residual variance are not directly observable. They are estimated and hence, they are subject to error in variables problems; see Greene (1997), chapter 9, p. 440. For that reason, their significance in explaining cross-sectional stock price reactions must be considered with care.

Variations in managers' holdings around equity issues convey information about a potential stock price overvaluation. Masulis and Korwar (1986) observe that the negative stock price reaction to SEO announcements is more severe when offerings involve a decrease in management holdings. Gombola, Lee and Liu (1997) document a significant insider net selling in the month immediately after the SEO announcement although the stock price reaction is negative. They argue that the issuing stock is still overpriced even after the announcement price decline. Thus, they consider that the stock price drop is a cheap insurance against the risk of illegal insider trading prior to the announcement. Their findings support the adverse selection hypothesis. In order to check if firms issue overpriced equity, Lee (1997) examines the trading behaviour of top executives prior to the offering. The stock price reaction is negative at the SEO announcement and is not sensitive to the different trading strategies of top executives. However, Lee (1997) concludes that it is less recommended to invest in firms issuing primary offerings. Top executives' trading strategy (net purchase is a positive signal and net sale is a negative signal) seems to be useful in estimating the quality of secondary seasoned offerings (involving the sale of new and existing shares). Beside signalling a potential stock price overvaluation, variations in managers' holdings could also have an agency costs effect. Lower holdings give more incentives to managers to spend resources in satisfying their own utility. Fields and Mais (1994) observe that, in 75 % of the cases, management holdings decrease after an equity issue.

The greatest influence of agency costs on the firm value should be observed through the relation between growth opportunities and the stock price reaction to equity issue announcements. Denis (1994) examines the explanatory power of different proxies for the quantity and quality of growth opportunities such as book-to-market ratio, Tobin's Q, dividend yield, the ratio of R&D expenditures to sales or the return on equity. He documents a significant positive relation between growth opportunities variables and the SEO valuation effect. For all levels of growth opportunities, the stock price reaction is negative but the decline is less severe for high growth issuers. This phenomenon can be attributed to the reduction of the agency costs of equity. A growth firm faces many profitable investment opportunities. Hence, the manager's incentive to over-invest or to consume perks is reduced. Denis (1994) finds that high growth firms are significantly smaller, younger and of higher risk compared to other issuers. In addition, they are less levered. In spite of being significant, the explanatory power of growth opportunities is only marginal. If the value of growth opportunities is small relative to the value of assets in place, market reaction could be

dominated by an information asymmetry effect about the value of assets in place. Nevertheless, the influence of agency costs is confirmed by the results of Dierkens (1991) about the positive relation between market-to-book ratio and the valuation effect, those of Dilz et al. (1992) about the negative relation between the increase in outside equity and the valuation effect and those of Mikkelson and Partch (1986) about the positive relation between capital expenditures and the valuation effect. In the same line of thought, Chung and Jo (1996) document a positive relation between the number of financial analysts following the firm and its value. Financial analysts provide efficient monitoring of corporate performance. They help motivate managers to work in the interest of shareholders and thus, they contribute to reduce the agency costs of equity.

McLaughlin, Safieddine and Vasudevan (2000) consider that the choice of the underwriting bank as a monitoring role as well as a certification role. In that sense, contracting a high prestige underwriter should reduce agency costs and have a positive effect on the stock price. Although the certification role of the underwriter is related to an agency costs explanation, the rationale of McLaughlin et al. (2000) is valid in the signalling context of Chemmanur and Fulghieri (1994). McLaughlin et al. (2000) observe no significant difference between valuation effects according the quality of the underwriter. However, high prestige investment bankers underwrite larger offerings, offerings made by growth and/or larger firms. These issuers could search for better certification because they should be more sensitive to agency costs problems.

**Table 2.2 : Stock price reaction to announcements of public cash SEOs**

<b>Authors</b>	<b>Market</b>	<b>Sample of Primary offerings</b>	<b>Announcement 2-day CAR</b>	<b>Significant explanatory variables</b>
Asquith and Mullins (1986)	US	01.1963-12.1981		<i>Size of the issue (-)</i>
		128 offerings	<b>-3.00 %</b>	<b>Run-up (+)</b>
Masulis and Korwar (1986)	US	01.1963-12-1980		<i>Size of the issue (-)</i>
		388 offerings	<b>-3.25 %</b>	<b>Momentum (-)</b> <b>Market momentum (+)</b> <b>Capital expenditure (+)</b>
Mikkelson and Partch (1986)	US	01.1972-12.1982		
		80 offerings	<b>-3.56 %</b>	
Kalay and Shimrat (1987)	US	01.1970-12.1982		Information asymmetry
		185 offerings	<b>-3.45 %</b>	
Bayless and Chaplinsky (1991)	US	01.1974-12.1983		<b>Momentum (-)</b>
		337 offerings	<b>-2.90 %</b>	<b>Post-issue perf. (+)</b> <b>Market momentum (-)</b>

**Table 2.2 : continued**

<b>Authors</b>	<b>Market</b>	<b>Sample of Primary offerings</b>	<b>Announcement 2-day CAR</b>	<b>Significant explanatory variables</b>
Dierkens (1991)	US	01.1980-12.1983 197 offerings	<b>-2.40 %</b>	<b>Market-to-book (+)</b> <b>Specific risk (-)</b> <b>Few disclosures (-)</b>
Dilz, Lockwood and Min (1992)	US	01..1980-12.1988 234 offerings	<b>-2.40 %</b>	<b>Size of the issue (+)</b> <b>Agency costs (+)</b>
Choe, Masulis and Nanda (1993)	US	01.1963-12.1983 669 offerings	<b>-2.62 %</b>	<b>Size of the issue (-)</b> <b>Debt ratio change (-)</b> <b>Ownership concentration (+)</b> <b>Momentum (-)</b> <b>Market momentum (+)</b>
Fields and Mais (1994)	US	01.1980-12.1986 95 offerings	<b>-2.14 %</b>	<b>Inside ownership (-)</b>
Denis (1994)	US	01.1977-12.1990 435 offerings	<b>-2.49 %</b>	<b>Momentum (-)</b> <b>Market momentum (+)</b> <b>Specific risk (+)</b> <b>income growth (+)</b>
Jung, Kim and Stulz (1996)	US	01.1977-12.1984 192 offerings	<b>-2.70 %</b>	<b>Market-to-book (+)</b>
Cornett, Mehran and Tehranian (1998)	US	06.1983-12.1991 70 voluntary 80 involuntary	<b>-1.62 %</b> -0.39 %	Involuntary issues are not motivated by managers' private information
McLaughlin, Safieddine and Vasudevan (2000)	US	01.1980-12.1994 649 offerings	<b>-2.90 %</b>	<b>High prestige underwriter (+)</b>
Kang and Stulz (1996)	Japan	01.1985-12.1991 185 offerings	<b>+0.51 %</b>	<b>Firm size (-)</b> <b>PER (-)</b> <b>Leverage ratio (+)</b>
Gajewski and Ginglinger (2002)	France	01.1986-12.1996 22 offerings	-0.42 %	

Italic means significant at a 10 % level, bold at a 5 % level and bold italic at a 1 % level. Normal in the stock price reaction column means statistically insignificant. The last column entails the significant explanatory variables in multivariate cross-sectional regressions run on the announcement abnormal return. The sign in parentheses shows the sign of the significant coefficient. The size of the issue is measured either by the relative number of new issued shares, by the relative amount to be offered or by the offer proceeds. "Momentum" means the stock price cumulative return computed over a pre-announcement period. "Market momentum" is the cumulative return on a market index over a pre-announcement period. "Market-to-book" represents the ratio of the market value of equity to the book value of equity. "Specific risk" is the residual variance of the stock return computed prior to the announcement. "Few disclosure" is a dummy variable taking the value 1 when the number of public information disclosures prior to the announcement is said to be low. "Debt ratio change" represents the change in the leverage ratio implied by the stock offering. For any additional information about the explanatory variables, refer to the original texts.

Masulis and Korwar (1986) observe that the stock price decline is less severe if the issue is announced after a period of good performance by the market. In other words, when the market is doing well, the bad signal conveyed by the equity financing decision appears to be attenuated. The adverse selection costs may be reduced by the good overall perspectives. The results of Choe et al. (1993) and Denis (1994) confirm the positive relation between market momentum and the valuation effect. However, they attribute it to an agency costs reduction effect. A good performing market denotes of better economic conditions and should favour the undertaking of profitable investment projects.

If the US empirical evidence agrees on a negative stock price reaction to announcements of public cash equity offerings, non-negative reactions are observed in France by Gajewski and Ginglinger (2002). Their sample is small as this flotation method is not predominant on the French market. The public cash procedure to issue equity in France is more risky because of the priority subscription period given to existing shareholders and should signal a better quality. The fact that the issuing price is set very close to the market price (98 % of the market price for uninsured public offerings and 94 % for underwritten public offerings; see Gajewski and Ginglinger, 2002; p. 297, Table II) confirms that this flotation method should be restricted to higher quality firms.

In Japan, according to Kang and Stulz (1996), announcements of public cash offerings exhibit a positive stock price reaction (+0.51 %). This announcement effect is negatively related to both the issuer size and the price earning ratio. The impact of the price earning ratio is consistent with the adverse selection theory. Firms with a high price earning ratio are more likely to be overvalued and thus they are expected to issue overpriced equity. This Japanese price earning pattern is similar to the US pre-issue stock price run-up. In addition, the positive reaction is stronger for small issuers. Large Japanese firms experience similar market reactions as US firms. The stock price reaction is positively related to the leverage ratio measured by the loans divided by the total assets. More levered firms that issue equity are expected to adjust their debt ratio. This operation tends to be better perceived by the market. The positive stock price reaction that occurs at the announcement date is, however, offset by a stock price drop at the issuing date. This pattern is not explained by the fact that Japanese banks support the stock price during the issuing period. Kang and Stulz (1996, p. 137) attribute the Japanese-specific stock price reaction to the behaviour of Japanese managers who are not as concerned about mispricing of existing securities as American managers seem

to be. Japanese managers may adopt a longer-term vision instead of a short-term shareholder value concern.

#### *2.2.1.2 Offerings with subscription rights*

US rights offerings announcements exhibit less negative reaction than public cash offerings announcements. The reaction remains significantly negative for standby rights offerings (-1.03 %) but it is no longer significant for uninsured rights offerings. Eckbo and Masulis (1992) show that the average direct flotation costs of uninsured rights offerings are significantly lower than that the costs of standby rights offerings which in turn are cheaper than firm-commitment public cash offers. Though, rights offerings nearly disappear since 1980 in the US. One explanation could be an adverse selection problem. If the current shareholders' take up is low, a rights offering is subject to the same adverse selection cost as a public cash offering. Outside shareholders infer that the stock price is overvalued at the time of the issue. Depending on the level of shareholders' take up, the rights offering flotation method and standby rights in particular offers no advantage in terms of reducing the costs of adverse selection. Furthermore, when the ownership dispersion increases, so does the reliance to public cash offerings, rights offerings being restricted to issues with a large blockholder subscription pre-commitment.

Like in the US, rights offerings are marginally used by Japanese firms (see Table 2.3 for details about the number of rights offerings). Kang and Stulz (1996) report an average positive valuation effect of 2.21 %. Cooney, Kato and Schallheim (2003) examine separately both rights flotation methods used by Japanese firms : the fixed-price and the formula-price methods. The positive announcement effect (1.56 %) is restricted to fixed-price offerings where the price is set several days before the subscription period, at a discount price relative to the current market price. The issuing price discount is negatively related to the announcement effect. This finding is consistent with the hypothesis that Japanese underwriters provide a certification about the true price being at least as great as the offer price. It is also supportive of Heinkel and Schwartz (1986) prediction and of the price setting hypothesis of Giammarino and Lewis (1988). In a formula-price offering, the issuing price is set closer in time to the subscription period and the offering is automatically cancelled if there is a significant decline in the market stock price. Hence, this flotation method is less risky for the underwriter and presents a lower level of certification.

In European countries, rights offering is the predominant flotation method, which creates a fundamental difference relative to the US and Japan. Overall, the stock price reaction to rights offerings announcements is positive or non-negative. However, it may depend on the contractual placement agreement, whether the issue is underwritten or uninsured. The main findings of the reviewed studies are summarised in Table 2.3. Positive valuation effects are found in the UK by Marsh (1979) who uses monthly data and finds an abnormal return of +2.1 % over the month following the announcement. Because of the data frequency, the abnormal reaction cannot be strictly attributed to the event announcement.

In Norway, Bohren, Eckbo and Michalsen (1997) find that a positive valuation effect to announcements of uninsured rights offerings (+1.55 %) while the stock price reaction is not significant for standby rights offerings. The difference between both announcement effects is significant. Direct flotation costs of uninsured rights offerings are lower than underwritten standby contract fees. Though, standby rights offerings are more numerous. This fact is attributed to the expected shareholders' take-up which is negatively related with the probability of underwritten standby rights offerings. The shareholder activism acts like a positive signal. When insiders subscribe to the offering in a large proportion, they inform the market about their positive expectations about the firm future performance. This is especially true if important inside shareholders increase their relative holdings despite of optimal portfolio diversification considerations. Besides, Bohren et al. (1997) observe that the valuation effect is negatively related to the size of the issue and to the stock return momentum. These findings are consistent with information asymmetry theories and with the US evidence about public offerings.

Tsangarakis (1996) tests a price setting hypothesis on the Greek market for equity rights issues. Rights offerings are differentiated according to the issuing price discount. Small discount offerings exhibit an average positive but insignificant valuation effect, while large discount offerings experience a significant positive stock price reaction of 5.39 %. The difference between both groups is not statistically significant. These findings are not consistent with the predictions of Heinkel and Schwartz (1986) about the signalling role of the issuing price.

Apart from the group of countries showing a globally positive valuation effect to rights equity offerings announcements, Switzerland, Germany and Italy form another group where equity issuers do not experience overall significant abnormal stock price reaction when they announce rights offerings. In Switzerland, Loderer and Zimmermann (1988) observe a non-

significant positive reaction during the month following rights offerings announcements. They explain it by the legality of insider trading and the use of rights offering that reduce agency costs and information asymmetry between managers and the capital market. In fact, the manager sets the issuing price in such a way that the post-issue market price reflect the true value of the firm. Furthermore, Swiss firms have the opportunity to issue three classes of shares giving different control right properties to their holders. Caramanolis, Gibson and Tuchschnid (1996) allow the different classes of shares to show specific announcement effects. They document that only the class of shares with the most voting rights power, when issued by partially controlled corporations, experiences a slightly significant positive valuation effect. This finding is attributed to the reduction of agency costs and/or the benefit of corporate control. The corporate control position of dominant shareholders does not interfere with the fund raising activity because of the rights flotation method and because of the potential restriction on the transfer of the registered share voting rights. However, country-specific factors such as the substitution role of equity issues for stock dividends or the quasi-split effect are not addressed in this study although they represent alternative ways to differentiate equity offerings and to test the neutrality of subscription rights.

Although no overall abnormal market reaction is noticed for German rights offerings, Gebhardt, Heiden and Daske (2001) observe significant valuation effects when they split their sample according to firm types or ownership structures. Offerings made by financial corporations exhibit a significantly negative stock price reaction of  $-0.58\%$  whereas non-financial issuers experience positive valuation effect of  $0.64\%$ . Non-financial firms undergo a severe certification process when their offering is underwritten by their “Hausbank”. In that sense, the positive market reaction could be explained by this certification argument. Furthermore, the issuing price discount could be viewed as signal of quality as predicted by Heinkel and Schwartz (1986). When the sample of non-financial issuers is split according to firm size. Small issuers show a positive stock price reaction of  $1.47\%$  whereas large issuers experience no significant reactions. The “Hausbank” certification process is more informative for small firms that are more likely to be listed on market segments with less constraining legal requirements. Family controlled issuers as well as those controlled by financial institutions exhibit a positive stock price reaction. These firms are assumed to face less agency costs problems because of their concentrated ownership. Moreover, if controlling shareholders exercise their rights, they contribute to reduce adverse selection problems. They would have no interest in selling overpriced securities to themselves. Conversely, managerial

firms experience a slightly significant stock price decline, which is consistent with the agency theory predictions. A non-negative valuation effect is observed for issuers that include information about dividends and earnings in their issuing prospectus. This result is consistent with the dividend paying – equity refund argument. However, no cross-sectional tests are made about the explanatory power of dividend payments on the announcement effect or on the issuing frequency.

In Italy, Bigelli (1998) finds no abnormal announcement effect for offerings with rights. Though, Italian firms issue equity with a large discount (50 % to 60 % of the market price) which generates a quasi-split effect (a permanent stock price decline). In addition, most of Italian rights issues combines stock dividends and cash offerings. The quasi-split effect is emphasised for combined offerings because it implies, for a constant dividend per share ratio, an increase in the dividend yield. If quasi-split effect is the main motive to the equity issue decisions, the announcement valuation effect cannot be interpreted as capital structure choice. Consequently, information asymmetry and agency costs variables do not explain cross-sectional variations in the announcement abnormal returns. The positive stock price reaction to combined offerings announcement (+2.77 %) is only explained by the magnitude of the quasi-split effect and by the increase in the dividend yield it proxies.

Unlike in other European countries, announcements of rights offerings in France and the Netherlands generates significant negative stock price reaction. Gajewski and Ginglinger (2002) document an average 2-day valuation effect of  $-1.11\%$  for uninsured rights offerings and of  $-0.74\%$  for standby rights offerings; the valuation effect of uninsured rights remains significantly negative over a 5-day interval from the announcement date on. These results contrast with the absence of abnormal reaction to public offering announcements. The valuation effect is negatively related to the size of the offering and to the stock return momentum. These findings are supportive of information asymmetry. When the offering proceeds serve to finance an identified acquisition, the stock price reaction is improved. Ownership structure and ownership changes after the issue have implications on the stock price reaction. For closely controlled issuers, existing shareholders' take up is negatively related to the announcement effect. In this case, a lower shareholders' take up reduces the conflicts between majority and minority shareholders. For firms without a majority shareholder, existing shareholders' take up has a positive influence on the stock price reaction as it signals a better quality.

**Table 2.3 : Stock price reaction to announcements of rights SEOs**

Authors	Market	Sample of Primary offerings	Announcement 2-day CAR	Significant explanatory variables
Eckbo and Masulis (1992)	US	01.1963-12.1981		Significantly less negative than announcement effect of public offerings
		41 standby rights	<b>-1.03 %</b>	
		26 uninsured	-1.39 %	
Cooney, Kato and Schallheim (2003)	Japan	02.1974-08.1991		<i>Flotation method (-)</i>
		555 offerings	<b>+0.63 %</b>	<i>Expected discount (-)</i>
Kang and Stulz (1996)	Japan	01.1985-05.1991		
		28 offerings	<b>+2.21 %</b>	
Marsh (1979)	UK	07.1962-12.1975		
		254 offerings	<b>+2.10 %</b>	monthly
Bohren, Eckbo and Michalsen (1997)	Norway	01.1980-12.1993		
		74 uninsured	<b>+1.55 %</b>	<b>Size of the issue (-)</b>
		114 standby	-0.23 %	<i>Momentum (-)</i>
Tsangarakis (1996)	Greece	01.1981-12.1990		
		20 small discount	+2.58 %	
		20 large discount	<b>+5.39 %</b>	
Gebhardt, Heiden and Daske (2001)	Germany	01.1981-12.1990		Positive for small and privately controlled non-financial firms
		129 non financial	<b>+0.64 %</b>	
		61 financial	<b>-0.58 %</b>	
Loderer and Zimmermann (1988)	CH	01.1973-12.1983		
		122 offerings	+2.00 %	Monthly
Caramanolis, Gibson and Tuchschnid (1996)	CH	01.1980-12.1992		
		97 offerings	+0.70 %	
Bigelli (1998)	Italy	01.1980-12.1994		
		46 offerings	-0.75 %	
De Jong and Veld (2001)	NL	01.1977-12.1996		<b>Return on assets (+)</b>
		51 offerings	<b>-1.46 %</b>	<b>Size of the issue (+)</b>
				<i>Acquisition (+)</i>
				<i>Over-investment (-)</i>
Gajewski and Ginglinger (2002)	France	01.1986-12.1996		<b>Size of the issue (-)</b>
		57 uninsured rights	<b>-1.11 %</b>	<i>Momentum (-)</i>
		140 standby rights	<b>-0.74 %</b>	<b>Acquisition (+)</b>
				<i>Share concentration (+)</i>

Italic means significant at a 10 % level, bold at a 5 % level and bold italic at a 1 % level. The last column entails the significant explanatory variables in multivariate cross-sectional regression run on the announcement abnormal return. The sign in parentheses shows the sign of the significant coefficient. The size of the issue is measured either by the relative number of new issued shares, by the relative amount to be offered or by the offer proceeds. "Momentum" means the stock price cumulative return computed over a pre-announcement period. For any additional information about the explanatory variables, refer to the original texts.

In the Netherlands, the negative stock price reaction to rights offerings announcements (-1.46 %; see de Jong and Veld, 2001) is explained by agency costs considerations. Managers' entrenchment and the risk of over-investment exacerbate the stock price decline. When managers announce an equity issue together with the completion of an acquisition, it has a positive impact on the stock price reaction. Investors being able to judge the use of the proceeds are less inclined to consider it as over-investment. On the other hand, information asymmetry and adverse selection are rejected as explanations of the valuation effect. The stock price reaction is positively related to the return on assets and to the size of the issue, which is converse to the information asymmetry predictions.

### *2.2.1.3 Public or rights equity offerings, what is the difference ?*

Marginal financing decision models assume passive existing shareholders and predict a negative impact of equity issues announcement on the firm value. Public cash offerings made by US firms fit that context perfectly. Therefore, information asymmetry and agency costs variables have a high explanatory power. Although it is not clear which model dominates the others, both theories are given some support. When public cash offerings made in another institutional context are considered, the valuation effect is no longer compatible with theories predictions. It is positive in Japan because Japanese managers are less concerned with short-term maximisation of equity market value. They care more about their leverage ratio than about selling overpriced securities. No valuation effect is observed in France because the direct cash flotation method is restricted to higher quality firms and conveys a positive signal that offset adverse selection and agency costs.

The explanatory power of marginal financing decision models is even more weakened with rights offerings. Existing shareholders may not be passive and the implications of adverse selection are strongly reduced. Shareholders' take-up becomes an important variable in the context of agency problems. Information asymmetry is still present but signalling takes over on adverse selection. Underwriter's certification, underwriting contracts or issuing discounts are more appropriate to explain positive or non-negative stock price reactions. Institutional specificities in Switzerland and Italy dominate capital structure or financing choices in the equity issue decision process. Only when the valuation effect is on average negative, "standard" explanatory variables get back some significant power as it is the case in France and in the Netherlands.

This overview of empirical evidence underlines the importance of well defining the experiment framework. Hypotheses to be tested must be set according to the institutional context and then interpretations of the results will be meaningful. For direct comparison with the US evidence, the market of French rights offerings seem to constitute the most adequate support. This observation is consistent with the examination of the institutional specificities made in the previous chapter.

### **2.2.2 Impact of other securities issues on the firm value**

Theories of capital structure predict particular stock price reactions not only to equity offer announcements but also to announcements of other securities issues. For instance, Myers and Majluf (1984) argue that offerings of straight bonds should generate less adverse selection costs than equity issues. Miller and Rock (1985) present the reliance to external financing as a bad signals about future earnings. According to those models, the announcement of any external financing solution should generate a negative stock price reaction. Offerings combining a cash component and a conditional offering involves a monitoring device that should be well perceived by the market. Theories of the agency costs of equity or of free cash flow predict a positive reaction to the announcement of a debt offering. The examination of the announcement effect of other securities issues could help understanding the explanatory power of a given theory of capital structure. It has been shown previously that it is not an easy thing to do when only new equity issues are considered. The findings of the articles reviewed in this section are summarised in Table 2.4.

#### *2.2.2.1 Units offerings*

An issue of units is a two-stage financing. Cash is first raised at the issuance of the security and then, in a second step, conditioned by the stock performance, cash can be raised over a period defined at the offering of the warrants. The two-stage financing mechanism involves a reduction in the agency costs at the time of the issue. Relying to a two-stage financing implies that there is a risk for the second financing to be cancelled (the warrants are not exercised). Therefore, choosing this type of financing should signal good prospects about the firm and its investment strategy. Both hypotheses predict the announcement effect of unit offerings should be less negative than announcements of pure equity financing. Byoun (2002) documents a negative valuation effect for announcements of US unit offerings (-1.97 %). The market reaction to units offering announcements is significantly less negative than that of common stock offerings over the same period (-2.68 %). The stock price reaction to unit offerings

announcements is negatively correlated with the pre-announcement stock return momentum, with the pre-announcement stock return volatility and with the book-to-market ratio, which is consistent with the US evidence about common stock offerings and with information asymmetry and agency costs predictions. However, the coefficient for the size of the issue and for the underwriter's prestige have the opposite sign relative to SEO evidence, which makes units issues different from common stock offerings. In addition, the valuation effect is inversely related to the fraction of warrant in the offering. This last finding mitigates the monitoring role of optional equity financing. Unit offerings are realised by firms that are smaller, younger, with less prestigious underwriter and with a larger growth potential than common equity issuers. For these firms, unit offerings may constitute an easier way to obtain equity financing, precisely because of the signalling and agency costs advantages. In other words, firms choosing units offerings are penalised by the market but at a lower degree than if they would have issued common stocks.

Gajewski and Ginglinger (2002) examine the announcement effect of unit offerings on the French market. Units are issued through rights or public flotation methods but both types exhibit insignificant announcement effect. This non-negative valuation effect could be due to a signalling effect. Higher quality firms may choose to issue equity with a two-stage financing procedure in order to benefit from the second income of cash that is conditioned by the firm performance. In a parallel research, Chollet and Ginglinger (2001) shows that French units are issued, partly, to prevent the cancellation of common public cash offerings. Because they can be under-priced, units offerings allow issuers to avoid the price setting rigidity of common stock public issues. At the same time, the proportion of the equity sold through the warrant can be viewed as a monitoring device. Consequently, units under-pricing is positively related to the future implied SEO size. These results support the hypothesis that issues of units signal the firm's quality to new investors and that it has high growth opportunities.

#### *2.2.2.2 Convertible bonds offerings*

In the US, announcements of convertible bond issues generate negative stock price reactions. Dann and Mikkelson (1984), Mikkelson and Partch (1986), Eckbo (1986) and Hansen and Crutchley (1990) all agree on a stock price decline ranging from -1.25 % to -2.13 % and statistically significant at a 1 % level. Information asymmetry finds support as an explanatory variable to the announcement effect. The issue of convertible bonds occurs when the stock price is overvalued. However, Dann and Mikkelson (1984) mitigates this adverse

selection effect as they do not document different reactions according to the use of the proceeds. Financing an investment project and refunding debt do not influence the market reaction. In Mikkelson and Partch (1986), the relative amount collected by the issue is negatively related to the stock price reaction, which is consistent with Krasker (1986). Eckbo (1986) argues that his results are inconsistent with theories of optimal capital structure which predict a positive effect on the market value for leverage increasing operations. Nonetheless, the overall stock price decline to announcements of convertible bonds issues is less severe than the one observed at the announcement of equity issues. This is consistent with the pecking order theory. The US evidence rejects the signalling aspect of mixed securities issues proposed by Brennan and Kraus (1987) and Constantinides and Grundy (1989). Issues of convertibles bonds are rather considered by the market as disguised and delayed equity offerings, which is attested by the market reaction at their announcements. US results are supported by Abhyankar and Dunning (1999) who also observe a significant negative valuation effect at the announcement of convertible bonds offerings in the UK.

The evidence is converse in Japan. Kang and Stulz (1996) document a positive market reaction. Unlike in other countries, convertible debt is the main source of external financing during the 80's for Japanese firms. Opposite to the US evidence, Japanese managers issue convertible bonds when their firm is undervalued, maybe to avoid the sale of undervalued equity. In their point of view, issuing convertible bonds signals good financial perspectives.

Unlike in the previous studies, Burlacu (2000) differentiates French convertible bonds according to their similarity with debt or equity. The convertible price sensitivity to a change in the value of the underlying stock serves to rank issues of convertibles into three different groups: debt-like convertibles for those being the least sensitive, equity-like convertibles for the most sensitive ones and mixed convertibles for the ones with an average sensitivity. The equity-like convertibles exhibit a significant negative stock price reaction which is consistent with the US evidence. The debt-like convertibles do not experience any significant market reaction and mixed convertibles show an average positive announcement valuation effect. Burlacu (2000) observes that issuers of mixed convertibles are undervalued. For them, the optional component signal the quality of their financial perspectives. In that sense, they adopt a similar behaviour as Japanese issuers. The market reaction to announcements of debt-like or equity-like convertibles issues is negatively related to the relative size of the issue and to the magnitude of financial slack, which supports the existence of an adverse selection effect. This adverse selection effect is greater the stronger the equity-like component is. In the case of

mixed convertibles, the relative size of the issue and the magnitude of financial slack are also significantly related to the announcement effect but the sign of the relations is positive, which underlines the difference between mixed convertibles and the other types. The findings of Burlacu (2000) may be viewed as supportive of the signalling devices of combined financing solution in the sense of Brennan and Kraus (1987). Actually, in the mixed category, the convertible is an integrated complex financial instrument that is neither equity-like nor debt-like.

### 2.2.2.3 Straight public debt offerings

The overall stock price reaction to announcements of straight public debt issues (straight bonds) is not significantly different from zero. The institutional setting does not seem to influence the market perception of such events. Similar results are obtained on the US market (Dann and Mikkelson, 1984; Mikkelson and Partch, 1986; Eckbo, 1986), on the Japanese market (Kang and Stulz, 1996) and in the Netherlands (de Jong and Veld, 2001), which is a French civil law origin country. Examined independently from other external financing forms, the absence of market reaction to debt financing decision is consistent with the capital structure irrelevancy and contradicts positive predictions of Ross (1977) for signalling the firm quality and Jensen (1986) for the reduction of free cash flow or negative predictions of Miller and Rock (1985) for signalling bad earnings perspectives. However, when considered with announcement effects for equity and convertible bonds, the non-negative market reaction to bond issue announcements supports the pecking order theory.

**Table 2.4 : Stock price reaction to announcements non-equity financing**

<b>Authors</b>	<b>Market</b>	<b>Sample of financing operations</b>	<b>Announcement 2-day CAR</b>	<b>Significant explanatory variables</b>
<i>Panel A : unit offerings</i>				
Byoun (2002)	US	01.1980-12.1997 251 offerings	-1.97 %	<b>Size of the issue (+)</b> <b>Underwriter prestige (-)</b> <b>Book-to-market (-)</b> <b>Optional size (-)</b> <b>Stock return volat. (-)</b> <b>Momentum (-)</b>
Gajewski and Ginglinger (2002)	France	01.1986-12.1996 17 rights units 42 public units	+0.23 % -0.51 %	

**Table 2.4 : continued**

<b>Authors</b>	<b>Market</b>	<b>Sample of financing operations</b>	<b>Announcement 2-day CAR</b>	<b>Significant explanatory variables</b>
<i>Panel B : convertible bonds</i>				
Dann and Mikkelson (1984)	US	01.1970-12-1979 132 issues	<b>-2.31 %</b>	
Mikkelson and Partch (1986)	US	01.1972-12.1982 33 issues	<b>-1.97 %</b>	<b>Size of the issue (-)</b>
Eckbo (1986)	US	01.1964-12.1981 75 issues	<b>-1.25 %</b>	
Hansen and Crutchley (1990)	US	01.1975-12.1982 67 issues	<b>-1.45 %</b>	Stock price reaction to convertible bonds announcements is significantly less negative than for SEOs
Abhyankar and Dunning (1999)	UK	01.1982-12.1996 129 issues	<b>-1.21 %</b>	<b>Callable maturity (+)</b>
Kang and Stulz (1996)	Japan	01.1985-12.1991 561 issues	<b>+0.83 %</b>	<b>Firm size (-)</b> <i>Loans/assets (-)</i>
Burlacu (2000)	France	01.1981-12.1998 187 issues	<b>-2.69 %</b>	<b>Financial slack (-)</b> <i>Size of the issue (-)</i> <b>Stock component (-)</b> <b>Convertible type (+)</b>
<i>Panel C : straight bond issues</i>				
Dann and Mikkelson (1984)	US	01.1970-12-1979 150 issues	-0.37 %	
Mikkelson and Partch (1986)	US	01.1972-12.1982 172 issues	-0.23 %	
Eckbo (1986)	US	01.1964-12.1981 422 issues	-0.06 %	
Kang and Stulz (1996)	Japan	01.1985-12.1991 13 issues	+0.85 %	
De Jong and Veld (2001)	NL	01.1977-12.1996 137 issues	+0.51 %	

Italic means significant at a 10 % level, bold at a 5 % level and bold italic at a 1 % level. The last column entails the significant explanatory variables in multivariate cross-sectional regressions run on the announcement abnormal return. The sign in parentheses shows the sign of the significant coefficient. Refer to the original texts for additional items.

In addition to public debt offerings, Mikkelson and Partch (1986) examine the announcement effect of private borrowing arrangements. They observe a significant positive market reaction of 0.89 % to announcements of credit agreements whereas private placement

of debt and term loans do not generate significant announcement effect. When the intended use of the proceeds is neither debt refinancing nor capital expenditures financing, the announcement effect is significantly positive. This finding may be consistent with an optimal capital structure argument if the primary motive to issue debt is to increase the leverage ratio.

### **2.2.3 The announcement effect of a debt-for-equity or equity-for-debt swap**

When marginal financing decisions are publicly announced, investors' reaction can be observed through the security market price response. Analysing the market reaction to pure capital structure change announcements makes it possible to confront the two main hypotheses of the static trade-off theory. Pure capital structure changes represent the direct trade-off of one type of security against another (i.e. debt-for-equity swap). On one hand, if the capital structure irrelevancy holds, exchanges of one security type against another should not generate any variation in the firm market value. On the other hand, if an optimal capital structure exists, a significant market reaction should be observed. The direction of the market reaction depends on the hypothesis to be tested.

Masulis (1980) analyses the announcement effect of pure capital changes in the US. Pure capital changes include debt for common stocks exchanges, preferred for common stocks exchanges and debt for preferred stocks exchanges. Debt includes convertible and straight bonds. The tests cover three hypotheses : 1) a corporate tax effect, 2) a bankruptcy costs effect and 3) a wealth redistribution effect. The wealth redistribution effect differs from the other effects in the sense that it does not generate a change in the total market value. What is gained by one type of security is lost by the other. Corporate tax effect and bankruptcy costs effect generate variations in the total market value of the firm.

Increasing leverage announcements generates significant positive returns on common stocks whereas decreasing leverage announcements causes negative returns. Evidence is found to the corporate tax effect which overcomes the potential bankruptcy costs effect. Opposite price changes are found across the different types of security which supports the wealth redistribution effect. Miller's (1977) argument about the weak explanatory power of bankruptcy costs is confirmed as no direct evidence about this effect is found. The significant corporate tax effect supports the existence of a relation between capital structure and firm value. The evidence is mixed about the existence of an optimal capital structure. Actually, decreasing leverage operations generate losses in total firm value. This implies that some financing decisions are not taken in order to get closer to a value maximising debt ratio.

Millon Cornett and Travlos (1989) also examine debt-for-equity and equity-for-debt exchange offers in the US. They reach to the same stock price reactions as Masulis (1980). However, the straight and convertible bond price reactions (respectively insignificant and positive for debt-for-equity and both negative for equity-for-debt) are inconsistent with the wealth redistribution hypothesis. Hull (1999) relates stock price reaction to pure capital structure changes to an industry effect. His results are consistent with the existence of a target debt ratio at the industry level.

### ***2.3 Informational content of security issues announcements***

Information asymmetry is one of the most cited explanation for the stock price reaction to external financing announcements, especially in the US setting. The size of the issue, the pre-issue stock price run-up as well as the residual variance have often significant coefficients in the multivariate analysis framework of the announcement effects. However, two elements mitigate the role of information asymmetry. First, competitive theories also have a significant explanatory power; e.g. agency costs. Second, the explanatory variables used as proxies for information asymmetry could support alternative hypotheses; e.g. the size of the issue could denote a price pressure reaction. The examination of the informational content of security issue announcements should outline the exact role of information asymmetry as an explanatory factor of the capital structure choices. External financing announcements could convey information about two elements : corporate earnings and the discount factor. For a negative stock price reaction, corporate earnings are expected to decrease after the announcement or business risk is expected to increase. The next two sub-sections review some of the main empirical findings about the informational content of security issues announcements. The last sub-section deals with the contribution of financial analysts' earnings forecasts in reducing information asymmetry.

#### **2.3.1 About expected earnings**

Hansen and Crutchley (1990) analyse the equity vs. debt financing decision according to the operating performance. Earnings decline after any financing solution and this decline persists on the long-run. The size of the decline is positively related to the size of the issue. Industrial firms raise external financing to supplement prolonged earnings decreases. On average, the amount raised is sufficient to offset five years of poor operating performance. It is interesting to notice that the timing of the equity and debt issues differ. Common stocks are

offered before the firm enter into a significant earnings downturn. This gives evidence to the managers' ability to issue overvalued security when they have superior information about their firms perspectives. Conversely, straight bond issues occur when the earnings downturn is already known by the investors. This is consistent with the agency hypothesis that debt issues are more likely to take place when growth opportunities are poor in order to increase the monitoring over the manager's actions. The bonds issue announcements do not convey bad news to the market since it already knows that the firm is in an earnings downturn.

If equity issue announcements convey information about the expected earnings, the announcements should imply revisions in analysts earnings forecasts. Moreover, the magnitude of the revisions should be related to the stock price reaction. These arguments are given evidence by Jain (1992) and Brous (1992). Jain (1992) takes the analysts' forecasts from the I/B/E/S data tape. He observes a positive relation between the negative average revision in earnings forecasts and the stock price decline at the SEO announcement. This result supports the information asymmetry hypothesis about future earnings. The equity issue provides a signal that expected earnings are currently overvalued. Brous (1992) also finds that SEO conveys bad news about the future earnings perspective. In addition, he compares the analysts' revisions of short-term and long-term earnings forecasts. Before the SEO announcement, both forecasts are abnormally raised. This finding is consistent with the previously documented positive abnormal stock returns prior to the SEO. Following the issue announcement, only short-term forecasts are revised downward and positively correlated with the stock price reaction. Long-term forecasts about the earnings growth remain unchanged. These findings are consistent with the temporary overvaluation of the firm's equity predicted by the adverse selection model of Myers and Majluf (1984) that allows managers to issue overpriced stocks.

The findings of Brous (1992) should draw the attention on the opportunity for the managers to overstate corporate earnings before announcing an equity issue. If earnings have an informative role about the stock price, managers could be able to manipulate earnings in such a way to cause the pre-issue stock price run-up. Several studies corroborate the earnings manipulation argument. For Rangan (1998), earnings management consists in shifting income from future periods, typically by borrowing future income to increase earnings around the offering. Consequently, earnings decrease afterwards as the part of "borrowed" income is reduced in the books. Rangan (1998) finds that the earnings manipulation occurs in the SEO quarter and in the quarter immediately following. No proof of manipulation is found in the

quarter preceding the issue. As expected, the operating performance decreases in the year following the issue and the magnitude of this decline in operating performance is positively related to the manager's manipulation. The stock market is not able to take the earnings manipulation into account when it prices the firm's equity. The mispricing allows the manager to issue overvalued securities. The earnings manipulation is significantly related to the negative announcement effect. However, when the reversal in the earnings releases occurs during the subsequent year, the market still corrects the stock price downward. Information asymmetry is not totally eliminated by the equity issue announcement and investors cannot infer the true value of the firm. Earnings manipulations and their implication on the sale of overpriced equity are confirmed by Teoh, Welch and Wong (1998). Earnings are artificially increased before the equity issue while cash flows from operations are declining. The pattern is reversed after the issue. Cash flows are improving but they are not sufficient to sustain the net income at its highest level.

Shivakumar (2000) observes similar earnings patterns around equity issues but abnormal stock price reactions to earnings releases show that investors are not fooled by earnings manipulations. If managers overstate earnings before an equity issue, investors anticipate this action and undo it at the offering announcement, explaining the stock price decline. The abnormal stock price reaction to earnings releases before the offering is positive. At the offering announcement, abnormal returns are negative and no abnormal stock price reaction is found at earnings disclosures made after the issue although earnings are decreasing. Because of information asymmetry, investors cannot identify which managers manipulate earnings. Thus, they rationally anticipate all offerings the same way. This investors' response gives incentives to unwilling managers to overstate earnings as well. Contrary to Teoh et al. (1998) and Rangan (1998), investors are able to fully correct the stock price at the announcement date. One reason, not addressed by Shivakumar (2000), for the absence of abnormal reaction to post-offering earnings releases could be that financial analysts revise downwardly their earnings forecasts informing investors about the earnings downturn.

### **2.3.2 About the discount factor**

Other things equal, an equity offering is expected to lower the leverage ratio and the issuer's financial risk. Accordingly, future earnings or cash flows should be discounted at a lower rate. From that "mechanical" point of view, equity  $\beta$  should decrease after the offering and the stock price should increase. If the use of the proceeds modifies the business risk, the

impact on the discount factor could be reversed. In other words, an investment project that is more risky than current activities could result in an increase in both assets and equity  $\beta$ . This increase in equity  $\beta$  may explain the stock price decline after a SEO announcement. In that sense, Healey and Palepu (1990) examine the relation between the stock price behaviour and changes in the business risk around US equity issues. They observe that managers issue equity when they anticipate an increase in the  $\beta$  of the firm assets. This change in the assets  $\beta$  lets the equity  $\beta$  increase as well. The effect caused by the assets  $\beta$  modification is greater than the one implied by the reduction of the financial risk. The implied increase in the equity  $\beta$  is, on average, consistent with the stock price decline at the SEO announcement. The information about the change in the firm systematic risk is specific to issuers since other firms in the same industry do not experience similar  $\beta$  and financial leverage changes. Furthermore, Healey and Palepu (1990) do not find evidence of significant revisions in analysts' earnings forecasts after the equity issue. Information conveyed by the SEO announcement is then strictly about changes in the business risk.

Discount factor implications to explain stock price abnormal reaction should be dealt with care. The discount factor is estimated and not directly observed. Thus, it is subject to error in variables problems. In addition, the estimation of the discount factor is also an asset pricing matter and it is sensitive to asset pricing model specification. Denis and Kadlec (1994) examine the relation between trading activity, the measurement of the stock price reaction to events and the change in systematic risk around US equity issue announcements. Opposite to Healey and Palepu (1990), they do not find evidence of changes in systematic risk surrounding these announcements once the estimation model has been corrected for stock price adjustment delays. To correct for these potential biases, daily stock returns should be regressed on lagged, contemporaneous and lead market returns in the manner of Fowler and Rorke (1983). When more than five leads and lags are used, changes in equity  $\beta$  around equity issue announcements become insignificant. Moreover, changes in equity  $\beta$  are consistent with those implied by the leverage ratio modification.

Bayless, Price and Monroe Smoller (1994) contradict the findings of Denis and Kadlec (1994). Using a Dimson (1979) estimation procedure, they observe that the average  $\beta$  of US equity issuers increases significantly after the financial decision announcement (from 1.07 to 1.22). This result is consistent with Healey and Palepu (1990). According to Bayless et al. (1994), the average financial conditions of the issuing firms declines after the offering.

There is a significant decrease in sales growth, asset growth, operating income growth, operating income, cash to total assets, free cash flow and capital expenditure. These findings suggest that the money raised by the issue is not allocated optimally. Financial leverage declines after the issue, which should lead to a decrease in the equity beta. However, it is not the case. Equity issues could be viewed as a signal that managers anticipate a riskier earnings stream and therefore, they reduce the leverage ratio. This rationale is supported by the negative stock price reaction and the declining financial conditions of the firm.

### **2.3.3 Contribution of financial analysts in reducing information asymmetry**

In presence of information asymmetry, financial analysts' earnings forecasts could constitute a way to transmit part of the private information to the investors. Financial analysts maintain privileged relationships with managers. They are the most entitled actors to collect private information at low costs. They should have the professional skills to notice managers' attempt to manipulate earnings. In that sense, financial analysts should contribute to reduce information asymmetry between the managers and the market. D'Mello and Ferris (2000) examine the role of financial analysts according to the quantity of information they convey to the market and according to the quality of this information. The quantity of information is proxied by the number of analysts following a given firm and the quality is estimated by the volatility of earnings forecasts in the consensus. Equity issuers that benefit from the largest quantity of information experience a less negative stock price decline at the SEO announcement than issuers that are followed by fewer analysts. Issuers cannot be differentiated according to the quality of information. However, the dispersion of analysts' forecasts may not be an accurate proxy for information asymmetry because of infrequent and non-simultaneous revisions in earnings forecasts.

Several authors raise some doubts about financial analysts being the most efficient vehicle to transmit information to the market. Lim (2001) argues that analysts could find it optimal to positively bias their earnings forecasts in order to gain management and information access. He finds that the forecasts bias is greatest for companies that are small, covered by fewer analysts, with more volatile payoffs, that experience poor stock performance or negative earnings surprises. At the same time, the forecasts bias is negatively related to the size of the brokerage firm and to the analyst's experience. These findings support the hypothesis that analysts trade off positively biased forecasts against an improved access to manager and future information. By doing so, they expect their forecasts to gain in accuracy over the

following periods. Therefore, the analyst's behaviour is driven by the will to reduce the information asymmetry between the firm and the market even if to do so, he must bias his forecasts.

Carleton, Chen and Steiner (1998) and Hayward and Boeker (1998) outline the conflicts of interests between financial analysts' departments and investment banking activities within the same institution. In universal banks, these conflicts of interests are expected to be even more emphasised as the client is offered a wider range of financial services. For Carleton, Chen, Steiner (1998), the motivation to capture underwriting work causes the investment recommendations of brokerage/investment banks to be overly optimistic about clients or potential clients financial perspectives. Analysts' trading recommendations should help to attract new underwriting contracts or to keep clients satisfied. Financial analysts are torn between issuing accurate earnings forecasts and emitting positively biased recommendations. Hayward and Boeker (1998) show that corporate finance departments have more power than analysts departments because their contribution to the bank profit is greater and because they are more represented in the institution top management – the second explanation being partly dependent of the first one. Hence, investment banking departments are able to overrule financial analysts' independence and force them to issue better ratings about existing or potential clients<sup>26</sup>. To moderate the corporate finance dominance, analysts' departments have to gain in reputation. Alternatively, an active job market for financial analysts could strengthen their independence. By issuing accurate forecasts, analysts increase their reputation<sup>27</sup>, which gives them access to higher position, more prestigious banks and larger remuneration. However, even in the US where career concerns and job market activity for security analysts should help them resist to external pressure, conflicts of interest are at the advantage of investment banking activities. In Europe, Bolliger (2001) shows that the job market of analysts does not value their track-record. Therefore, financial analysts have no incentives to produce accurate earnings forecasts to seek for top positions. Reputation concerns do not counterbalance the potential pressure from investment banking department.

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<sup>26</sup> The firing of a Credit Suisse financial analyst that issued sell recommendations on Swissair, before the Swiss airline company collapsed in 2001, illustrates the conflict of interests and its implication on analysts' career. Crédit Suisse was one of Swissair main creditors and a large shareholder as well.

<sup>27</sup> See Hong and Kubik (2000) for a study on US security analysts job market.

#### **2.3.4 Informational content of security issues in summary**

The informational content of security issue announcements has been analysed in terms of information asymmetry about the firm value. The firm market value is defined as the sum of the discounted future cash flows. Thus, the signal included in the external financing decision deals with either the stream of future cash flows or the discounting factor. The evolution of earnings and earnings forecasts proxies the informational content about cash flows. Changes in systematic risk measure the informational content about the discounting factor. Table 2.5 summarises the empirical studies reviewed in this section. All these researches are based on US data, for which information asymmetry is one of the significant explanations of the marginal capital structure choices.

Equity issues are found to occur before a downturn in corporate earnings. Furthermore, some evidence has been given that abnormally good earnings have been disclosed just prior the offering announcements. These findings are consistent with the adverse selection model of Myers and Majluf (1984) and the signalling model of Miller and Rock (1985). It has also been discussed that earnings may be subject to manipulations by managers in order to overvalue the stock price at the time of the equity issue. This argument assumes a great level of information asymmetry because investors are not able to detect the stock overpricing and the earnings manipulations before the equity issue is announced. Financial analysts through their earnings forecasts should help lowering this level of information asymmetry but they are subject to conflicts of interests that could lead them to over-estimate their forecasts. By doing so, they may even contribute to the overpricing pattern.

Evidence about the information content about risk is mixed. Other things equal, an equity issue should decrease the leverage ratio and hence the level of systematic financial risk. The empirical findings contradict this assumption. The equity beta increases after the issue or does not change. The results about beta changes depend on the estimation procedure of the coefficient of systematic risk. A part (if not all) of the increase could be due to infrequent trading and price adjustment delays.

**Table 2.5 : The informational content of security issues announcements**

<b>Authors</b>	<b>Market</b>	<b>Sample</b>	<b>Results</b>
<i>Panel A : information about corporate earnings</i>			
Hansen and Crutchley (1990)	US	364 equity, convertibles and straight bonds offerings 1975 and 1982	Negative abnormal earnings after all types of issues  Equity issues are made before the earnings downturn while straight debt issue are made during the downturn
Jain (1992)	US	269 equity issues 1978 and 1983	Revisions of financial analysts' earnings forecasts are related to announcement returns of equity issues
Brous (1992)	US	350 equity issues 1976 and 1985	Decrease in short-term earnings forecasts after an equity issue  No change in long-term forecasts
Rangan (1998)	US	230 equity offerings 1987 and 1990	Earnings management around the equity issue explains the earnings changes and the stock price reaction
Teoh, Welch and Wong (1998)	US	1265 equity offerings 1976 and 1989	Issuers overstates their earnings by manipulating discretionary accruals
Shivakumar (2000)	US	1222 equity issues 1983 and 1992	Earnings management around equity issues but no abnormal market reactions to subsequent earnings disclosures
<i>Panel B : information about risk</i>			
Healey and Palepu (1990)	US	96 equity issues 1966 and 1981	Equity issues announcements convey information about an increase in assets and equity betas which is specific to the issuing firm
Denis and Kadlec (1994)	US	792 equity issues 1984 and 1989	Betas do not change around equity issue if estimated properly
Bayless, Price and Monroe Smoller (1994)	US	2391 equity issues 1974 and 1992	Beta increases around equity issues even if they are estimated properly
<i>Panel C : Financial analysts' contribution</i>			
D'Mello and Ferris (2000)	US	576 equity issues 1977 and 1988	Equity financing announcement effects are more negative for firms followed by fewer financial analysts (more subject to information asymmetry)

Equity issues are event that could be, at least partly, anticipated by investors. The total economic valuation effect of equity issue decisions involves the expected value that investors give to managers' private information. Conditional event study methodology is able to take into account that private information value. If it significantly explains stock price reactions to equity issue announcement, then the event is proved to have an informational content. Otherwise, the valuation effect should be attributed to other determinants of capital structure choices. Guo and Mech (2000) apply a conditional event study methodology to the equity

issue announcements. They find that the issue decision is taken in periods of low information asymmetry and that earnings disclosures, stock split declarations and dividend announcements help investors anticipate equity issues. However, the anticipation power of their model remains low and no clear distinction can be made between anticipation and private information effects. Their conditional approach is interesting although their model specification is open to criticism, especially on how they model the impact of private information on the announcement stock price reaction<sup>28</sup>.

## ***2.4 Timing of security issues***

The hypothesis of timing security issue decisions finds its justification in both information asymmetry and agency costs theories. High quality firms may forego profitable investment opportunities if they have to finance them by issuing undervalued securities. If they have the opportunity to postpone these projects, they could avoid under-investment by timing their investment-financing decisions in periods when adverse selection costs are lower, when information asymmetry is reduced. One condition for the timing hypothesis to hold is that information is time-varying. In the first sub-section, two empirical studies are reviewed that deals with the impact of time-varying information asymmetry on the timing of financing decisions.

Business cycle may also influence the timing of security issues. During periods of economic expansions growth opportunities are more numerous. Investment projects have a greater chance of success or to be profitable. According to that, the risk of over-investment is reduced as well as the agency costs of equity. In the same way, information asymmetry about investment opportunities is less severe, which lowers the adverse selection costs. Managers should be less reluctant to issue equity during expansion phases of the business cycle. The implication of business cycle on security issue decisions are examined in the second sub-section.

Firms may be inclined to take similar financing decisions at the same time, creating hot issue periods for equity or for debt. A manager, noticing that many firms in his environment issue equity, may be influenced to realise such an operation. These hypotheses are addressed in the third sub-section with the ability of financial analysts to create hot issue periods by

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<sup>28</sup> By letting the variance of private information be firm-specific, Guo and Mech (2000) make assumptions about the sign and the magnitude of the estimated value given to that private information that are not in accordance with the work of Acharya (1988; 1993) and Eckbo, Maksimovic and Williams (1990.)

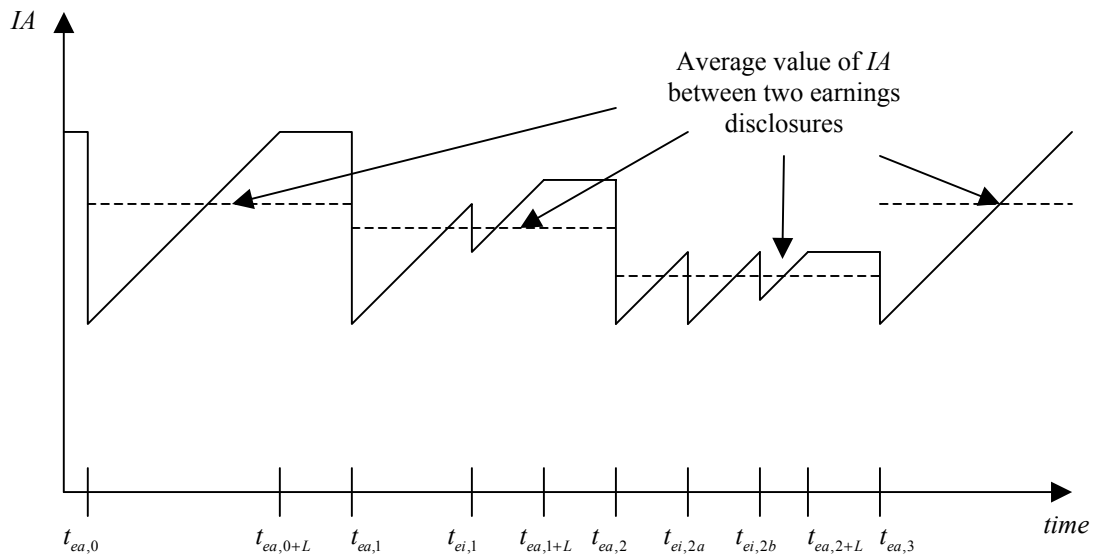
being over-optimistic about their growth forecasts. In the fourth sub-section, the timing of financing decision is analysed in a long-term or historic perspective as current capital structures seem to be better explained by past financing choices than by contemporaneous determinants. The section concludes with a summary of managers' timing ability and consequences on firm value.

#### **2.4.1 Equity issues clustering in periods of low information asymmetry**

Information asymmetry models of marginal financing decisions assume that managers have private information, that they base their investment-financing decision on that private information and that the announcement of the decision reveals their private information to the market. Information asymmetry is implicitly supposed to be constant over time, at least until private information is released. Dierkens (1991) describes the information environment of the firm. Managers and investors share the same information about market-wide uncertainty. However, managers cumulate private information over time which is conveyed sooner or later to investors through one of the following manners: First, it is assumed that investors automatically learn about firm-specific information after a given delay,  $L$ . Second, managers are forced to reveal their private information on a periodical basis (disclosure requirements). Third, managers voluntarily reveal private information by announcing a given event. Figure 2.1 is inspired by the Figure 2 in Dierkens (1991, p. 185) and illustrates the information environment of the firm. Information asymmetry,  $IA$ , appears on the vertical axis.

Figure 2.1 clearly shows the impact on time-varying information asymmetry. Information asymmetry is at its lowest level immediately after private information releases such as earnings or turnover disclosures. It reaches its maximum level when investors automatically start to learn about private information. From that point on, additional private information still arrives to managers but its effect on the information asymmetry level is compensated by the automatic learning process. Voluntary private information disclosures made between two legally required releases lowers the average level of information asymmetry. Managers have the ability to time their financing decision according to the level of information asymmetry but they can also modify this level by releasing voluntarily more or less private information.

**Figure 2.1 : Information environment of the firm with time-varying asymmetry**



$t_{ea,0(1,2,3)}$  is the date of the earnings disclosure in period 0 (1, 2, 3),

$t_{ea,0(1,2)+L}$  is the date when the initial private information starts to automatically learned by the market,

$t_{ei,1(2)}$  is the announcement dates of voluntary events, one during period 1 and two during period 2.

For Dierkens (1991), information asymmetry is given by the difference between the total uncertainty about the firm value perceived by the market and the market-wide uncertainty shared by managers and investors. Information asymmetry proxies are the residual variance of stock returns, the standard deviation of the abnormal returns observed at the announcement of the quarterly earnings, the intensity of public announcements (number of information releases made by the firm in the media) and the trading volume. The stock price reaction to SEO announcements is negatively related to the residual variance and to the volatility of earnings disclosures abnormal returns. It is positively related to the intensity of public announcements and to the trading volume. All four variables are not mutually exclusive. They capture different and specific components of information asymmetry. About the timing of equity issues, Dierkens (1991) observes that SEO announcements are concentrated soon after quarterly earnings disclosures, in a period when the residual variance is at a lower level.

In addition to time-varying information asymmetry, Korajczyk, Lucas and McDonald (1992) assume that the undertaking of investment project may be postponed but

that this delay introduces a risk of evaporation. Adverse selection costs are small soon after dividends or quarterly earnings releases. In order to avoid the sale of undervalued stocks, managers are more likely to wait for periods of low information asymmetry to announce equity issues. Managers of high quality firm balance the benefit of postponing the issue to a favourable information asymmetry period against the risk of project evaporation. The shorter the time until the next periodical information release, the worthier becomes the delaying of the issue-invest decision. For lower quality firms, timing is not a concern. The risk of evaporation is greater and managers are more tempted to issue overpriced securities. All in all, Korajczyk et al. (1992) predict that equity issues are more likely to be concentrated after plausible information releases and that market reactions should be more severe for issues that occur outside of these favourable information asymmetry periods.

Korajczyk, Lucas and McDonald (1991) find support of their model. US Firms tend to issue equity soon after quarterly earnings disclosures rather than late after. They avoid to issue equity during the few weeks after the fourth quarter earnings announcement. They prefer waiting for the release of the audited annual report, published several weeks after the last earnings release and considered as more informative (certification by the independent auditors). The stock price reaction to equity issue announcements is negatively related to the time between the last quarterly earnings release and the announcement date. This relation is supportive of the timing hypothesis. Evidence is also given to the informational content of earnings releases. On average, earnings releases in the year prior to the equity issue convey good news and generate a larger stock price reaction than those made in the year following the issue. This finding could indicate that equity issue may be timed after a period of good performance, which is consistent with the pre-issue stock price run-up predicted by Myers and Majluf (1984).

#### **2.4.2 Business cycle and external financing decisions**

The relation between external financing decisions and the business cycle is addressed by Berkovitch and Narayanan (1993) in an imperfectly competitive financial market. Managers have superior information about security prices and they are given the choice to issue debt or equity according to general economic conditions. All things being equal, the decision to issue equity or debt to finance an investment project depends on how existing shareholders' wealth is affected by the financing decision. Firms of higher quality would prefer debt financing as they could signal their current under-valuation on the stock market. Firms of lower quality

choose equity financing because they are currently overprice on the stock market. Global economic conditions have three direct implications on external financing decisions. First, the need for external financing is more important during expansion phases of the business cycle than during recessions, even for a constant level of investment profitability. Second, if investment projects payoffs are assumed to be increasing with economic conditions, equity issuers will face lower adverse selection costs and lower agency costs of free cash flow during business cycle up turns. Consequently, more firms choose equity financing as they anticipate better announcement valuation effects. In other words, equity issues are expected to increase more than debt issues when economic conditions are growing. Third, total market capitalisation increases during economic expansion phases. This increase accelerates the issue-invest decisions and the number of external financing decisions is positively correlated with the growth rate in the economy.

Inspired by the predictions of Berkovitch and Narayanan (1993), Choe, Masulis and Nanda (1993) propose a testable model describing the influence of business cycle on external financing decisions. They assume that the relative magnitudes of adverse selection costs, agency costs and flotation costs depend on global economic conditions and that managers base their investment-financing decisions on these costs. During business cycle expansion phases, the market value of assets in place is expected to be higher and the number of profitable investment opportunities more important. For any external financing solution, adverse selection costs should be lower. The risk of over-investment should be reduced and flotation costs should be less expensive because the issue market is more active and less risky. Other things equal, equity issuers are predicted to benefit from larger costs reduction than debt issuers. Consequently, equity issues should be more numerous than debt issues and the stock price reaction to equity issue announcements should be less severe than during economic recessions. Opposite outcomes are expected during business cycle contraction phases. Firms relying on external financing are predicted to incur greater adverse selection, agency and flotation costs and equity issuers should suffer from worst issuing conditions. In order to test their model, Choe et al. (1993) analyse the frequency of equity offerings relative to debt offerings in periods of business cycle expansions or contractions. As expected, they observe that equity issues are concentrated in expansion phases. Business cycle variables have a significant explanatory power in accounting for the magnitude of stock price reaction. The stock price reaction to equity issue announcements is less negative in periods of economic

expansions. Conversely, debt issues are relatively more numerous in peak-to-trough business cycle phases.

### **2.4.3 Equity offerings clustering in “hot” issue periods**

Bayless and Chaplinsky (1996) explain the fact that equity issues are clustered in selected periods by the presence of windows of opportunity. “Hot” issue periods are periods during which a large aggregate amount of new equity is issued. Their argument states that when the total amount raised by equity issues is important, adverse selection costs for the marginal equity issuer are expected to be low, encouraging firms to select this financing source. Investors may perceive the number of operations as a signal that the information asymmetry level is currently low. Between 1968 and 1990 on the US market, 53 % of the SEO proceeds are raised in “hot” issue markets that represent only 25 % of the whole period. The stock price reaction to SEO announcements is always negative but it is less severe if the operation occurs in a “hot” issue period. From an economic standpoint, offering equity during hot issue markets reduces the negative impact on the firm value by up to 233 basis points. The gain in value exceeds the direct flotation costs paid by the issuer. This outlines the importance of a good timing in issuing equity and supports the hypothesis that higher quality firms may find it profitable to postpone their equity financing decision to periods of lower information asymmetry degree.

The measure of “hot” and “cold” issue periods is not based on economic considerations. In order to check the robustness of the results of Choe et al. (1993), Bayless and Chaplinsky (1996) examine the conformity of their cold issue periods with the NBER “peak to trough” periods. They observe that 62 % of the periods do not overlap. “Hot” and “cold” issue periods are not substitute for the business cycle explanation of equity issue timing. However, both explanations are not mutually exclusive. The level of information asymmetry could depend on firm specific factors such as private information releases specific to a given firm in the manner of Dierkens (1991). It could depend on the business cycle as shown by Choe et al. (1993). It could also depend on factors common to all firms in the market or in the industry, these last factors being responsible for the “hot” issue periods according to Bayless and Chaplinsky (1996). However, Bayless and Chaplinsky (1996) do not identify any factor, which constitutes the main drawback of their rationale.

Rajan and Servaes (1997) examine financial analysts’ earnings forecasts to explain “hot” issue periods in the IPO market. They observe that the clustering of IPOs in selected periods

can be partially explained by financial analysts' long-term earnings growth forecasts and more specifically by their over-optimism. The number of IPOs realised in a given quarter is positively related to the long-term growth forecasts of firms that were introduced during the year preceding that given quarter. The explanatory power of analysts' forecasts is not affected by the inclusion of control variables such as market-to-book ratio or economic conditions. These findings give evidence that managers time their IPO decision on windows of opportunity based on favourable growth forecasts made for firms of similar condition.

The rationale of Rajan and Servaes (1997) about the timing of IPOs can be transposed into the SEO context to explain "hot" issue markets. Equity issue could be concentrated in periods when the analysts' growth forecasts are really good, especially those about firms that issued equity recently. This hypothesis is consistent with the fact that firms with high growth opportunities are more inclined to be financed with equity. Furthermore, it proposes an observable variable to explain "hot" and "cold" issue markets. In that sense, it complements the work of Bayless and Chaplinsky (1996).

Dereeper (2002) examines the window of opportunity argument on the French market. He observes that French equity issues are concentrated in "hot" issue periods that can be determined by the number of operations and by the aggregate proceeds. This finding is consistent with Bayless and Chaplinsky (1996). "Hot" issue periods coincide with the publication of annual reports (end of the second quarter for 90 % of the firms). Beside the "economic" window of opportunity proposed by Berkovitch and Narayanan (1993) and the "market" window of opportunity proposed by Bayless and Chaplinsky (1996), Dereeper (2002) argues that managers could time their equity issue decisions relative to a "technical" window of opportunity. The "technical" window of opportunity has something in common with the timing argument of Korajczyk et al. (1991). Managers have incentives to realise their operations soon after the disclosure of an audited financial report. By doing so, they economise on audit costs and on negotiation costs with the COB. French practitioners agree on the importance of the "technical" argument to explain the timing of equity issues<sup>29</sup>. In the US, Korajczyk et al. (1991) reject the "technical" window of opportunity because the stock price reaction pattern favours the hypothesis of the informational content of audited report instead of a logistic explanation.

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<sup>29</sup> See the interviews with investment bankers in Dereeper (2002).

Dereeper (2002) finds that stock market reactions to equity issue announcement are insignificant during “cold” issue periods while they are significantly negative during “hot” issue periods. The explanation of this unexpected finding lies in the structure of the French market. Because of the smaller size of the French market relative to the US or the UK markets, issuing in a “hot” market is not advantageous. Being in competition with other equity offers enhances the difficulty to place the shares. French issuers have an incentive to differentiate themselves from each other by isolating their equity offerings. The ability to attract potential subscribers’ attention is more important than adverse selection or agency considerations. This observation outlines once more the difference relative to the institutional setting and to market characteristics.

#### **2.4.4 Long-term implications of the timing of external financing decisions on capital structure**

Baker and Wurgler (2002) analyse the timing of net equity issues. They base their study on a sample of US non-financial firms that get listed between 1968 and 1998. For each of these firms, they trace the history of capital structure as well as the variables that determine the capital structure choice. Using firms with a known IPO date allows to observe the whole capital structure evolution.

Market-to-book ratio is used to measure the market timing opportunities. A high market-to-book ratio encourages equity issue because of the current high valuation of the stocks. On a more general level, firms are expected to be financed with the security that has the lowest current cost of capital, yet the most valued. Indeed, Baker and Wurgler (2002) observe that low-leveraged firms usually raise funds when their valuation is high while high-leveraged firms do it when they are low-valued. Not only current market-to-book ratio has an important influence on the capital structure but its influence lasts over one decade. Current capital structure is mostly explained by the weighted-average<sup>30</sup> of past market-to-book ratios. In other words, a 10-year-old market-to-book ratio has often more influence on the current capital structure than any other contemporary determinants.

These finding have to be interpreted with care because they do not fit with static trade-off theories of capital structure. Tax, information asymmetry, agency costs or assets and products specificities are predicted to let the capital structure deviate only temporarily from its

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<sup>30</sup> The past market-to-book ratios are weighted according to the relative importance of their contemporary net equity and debt issues; see Baker and Wurgler (2002, p. 12; equation 3) for the detailed explanation.

optimum. Persistent, if not permanent, effects are not addressed. Baker and Wurgler (2002) propose as an explanation the fact that the current capital structure is the direct outcome of all past financing decisions. If the financing decisions are taken exclusively according to timing considerations, the influence of timing opportunities become permanent. In the previous subsections, it is shown that equity issues are timed when adverse selection costs are lower or when the business cycle is in an expansion phase. Both of these situations imply a higher stock valuation which is consistent with the cumulative timing hypothesis. An alternative explanation would be that managers irrationally perceive a stock mispricing. Thus, they would issue equity when they consider that the stock price is overvalued and repurchase stocks when they think it is under-valued. The outcome of this study is that no optimal capital structure exists.

#### 2.4.5 The timing arguments in summary

Table 2.6 summarises the empirical findings reviewed in the section. Evidence is given to the existence of time-varying information asymmetry. Managers tend to time their equity issue decisions according to periods of low level of information asymmetry. Conflicting results have been found about the ability of the business cycle to influence the timing decisions of equity issues. Macroeconomic variables influence the choice between debt and equity but cannot explain the equity financing decision alone. Windows of opportunity exist. These periods favour equity issues in the sense that the adverse selection costs associated with the announcements of the offerings are reduced. For IPOs, windows of opportunity are partially explained by long-term growth perspective forecasted by financial analysts. Furthermore, capital structure seems to correspond to the outcome of past attempts to time the equity market instead of a value-maximising tool.

**Table 2.6 : The timing of equity issues**

<b>Authors</b>	<b>Market</b>	<b>Sample</b>	<b>Results</b>
<i>Panel A : Time-varying information asymmetry</i>			
Dierkens (1991)	US	197 equity offerings 1980 and 1983	Information asymmetry proxies explain part of the stock price reaction to equity issue announcements Equity issue announced shortly after earnings releases experience less negative announcement effect
Korajczyk, Lucas and McDonald (1991)	US	1247 equity issues 1978 and 1983	Equity issues tend to follow credible information releases The price drop at the equity issue announcement increases with the time since the last information release

**Table 2.6 : continued**

<b>Authors</b>	<b>Market</b>	<b>Sample</b>	<b>Results</b>
<i>Panel B : Timing of equity issues and business cycle</i>			
Choe, Masulis and Nanda (1993)	US	669 equity issues 1971 and 1991	Equity issues are more numerous relative to debt offerings in economic expansion phases  Equity issue announcement effect is less negative in economic upturn  The costs of adverse selection are negatively related with the economic conditions
<i>Panel C : Clustering of equity issues in “hot” markets</i>			
Bayless and Chaplinsky (1996)	US	1881 equity issues 1974 and 1990	Announcement effect of equity issues is less negative during “hot” issue periods  “Hot” and “cold” issue periods are independent from macroeconomic characteristics but are related to firm-specific characteristics  “Hot” issue periods correspond partially to periods of reduced information asymmetry
Dereeper (2002)	France	452 equity issues 1984 and 1999	“Cold” markets announcement effects are not significant. “Hot” markets ones are negative  Number of issues and aggregate proceeds explain “Hot” and “cold” markets  French market structure explains why issuing outside from “hot” markets could be advantageous
<i>Panel D : Long-term implications of market timing</i>			
Baker and Wurgler (2002)	US	2839 firms with IPO between 1968 and 1998	Low-leveraged firms raise funds when their valuation is high. High-leveraged raise funds when their valuation is low.  Fluctuations in market valuations have large effects on capital structure that persist for at least a decade

Windows of opportunity to issue equity have been considered as periods during which issuing conditions are improved for investors, when adverse selection and agency costs are reduced. From the manager’s point of view, the opportunity to sell overpriced security may appear to overwhelm optimal investment considerations. Assume private information is only partially released at the equity issue announcement. The penalty costs imposed by investors to equity issuers may not take into account the entire overvaluation. A branch of the literature about long-term stock underperformance following an equity issue attributes this

underperformance to the ability of managers to take advantage of such windows of opportunity. This subject will be analysed in more details in Chapter 4.

## ***2.5 What do we learn about capital structure ?***

The institutional setting seems to influence both the market perception of marginal financing decisions and the motivations of managers to issue a given type of securities. The first raw evidence about the market reaction to equity issue announcements is that the impact is negative in France, the Netherlands and the US, and non-negative – if not positive – elsewhere in the world. The difference between these countries cannot be attributed to the flotation methods alone, as both US public and rights offerings experience negative announcement stock price reaction. In the US, information asymmetry between managers and the market induces the former to time their equity issues. Equity offerings are concentrated within periods of lower information asymmetry level. Outside the US, ownership structure seems to play an important role in explaining the absence of negative reactions. In addition, important inside shareholders' take up associated with the neutrality of the subscription rights mitigate the impacts of information asymmetry and agency costs.

This section is dedicated to the analysis of capital structure choices. Selected empirical studies about capital structure determinants in a single institutional setting or in international comparisons are reviewed in the first sub-section. Beside valuation effects and their main determinants, capital structure choice are dictated by other factors such as industry, size, product specificities. The second sub-section addresses to the determinants of the external financing decision. What factors do influence the choice to issue equity instead of debt ? In other words, is it possible to anticipate a given marginal financing decision ? In the last sub-section, the point of view of practitioners is examined. More attention is paid to which extend they rely on theoretical predictions in their capital structure choices.

### **2.5.1 Influence of capital structure determinants**

The influence of capital structure determinants is analysed by observing the leverage ratios of sample of firms at one moment in time and by testing whether these ratios are correlated to a set of variables that proxy for the selected theories. In that sense, capital structure choices are examined in a static perspective and no conclusion can be drawn about impact on the firm value. Studies reviewed here are ranged in two categories. The first category involves works on capital structure determinants based on a single institutional setting. Determinants include

industries, size, taxes, information asymmetry, assets specialisation or agency considerations. A summary of their main findings is presented in Table 2.7. The second category of studies presents international comparisons of capital structures across G-7 countries or across developing countries. Their aim is to verify if capital structure determinants valid in the US institutional setting are also pertinent worldwide. They constitute a challenge to the universality of capital structure theories vs. country-specific explanations.

#### *2.5.1.1 Single institutional setting analysis*

Industry comes out to be a major capital structure determinant. In the US, Bradley, Jarrell and Kim (1984; p. 869) regress leverage ratios of 851 firms on 24 industry dummies. They find a regression  $R^2$  of 54 %, which means that more than half of the cross-sectional variance in leverage ratios are explained by industries. Variations in leverage across industries are on average greater than the variations within industries. These results are supported by Schwartz and Aronson (1967) and to a less extent by Ferri and Jones (1979). In fact, Ferri and Jones (1979) document a persistent distribution in capital structure only for selected industries such as oil and gas. In France, Dubois (1985) does not observe a significant relation between industry and capital structure. Flath and Knoeber (1980) observe that US firms in regulated industries have more debt in their capital structure. The explanation could be that regulated firms have a lower probability of risk shifting in their investment policies. The same observation is made by Gul (1999) for Japanese regulated firms. Castanias (1983) shows that firms in industries with higher historical rates of failure use less debt. They maintain higher cash flow-to-long-term debt ratios and smaller leverage ranges around the industry mean. These findings about the influence of industry on capital structure choices are consistent with the existence of an industry target debt ratio. In that sense, industry could be a general variable that covers several determinants common to all firms in the sector.

Capital structure irrelevancy states that firm value is independent from capital structure choices. It is determined by the assets profitability adjusted for the level of business risk. Dubois (1985), Titman and Wessels (1988) and Gul (1999) observe that leverage ratio is negatively related to profitability. These findings are opposed to the monitoring and signalling role of debt. Profitable firms should be more sensitive to free cash flow problems and use more debt. Furthermore, profitable firms are expected to signal their quality by being more levered. According to Dubois (1985), assets profitability is the most important determinant of French firms capital structure. This finding is consistent with Brennan and Schwartz (1984).

The result of Titman and Wessels (1988) supports the pecking order in the sense that if profitability proxies the ability to create financial slacks, profitable firms should rely less on debt financing. For US firms, leverage is negatively related to business risk which is consistent with the financial distress hypothesis. Cash flows or earnings volatility increases the risk of default and should be negatively associated to debt as it is documented by Ferri and Jones (1979), Flath and Knoeber (1980) and Bradley, Jarrell and Kim (1984).

Firm size affects capital structure choices but the sign of its influence varies across countries. In the US, on one hand, Titman and Wessels (1988) and Gupta (1969) find a negative relation between the leverage ratio and firm size. For Titman and Wessels (1988), the relation is stronger between short-term debt and firm size. On the other hand, Ferri and Jones (1979) observe that larger firms have mixed capital structures while smaller firms are either highly levered or almost unlevered. The access to debt financing seems to be determined by market conditions and by past performance. Gul (1999) in Japan and Lasfer (1995) in the UK document a positive relation between leverage and firm size. This finding is consistent with the transaction costs hypothesis that larger firms can negotiate a lower cost of debt. In addition, if size is associated with diversification, they are expected to benefit from more stable cash flows. Overall, the difference between the US and other countries outlines the influence of the institutional setting on capital structure choices.

Agency considerations also impact financial structure decisions. Chatterjee and Scott (1989) show that the use of long-term debt is motivated by an agency effect. Shareholders hope to benefit from a wealth transfer from unprotected creditors. This phenomenon is emphasised for firms subject to low transaction costs and a high degree of information asymmetry. For Bradley et al. (1984), expenditures in advertising and R&D are negatively related to leverage. These expenditures proxy managers' discretionary power. Thus, the sign of the relation is consistent with the monitoring role of debt in an agency context. Furthermore, debt forces managers to take actions when financial distress is imminent. Ofek (1993) shows that levered firms react faster to a deterioration in their financial situation.

In Japan, Gul (1999) finds that leverage ratios are negatively related to growth opportunities. This result is consistent with the hypothesis that high-growth firms are less subject to over-investment problems. In the UK, the findings of Lasfer (1995) indicate that agency theory has a greater explanatory power than taxes. The level of debt is greater for low growth firms whatever the measure of the leverage ratio. Firms with potential free cash flow problems have more debt on the long-run while firms without free cash flow problems have

less debt on the short-run. Dubois (1985) documents for French firms that growth is positively correlated with short-term debt and negatively correlated with the leverage ratio computed in market values. These results are supportive of the Myers (1977) where capital structure is expressed in terms of financing source maturities. Only Gupta (1969) observes that the total debt to total assets ratio is positively correlated with firm growth. For Spanish firms, De Miguel and Pindado (2001) show that the influence of agency costs is subordinated to the level of information asymmetry. When this level is low, firms favour debt financing to mitigate free cash flow problems and they privilege private debt when agency costs of debt are more important. In Italy, Bianco and Casalova (1999) document that, because investors suffer from a low level of legal protection against expropriation, firms are financially constrained. They have to form pyramidal organisations to create an internal capital market. The reliance to internal market financing is exacerbated by growth opportunities.

Titman (1984) prediction that leverage is expected to decrease with the degree of assets intangibility or with products uniqueness is given evidence by Chatterjee and Scott (1989), Titman and Wessels (1988) and Bradley et al. (1984). These results also support the transaction costs hypothesis that the degree of assets specialisation should be positively related to the presence of equity in the capital structure. For Titman and Wessels (1988), product uniqueness represent the capital structure determinant with the most explanatory power. Dubois (1985) also observes that the proportion of tangible fixed assets is positively correlated with the leverage ratio expressed in market value but the sign is reversed when the leverage ratio is expressed in book value. Indeed, the sign of the correlation is sensitive to the measure of capital structure (book or market values, with or without trade receivables). The influence of taxes is recognised in Kale, Noe and Ramirez (1991) who find that the relational form between leverage ratio and business risk is driven by corporate and personal taxes considerations as predicted by DeAngelo and Masulis (1980). Taxes have a marginal explanatory power in Bradley et al. (1984), Chatterjee and Scott (1989) and De Miguel and Pindado (2001).

**Table 2.7 : Cross-sectional determinants of the capital structure**

Authors	Market	Capital structure	Main findings
Schwartz and Aronson (1967)	US	1928 and 1961	Equivalent within industries and different across.
		4 broad industries	Differences across industries sharpen with time
Gupta (1969)	US	Equity to total financing	
		1961-62	Size negatively related to debt financing
Ferri and Jones (1979)	US	Total debt to total assets	No relation between industry growth rate and capital structure at the industry level but a positive relation exists at the firm level
		1974 and 1976	Slight relation between industry and capital structure
Flath and Knoeber (1980)	US	233 firms	Large firms mixed capital structure, small firms either highly or less levered
		Debt to total assets	Negative relation between business risk and debt
Castanias (1983)	US		Negative relation between operating leverage and debt
		1957-64 and 1965-72	Negative relation between operating risk and leverage but not significant
Bradley, Jarrell and Kim (1984)	US	38 industries	Firms in regulated industries issue more debt
		interest payments to earnings	
Titman and Wessels (1988)	US	1977	Leverage is negatively correlated with historical failure rate in the industry
		21 industries	Firms in riskier industries have smaller leverage ranges and are better covered (higher cash flow to long-term debt ratio)
Chatterjee and Scott (1989)	US	Long-term debt to total assets	
		1962-81	Industry classification explain 54 % of the leverage ratio changes
Kale, Noe and Ramirez (1991)	US	851 firms	Leverage is negatively related to business risk
		mean long-term debt divided by the sum of mean long-term debt and equity	Leverage is positively related to non-debt tax shields
Kale, Noe and Ramirez (1991)	US		Leverage is negatively related to advertising and R&D expenditures
		1974-82	Leverage is negatively related to uniqueness of the products
Kale, Noe and Ramirez (1991)	US	469 firms	Short-term debt is negatively related to firm size
		long-term, short-term and convertible debt divided by market or book values of equity	Leverage ratio in market value is negatively related to profitability
Kale, Noe and Ramirez (1991)	US	1977-79	Leverage is positively related to potential wealth transfer from unprotected creditors
		238 firms	The net tax effect does not offset the wealth transfer effect on leverage
Kale, Noe and Ramirez (1991)	US	Present value of interest-paying debt to sales, total assets or market value	Leverage is positively related to fixed assets
		1984 and 1985	Business risk is related to leverage through a U-shaped functional form
Kale, Noe and Ramirez (1991)	US	233 firms	
		debt interest to cash flow	The shape of the functional form comes from tax implications at both corporate and personal levels

**Table 2.7 : continued**

<b>Authors</b>	<b>Market</b>	<b>Capital structure</b>	<b>Main findings</b>
Ofek (1993)	US	1983-87 358 firms Debt divided by the sum of debt and market value of equity	Positive relation between leverage and operational actions in case of poor market performance Managerial firms react slowly to financial distress Debt has a positive influence in preserving the going concern value of the firm
Dubois (1985)	France	1979 118 firms Debt divided by assets in book value Debt divided by the sum of debt and market value of equity	Leverage is negatively correlated with profitability Short-term debt is positively correlated with growth Leverage ratio in market value is negatively correlated with growth Leverage in book value is negatively correlated with tangible fixed assets Leverage in market value is positively correlated with tangible fixed assets
Lasfer (1995)	UK	1972 to 1983 88 firms Long-term debt divided by the sum of long-term debt and book value of equity Long-term debt divided by the sum of long-term debt and market value of equity	Leverage is not affected by tax variables Leverage is negatively related to growth rate Firms with free cash flow problems have more debt on the long-run Firms without free cash flow problems have less debt on the short-run Leverage is positively correlated with size Leverage is positively correlated with systematic risk on the short-run
Gul (1999)	Japan	1988 to 1992 5308 observations Debt to market equity Debt to book equity	Leverage is negatively related to growth opportunities Leverage is positively related to size Leverage is negatively related to profitability Leverage is greater for regulated firms
Bianco and Casavola (1999)	Italy	1993 1385 firms (listed/private) Infra-group net debt	Firms that suffer from tighter financial constraints on the external capital market receive more funds from the internal capital market of the group. Infra-group debt is positively related to growth opportunities and negatively related to cash flow
De Miguel and Pindado (2001)	Spain	1990 to 1997 133 firms Long-term debt divided by the sum of long-term debt and market value of equity	In the presence of information asymmetry, leverage is negatively related to cash flow In the absence of information asymmetry, leverage is positively related to cash flow Leverage is negatively related to non-debt tax shields

The pecking order theory is given some evidence by Titman and Wessels (1988) even if it is not their main concern. Shyam-Sunder and Myers (1999) and Frank and Goyal (2003) propose direct tests of the pecking order. For Shyam-Sunder and Myers (1999), the pecking order explains capital structure better than the static trade-off model. Their test is based on a

sample of mature firms for which the pecking order may be well specified. Frank and Goyal (2003) use a larger sample. They observe that net equity financing tracks the financing deficit more closely than net debt financing. This finding is opposed to the pecking order predictions. The financial deficit is the need for external financing computed between two fiscal years. When they restrict their sample to larger firms, they find some aspects of the pecking order but they are not sufficient to validate the existence of a financing hierarchy.

#### *2.5.1.2 International analysis*

Rajan and Zingales (1995) examine the capital structure of firms located in G-7 countries<sup>31</sup> in 1991. They observe that United Kingdom and Germany have the lowest leverage among the G-7 countries. Other countries do not experience great differences in leverage. Japanese firms are found to rely more on external than internal financing. For the other countries, the fraction of external financing relative to total financing ranges from 23 % for the US to 36 % for the UK. Again, no clear distinction can be made among the G-7 countries in exception of Japan. The dominant source of external financing is debt, except for France. The net equity issuance in the US is negative between 1984 and 1991.

In order to check whether the determinants of capital structure in the US keep their explanatory power when confronted to international data, Rajan and Zingales (1995) perform cross-sectional tests where the leverage ratio is regressed on a set of control variables for the year 1991. These variables include the tangibility of assets, the market-to-book ratio, the size of the firm measured by the log of sales and the return on assets. All determinants are significant for US firms and with the theoretically predicted sign. The negative relation between growth opportunities and leverage is observed in all countries. When significant, the determinants in other countries have the same sign as in the US. Overall, the determinants of capital structure found significant in the US also exhibit an explanative power in other G-7 countries although it is not as clearly noticeable. These findings support the preliminary results about the direct comparison of the capital structure measures.

Lane and Milesi-Ferretti (2001) extend the international comparison of the capital structure determinants. They observe a sample of 132 countries in 1997. Their sample includes both developed and developing countries. Their focus is put on explaining the international capital flows to developing countries. They use three variables of financing : debt financing, equity financing and foreign direct investments. They find that equity financing is directly related to

the degree of trade openness in developing countries. Among developing countries, transition economies rely more on debt financing. The ratio of privatisation proceeds-to-GDP explains why, in some countries, equity has increased more than debt financing. More open and more advanced developing countries raise more external financing. The degree of trade openness stimulates all forms of external financing. Foreign direct investment is attracted by the presence of natural resources and privatisation programs. The size of the country and the stock market capitalisation are important variables to attract foreign equity financing.

Booth, Aivazian, Demiguc-Kunt and Maksimovic (2001) compare the capital structure of 10 developing countries<sup>32</sup> to the evidence found in the G-7 countries by Rajan and Zingales (1995). The first difference between developing and developed countries is the lower ratio of long-term debt found in developing countries. In cross-sectional tests of the determinants of capital structure, the coefficients for size, asset tangibility and profitability are similar in developing and developed countries. Overall, theoretical models that explain the capital structure choices in developed countries have also an explanatory power in developing countries. For instance, the fact that, in developing countries, the more profitable the firm, the lower is the debt ratio is consistent with the pecking order hypothesis. Moreover, it outlines the role of information asymmetry as a determinant of the financing decisions. Highly profitable firms in developing countries seem to rely more on internal financing. Their managers like those in developed countries could be inclined to benefit from the discretionary power over free cash flow to spend it in private consumption instead of paying it back to investors.

The results of Booth et al. (2001) need to be considered carefully. More differences occur across developing countries than across G-7 countries. Determinants do not systematically have the expected sign and their general impact in explaining the capital structure remains low. These findings emphasise the combined role of universal determinants of capital structure and country-specific factors to explain financing decisions internationally. International comparisons are also subject to potential biases due to different accounting standards. Correcting for these biases is a matter of data availability and subjective interpretation. Details about the term structure of debt cannot always be obtained. The same is true for a clear distinction between financial and trade credit indebtedness. Nevertheless,

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<sup>31</sup> G-7 countries include the US, Japan, Germany, France, Italy, the UK and Canada

<sup>32</sup> Their developing countries include Brazil, Mexico, India, South Korea, Jordan, Malaysia, Pakistan, Thailand, Turkey and Zimbabwe.

international studies of capital structure outline the existence of “universal” determinants explaining, at least partially, the allocation between debt and equity.

### **2.5.2 Factors affecting equity vs. debt financing decisions**

Factors affecting marginal financing decisions should help to understand what determinants motivate managers to issue debt instead of equity or vice-versa. Investors try to anticipate managers’ actions? In that sense, what variables should they consider to improve their expectations. Timing is an important determinant of financing decision. Information releases, global economic conditions, earnings and growth forecasts are observable variables that should contribute to form investors’ anticipations. Discrete choice methodologies such as Probit or Logit regressions are used to estimate the probability a firm has to issue debt instead of equity and to determine what factors significantly influence this probability. The main findings of the reviewed studies are summarised in Table 2.8.

Not surprisingly, static trade-off, information asymmetry, agency costs and timing influence managers’ choices about external financing. In most cases, different theoretical explanations are not mutually exclusive. Static trade-off contributions in estimating the probability of a given security issue occur through the existence of a target debt ratio, the degree of assets specialisation and taxes. In the US, MacKie-Mason (1990) find that non-debt tax shields like investment tax credit and tax-loss carry-forward are negatively related to the probability to issue debt. Similar non-debt tax shields effect is documented by Saà-Requejo (1996) on the Spanish market. Jung, Kim and Stulz (1996) show that the probability to issue debt increase with the amount of tax payments. Evidence about the influence of a target debt ratio is found by Marsh (1982) in the UK and by Saà-Requejo (1996) in Spain. When firms deviate from their target debt ratio, they are expected to issue the securities that bring their ratio close to the target. Marsh (1982) measures the deviation from the target debt ratio by the difference between current ratio and its 10-year average. He does not use an industry target as theory and evidence about static capital structure determinants could indicate. Consistent with Titman (1984) prediction and Titman and Wessels (1988) findings, MacKie-Mason (1990) and Bayless and Chaplinsky (1991) observe that the degree of assets intangibility is positively related to the probability to issue equity.

Stock return momentum is positively related to the probability to issue equity. This finding is common to MacKie-Mason (1990), Bayless and Chaplinsky (1991), Jung et al. (1996) in the US and to de Jong and Veld (2001) in the Netherlands. It outlines the role of information

asymmetry and specifically the role of adverse selection in managers' external financing decision process. The presence of financial slacks in de Jong and Veld (2001) and a greater assets profitability in Bayless and Chaplinsky (1991) and Saà-Requejo (1996) favours debt financing as it is predicted by the pecking order. The size of the issue proxies the level of information asymmetry. According to Bayless and Chaplinsky (1991) and de Jong and Veld (2001), larger issues are expected to be realised in form of debt offering in order to reduce the costs imputed to information asymmetry.

For Jung et al. (1996), agency theory explains financing decisions better than the pecking order or timing, although information asymmetry and timing variables may have a significant influence on the probabilities to issue debt or equity. Firms with poor investment opportunities have an incentive to depart from the pecking order and to select equity instead of debt financing. By doing so, they reduce the disciplinary role of debt and are able to invest in low profitability projects. Jung et al. (1996) reject the timing hypothesis because they do not find that equity issuers under-perform after of the issue as it would be the case if market and global economic conditions deteriorate afterwards. The influence of agency theory is expressed through the market-to-book ratio. A higher market-to-book ratio denotes of more growth opportunities. It is positively related to the probability of issuing equity. Additional evidence about agency implications are presented by MacKie-Mason (1990) who finds that the presence of uncommitted cash favours debt financing and by de Jong and Veld (2001) who observe that firms subject to over-investment problems are more likely to issue equity.

Timing of security issues affects the financing decision through the performance of the stock market or the level of interest rates (see Marsh, 1982; Bayless and Chaplinsky, 1991), and through the level of global economic indicators (see Jung et al., 1996). Stock market momentum influences positively the probability to issue equity whereas debt issues are anticipated when interest rates are low. Consistent with Choe et al. (1993), better perspectives about global economic conditions favour equity financing. Marsh (1982) outlines the relation between the existence of "hot" issue markets and the probability to issue. The "hot" issue market implication is valid for both debt and equity financing. An active SEO market increases the anticipation of equity issues whereas the probability of debt issue is positively linked to the aggregate level of debt financing.

Bayless and Chaplinsky (1991) observe that the stock price reaction to security offer announcements is significantly explained by the expected issuer's type. Firms that issue debt when they are expected to issue equity experience a positive stock price reaction. When not

anticipated, a debt issue conveys good news to the market. Firms that issue equity when debt is expected exhibit a deeper stock price decline. These findings are consistent with the pecking order. In addition, they underline the importance of market anticipations when considering the informational content and the valuation effect of security issue announcements.

**Table 2.8 : Determinants of the marginal financing decision**

Author	Market	Samples	Determinants of the financing decision
Mackie-Mason (1990)	US	1747 security issues 1977 and 1987	Uncommitted cash favours debt Non-debt tax shields favour equity Earnings volatility favours equity Fraction of tangible assets favours equity Stock return momentum favours equity
Bayless and Chaplinsky (1991)	US	489 debt offerings 337 equity issues 1974 to 1983	Size of the issue favours debt Assets profitability favours debt Decrease in interest rates favours debt Stock return momentum favours equity Fraction of tangible assets favours equity Financial distress favours equity Stock market momentum favours equity
Jung, Kim and Stulz (1996)	US	276 bond issues 192 equity issues 1977 and 1984	Tax payments favour debt Market-to-book ratio favours equity Leading economic indicators favour equity Stock return momentum favours equity
Marsh (1982)	UK	399 debt issues 349 equity issues 1959 and 1974	Existence of target debt ratio Deviation from target debt ratio “Hot” debt or equity markets Low interest rates favour debt Stock market momentum favours equity
Saà-Requejo (1996)	Spain	188 firms 1984 and 1988	Deviation from target debt ratio Non-debt tax shields favour equity Information asymmetry favours private financing Firm size favours public financing High past debt ratio favours public debt
de Jong and Veld (2001)	Netherlands	137 debt issues 110 equity issues 1977 and 1996	Financial slacks favour debt Stock return momentum favours equity Size of the issue favours equity Over-investment favours equity

Saà-Requejo (1996) extends the analysis of the factors affecting the financing decision to the choice between private and public funds. His results indicate that managers care at least as much about the provider of the funds (private or public) as about the type of financing (debt or equity). A greater level of information asymmetry increases the probability of private financing. The negotiation process between managers and private financiers is more efficient in forcing the former to reveal their private information. Larger firms are anticipated to rely more extensively to public financing than smaller ones. If the firm is tracked as a highly levered firm, its financing choice is influenced toward public debt. The findings of Saà-Requejo (1996) are representative of the dual explanation to capital structure choices. Some factors are universal like information asymmetry. Besides, the institutional setting has specific implications. In the case of Spanish firms, bankruptcy law mitigates the bargaining power of managers in negotiating restructuring plans relative to the US law. Furthermore, Spanish tax code allows many types of non-debt tax shields, which increases the tax savings influence in the financing decisions.

### **2.5.3 What do practitioners think about capital structure ?**

In standard tests of capital structure, problems may arise from error in variables, model misspecification or inaccurate proxies. With a survey, the point of view expressed by the practitioners is not objective. It denotes opinions instead of actions. In addition, the conflicts related to the separation of ownership and control are under-estimated as well as the fact that private information could lead to strategic behaviours from managers that they are not willing to communicate.

Graham and Harvey (2001) survey 392 Chief Financial Officers (CFOs) of US firms in 1999 about the cost of capital, capital budgeting and capital structure. I focus on the capital structure decisions. The sample includes small (sales less than 100 millions USD) medium and large firms (sales greater than 1 billion USD). According to other criteria such as PER, industry, long-term debt ratio or credit rating, the sample also covers a wide range of firms. Beside Graham and Harvey (2001), other US surveys include Pinegar and Wilbricht (1989) and Norton (1991) whose samples consist of, respectively 176 and 98 Fortune 500 companies that responded in 1986, and Pruitt and Gittman (1991) with 114 of the 1000 largest US firms in 1988. Their main findings are reported to complement those of Graham and Harvey (2001) and to control for a time pattern in the managerial practices and concerns. Bancel and Mittoo (2002) survey 87 CFOs of European firms, coming from sixteen different countries

about their determinants of capital structure choices. Their study is articulated to allow comparisons with that of Graham and Harvey (2001). The questionnaires were sent between the end of 2001 and the beginning of 2002.

CFOs were asked separate questions about debt, equity, debt maturity, convertible debt, target debt ratios, credit ratings and actual debt ratios. The review of the CFOs' opinions is organised by wide concepts such as the existence of a target debt ratio, financial flexibility, debt financing and equity financing. The main results of the European survey are exposed at the end of the sub-section.

When asked if they are concerned about a target debt ratio, only 10 % of the CFOs surveyed by Graham and Harvey (2001) declare trying to stick to a strict target debt ratio and 34 % to a somewhat tight target ratio or range. Large firms are more likely to stick to a tight target debt ratio. The existence of a target debt ratio is characterised by the concern about credit rating and by an industry norm. Sticking to a given capital structure helps preserving or increasing the credit rating assigned by rating agencies. CFOs refuse considering debt as an incentive to maintain or increase the output level. When firms stick to a target debt ratio, it is considered in book values because it is less subject to temporary variations. CFOs do not refer to tax considerations to set an optimal debt ratio. This result is contested by Norton (1991) who observes that taxes are of primary importance in determining capital structure. Norton (1991) realises his survey in 1986 during the major US tax reform, which can explain the influence of taxes.

The importance of a target debt ratio is also contested by the results of Pinegar and Wilbricht (1989). They observe that only 47 out of 176 firms declare sticking to a target debt ratio while the other 121 firms say following a financing hierarchy. In addition, managers declare that they consider investment and financing decisions simultaneously. They focus on the projected cash flow of the assets to be financed and on their risk to take their financing decisions. Therefore, the stock price reaction to financing decision announcements should reflect changes in the anticipated operating performance, which is partly consistent with the empirical evidence. Overall, little evidence is given to the existence of a target debt ratio although industry clustering exists.

In Graham and Harvey (2001), one important concern of CFOs is to maintain the highest level of financial flexibility. Financial flexibility consists in keeping unemployed capacity in every financing source. It leads CFOs to deviate from the pecking order but it is consistent

with the timing hypothesis. Financial flexibility is particularly important in case of debt financing. CFOs seem to use debt financing in order to save some retained earnings for periods when external financing conditions are poor. Timing long-term debt in periods of low interest rates also reduces the need to refinance in bad times. Thus, the maturity of debt plays a role in maintaining the financial flexibility. The influence of equity issues on financial flexibility is limited to adjusting the debt ratio when it becomes too high. This phenomenon introduces an indirect evidence that CFOs are concerned about managing their debt ratio.

Both Norton (1991) and Pinegar and Wilbricht (1989) underline the concern given to financing flexibility. According to Norton (1991), financial flexibility is reflected in the managers' preferences for financial solutions with less covenants. In Pinegar and Wilbricht (1989), managers declare maintaining the financial flexibility in order to ensure the long-term survivability of the firm. They take it into account when they plan their financing strategy. Besides financial flexibility, managers care about issuing correctly priced securities and they work on maximising the price of outstanding securities. A trade-off may then appear between long-term considerations of financial flexibility and short-term concerns about security prices.

Beside financial flexibility, the main factors affecting debt policy are : credit rating, earnings and cash flow volatility, insufficient internal funds and interest rates. These factors are considered as important or very important by more than 40 % of the CFOs surveyed by Graham and Harvey (2001). The importance given to credit rating and business risk shows that firms are concerned about the risk of default when they adopt their debt policy. Credit rating is especially valued by large, highly levered, not regulated and dividend-paying firms. Insufficient internal funds affecting the debt policy is consistent with the pecking order. However, associated with the level of interest as a measure of debt issue timing, it supports the financial flexibility concern. Bankruptcy or distress costs, the monitoring role of debt or free cash flow disgorgement are not retained as important determinants of the debt policy. CFOs consider convertible debt as back-door equity and they use it as a delayed equity issue. This practice is perfectly anticipated by investors on the US market. The stock price reaction to convertible bond issue announcements is close to the one following equity issue announcements. CFOs also consider that convertible debt can attract investors who are unsure about the company's risk. This is especially true for small firms with large managerial ownership which are expected to face more information asymmetry.

According to Pruitt and Gittman (1991), the most cited determinants of debt financing are the current debt-to-equity ratio, the capital investment requirements, the market interest rates, the level of cash flows and the available working capital. These results outline the influence of the pre-existing capital structure, of the market conditions and of the internal financing capacity. Hence, they are supportive partly of the static trade-off theory and partly of the pecking order and timing. Pinegar and Wilbricht (1989) observe that maximising the market price of securities is the main determinant for the issuance of straight debt while the survivability of cash flow is the one for convertible debt.

Earnings per share dilution, the magnitude of equity under or over-valuation, recent stock price increases, providing shares to employees and diluting holdings of certain shareholders represent the main factors affecting equity financing. They are considered as important or very important by more than 50 % of the CFOs surveyed by Graham and Harvey (2001). The importance given to earnings dilution is somehow surprising. Theory predicts that earnings are not diluted if the firm earns the required return on the use of the funds. Firms that care the most about earnings dilution in case of equity financing are large, paying dividends or regulated. When the CEO has a higher degree of education (MBA or more), he or she is less concerned about earnings dilution. Timing seems to play an important role in the equity financing. Equity under or over-valuation comes in second after earnings dilution and the empirically well documented pre-issue stock price run-up comes in third. These results are consistent with the adverse selection argument that firms that could be undervalued wait for a period of strong price increase to issue overpriced equity. They are also supportive of the cumulative timing explanation to capital structure choices presented by Baker and Wurgler (2002).

Pinegar and Wilbricht (1989) also outline the importance of the ownership structure in the equity financing decision. Avoiding ownership dilution is the main concern of managers when they issue outside equity. Pruitt and Gittman (1991) observe the ranking of the determinants of equity financing. Capital investment requirements come in first, which denotes the link between investment and financing policies. Though, the current debt-to-equity ratio is ranked second, which underlines the concern about an optimal capital structure. The current market share price, the level of cash flow and the market interest rates are the next most cited determinants. They reflect that managers care about market conditions and internal financing when they decide to issue outside equity, which is consistent with both a

financing hierarchy and a time-varying information asymmetry that could break the financing hierarchy.

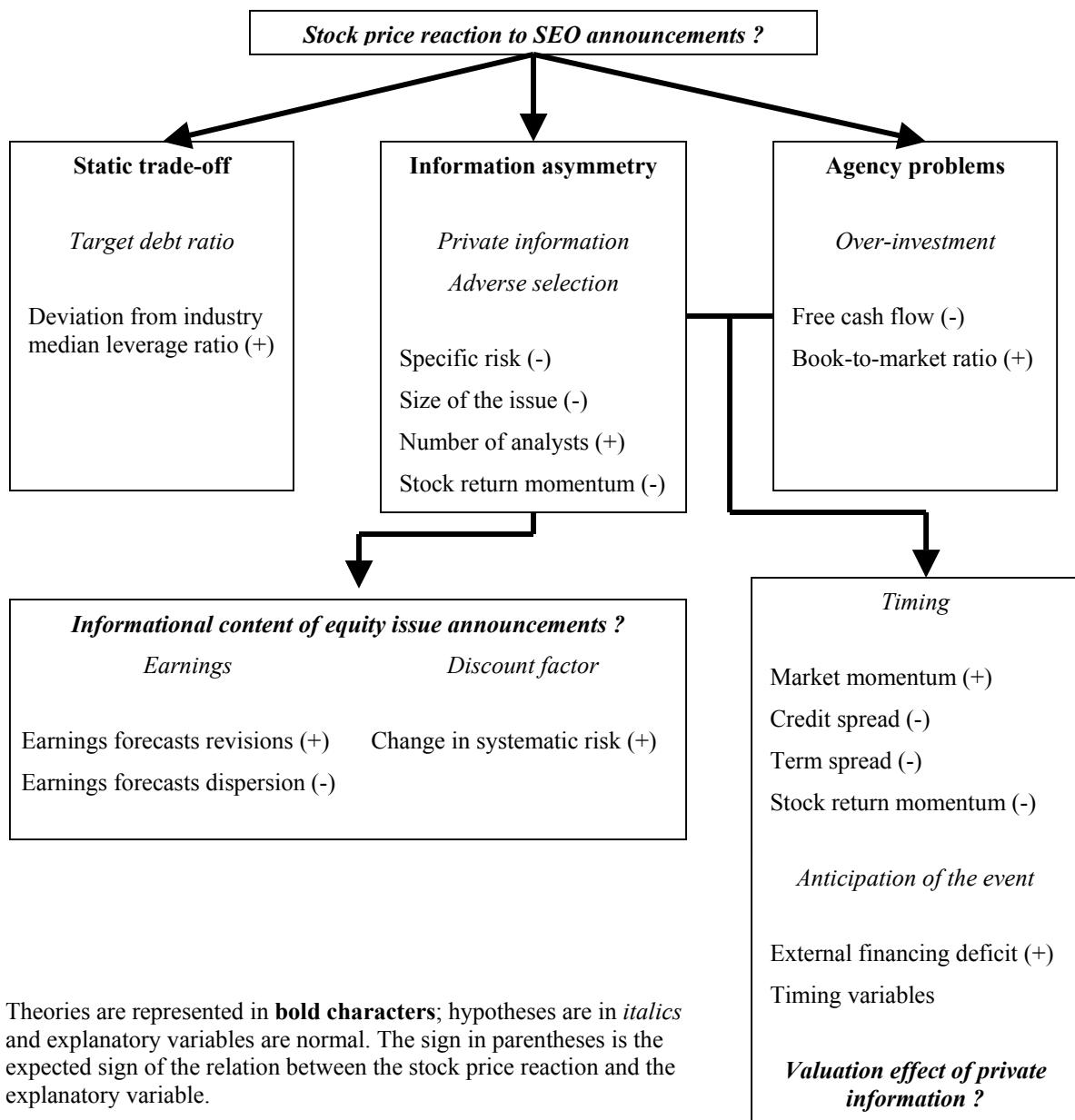
According to Bancel and Mittoo (2002), capital structure determinants across Europe are similar to those in the US. Debt financing decisions are based on considerations about financial flexibility and credit rating. Short-term debt is issued until long-term rates decline and long-term debt becomes advantageous. In that sense, European CFOs show as much concern about timing their financing decisions as their US counterparts. Matching the maturity of debt with that of assets is also of relevant importance. Earnings per share dilution and stock current over or under-valuation are the main determinants of equity financing decisions. Like for debt, timing is important. Financial flexibility shows through the concern of maintaining a target debt ratio. Convertible debt issues are considered as delayed equity issues by most of the surveyed European CFOs. This financing sources is generally used when equity is under-valued. Overall, consistent with the US evidence, moderate support is given to static trade-off. CFOs are concerned about trade-off only once in a while. This may be due the fact that trade-off conditions do not change much over time. CFOs pay more attention to market conditions when they make their financing decisions. Agency theory, pecking order and industry norms are given only little evidence in Europe.

The similarity between European and US determinants of capital structure choices could be misleading. Bancel and Mittoo (2002) document substantial differences within European countries. Financial flexibility, tax advantage of interest deductibility, the matching of debt and assets maturities and the timing of short-term debt are the factors with the greatest differences across countries. The origin of the legal system seems to play a role in the external financing decision process. However, the quality of legal environment cannot explain those differences by itself. On one hand, French and German civil law countries have similar responses on debt and equity policies although their legal systems differ. In fact, their responses are significantly different only concerning the use of short-term debt to wait for advantageous long-term borrowing conditions. On the other hand, English law countries exhibit different responses to the US sample of Graham and Harvey (2001) especially about the tax advantage of interest deductibility and about the matching of debt and assets maturities. Overall, the differences across European countries do not appear to be driven by firm-specific or industry-specific considerations.

## 2.6 Empirical evidence in summary

When observed, negative stock price reactions to equity issue announcements are explained by information asymmetry, agency and timing variables. Institutional setting is the main cause for non-negative valuation effects. The influence of institutional setting appears through specific ownership structure, larger shareholders' take up, motivations to issue different from financing/investing decisions, different corporate governance practices or different managers' objectives.

**Figure 2.2 : Hypotheses to explain the valuation effect of SEO announcements**



Theories are represented in **bold characters**; hypotheses are in *italics* and explanatory variables are normal. The sign in parentheses is the expected sign of the relation between the stock price reaction and the explanatory variable.

Figure 2.2 illustrates the main theories and hypotheses that explain stock price reactions to SEO announcements. Even if static trade-off is not given much credit in the empirical literature, deviations from an industry target debt ratio constitutes a control variable for industry clustering in capital structure choices. The explanatory power of information asymmetry and agency costs finds a greater support in the US, in France and in the Netherlands. The presence of information asymmetry implies the release of managers' private information about future earnings or about the risk level of new investment projects. Simultaneously, information asymmetry associated with agency costs concerns could lead managers to time their equity issue. Timing implies that given conditions exist that favour equity offerings. If they can identify the factors that proxy these favourable conditions, investors may be able to anticipate the issue and its informational content. Applying a conditional methodology to the explanation of the announcement effect allows to estimate the contribution of private information to the valuation effect. By doing so, it could be possible to differentiate information asymmetry effect from both agency and timing effects.

The concern of CFOs about preserving the financial flexibility introduces the concept of an alternative use of financing sources. This concern could come from a longer managers' horizon than the one predicted by marginal financing decision models. The goal of CFOs appears to be the maintain of the lowest possible long-term cost of capital. CFOs may find it optimal to use debt financing even if at that time internal financing is sufficient and cheaper. By doing so, they preserve the internal financing capacity for periods of higher costs of debt. From time to time, CFOs have to issue equity to preserve their debt capacity as well. The motivations behind these operations are not the financing of a new investment project but they are pure capital structure operations. Their announcement is not supposed to include any private information about the value of investment opportunities. It should not constitute a bad signal about the inability of future earnings to sustain the investment policy. If these capital structure operations could be identified and separated from financing/investing ones, different stock price reaction could be noticed. Nonetheless, the fact that given equity issues may not be informative about investment opportunities does not mean that these operations are not timed. They should occur when the cost of equity is low, when the stock market is performing well, and when the issuer's stock price is not undervalued.

## **Chapter 3 : Stock price reaction to equity issue announcements revisited**

The aim of this chapter is to cover most aspects of the SEO announcement valuation effect. Is the negative stock price reaction a characteristic to all issuers or is it restricted to a given type? What theories have the greater explanatory power? If SEO are informative events, what does the information deal with? Future cash flow or risk? In addition to that standard methodology, I implement a conditional methodology in order to take into account the fact that the event could be partially and progressively anticipated by the market. It should reflect to what extent the announcement valuation effect is a surprise to the investors. The originality of this methodology lies in the selection process of a non-event sample that should outline the anticipation effect.

The review of theoretical models in Chapter 1 outlines, roughly summarising, two main strands. First, following Modigliani and Miller (1958), capital structure choices should be irrelevant to firm value. Second, when the equity financing decision is related to an investment project, investors could modify their expectations about the firm market value. The modification is induced by the event implications in terms of information asymmetry and agency problems. The empirical evidence presented in Chapter 2 gives support rather to the latter strand and it introduces the notion of timing, to mitigate that negative announcement effect. However, no particular effort is spent in differentiating operations that finance a specific investment project from the ones that are a pure capital structure matter. These pure capital structure operations are consistent with the CFOs opinion that financial flexibility is one major concern when planning the financing policy. Equity issues could be realised not to finance a new investment project but to improve the capital structure. The offering proceeds would then be spent in going concern investments or to repay debt. I build the “use of the proceeds” argument on this typology of equity issue motives. It relates the intended use of the funds raised through the equity offer to the impact of that financing decision on the firm value.

“Capital Structure” offerings group a wide range of motives to issue equity : repaying debt, improving the capital structure, preserving a full financing capacity to seize every profitable investment opportunity in the future, increasing the cash and enlarging the shareholders’ basis. Marginal financing decisions taken for such motives fit well in the capital structure irrelevancy framework. If an optimal capital structure exists, an equity issue that moves the

debt ratio closer to the target should have a positive impact on the firm value. However, Brennan and Schwartz (1984) and Kane et al. (1984) argue that the optimal allocation between debt and equity may not be a fixed ratio but a range within it marginal financing decisions do not imply a significant change in the firm value. Consequently, one could reasonably expect announcement of “Capital Structure” equity issue to have no effect on the stock price.

“Financing New Investment” offerings are the operations realised to finance a specific investment project. For such equity issues, the information released at that time addresses to a capital structure matter as well as to the investment opportunity. Thus, the announcement effect can differ from the one observed from pure capital structure changes. Information asymmetry could be greater because it concerns both the value of assets in place and the project NPV. The adverse selection model of Myers and Majluf (1984) is developed on the assumption that the SEO proceeds serve to finance an investment project. Thus, the stock price reaction to “Financing New Investment” offerings announcements is expected to be negative if information asymmetry and adverse selection are its determinants. According to the agency theory, the investment project may not be optimal for shareholders. It could suit better the managers’ interests. In that case also, the stock announcement valuation effect is expected to be negative.

Capital structure irrelevancy and the static trade-off theory on one side, information asymmetry and agency theory on the other side justify that the stock price reaction to equity offerings announcement could be different relative to the use of the proceeds. Timing considerations, especially those about market and macro economic conditions, are expected to affect both types of operations. Indeed, if a downturn in the economy is expected, all firms’ future earnings are more inclined to decrease and an equity issue could be appropriate to compensate for the future loss in the internal financing capacity. It maintains the financing flexibility during the downturn phase for “Capital Structure” issuers. It allows the financing of a specific project when the internal financing capacity is expected to be insufficient for “Financing New Investment” issuers. Controlling for the use of the proceeds allows a better analysis of the determinants of the marginal financing decision on the firm market value.

Section 3.1 presents the French SEO market: the sample formation, the issuers’ characteristics and a test of seasonality in the French equity issues market. Section 3.2 addresses to the estimation of the SEO announcement valuation effect. A standard cross-sectional analysis is performed to verify what theories contribute to explain the stock price

reaction. The focus is put on examining the informational content of the equity issues announcement and its timing. The presence of static trade-off and agency costs effects are also controlled for. Section 3.3 is dedicated to the implementation and to the results of the conditional event study. Concluding remarks about the short-term analysis of the equity financing impact on firm value appear in Section 3.4.

### ***3.1 The French SEO market***

#### **3.1.1 Sample formation**

Rights offerings of common stocks is the most commonly used method to issue equity in France. Besides, two-third of French public offerings involve an international placement which make them different from rights offerings. The issue of units – a mix of common stock and warrants – is also more likely to introduce a bias in the computation of the stock price reaction. Because of the difficulty to value the warrant, units offerings may be used to make the public offering process less risky (see Chollet and Gajewski, 2001). Public and units offerings are worth to be studied separately from rights offerings of common stocks. However, the data requirements eliminate too many of these operations to form samples of relevant size.

Between January 1984 and December 2000, French firms realise 436 rights offerings of common stocks (“All rights” sample). To be included in the final sample, issuers must be present in the *AFFI* database for operations realised before July 1, 1991 and in *Datastream*<sup>33</sup> for operations made from July 1, 1991 on<sup>34</sup>, from which daily prices, dividends, market value and volumes are collected. Each issuer must have data available at least from one year before the operation until one year after. Firms with more than 50 % of missing daily returns are excluded. A daily return is defined as missing when both the daily price variation and the volume of trades are equal to zero. Information about the issue modalities and the use of the proceeds are taken from the issuing prospectus<sup>35</sup>. When these data are unavailable at the COB, the SBF and at the firm itself, the operation is eliminated. Balance sheet and profit and loss statements must be available for the last five fiscal years. This requirement is reduced to

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<sup>33</sup> I thank D. Isakov (HEC-Genève) for the access to the database.

<sup>34</sup> Before the nineties, the number of French firms included in *Datastream* is low and it involves only the largest companies, less than a hundred. The *AFFI* database covers 863 firms in June 1991 against 746 in *Datastream*. At this point in time, the transition from one base to the other can be made without affecting the continuity of returns time series for both event and matching firms.

three years for firms listed on the Nouveau Marché. The final “Short-term” sample includes 198 operations with 98 for pure capital structure matters (“Capital Structure” [CS]) and 100 for financing a new investment project (“Financing New Investment” [FNI]).

**Table 3.1 : Formation of the French rights offerings samples**

<b>Sample</b>	<b>Observations</b>
<i>All operations 1984-2000</i>	<i>649</i>
Issues of certificates of investment	- 39
<i>“All equity” issues</i>	<i>610</i>
Units offerings, both cash and with rights	- 93
Direct cash offerings of common stocks	- 64
Rights offerings of stocks combined with a capital reduction	- 17
<i>“All rights” sample</i>	<i>436</i>
Operations excluded because of issuing prospectus unavailability	- 155
Operations excluded because of missing book data	- 32
Operations excluded because of more than 50 % of missing daily returns	- 51
<b><i>“Short-term” sample</i></b>	<b><i>198</i></b>
Offerings in the “Short-term” sample realised between 1984 and 1986	- 26
Operations with missing I/B/E/S data	- 62
<b><i>“I/B/E/S” sample</i></b>	<b><i>110</i></b>

All operations, their type and their dates are identified from the annual SBF report “L’Année Boursière”, except for the year 2000 when they are taken from the “Commission des Opérations de Bourse” (COB) communicates (available at <http://www.cob.fr>). Market data are taken from the AFFI database for operations prior to June 1991 and from Datastream for operations realised since June 1991. Book data come from the “Dictionnaire Dafa Desfossés des Sociétés”. I/B/E/S data are taken from the International History Tape.

The use of financial analysts data reduces the sample in two ways. First, the I/B/E/S international history tape covers French firms only from January 1987. Second, not all issuers have earnings forecasts available in the database. Therefore, when earnings forecasts are concerned, the sample entails 110 operations (53 CS and 57 FNI). Table 3.1 summarises the detailed sample formation.

The yearly distribution of French equity issues is presented in Panel A of Table 3.2. It is high between 1984 and 1987 for both “All equity issues” and “All rights” columns. From 1988 on, the annual number of rights offerings range between 12 and 21, except for 1991 (35 operations) and 1994 (44 operations). The Panel B of Table 3.2 shows that equity offerings are realised mostly between April and June (almost 40 % of the rights issues) and in the last

<sup>35</sup> I thank Grégoire Henriotte at the COB and Marc Douëzi at the SBF for their help in collecting the issuing

quarter of the year (31 % of the rights issues). The second quarter of the year includes most of the Shareholders' Annual Meetings, which often coincide with the Extraordinary Meetings. Thus, it is not surprising to observe numerous SEO concentrated during this period.

**Table 3.2 : Equity issues in France from 1984 to 2000**

	<b>“All equity” issues</b>	<b>“All rights” sample</b>	<b>“Short-term” sample</b>	<b>“I/B/E/S” sample</b>
<i>Panel A : Yearly distribution of equity issues</i>				
1984	37	34	7	--
1985	47	41	9	--
1986	63	46	10	--
1987	50	44	16	9
1988	20	18	9	5
1989	26	21	13	9
1990	26	18	9	3
1991	50	35	18	13
1992	31	20	9	6
1993	33	19	8	3
1994	57	44	24	15
1995	19	14	7	5
1996	22	18	11	10
1997	25	18	14	12
1998	28	12	10	6
1999	28	18	11	9
2000	48	16	13	5
<i>Panel B : Intra-year repartition</i>				
January	28	17	15	8
February	33	23	11	7
March	34	15	9	6
April	41	33	19	7
May	56	49	34	22
June	115	81	28	16
July	55	39	11	8
August	21	14	2	1
September	42	30	16	7
October	65	48	26	15
November	63	44	18	9
December	57	43	9	4
<i>Total</i>	<i>610</i>	<i>436</i>	<i>198</i>	<i>110</i>

reports.

**Table 3.2 : continued**

	“All equity” issues	“All rights” sample	“Short-term” sample	“I/B/E/S” sample
<i>Panel C : Industry repartition</i>				
Natural resources and construction	54	42	14	6
Food	16	13	7	5
Transformation industries	62	45	20	9
Manufacturing industries	114	75	39	22
Transports	30	23	10	4
Communication and internet	15	4	2	2
Retail	47	31	21	13
Bank and insurance	90	68	22	13
Real estates	35	28	14	6
Other financial companies	55	44	17	4
Services	79	55	30	25
Utilities, services to the community	13	8	2	1
<i>Total</i>	<i>610</i>	<i>436</i>	<i>198</i>	<i>110</i>

Equity issues as well as the issuing dates are taken from the annual SBF report “L’Année Boursière”. The samples are formed according to the process described in Table 3.1. The industry classification is the Worldscope one-digit SIC codes to which Transport, Bank and insurance, Real estates, and Utilities and services to the community are added.

The repartition of French issuers across industries is presented in Panel C of Table 3.2. It is based on the industry classification of Worldscope one-digit SIC codes. Four additional categories are created. Transport is separated from communication and internet. Banks and insurance companies as well as real estates are differentiated from other financial firms. Finally, utilities and services to the community (medical care facilities or laboratories and educational services) are taken out of other private services. Manufacturing industries, Banks and insurance companies, and Services are the most represented industries. When the sample of rights issuers is compared to the industrial structure of the entire French economy, no significant difference is observed ( $\chi^2$  test  $p$ -value of 0.37).

**Table 3.3 : Differences across samples**

<i>p</i> -values	<b>“All equity” vs. “all Rights” sample</b>	<b>“All rights” vs. “Short-term” sample</b>	<b>“Short-term” vs. “I/B/E/S” Sample</b>
Yearly distribution	0.10	0.40	0.71
Intra-year repartition	0.87	0.60	0.66
Industry repartition	0.69	0.41	0.51

Sample formation is described in Table 3.1. *p*-values of  $\chi^2$  test are in italic.

Since the size of the samples has been reduced because of data unavailability, biases could have been introduced. Potential differences across samples relative to the three variables, yearly distribution, intra-year repartition and industry repartition are tested. Table 3.3 presents the  $\chi^2$  test *p*-values. None of the *p*-values are close or inferior to the 5 % level. The excluded observations do not significantly affect the composition of both “Short-term” and “I/B/E/S” samples.

#### *3.1.1.1 Characteristics of the French equity issuers*

Table 3.4 entails the descriptive statistics of “All equity” issues and the three rights offerings sample. In Panel A, mean and median issuer size, *BM* ratio, offering size and issuing discount are displayed. As the required amount of information about the issuers increases, the mean and median size increase as well, which is not surprising. Analysts are more likely to follow large firms. Thus, the “I/B/E/S” sample exhibits a median market capitalisation that is almost twice the one of the “All rights sample”. Differences between mean and median values indicate that samples distributions are highly skewed to the right. Market value of equity is the denominator of both *BM* ratio and relative offering size, which explains why both variables decrease when the proportion of large firms in the sample increases. The average issuing discount of 22 % is consistent with the findings of Gajewski and Ginglinger (2002).

**Table 3.4 : Descriptive statistics of French equity issuers**

	Obs.	Issuer size (millions FRF)	BM ratio	Relative size of the offering	Issuing discount
All equity issues (1984-2000)	610				
mean		5364	0.86	0.42	0.18
median		795	0.50	0.24	0.16
“All rights” sample (1984-2000)	436				
mean		3998	0.85	0.43	0.22
median		626	0.53	0.20	0.21
“Short-term” sample (1984-2000)	198				
mean		6639	0.77	0.37	0.20
median		910	0.51	0.18	0.20
“I/B/E/S” sample (1987-2000)	110				
mean		10103	0.70	0.31	0.20
median		1145	0.55	0.17	0.22

The issuer size is given by the market value of equity at the pre-SEO month taken from Datastream. The book-to-market (BM) ratio is computed as the last pre-SEO fiscal year book value of equity divided by the market value of equity at the pre-SEO month. The book value of equity is taken from the “Dictionnaire Dafsfa-Desfossés des Sociétés”. The relative size of the offering is the raw SEO proceeds divided by the market value of equity at the pre-SEO month. The raw proceeds is taken from the issuing prospectus. The issuing discount is equal to  $1 - \frac{\text{issuing price}}{\text{last market price}}$  and it is taken from the SBF report “L’Année Boursière”.

A closer examination of the characteristics of issuers in the “Short-term” sample is shown in Table 3.5, the focus being put on potential differences relative to the use of the proceeds. The Panel A resumes data about market capitalisation, book-to-market ratio, the offering size, and the issuing discount. The first four columns show means and medians of both sub-samples while the last column exhibits their difference in medians. No differences are detected according to the use of the proceeds. The average “Capital Structure” issuer is similar to the average “Financing New Investment” issuer.

In Panel B of Table 3.5, data about issuers’ financial structure are exposed. The debt-to-assets ratio, the cash-to-assets ratio and the cash flow-to-assets ratio are computed, at the end of the pre-SEO fiscal year, with accounting data taken from the *Dictionnaire Dafsfa Desfossés des Sociétés*. “Capital Structure” issuers appear to be significantly more levered than “Financing New Investment” firms. They also have less cash and less cash flow.

**Table 3.5 : Characteristics of the “Short-term” sample of rights offerings**

	"Capital Structure"		"Financing New Investment"		Difference
	98 observations		100 observations		CS - FNI
	mean	median	mean	median	median
<i>Panel A : General characteristics</i>					
Issuer size (millions FRF)	5344	654	6959	1070	-416 (-1.17)
Book-to-market ratio	0.84	0.56	0.68	0.50	0.04 (0.58)
Relative size of the offering	0.32	0.22	0.43	0.16	0.06 (1.32)
Issuing discount	0.19	0.19	0.21	0.21	-0.02 (-0.58)
<i>Panel B : Financial characteristics</i>					
Debt-to-assets ratio	0.32	0.29	0.24	0.21	0.08 <sup>a</sup> (3.10)
Cash-to-assets ratio	0.06	0.03	0.08	0.06	-0.03 <sup>a</sup> (-3.36)
Cash flow-to-assets ratio	0.02	0.03	0.08	0.09	-0.06 <sup>a</sup> (-4.78)
<i>Panel C : Systematic risk characteristics</i>					
$\beta_{E\ OLS}$	0.80	0.73	0.73	0.71	0.02 (0.15)
$\beta_{A\ calculated}$	0.34	0.27	0.44	0.36	-0.09 (-1.56)
$\Delta\beta_{E\ OLS}$	-0.18 (-1.09)	-0.13 (-0.61)	0.19 <sup>a</sup> (2.58)	0.12 <sup>b</sup> (1.80)	-0.25 <sup>a</sup> (-2.29)
$\Delta\beta_{E\ calculated}$	-0.17 <sup>a</sup> (-4.02)	-0.06 <sup>a</sup> (-6.06)	-0.09 <sup>a</sup> (-7.05)	-0.04 <sup>a</sup> (-8.80)	-0.02 (-0.62)
$\Delta\beta_{E\ OLS} - \Delta\beta_{E\ calculated}$	-0.01 (-0.09)	0.04 (0.40)	0.28 <sup>a</sup> (3.76)	0.18 <sup>a</sup> (2.60)	-0.14 <sup>b</sup> (-1.86)

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

The issuer size, the book-to-market (BM) ratio, the relative size of the offering and the issuing discount are defined in Table 3.4. Financial characteristics are expressed in book values taken from the “Dictionnaire Dafsadesfossés des Sociétés”. Following Fowler and Rorke (1983),  $\beta_{E\ OLS}$  is estimated from a market model with five leads and five lags on the market return, over the pre-SEO period [-255;-6].  $\beta_{A\ calculated}$  is computed with the Hamada (1972) relation (without tax).  $\Delta\beta_{E\ OLS}$  is the difference in beta between pre and post-SEO estimation periods.  $\Delta\beta_{E\ calculated}$  is the variation in equity beta implied by the SEO, other things equal. *T*-stats are given in parentheses below mean values, *z*-stat appear in parentheses below median values and Wilcoxon rank test statistics are given in parentheses below median differences in the last column.

These findings appeal three remarks. First, the equity issue for the “Capital Structure” sample is expected to lower the leverage ratio, to improve cash and to compensate for a lower cash flow. Consequently, it is consistent with either the pecking order and the financial flexibility argument. Second, on average, “Financing New Investment” issuers select an equity offering while other financing sources seem to be available to them. Following Myers and Majluf (1984), they should be more penalised by the market when they announce their financing decision. Third, because they differ in leverage, “Capital Structure” and “Financing New Investment” issuers could have different equity systematic risk coefficient. This distinction has to be checked carefully when interpreting the stock price reaction to the offering announcement.

Systematic risk characteristics of equity issuers are exposed in Panel C of Table 3.5. The market model equity beta,  $\beta_{E\ OLS}$ , is estimated, following Fowler and Rorke (1983), with five leads and five lags over a 250-day period [-255;-6] prior to the SEO announcement. This methodology allows to take into account that information diffuse slowly into stock prices (see Denis and Kadlec, 1994). The equity beta is not different across issuer’s types. Neither is the assets beta,  $\beta_{A\ calculated}$ , calculated with the Hamada (1972) relation (without tax) :

$$\beta_E = \beta_A \left( 1 + \frac{D}{E} \right) \quad (3.1)$$

where  $\beta_E$  is the systematic risk of equity,

$\beta_A$  is the unlevered firm systematic risk or the firm business risk,

$D$  is the book value of financial debt,

$E$  is the book value of equity.

More interesting is the variation in equity systematic risk around the SEO announcement. The estimated variation in equity beta,  $\Delta\beta_{E\ OLS}$ , represents the difference between the equity beta estimated after the SEO announcement, over the period [+6;+255] and the equity beta estimated prior to the announcement. The estimated equity beta increases significantly after the announcement only for “Financing New Investment” issuers, this variation being significantly greater than the one of “Capital Structure” issuers. At the same time, the variation in equity beta implied by the change in the financial structure following the equity issue is significantly negative for both issuer’s types. The difference between the estimated and the calculated variation in equity beta is not different for “Capital Structure” issuers while it is

significantly positive for “Financing New Investment” issuers. These findings are consistent with the fact that the new investment project financed with equity increases the business risk of “Financing New Investment” issuers in a proportion greater than the implied reduction in the financial risk. Not presented here, the equity issue announcement does not convey any information about the specific risk since its estimate is not affected by the estimation period (prior to or after the SEO announcement).

In summary, “Capital Structure” issuers seem to be more restricted on alternate financing sources than “Financing New Investment” ones. Otherwise, they do not appear to be different. In that sense, the use of the proceeds seems to capture the difference in financial structure. It may also constitute a good indicator to discriminate the two strands of capital structure theory, capital structure irrelevancy and valuation impact of marginal financing decisions. When it is explicitly notified, equity appears to be dedicated to the financing of risky investment projects. Furthermore, “Financing New Investment” issuers deliberately select equity financing although they are less levered and have more cash and cash flow than “Capital Structure” issuers. Thus, one could expect “Financing New Investment” issuers to be more exposed to adverse selection or agency problems.

### *3.1.1.2 The dateline of the issuing process*

The French equity issuance process is regulated by the Code de Commerce, Livre II, Chapitre V, articles L225-127 to L225-149. The Extraordinary Shareholders’ Meeting is the only competent organ to authorise a SEO. The decision must be taken at the qualified majority of 2/3. The board of directors is given the authorisation to realise a SEO within a 5-year period. Current shareholders are granted subscription rights on a pro-rata basis. Once the authorisation has been voted, the board of directors decides when and at what conditions the equity issue will take place. An issuing prospectus has to be elaborated and submit to the “Commission des Opérations de Bourse” (COB). Once the COB has given its approval (visa COB), an official announcement is made in the “Bulletin des Annonces Légales Officielles” (BALO<sup>36</sup>) and the prospectus is publicly available from the issuer and the members of the underwriters’ syndicate. The subscription period for a rights offering must last at least ten business days . This period can be shortened as soon as all the rights have been exercised or that the issue is fully subscribed. There is also a legal minimum period of seven days between the BALO date and the issue itself.

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<sup>36</sup> The BALO is the weekly official journal of French legal announcements.

One central problem in event studies is the selection of the announcement date. When does the market integrate the information conveyed by the event into the stock price? In the case of French SEO, two official dates are available: the visa COB date and the BALO date. The visa COB date precedes the BALO date by at least one and up to nineteen days (median equals four days). Therefore, the COB date is preferred to the BALO as the first announcement date. The visa COB is also the first announcement that includes the complete modalities of the issue. Media may have published news about the operation but this kind of communications has two drawbacks. First, it is rarely complete. The exact proceeds, the issuing price, the modalities of the subscription rights are not known. Second, the operation has not been approved by the COB, which means that every information is susceptible to be modified. Of course, these press releases help investors anticipate the event. However, the main informational content remains in the visa COB announcement.

Figures about the timeline of the “Short-term” sample are presented in Table 3.6. Panel A shows that about 70 % of the issues are realised within the year following the EM decision. Less than 15 % of the operations occur during the second year. The last 15 % are distributed among years 3 to 5. These figures indicate that managers, to a large extent, do not wait for years before realising the SEO. No differences are noticeable between both issuers’ type. Panel B of Table 3.6 describes the median length of the different periods during the issuing process. The median time between the EM authorisation and the visa COB equals 162 days, showing that half of the operations are done within a 6-month period after the shareholders’ approval.

The median time between the visa COB and the first day of the subscription rights are traded lasts twelve days, which roughly corresponds to the median number of days between the visa COB and the publication in the BALO (four days) plus the legally required seven days between the BALO date and the first trading day of the rights. The median rights trading period is twenty calendar days while the minimum legally required period is ten trading days. All in all, the median time between the authorisation to issue and the end of the subscription rights trading period counts 194 days. Rights offerings are not decided and implemented very quickly. In that sense, they are less likely to constitute real surprises for investors. These characteristics make them even more interesting to examine through a conditional event study methodology.

**Table 3.6 : Timeline of the “Short-term” sample of rights issuers**

	“Short-term” sample	“Capital Structure”	“Financing New Investment”
<i>Panel A : Percentage of offerings occurring during the</i>			
first year after EM	69.84	70.49	69.23
second year after EM	14.29	14.75	13.85
third year after EM	8.73	9.84	7.69
Fourth year after EM	3.97	1.64	6.15
fifth year after EM	3.17	3.28	3.08
<i>Panel B :Length of the different periods of the issuing process (days)</i>			
Median time between EM and visa COB date	162	162	162
Median time between visa COB and first trading day of the rights	12	12	11
Median length of the rights trading period	20	20	21

EM is the date of the Extraordinary Meeting when the authorisation to raise new equity is voted. Visa COB date is the day when the COB approves the equity issue. The rights trading period corresponds to the time when subscription rights can be traded or exercised

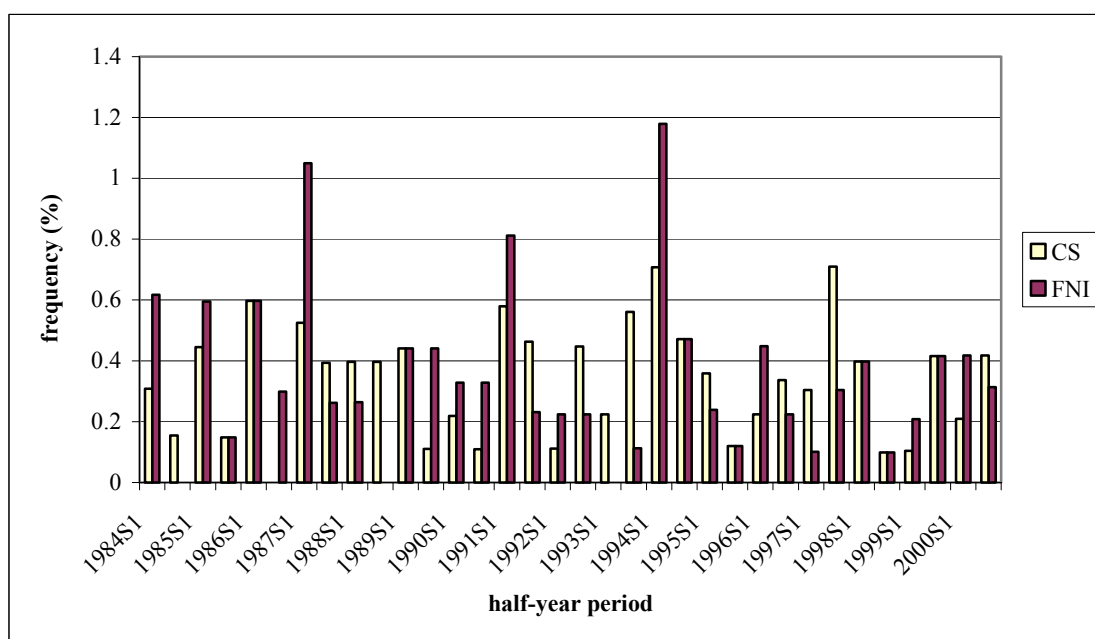
### 3.1.2 Seasonality in the French SEO market

Hot market seems to be a characteristic of US SEO; see Bayless and Chaplinsky (1996). Equity issues are not uniformly distributed over time. The purpose of this section is to control for the presence of seasonality in the French SEO market. Then, if the phenomenon is detected, financial analysts’ earning forecasts are used to attempt to explain it in the manner of Rajan and Servaes (1997) for IPO.

#### 3.1.2.1 Frequency of rights offerings

The frequency of rights offerings is examined through the number of operations aggregated within half-year horizons and divided by the number of firms listed on the French market at the end of the previous year. Half-year numbers of SEO are normalised to avoid any bias due to the growth of the number of listed firms throughout time. The SEO frequency is given as a percent of the listed companies. The period between January 1984 and December 2000 is split into thirty-four 6-month periods. The half-yearly frequencies of both issuer’s types samples are illustrated in Figure 3.1. Firms may take advantage of hot issue markets to concentrate their operations, creating time dependencies across events.

**Figure 3.1 : Half-yearly frequency of French equity issues with rights**



If seasonality exists on the French SEO market, equity issues should not be uniformly distributed over time. The fact the most shareholders' Extraordinary Meetings are held during the first half of the year, on the same day as the General Meeting could also introduce a seasonality effect, as it is suggested by the intra-year repartition shown in Panel B of Table 3.2. Results of the tests about the presence of seasonality are presented in Table 3.7. Operations in the "Short-term" sample are not uniformly distributed (first row of the Table). When the sample is split according to the use of the proceeds, only "Financing New Investment" issues are not distributed uniformly. However, the difference between both sub-samples is not significant. The same pattern is observed for the repartition between first and second half of the year (second row of the Table). In this case, the difference between samples is almost significant at the 5 % level.

**Table 3.7 : Tests of the issuing frequency on the French market**

<i>p</i> -values	"Short-term" sample	"Capital Structure"	"Financing New Investment"	CS - FNI
Uniformly distributed ?	0.001 <sup>a</sup>	0.688	0.004 <sup>a</sup>	0.852
No half-year effect ?	0.004 <sup>a</sup>	0.493	0.001 <sup>a</sup>	0.061

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

*P*-values are computed from unilateral chi-square tests. The first row test if equity issues are uniformly distributed over the 1984 – 2000 period. The second row tests if the number of equity issues realised in the first half of the year is equal to the number of the second half.

The seasonality of “Financing New Investment” could come from the fact that they are concentrated within the first half of the year. These equity issues are expected to face a higher costs of adverse selection and information asymmetry. Therefore, managers could attempt to mitigate these costs by timing the issue soon after the release of the audited yearly financial statements that mostly occurs within the same period. However, this explanation is not unique and the seasonality could be due to economic conditions or hot issue periods. These hypotheses are tested in the next sub-section.

### *3.1.2.2 Financial analysts’ earnings forecasts and SEO seasonality*

Macroeconomic conditions affect the timing of the equity financing decision; see Choe et al. (1993), Kaplan and Levy (2001), Korajczyk and Levy (2003). To test the seasonality of French equity issues, the series of half-year aggregate numbers of SEO is used as the dependent variable. The period starts July 1987 because of the non-availability of earnings forecasts data prior to 1987<sup>37</sup>. The series of half-year SEO numbers is regressed on lagged macro indicators and measures of financial analysts’ over-optimism. The macro indicators include the stock market past performance,  $Mrunup$ , the credit spread,  $\Delta credit$ , and the term spread,  $\Delta term$ . The stock market past performance is the buy and hold return computed over the 6-month period preceding that of the SEO. It is positively related to the business cycle and thus, the greater it is, the more issues there should be. The credit spread is the average difference between 10-year French corporate bond yield and 10-year French government bond yield<sup>38</sup> taken over the half-year period preceding that of the SEO. It is interpreted as a proxy for the current economic conditions<sup>39</sup>. The higher it is, the greater is the chance to be in a downturn phase of the economy. As shown by Choe et al. (1993), equity issues tend to be concentrated in the expansion phase of the business cycle. Thus, one can expect the credit spread to be negatively correlated with the number of equity issues. The term spread is the average difference between the 10-year French government bond yield and the 1-month Euro FRF interest rate taken over the half-year period prior to that of the SEO. It is assumed to reflect the GDP growth rate. The larger the term spread is in a given 6-month period, the more numerous the equity issues should be in the next six months.

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<sup>37</sup> The tests realised in the previous sub-section about the distribution of SEO are not affected by the reduction of the period.

<sup>38</sup> Time series of macro indicators are taken from Datastream.

<sup>39</sup> See Oertmann (1997) for a survey of the global economic conditions proxies.

Can the SEO seasonality be explained by financial analysts' earnings forecasts? Can the over-optimism of financial analysts about the prospects of the issuer, its industry or the market in general create hot issue periods? From the issuer's standpoint, taking advantage of the analysts' over-optimism could facilitate the placement of the new shares and/or allow a higher issuing price. Thus, optimistic earnings forecasts could influence the timing of the equity issue decision. In addition to macro indicators, three measures of financial analysts' over-optimism<sup>40</sup> are included in the test of seasonality. The first one, *FSI3*, represents the degree of over-optimism dedicated to the issuer itself; the second one, *ISI3*, proxies the degree of over-optimism within the issuer's industry; and the third one, *MSM3*, represents the degree of over-optimism at the market level. They are computed as follows :

$$FSI3_{s-1} = \frac{1}{k} \sum_{n=1}^k \frac{F3_{n,s}}{P_{n,s}} - SI3_{n,s-1} \quad (3.2)$$

where  $F3_{n,s}$  is the last 3-year earnings forecasts about issuer  $n$ , prior to the SEO announcement in half-year period  $s$ ,

$P_{n,s}$  is the stock price corresponding to  $F3_{n,s}$ ,

$SI3_{n,s-1}$  is the median 3-year earnings forecast relative to the industry of issuer  $n$ , over the half-year period  $s-1$  and divided by its corresponding median price,

$k$  indicates the number of operations in the half-year period  $s$ .

$ISI3_{s-1}$  is computed by replacing  $F3_{n,s}$  in Equation 3.3 by the last industry median 3-year earnings forecast prior to the SEO announcement and  $P_{n,s}$  by the corresponding industry median price. To obtain  $MSM3_{s-1}$ ,  $F3_{n,s}$  in Equation 3.3 is replaced by the last overall market median 3-year earnings forecasts prior to the SEO announcement and  $SI3_{n,s-1}$  is replaced by the overall market median 3-year earnings forecast over the half-year period  $s-1$  (both forecasts are divided by their corresponding median price).

Because the dependent variable (the number of SEO realised in the half-year period  $s$ ) is truncated to zero, Tobit regressions are used. The model is as follows :

$$nbseo_s = a_0 + a_1 Mrunup_{s-1} + a_2 \Delta credit_{s-1} + a_3 \Delta term_{s-1} + a_4 AOO_{s-1} + \epsilon_s \quad (3.3)$$

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<sup>40</sup> Data about financial analysts' earnings forecasts are taken from the I/B/E/S international history tape.

where  $nbseo_s$  is the number of SEO in half-year period  $s$  divided by the number of firms listed on the French market at the end of the previous year,

$AOO_{s-1}$  is either  $FSI3_{s-1}$ ,  $ISI3_{s-1}$ ,  $MSM3_{s-1}$ ,

$\varepsilon_s \sim N(0, \sigma_s)$  is an error term.

The results of the Tobit regressions are presented in Table 3.8. Panel A entails the parameters estimates for the “Short-term I/B/E/S” sample. Panels B and C present, respectively, results for the “Capital Structure I/B/E/S” and the “Financing New Investment I/B/E/S” samples. Overall, the results are inconclusive about the seasonality of French SEO. Macro indicators are not significant, except for the credit spread in the “Capital Structure I/B/E/S” sample that is significantly negative. “Capital Structure” operations tend to be frequent after a 6-month period during which economic conditions are high. This is consistent with the fact that SEO are more likely to occur in expansion phase of the business cycle. “Financing New Investment” offerings are not concentrated relative to past economic conditions. This finding could indicate that the timing of such operations is made relative to the investment opportunity and that it is firm-specific. Financial analysts’ over-optimism is never significantly related to the number of SEO.

**Table 3.8 : Tobit regressions to test the seasonality of French SEO**

	$\alpha 0$	$Mrunup$	$\Delta credit$	$\Delta term$	$FSI3$	$ISI3$	$MSM3$	adj. $R^2$
<i>Panel A : "Short-term I/B/E/S" sample</i>								
Issuer	0.0080 <sup>a</sup> (9.14)	0.0005 (0.10)	-0.0748 (-0.94)	-0.0759 (-1.35)	-0.0149 (-0.55)			0.08
Industry	0.0072 <sup>a</sup> (6.84)	0.0003 (0.06)	-0.0957 (-1.20)	-0.0280 (-0.57)		0.0079 (0.47)		0.07
Market	0.0073 <sup>a</sup> (8.55)	-0.0004 (-0.08)	-0.0857 (-1.06)	-0.0317 (-0.66)			0.0240 (0.77)	0.08
<i>Panel B : "Capital Structure I/B/E/S" sample</i>								
Issuer	0.0041 <sup>a</sup> (11.11)	0.0010 (0.49)	-0.0679 <sup>b</sup> (-2.04)	-0.0282 (-1.12)	-0.0004 (-0.05)			0.17
Industry	0.0039 <sup>a</sup> (8.93)	0.0010 (0.49)	-0.0792 <sup>b</sup> (-2.16)	-0.0208 (-0.95)		-0.0028 (-0.25)		0.15
Market	0.0037 <sup>a</sup> (10.08)	0.0009 (0.43)	-0.0702 <sup>b</sup> (-2.00)	-0.0184 (-0.89)			0.0112 (0.83)	0.17

**Table 3.8 : continued**

	<i>a0</i>	<i>Mrunup</i>	$\Delta credit$	$\Delta term$	<i>FSI3</i>	<i>ISI3</i>	<i>MSM3</i>	adj. $R^2$
<i>Panel C : "Financing New Investment I/B/E/S" sample</i>								
Issuer	0.0042 <sup>a</sup> (6.07)	0.0010 (0.25)	-0.0347 (-0.48)	-0.0182 (-0.47)	-0.0072 (-0.42)			0.03
Industry	0.0034 <sup>a</sup> (4.79)	0.0009 (0.26)	-0.0303 (-0.57)	-0.0252 (-0.73)		0.0118 (1.36)		0.10
Market	0.0039 <sup>a</sup> (6.41)	-0.0010 (-0.27)	-0.0194 (-0.34)	-0.0332 (-0.94)			0.0105 (0.42)	0.04

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

The dependent variable is the number of SEO realised within a half-year period divided by the number of firms listed on the French market at the end of the previous year. The period is taken from the second half of 1987 to the last six months of 2000. Data are half-year average taken over the six months prior the SEO half-year. *Mrunup* is the market return buy and hold return over the six months preceding the SEO half-year.  $\Delta credit$  and  $\Delta term$  are respectively the credit spread (10-year corporate bond yield minus 10-year government bond yield) and the term spread (10-year government bond yield minus the 1-month FRF Euro rate). *FSI3* measures the difference between the issuer's last 3-year earnings forecast prior to the SEO and the last six months industry median. *ISI3* measures the difference between the last industry median 3-year earnings forecast and the last six months industry median. *MSM3* measures the difference between the last overall (market) median 3-year earnings forecast and the last six months overall (market) median. Z-stat are given in parentheses.

The findings indicate that French equity issues are not timed according to hot issue periods derived from the business cycle or from over-optimism about future earnings. They are consistent with Dereeper (2002) who argues that French managers time their equity issuers out of windows of opportunities to avoid the competition with equity issues from other firms. The reduction of information asymmetry could prevail to explain the concentration of equity issue during the first six months of the year. The lack of significance of the explanatory variable could also come from the splitting into 6-month periods. However, reducing the length of the periods increases the number of cases with no issues, which affects the results as well.

## 3.2 Valuation effect estimation on stocks

### 3.2.1 Methodology

Market model prediction errors are used to estimate the abnormal stock return at the equity issue announcement. Two problems arise when estimating the model parameters. The first one is related to missing data<sup>41</sup> which is corrected by the method introduced by Heinkel and

<sup>41</sup> The reader should recall that firms with more than 50 % of missing data over the estimation period are excluded from the final sample.

Kraus (1988). The parameters are estimated by a weighted least square regression with the weights equal to the square root of the number of days over which the return is computed. The second one comes from the event itself and it is related to the selection of the estimation period. As shown in Table 3.5, the equity offering modifies the equity  $\beta$  of “Financing New Investment” issuers. In order not to be negatively biased, abnormal returns are estimated from a post-announcement estimation period, [+6;+255], starting 6 days after the announcement and covering 250 trading days. Daily returns are logarithmic returns computed with closing price adjusted for capital structure changes<sup>42</sup>. The market-model type regression is the following<sup>43</sup> :

$$R_{i,t} = \alpha_i + \beta_i R_{M,t} + \sum_{j=A_i-5}^{A_i+5} \eta_{i,j} d_{i,j,t} + \varepsilon_{i,t} \quad (3.4)$$

where  $R_{i,t}$  is the return of stock  $i$  on day  $t$ ,

$R_{M,t}$  is the market return (on the SBF 250 index) on day  $t$ ,

$A_i$  is the announcement day (visa COB date) for issuer  $i$ ,  $t = 0$

$d_{i,j,t}$  is a dummy variable taking the value 1 when  $j = t$  and 0 otherwise, with  $t \in \{-5; +255\}$ ,

$\varepsilon_{i,t} \sim N(0, \sigma_i)$  is an error term.

The dummy variables methodology is used because it presents the advantage that the prediction errors and the standard errors are directly obtained as coefficient estimates,  $\eta_{i,j}$ , of the model. Boehmer, Musumeci and Poulsen (1991) argue that the standardised cross-section method is appropriate to adjust to the variance effect induced by the event. Statistical tests are computed according to this technique. To assess the robustness of the results, a non-parametric statistics, the generalised sign test proposed by Cowan, Nayar and Singh (1990) is also employed.

In order to allow information conveyed by the SEO announcement to be fully integrated into the stock prices, the analysis period, over which the announcement valuation effect is computed, is extended to several days. Daily abnormal returns are cumulated over this analysis period. Cumulative abnormal returns ( $CAR$ ) are estimated simultaneously as the

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<sup>42</sup> Refer to Section 3.1.2.1 of this Chapter for the detailed data sources.

market model parameters with a dummy variable taking the value  $1/nd$  during the analysis period and zero otherwise,  $nd$  being the number of days the  $CAR$  is computed on. The  $CAR$  estimate is directly given by the dummy variable coefficient. This methodology jointly estimates the components of the  $CAR$ . It eliminates the cross-dependences across  $AR$  that is reluctant to the use of one single model to estimate each  $AR$  separately. The second advantage lies in the elimination of errors coming from different prediction horizons when separately estimated  $AR$  are cumulated. The standard deviation of the  $CAR$  is given by the standard deviation the dummy variable parameter. The  $CAR$  is estimated with the following model :

$$R_{i,t} = \alpha_i + \beta_i R_{M,t} + CAR_i d_{i,nd,t} + \varepsilon_{i,t} \quad (3.5)$$

where  $d_{i,nd,t}$  is a dummy variable taking the value  $1/nd$  if  $t$  is included in the  $CAR$  horizon of  $nd$  days and zero otherwise.

Statistical tests of the  $CAR$  include the standardised  $t$ -statistic of Boehmer et al. (1991) and the generalised sign test of Cowan et al. (1990).

Two main hypotheses are tested. The first one addresses to the existence of an abnormal stock price reaction to announcements of SEO with rights in France :

$$\begin{cases} H1_0 : AAR_j = 0 & \text{vs. } H1_A : AAR_j \neq 0 \\ H1_0' : CAAR_{nd} = 0 & \text{vs. } H1_A' : CAAR_{nd} \neq 0 \end{cases} \quad (3.6)$$

where  $AAR_j$  is the average abnormal return on day  $j \in [-5; +5]$ ,

$CAAR_{nd}$  is the average cumulative abnormal return over the horizon  $nd$ .

The second hypothesis is based on the “use of the proceeds” argument :

$$\begin{cases} H2_0 : AAR_{j,CS} \leq AAR_{j,FNI} & \text{vs. } H2_A : AAR_{j,CS} > AAR_{j,FNI} \\ H2_0' : CAAR_{nd,CS} \leq CAAR_{nd,FNI} & \text{vs. } H2_A' : CAAR_{nd,CS} > CAAR_{nd,FNI} \end{cases} \quad (3.7)$$

The significance of the mean differences between both “use of the proceeds” samples is given according to a  $t$ -statistics and the one of median differences according to a Wilcoxon rank test.

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<sup>43</sup> Abnormal returns are also estimated using a one-lagged market return and/or over a pre-announcement period [-255;-6]. Results, not shown here, are not significantly modified by the changes in the estimation technique.

### 3.2.2 Announcement abnormal returns

Daily abnormal returns are computed from five days prior to the announcement day to five days after. Mean and median of market prediction errors are presented in Table 3.9 with their corresponding statistical tests. In addition, cumulative abnormal returns computed on three different horizons are shown in the last rows of Table 3.9. The *CAR* horizons are two, three and five days starting from the announcement day. Beside the different time intervals, the stock price reaction is computed separately for three samples: “Short-term”, “Capital Structure” and “Financing New Investment”. The last two columns of Table 3.9 show the differences in means and medians between the “Capital Structure” and the “Financing New Investment” samples.

Daily abnormal returns are not statistically significant before the announcement day<sup>44</sup>, for any sample. Mean abnormal returns on day 0, +1 and +2 are significantly negative for the “Short-term” sample, ranging from -0.33 % to -0.55 %. Median abnormal returns are significantly negative on day 0 and +2. When equity issues are separated according to the use of the proceeds, the negative stock price reaction is restricted to the “Financing New Investment” sample (with mean *AR* of -0.55 %, -0.66 % and -0.95 % on, respectively, days 0, +1 and +2). As expected by the “use of the proceeds” argument, the announcement of a “Capital Structure” offering has no impact, on average, on the stock price. After day +2, no abnormal returns are significantly different from zero for any samples. “Capital Structure” mean prediction errors are significantly greater than those of “Financing New Investment” issuers on days 0, +1 and +2 while median differences are only significant on days 0 and +2. This finding is consistent with the assumption that an equity offering realised for pure capital structure purposes does not convey any additional information about the firm value.

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<sup>44</sup> The significance of the *AR*(-4) in the “Financing New Investment” sample is due to an outlier (*AR*(-4) = 10 %). When it is not taken into account, the *AR*(-4) coefficient becomes insignificant at a convenient level (*t*-stat = 1.70).

**Table 3.9 : Stock price reaction to SEO announcements**

	"Short-term" sample, 198 observations		"Capital Structure", 98 observations		"Financing New Investment", 100 observations		CS sample – FNI sample	
	mean	median	mean	median	mean	median	mean	median
<i>AR</i> (-5)	0.18 (0.93)	-0.05 (-0.71)	0.39 (1.16)	-0.12 (-0.30)	-0.02 (-0.10)	-0.05 (-0.60)	0.41 (1.04)	-0.06 (-0.01)
<i>AR</i> (-4)	0.17 (0.93)	0.14 (1.72)	-0.12 (-0.44)	0.12 (1.11)	0.45 <sup>b</sup> (2.05)	0.15 (1.41)	-0.57 (-1.61)	-0.04 (-0.90)
<i>AR</i> (-3)	0.07 (0.38)	0.03 (0.28)	0.04 (0.12)	-0.02 (-0.10)	0.11 (0.46)	0.05 (0.60)	-0.07 (-0.19)	-0.06 (-0.04)
<i>AR</i> (-2)	-0.09 (-0.40)	0.09 (1.14)	-0.06 (-0.18)	0.16 (1.73)	-0.12 (-0.40)	-0.01 (0.00)	0.06 (0.12)	0.17 (1.42)
<i>AR</i> (-1)	-0.10 (-0.62)	0.02 (0.14)	-0.06 (-0.23)	0.13 (0.91)	-0.15 (-0.68)	-0.04 (-0.60)	0.09 (0.26)	0.17 (0.83)
<i>AR</i> (0)	-0.33 <sup>b</sup> (-2.38)	-0.11 <sup>b</sup> (-2.01)	-0.11 (-0.89)	-0.04 (-0.50)	-0.55 <sup>b</sup> (-2.52)	-0.21 <sup>b</sup> (-2.26)	0.45 <sup>b</sup> (1.81)	0.17 <sup>a</sup> (2.00)
<i>AR</i> (+1)	-0.37 <sup>b</sup> (-2.27)	-0.06 (-1.72)	-0.08 (-0.84)	-0.05 (-0.30)	-0.66 <sup>b</sup> (-2.34)	-0.12 <sup>b</sup> (-2.04)	0.58 <sup>a</sup> (2.01)	0.07 (1.42)
<i>AR</i> (+2)	-0.55 <sup>b</sup> (-2.15)	-0.14 <sup>b</sup> (-2.16)	-0.15 (-0.68)	-0.03 (-0.50)	-0.95 <sup>b</sup> (-2.59)	-0.22 <sup>b</sup> (-2.47)	0.80 <sup>a</sup> (2.23)	0.20 <sup>b</sup> (1.85)
<i>AR</i> (+3)	0.25 (1.14)	0.03 (0.57)	0.44 (1.28)	0.07 (0.91)	0.07 (0.24)	-0.01 (0.00)	0.37 (0.84)	0.08 (1.13)
<i>AR</i> (+4)	0.24 (0.98)	-0.06 (-0.28)	-0.16 (-0.44)	-0.24 (-1.73)	0.64 (1.92)	0.26 (1.41)	-0.80 (-1.61)	-0.50 (-1.30)
<i>AR</i> (+5)	0.29 (1.19)	0.02 (0.28)	0.31 (0.78)	-0.05 (-0.10)	0.27 (0.94)	0.11 (0.60)	0.04 (0.08)	-0.15 (-0.30)
<i>CAR</i> (0,+1)	-0.71 <sup>b</sup> (-2.55)	-0.30 <sup>b</sup> (-2.08)	-0.19 (-0.89)	-0.08 (-0.50)	-1.22 <sup>a</sup> (-2.75)	-0.77 <sup>b</sup> (-2.47)	1.03 <sup>b</sup> (1.67)	0.69 <sup>b</sup> (1.88)
<i>CAR</i> (0,+2)	-1.26 <sup>b</sup> (-2.39)	-0.46 <sup>b</sup> (-2.37)	-0.33 (-0.19)	-0.19 (-0.91)	-2.16 <sup>a</sup> (-2.89)	-0.80 <sup>b</sup> (-2.47)	1.83 <sup>a</sup> (2.16)	0.61 <sup>a</sup> (2.06)

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

Mean and median values are given in percents. Abnormal returns (*AR*) and cumulative abnormal returns (*CAR*) around the SEO announcements are calculated with the following model : the parameters are estimated over a 250-day period after the announcement [+6;+255] with a WLS regression according to the Heinkel and Kraus (1988) methodology; *t*-stats (given in parentheses below means) are computed by normalising abnormal returns by their standard deviations as in Boehmer et al. (1991). A generalised sign test (given in parentheses below medians) is presented in order to assess the robustness of the results. The correspondent statistics is computed as in Cowan (1992). The significance of the differences in mean and median between both use of the proceeds sample are checked according to, respectively, a *t*-statistics and a Wilcoxon rank test (given in parentheses below mean and median differences).

Results about the cumulative abnormal returns deserve two comments. First, the entire stock price reaction to the SEO announcement is reflected in the 3-day *CAR*,  $CAR(0,+2)$ , which is expected since the daily abnormal returns are significantly negative on these days. The second comment addresses to the “use of the proceeds” argument that is given strong evidence. The significance of the 3-day mean and median *CAR* is restricted to the “Financing New Investment” sample. Furthermore, the stock price reaction of these issuers is significantly worse than that of “Capital Structure” issuers.

The stock price reaction observed here is globally similar to the results of Gajewski and Ginglinger (2002, p. 306, Table VI). The main difference is the significance of their longest *CAR* (a 5-day horizon starting from the announcement day). The sample of rights offerings in Gajewski et al. covers the 1986-1996 period and their market model parameters<sup>45</sup> are estimated over a pre-announcement period [-220;-21]. In order to allow a better comparison, I compute a 2-day and a 5-day *CAR* restricting the “Short-term” sample to the 1986-1996 period and using a pre-announcement estimation period [-255;-6]. The 2-day *CAR* (-0.64 %) is significantly negative. Although not significant at the 5 % level, the 5-day *CAR* (-1.06 %) exhibits an *t*-stat of -1.88. These findings are close to those of standby rights offerings in Gajewski et al. Overall, the changes in estimation technique have only slight impacts on the magnitude and significance of the stock price reaction.

### **3.2.3 Where does the valuation effect come from ?**

#### *3.2.3.1 Explanatory variables of the valuation effect*

As presented in Figure 2.2 at the end of the previous Chapter, three theoretical backgrounds are in competition to explain the stock price reaction to SEO announcements : static trade-off, **TO**, information asymmetry, **IA** and agency costs, **AC**. Based on information asymmetry and agency considerations, a fourth explanation emerges : timing, **TG**. Proxies for the different theoretical trends are used as explanatory variables to the stock price reaction. Deviation from a target debt ratio controls for the static trade-off theory. The variable  $\Delta target$  represent the difference between the financial debt to assets ratio of the issuer at the end of the last fiscal year before the announcement and the industry median ratio. The higher above the target is the issuer’s debt ratio, the better should be considered the SEO that drives

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<sup>45</sup> Gajewski and Ginglinger (2002) uses a Dimson (1979) method with two lags and two leads on the market return to compute their mean excess returns. They do not estimate their model with weighted least squares to correct for the missing data problem.

the ratio closer to its target. Thus,  $\Delta target$  is expected to be positively correlated with the stock price reaction.

Among potential variables that proxy information asymmetry, I retain, following Dierkens (1991), the issuer's specific risk, *specific*, represented by the volatility of the market model residuals estimated over the pre-announcement period [-255;-6]. The greater the specific risk, the more negative should be investors' reaction to the SEO announcement. Adverse selection is one of information asymmetry major implications. The issuer's stock price runup before the offering announcement is considered by the information asymmetry literature as a proxy for adverse selection costs; see Myers and Majluf (1984). It is measured as the buy and hold return on the issuer's stock over the period [-255;-6]. It is expected to be negatively correlated with the announcement valuation effect. Indeed, it should increase with the potential overvaluation of the stock price. Additional variables such as the size of the offering and the number of financial analysts that follow the issuer also constitute proxies for the degree of information asymmetry. However, since they are less correlated with the stock price reaction than other information asymmetry variables in a univariate framework, they are not included in the multivariate analysis<sup>46</sup>.

Proxies for the agency costs impact on the stock price reaction include the book-to-market (*BM*) ratio and the free cash flow, *FCF*. The *BM* ratio is an estimate of the issuer's growth potential. It represents the quality and quantity of growth opportunities. The better is the growth potential, the lower the impact of managers' moral hazard on the firm value is expected to be. Hence, the *BM* ratio should be negatively correlated with the announcement valuation effect. The measure of free cash flow is taken at the end of the fiscal year preceding the SEO announcement. The raw free cash flow is normalised by the total assets. It proxies the fraction of internal financing left in the managers' hand after all profitable investment opportunities have been undertaken. The greater is the free cash flow, the higher should be the agency costs and the lower the stock price reaction. Formally, the free cash flow is computed as follows :

$$FCF_i = \frac{CF_{i,t-1} - dividend_{i,t-1} - investment_{i,t-1}}{Assets_{i,t-1}} \quad (3.8)$$

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<sup>46</sup> The correlation between the 3-day CAR and, respectively the size of the offering and the number of analysts is -0.11 and 0.02, while the correlations for the specific risk and the stock price runup are -0.49 and -0.45. Limiting the number of explanatory variables in the multivariate analysis makes the result more robust, especially given the size of the samples.

where  $CF_{i,t-1}$  is the operating cash flow of issuer,  $i$ , during the last fiscal year prior to the SEO announcement,  
 $dividend_{i,t-1}$  is the dividends paid by issuer,  $i$ , during the last fiscal year prior to the SEO announcement,  
 $investment_{i,t-1}$  is the variation in fixed tangible assets for issuer,  $i$ , during the last fiscal year prior to the SEO announcement,  
 $Assets_{i,t-1}$  is the total assets of firm,  $i$ , at the end of the last fiscal year prior to the SEO announcement.

Two additional financing variables are tested. The first one is a measure of the external financing deficit,  $exfindef$ . It is computed as follows :

$$exfindef_i = \frac{dividend_{i,t-1} + investment_{i,t-1} - CF_{i,t-1} - Cash_{i,t-1}}{Assets_{i,t-1}} \quad (3.9)$$

where  $Cash_{i,t-1}$  is the amount of cash stated in the balance sheet of issuer,  $i$ , at the end of the last fiscal year prior to the SEO announcement.

The second variable measures the deficit in equity financing,  $equitydef$ . It corresponds to the external financial deficit variable less the variation in financial debt during the last fiscal year prior to the SEO announcement.

$$equitydef_i = exfindef_i - \frac{\Delta Debt_{i,t-1}}{Assets_{i,t-1}} \quad (3.10)$$

where  $\Delta Debt_{i,t-1}$  is the variation in financial debt of issuer,  $i$ , during the last fiscal year prior to the SEO announcement.

The variables  $FCF$ ,  $exfindef$  and  $equitydef$  should help clarifying the impact of agency costs. Indeed, free cash flow contributes to increase the financial slack. Therefore, its explanatory power could also be related to information asymmetry as argued by Myers and Majluf (1984). The variable,  $exfindef$ , is more accurate in controlling for a financial slack effect. The more negative it is, the greater is the amount of cash available to the firm. According to the pecking order, this cash should be used with priority to finance new investment projects. The sign of the  $exfindef$  impact on the stock price reaction is expected to be positive. The variable,  $equitydef$ , takes into account the debt policy of the firm. It proxies the equity financing deficit and it should also control for the pecking order. The stock price

reaction should be less negative, the greater is the need for equity financing. Given that, *equitydef* is expected to be positively correlated with the stock price reaction.

Timing variables are macro indicators that help investors to estimate the general economic conditions, current and future. The stock price reaction is expected to be less negative if the issue occurs in an upturn phase of the business cycle. However, if the equity offering is realised when a downturn in the economy is anticipated, the financing decision could signal that the proceeds are dedicated to compensate future low earnings. The stock market past performance, *Mrunup*, should be positively correlated with the stock price reaction. A high market runup is interpreted as a good signal about the degree of information asymmetry, adverse selection and even about the quality of growth opportunities.

The credit spread,  $\Delta credit$ , and the term spread,  $\Delta term$ , are defined in Table 3.8. Because bond yields and interest rates are easily and rapidly observable, both variables are taken with a 1-month lag. In other words, the spreads used as timing proxies cover the month preceding the SEO announcement. The credit spread is an indicator of current economic conditions. The wider it is, the greater is the chance to be in a downturn phase of the business cycle. Therefore, it is expected to be negatively correlated with the stock price reaction. Conversely, the term spread reflects the GDP growth rate and it should be positively correlated with the announcement valuation effect. Indeed, the better the expected economic conditions, the more positive should be the timing effect on the investors' reaction.

An alternative macro indicator is considered as a timing variable : the OECD<sup>47</sup> Composite Leading Indicator. It is released with a 3-month delay This lag is taken into account when the variable is introduced in the multivariate analysis. The series retained in the analysis is the short-term indicator, the 6-month lead rate of change in the Composite Leading Indicator, *CLI*. It indicates whether the short-term forecasted conditions are optimistic (positive) or pessimistic (negative). According to that, the stock price reaction should be positively impacted by the *CLI* variable. The term spread is one of the *CLI* component. Both series are positively correlated ( $\rho_{\Delta term, CLI} = 0.37$ ), which implies that they are used separately in the cross-section analysis. Table 3.10 summarises the explanatory variables, their definition and their expected coefficient sign.

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<sup>47</sup> Data source : <http://webnet1.oecd.org/EN/documents/0,,EN-documents-509-15-no-1-no-0,00.html>. The components of the CLI are also listed on the OECD website.

**Table 3.10 : Explanatory variables of the announcement valuation effect**

Theory	Variable	Expected sign	Definition
“Static Trade-Off”, <b>TO</b>	$\Delta target_i$	+	Deviation from the industry median leverage ratio (debt over assets in book values)
“Information Asymmetry”, <b>IA</b>	$specific_i$	-	Issuer’s specific risk estimated over the 250 trading days prior to the announcement day
	$runup_i$	-	Issuer’s stock price runup computed over the 250 trading days prior to the announcement day
“Agency Costs”, <b>AC</b>	$BM_i$	-	Book-to-market ratio at the end of the month preceding the SEO announcement
	$FCF_i$	-	Free cash flow at the last fiscal year end prior to the SEO announcement
“Agency Costs” vs. “Pecking Order”, in <b>AC</b>	$exfindef_i$	+	External financing deficit at the last fiscal year end prior to the SEO announcement
	$equitydef_i$	+	Equity financing deficit at the last fiscal year end prior to the SEO announcement
“Timing”, <b>TG</b>	$Mrunup_i$	+	Stock market runup computed over the 250 trading days prior to the announcement day
	$\Delta credit_i$	-	Credit spread (difference in yield between 10 year French corporate bonds and 10-year French government bonds) at the end of the month prior to the SEO announcement
	$\Delta term_i$	+	Term spread (difference in interest rate between 10-year French government bonds and 1-month Euro FRF rate) at the end of the month prior to the SEO announcement
	$CLI_i$	+	The 6-month lead rate of change in the OECD Composite Leading Indicator taken with a 3-month lag relative to the SEO announcement

### 3.2.3.2 Information asymmetry, agency or timing ?

The cross-section regression entails the variables that proxy the four competing theories. A dummy variable,  $UOP_i$ , equal to 1 when issuer,  $i$ , belongs to the “Financing New Investment” sample and 0 otherwise, is added to control for the “use of the proceeds” argument. Coefficient are estimated with OLS, standard errors being corrected according to White (1980) when necessary. The 3-day  $CAR$  starting from the announcement date,  $CAR(0,+2)$ , is the dependent variable. The regression equation is the following :

$$CAR(0,+2)_i = \alpha_0 + \alpha_1 \times UOP_i + \mathbf{a}'\mathbf{TO}_i + \mathbf{b}'\mathbf{IA}_i + \mathbf{c}'\mathbf{AC}_i + \mathbf{d}'\mathbf{TG}_i + \varepsilon_i \quad (3.11)$$

where  $UOP_i$  is a dummy variable equal to 1 for “Financing New Investment” issuers and 0 otherwise,

$\mathbf{TO}_i$ ,  $\mathbf{IA}_i$ ,  $\mathbf{AC}_i$ ,  $\mathbf{TG}_i$  are vectors of explanatory variables defined in Table 3.10,

**a, b, c, d** are vectors of parameters,

$\varepsilon_i$  is an error term  $\sim N(0, \sigma_i)$ .

Coefficient estimates are presented in Table 3.11. The first three columns show the results of the “Short-term” sample. The “agency” regression includes the free cash flow variable as a control for agency costs. In the “slack” regression, the free cash flow variable is replaced by the external financing deficit and the “equity” regression features the equity deficit instead. As heteroskedasticity is high in the “Short-term” sample regressions, issuers are split according to their use of the proceeds. The last six columns of Table 3.11 show the results of the “Capital Structure” [CS] and “Financing New Investment” [FNI] samples. It is worth noticing that standard errors in the CS sample do not need to be corrected for heteroskedasticity. Panel A of Table 3.11 entails the results according to the timing variables, *Mrunup*,  $\Delta credit$  and  $\Delta term$ , while in Panel B, the term spread is replaced by the *CLI* variable.

The trade-off theory does not have any explanatory power to the stock price reaction since the  $\Delta target$  coefficient is not significant, although it has the expected positive sign. When the “Capital Structure” issuers are analysed separately, the distance from the debt target ratio becomes significant in the “agency” equation of Panel A. In the remaining equations, the *t*-stats increase as well but not enough to become significant at a convenient level. It shows that the static-trade-off theory is more likely to explain the stock price reaction at the announcement of pure capital structure operations. Both variables of information asymmetry, *specific* and *runup*, are significant and have the expected sign for the “Short-term” sample. In other words, the stock price decline at the SEO announcement is greater for issuers with higher specific risk and that have experienced a larger stock price runup. These findings are consistent with information asymmetry predictions. When separated across uses of the proceeds, the explanatory power of information asymmetry is restricted to the “Financing New Investment” issuers, showing that only these SEO announcements convey private information about the firm value.

Overall, the book-to-market ratio has no effect in explaining the announcement valuation effect. Unexpectedly, when examined separately, the “Financing New Investment” sample exhibits a significantly positive coefficient, which is not consistent with agency theory predictions. This result underlines the marginal role of agency costs comparing to information asymmetry.

**Table 3.11 : Cross-sectional analysis of the SEO announcement effect**

	“Short-term” sample			CS sample			FNI sample		
	“agency”	“slack”	“equity”	“agency”	“slack”	“equity”	“agency”	“slack”	“equity”
<i>Panel A : Timing variables (Mrunup , <math>\Delta credit</math> , <math>\Delta term</math>)</i>									
$\alpha_0$	0.006 (0.82)	0.002 (0.29)	0.006 (0.78)	-0.002 (-0.25)	-0.007 (-0.82)	-0.008 (-0.87)	-0.008 (-1.03)	-0.004 (-0.39)	0.005 (0.62)
<i>UOP</i>	-0.011 (-1.62)	-0.011 (-1.59)	-0.011 (-1.62)						
$\Delta target$	0.015 (0.82)	0.018 (0.97)	0.016 (0.81)	0.036 <sup>b</sup> (1.99)	0.040 (1.75)	0.036 (1.64)	0.015 (0.46)	0.008 (0.24)	0.021 (0.60)
<i>specific</i>	-10.84 <sup>a</sup> (-2.72)	-9.75 <sup>b</sup> (-2.29)	-10.84 <sup>b</sup> (-2.57)	-3.51 (-0.95)	-2.58 (-0.67)	-2.60 (-0.68)	-14.69 <sup>b</sup> (-2.15)	-16.75 <sup>b</sup> (-2.20)	-20.65 <sup>a</sup> (-2.82)
<i>runup</i>	-0.030 <sup>b</sup> (-2.60)	-0.030 <sup>a</sup> (-2.74)	-0.030 <sup>a</sup> (-2.65)	-0.001 (-0.07)	-0.003 (-0.27)	-0.005 (-0.41)	-0.049 <sup>a</sup> (-3.07)	-0.046 <sup>a</sup> (-2.93)	-0.044 <sup>a</sup> (-2.89)
<i>BM</i>	0.003 (0.81)	0.004 (0.91)	0.003 (0.82)	-0.005 (-1.27)	-0.005 (-1.12)	-0.005 (-1.00)	0.017 <sup>b</sup> (2.48)	0.016 <sup>b</sup> (2.35)	0.015 <sup>b</sup> (2.19)
<i>FCF</i>	-0.002 (-0.06)			-0.180 <sup>a</sup> (-3.80)			0.089 (1.70)		
<i>exfindef</i>		-0.029 (-1.19)			-0.046 (-1.48)			-0.009 (-0.24)	
<i>equitydef</i>			0.001 (0.03)			-0.043 (-1.51)			0.051 (1.62)
<i>Mrunup</i>	0.073 <sup>a</sup> (2.99)	0.073 <sup>a</sup> (3.04)	0.073 <sup>a</sup> (3.01)	0.056 (1.62)	0.053 (1.61)	0.053 (1.62)	0.076 <sup>b</sup> (2.10)	0.066 (1.78)	0.069 (1.84)
$\Delta credit$	-1.521 <sup>a</sup> (-3.57)	-1.507 <sup>a</sup> (-3.61)	-1.520 <sup>a</sup> (-3.61)	-1.109 <sup>b</sup> (-2.57)	-1.250 <sup>a</sup> (-2.74)	-1.287 <sup>a</sup> (-2.76)	-1.304 <sup>b</sup> (-1.99)	-1.443 <sup>b</sup> (-2.13)	-1.446 <sup>b</sup> (-2.20)
$\Delta term$	-0.166 (-0.79)	-0.176 (-0.86)	-0.165 (-0.79)	0.201 (0.75)	0.085 (0.32)	0.145 (0.54)	-0.094 (-0.37)	-0.197 (-0.75)	-0.140 (-0.53)
<i>adj. R<sup>2</sup></i>	0.27	0.28	0.27	0.23	0.13	0.12	0.46	0.44	0.46

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

White heteroskedasticity-consistent standard errors

*T*-stat are given in parentheses.

**Table 3.11 : continued**

	“Short-term” sample			CS sample			FNI sample		
	“agency”	“slack”	“equity”	“agency”	“slack”	“equity”	“agency”	“slack”	“equity”
<i>Panel B : Timing variables (Mrunup , <math>\Delta credit</math> , CLI)</i>									
$\alpha_0$	0.010 (1.29)	0.006 (0.74)	0.011 (1.33)	0.003 (0.43)	-0.002 (-0.27)	-0.002 (-0.23)	-0.005 (-0.64)	-0.001 (-0.09)	0.009 (0.98)
<i>UOP</i>	-0.012 (-1.76)	-0.011 (-1.72)	-0.012 (-1.75)						
$\Delta target$	0.012 (0.64)	0.014 (0.79)	0.013 (0.69)	0.028 (1.51)	0.033 (1.51)	0.030 (1.37)	0.013 (0.40)	0.007 (0.21)	0.020 (0.59)
<i>specific</i>	-10.60 <sup>a</sup> (-2.79)	-9.62 <sup>b</sup> (-2.36)	-10.92 <sup>a</sup> (-2.69)	-3.49 (-0.96)	-2.60 (-0.67)	-2.77 (-0.71)	-14.49 <sup>b</sup> (-2.19)	-16.77 <sup>b</sup> (-2.31)	-20.79 <sup>a</sup> (-3.05)
<i>runup</i>	-0.028 <sup>b</sup> (-2.64)	-0.028 <sup>a</sup> (-2.77)	-0.028 <sup>b</sup> (-2.64)	0.000 (-0.02)	-0.002 (-0.21)	-0.004 (-0.35)	-0.047 <sup>a</sup> (-3.12)	-0.045 <sup>a</sup> (-3.07)	-0.042 <sup>a</sup> (-2.93)
<i>BM</i>	0.004 (0.85)	0.004 (0.94)	0.003 (0.81)	-0.005 (-1.14)	-0.005 (-0.95)	-0.005 (-0.90)	0.016 <sup>b</sup> (2.30)	0.015 <sup>b</sup> (2.10)	0.014 (1.91)
<i>FCF</i>	0.000 (0.01)			-0.172 <sup>a</sup> (-3.57)			0.091 (1.77)		
<i>exfindef</i>		-0.027 (-1.18)			-0.044 (-1.56)			-0.010 (-0.26)	
<i>equitydef</i>			0.008 (0.35)			-0.035 (-1.35)			0.055 (1.78)
<i>Mrunup</i>	0.076 <sup>a</sup> (3.61)	0.076 <sup>a</sup> (3.64)	0.076 <sup>a</sup> (3.59)	0.054 (1.60)	0.052 (1.59)	0.052 (1.60)	0.080 <sup>a</sup> (2.83)	0.076 <sup>a</sup> (2.66)	0.075 <sup>b</sup> (2.62)
$\Delta credit$	-1.511 <sup>a</sup> (-3.66)	-1.496 <sup>a</sup> (-3.67)	-1.509 <sup>a</sup> (-3.68)	-1.208 <sup>a</sup> (-2.85)	-1.323 <sup>a</sup> (-2.86)	-1.358 <sup>a</sup> (-2.88)	-1.273 <sup>b</sup> (-1.99)	-1.400 <sup>b</sup> (-2.11)	-1.409 <sup>b</sup> (-2.20)
<i>CLI</i>	-0.002 <sup>b</sup> (-2.58)	-0.002 <sup>b</sup> (-2.61)	-0.002 <sup>b</sup> (-2.63)	-0.001 (-1.23)	-0.001 (-1.26)	-0.001 (-1.09)	-0.001 (-1.42)	-0.001 (-1.39)	-0.002 (-1.46)
<i>adj. R<sup>2</sup></i>	0.29	0.30	0.30	0.23	0.14	0.13	0.47	0.45	0.47

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level  
White heteroskedasticity-consistent standard errors

The dependent variable is the 3-day *CAR*. *UOP* is the use of the proceeds dummy. The deviation from the industry median debt ratio,  $\Delta target$ , proxies the static trade-off theory. Information asymmetry variables include the volatility of market model pre-announcement residuals, *specific*, and the stock price runup before the announcement, *runup*. The influence of agency costs is tested by the book-to-market ratio, *BM*, and by the free cash flow, *FCF*. Both variables, *exfindef* and *equitydef*, represent the external financing deficit and the equity financing deficit that control for financial slack and pecking order effects. Timing is proxied by the market runup prior to the announcement, *Mrunup*, the credit spread,  $\Delta credit$ , and the term spread,  $\Delta term$  or the 6-month lead rate of change in the OECD Composite Leading Indicator, *CLI*. *T*-stat are given in parentheses.

The magnitude of free cash flow does not influence the announcement valuation effect, except for the “Capital Structure” sample. For these issuers, the presence of free cash flow could signal to the market that an equity issue is not the optimal operation to manage their capital structure. To lower their debt ratio, they could use the free cash flow to repay debt. The overall findings about free cash flow outline the marginal role of the agency theory in explaining the investors’ reaction to SEO announcements. The variables *exfindef* and *equitydef* are not significant either. The presence of financial slack (*exfindef* being negative) does not significantly pressure down the stock price reaction. Conversely, the SEO announcement is not better perceived when equity is the most needed (*equitydef* being positive). The overall results of regressions “agency”, “slack” and “equity” are similar and so are their adjusted  $R^2$ .

With information asymmetry, timing appears to have a strong explanatory power. SEO realised after a period of good market performance are better perceived (significantly positive coefficient for *Mrunup*). However, the explanatory power of past market performance is reduced for “Capital Structure” issuers. Current economic conditions also influence positively the stock price reaction. This pattern is illustrated by a negative coefficient for the  $\Delta credit$  variable. Expected economic conditions proxied by  $\Delta term$  in Panel A and by *CLI* in Panel B do not contribute to explain the announcement valuation effect in the sense predicted by the theory. The term spread coefficient is negative and insignificant. Moreover, the *CLI* variable is significantly and negatively related to the 3-day *CAR* at the “Short-term” sample level. The significance is eliminated when both uses of the proceeds are analysed separately, indicating that it could be due to the heteroskedasticity.

Unlike information asymmetry, timing seems to affect both issuer’s types, although the significance of the coefficients is higher for “Financing New Investment” issuers. When jointly tested, the timing coefficients (*Mrunup*,  $\Delta credit$  and  $\Delta term$ ) are not different between issuer’s types<sup>48</sup>. By comparison, information asymmetry coefficients (*specific* and

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<sup>48</sup> Wald tests on the coefficients are performed from the regression :

$$CAR(0,+2)_i = \alpha_0 + \alpha_1 \times UOP_i + \mathbf{a}_{CS}' \mathbf{TO}_i \times CS_i + \mathbf{a}_{FNI}' \mathbf{TO}_i \times FNI_i + \mathbf{b}_{CS}' \mathbf{IA}_i \times CS_i + \mathbf{b}_{FNI}' \mathbf{IA}_i \times FNI_i \\ + \mathbf{c}_{CS}' \mathbf{AC}_i \times CS_i + \mathbf{c}_{FNI}' \mathbf{AC}_i \times FNI_i + \mathbf{d}_{CS}' \mathbf{TG}_i \times CS_i + \mathbf{d}_{FNI}' \mathbf{TG}_i \times FNI_i + \varepsilon_i$$

where  $CS_i$  ( $FNI_i$ ) equals 1 if issuer  $i$  belongs to the “Capital Structure” (“Financing New Investment”) sample.

The hypotheses on the coefficients are the following :

timing,  $H_0 : \mathbf{d}_{CS} = \mathbf{d}_{FNI}$  vs.  $H_A : \mathbf{d}_{CS} \neq \mathbf{d}_{FNI}$

information asymmetry,  $H'_0 : \mathbf{b}_{CS} = \mathbf{b}_{FNI}$  vs.  $H'_A : \mathbf{b}_{CS} \neq \mathbf{b}_{FNI}$

$P$ -values of the  $F$ -stat Wald test are 0.78 for timing coefficients and 0.01 for information asymmetry coefficients.

*runup*) are significantly different between “Capital structure” and “Financing New Investment” issuers, at the 1 % level.

In the “Short-term” sample regressions, the coefficients of the *UOP* dummy variable is negative but not significantly different from zero at a convenient level. This outcome indicates that the difference in abnormal returns between both uses of the proceeds is explained by the other control variables. According to that, the use of the proceeds should be considered as a raw summary of various characteristics related to the issuer’s type. It does not contain specific information that investors cannot observe elsewhere.

In their cross-section analysis, Gajewski and Ginglinger (2002, Table VIII, p. 312) test with priority the influence of the flotation method and the shareholders’ take up on the stock price reaction. The stock price runup prior to the announcement and a use of the proceeds dummy are the explanatory variables common to both studies. The negative impact of the stock price runup on the announcement abnormal return is consistent with the results of Gajewski and Ginglinger (2002). They find highly significant negative coefficients of similar magnitude as those reported in Table 3.11 (-0.024 vs. -0.030). For the use of the proceeds, they obtain significantly positive coefficients, which is opposed to the “use of the proceeds” argument. They argue that the simultaneous announcement of the financing source and the investment project reduces information asymmetry and moral hazard. Their sample includes direct cash offerings that are associated, in 55 % of the cases, with the announcement of a specific investment project. Direct cash offerings announcements do not generate abnormal stock price reaction. Therefore, their inclusion could explain the difference observed for the use of the proceeds dummy<sup>49</sup>. The absence of static trade-off, agency and timing variables has for consequences significant regression constants and lower adjusted  $R^2$  (up to 0.15 against 0.27/0.30 in Table 3.11).

In summary, information asymmetry and timing are given strong support while only a marginal influence of the agency theory and none for the static trade-off are detected. Information asymmetry is restricted to “Financing New Investment” issuers, which is consistent with Myers and Majluf (1984) framework. Indeed, in the adverse selection model, the equity issue decision is indissociable from an investment project and information asymmetry affects the value of existing assets and that of the investment project. The impact

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<sup>49</sup> In addition, the source the use of the proceeds is collected from is not indicated, which could also explain part of the difference.

of timing is allocated between both issuers' types. The stock price reaction is particularly influenced by current economic conditions and also by past market performance. Expected global economic conditions are not found to have the predicted explanatory power. The next step is to analyse what information is conveyed by the SEO announcement, especially for "Financing New Investment" operations. If private information is about future earnings, revisions in earnings forecasts around the announcement should be significantly related to the stock price reaction.

### 3.2.3.3 *What is the contribution of financial analysts*

In the presence of information asymmetry, the SEO announcement conveys the managers' private information about the firm value to investors. A further test of the announcement valuation effect consists in verifying if the signal is about earnings. For that purpose, a multivariate analysis is run on the "Short-term I/B/E/S" sample with two additional explanatory variables : the revision of the earnings forecast after the issue announcement and the dispersion in the earnings forecasts at the time of the SEO announcement. Not only the significance of the new variables would be interesting but so would be the impact of their inclusion onto the significance of the other explanatory variables, especially those that proxy information asymmetry and timing.

As a preliminary remark, the switching from the "Short-term" to the "Short-term I/B/E/S" sample and the implied reduction in the number of observations does not affect significantly the announcement valuation effect. The average 3-day *CAR* of the "Short-term I/B/E/S" sample is equal to -1.56 % , significant at the 1 % level. The average valuation effect of the "Capital Structure I/B/E/S" and the "Financing New Investment I/B/E/S" samples are equal to, respectively, -0.69 % (not significant at a convenient level) and -2.36 % (significant at the 1 % level). The difference in stock price reaction between both sub-samples is significant at the 5 % level. Moreover, the cross-section analysis presented in Table 3.11 but performed on the I/B/E/S samples leads to similar results<sup>50</sup>. Therefore, differences that would be found after the inclusion of the earnings forecast variables cannot be imputed to the sample size reduction.

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<sup>50</sup> Results are not presented here for the sake of brevity. The risk specific and the stock price runup are significantly negative except for the "Capital Structure I/B/E/S" sample. The book-to-market ratio is positive only for "Financing New Investment" issuers. The market runup and the credit spread are also significant with proper signs.

The revision of the earnings forecasts is computed with 3-year earnings forecasts. One reason is that 3-year earnings forecasts are less sensitive to marginal news about the issuer's financial situation that could contaminate 1-year forecasts. In that sense, revisions of 3-year forecasts should be more relevant in isolating the signal of the event on future earnings. The second reason addresses to the timing hypothesis. If equity issues are timed before a downturn in earnings and to compensate for future decreases in the internal financing capacity, the downturn should be on a long-term basis. Indeed, temporary low earnings should not incline managers to raise additional cash. According to that, 3-year earnings forecasts constitute the longest forecast horizon with sufficient data available for French firms in I/B/E/S<sup>51</sup>. The revision measure, *RIF3*, is adjusted by the median industry revision<sup>52</sup>. It is calculated as follows :

$$RIF3_{i,t} = \frac{F3_{i,t+6} - F3_{i,t}}{P_{i,t}} - \frac{I3_{i,t+6} - I3_{i,t}}{IP_{i,t}} \quad (3.12)$$

where  $F3_{i,t+6}$  is the 3-year earnings forecast available for issuer,  $i$ , six months after the SEO announcement<sup>53</sup>,

$F3_{i,t}$  is the last 3-year earnings forecast available for issuer,  $i$ , prior to the SEO announcement,

$P_{i,t}$  is the stock price at the time of the pre-announcement forecast,

$I3_{i,t+6}$ ,  $I3_{i,t}$  and  $IP3_{i,t}$  are the corresponding industry median 3-year forecasts and price.

If the SEO announcement is informative about a future earnings decline, the *RIF3* variable should be positively correlated with the stock price reaction. The use of the proceeds allows a deeper analysis about the informational content of SEO announcement. If information asymmetry concerns the value of the new investment project, the explanatory power of the *RIF3* variable should be restricted to the "Financing New Investment" issuers. However, the SEO announcement could convey information in the sense of Miller and Rock (1985), that is the equity issue is realised to compensate for a decline in future earnings. In that case,

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<sup>51</sup> The long-term growth rate forecast is available for only 70 of the 110 issuers in the "Short-term I/B/E/S" sample.

<sup>52</sup> Adjusting the earnings forecast revision by its industry median prevent its impact on the stock price reaction to be due to an industry effect. It guarantees that this impact is issuer-specific.

<sup>53</sup> As shown by O'Brien (1988), only 20 % of earnings forecasts are revised in a given month. Therefore, waiting for six months after the announcement ensures that earnings forecasts about issuers have been revised.

earnings forecasts revisions should be significant for all offering types. Timing would be the main determinant of the equity issue decision but it would be firm-specific and not economy-wide. The reason is that the stock price reaction is not influenced by the expected global economic conditions; see the  $\Delta term$  and  $CLI$  variables in Table 3.11. The inclusion of the  $RIF3$  variable should have only a limited effect on the explanatory power of timing variables.

The dispersion in 3-year earnings forecast is taken from the last consensus forecast available before the SEO announcement. Like the measure of earnings forecast revision, it is adjusted by its industry median. The greater is the dispersion, the less accurate is the earnings forecasts. The dispersion also decreases when the number of forecasts within the consensus increases. In that sense, it proxies information asymmetry. A lower dispersion should induce a lower degree of information asymmetry and, in turn, a less negative stock price reaction.

The regression model is an extended version of Equation 3.10, including both earnings forecast variables and it expresses as follows :

$$CAR(0,+2)_i = \alpha_0 + \alpha_1 \times UOP_i + \mathbf{a}'\mathbf{TO}_i + \mathbf{b}'\mathbf{IA}_i + \mathbf{c}'\mathbf{AC}_i + \mathbf{d}'\mathbf{TG}_i + \mathbf{e}'\mathbf{EF}_i + \varepsilon_i \quad (3.13)$$

where  $UOP_i$ ,  $\mathbf{TO}_i$ ,  $\mathbf{IA}_i$ ,  $\mathbf{AC}_i$ ,  $\mathbf{TG}_i$  are dummy variable and vectors of explanatory variables as defined in Table 3.10,

$\mathbf{EF}_i$  is the vector containing the issuer,  $i$ , earnings forecast variables  $RIF3_i$  (industry median adjusted revision in 3-year earnings forecast around the SEO announcement) and  $DIF3_i$  (the industry median adjusted dispersion in pre-SEO 3-year earnings forecasts),

$\mathbf{a}$ ,  $\mathbf{b}$ ,  $\mathbf{c}$ ,  $\mathbf{d}$ ,  $\mathbf{e}$  are vectors of parameters,

$\varepsilon_i$  is an error term  $\sim N(0, \sigma_i)$ .

Results are presented in Table 3.12. Since the replacement of  $\Delta term$  by  $CLI$  does not alter the explanatory power of other variables, only the results with  $\Delta term$  are reported. The first three columns show the coefficients of the “Short-term I/B/E/S” sample, each column referring to, respectively, the “agency”, “slack” and “equity” regressions. Figures about the use of the proceeds samples are reported in the remaining columns. As expected, the  $RIF3$  variable has a positive coefficient that is significant for the “Short-term I/B/ES” sample. However, the explanatory power of the earnings forecast revisions is restricted to the “Financing New Investment” operations when the issuer’s types are analysed separately.

**Table 3.12 : Informational content of SEO announcements related to earnings**

	“Short-term I/B/E/S” sample*			“CS I/B/E/S” sample*			“FNI I/B/E/S” sample*		
	“agency”	“slack”	“equity”	“agency”	“slack”	“equity”	“agency”	“slack”	“equity”
$\alpha_0$	-0.009 (-0.95)	-0.012 (-1.16)	-0.010 (-0.97)	0.000 (0.03)	-0.004 (-0.24)	-0.005 (-0.32)	-0.014 (-1.40)	-0.016 (-1.43)	-0.012 (-1.36)
<i>UOP</i>	-0.003 (-0.31)	-0.003 (-0.28)	-0.003 (-0.33)						
$\Delta target$	-0.005 (-0.21)	-0.002 (-0.08)	-0.008 (-0.35)	0.018 (0.62)	0.024 (0.84)	0.023 (0.79)	-0.004 (-0.15)	-0.012 (-0.46)	-0.025 (-0.88)
<i>specific</i>	0.78 (0.33)	1.18 (0.49)	1.07 (0.46)	-9.43 (-1.22)	-9.01 (-1.15)	-9.20 (-1.21)	-1.26 (-0.37)	0.37 (0.09)	0.46 (0.13)
<i>runup</i>	-0.046 <sup>b</sup> (-2.23)	-0.047 <sup>b</sup> (-2.23)	-0.047 <sup>b</sup> (-2.22)	-0.031 (-1.62)	-0.027 (-1.42)	-0.030 (-1.45)	-0.042 (-1.42)	-0.043 (-1.33)	-0.043 (-1.27)
<i>BM</i>	0.007 (0.98)	0.007 (0.98)	0.007 (0.96)	-0.003 (-0.16)	-0.001 (-0.08)	-0.001 (-0.08)	0.004 (0.56)	0.004 (0.54)	0.003 (0.36)
<i>FCF</i>	0.021 (0.39)			-0.114 (-2.13) <sup>b</sup>			0.115 (1.49)		
<i>exfindef</i>		-0.026 (-0.97)			-0.012 (-0.28)			-0.050 (-1.24)	
<i>equitydef</i>			-0.013 (-0.47)			-0.024 (-0.52)			-0.023 (-0.73)
<i>Mrunup</i>	0.079 (1.70)	0.079 (1.68)	0.080 (1.70)	0.051 (0.92)	0.047 (0.84)	0.049 (0.86)	0.090 (1.16)	0.093 (1.12)	0.096 (1.11)
$\Delta credit$	-0.766 (-1.82)	-0.769 (-1.84)	-0.797 (-1.87)	-0.702 (-1.63)	-0.648 (-1.34)	-0.722 (-1.40)	-0.402 (-0.61)	-0.346 (-0.49)	-0.461 (-0.65)
$\Delta term$	-0.226 (-0.55)	-0.277 (-0.69)	-0.259 (-0.64)	-0.062 (-0.15)	-0.039 (-0.09)	-0.048 (-0.11)	0.048 (0.07)	-0.171 (-0.24)	-0.132 (-0.18)
<i>RIF3</i>	0.339 <sup>a</sup> (2.86)	0.332 <sup>a</sup> (2.86)	0.338 <sup>a</sup> (2.84)	0.102 (0.92)	0.089 (0.74)	0.083 (0.69)	0.645 <sup>b</sup> (2.40)	0.655 <sup>b</sup> (2.28)	0.666 <sup>b</sup> (2.09)
<i>DIF3</i>	-0.024 <sup>b</sup> (-2.11)	-0.023 <sup>b</sup> (-1.96)	-0.022 (-1.91)	0.002 (0.08)	-0.001 (-0.03)	0.003 (0.13)	-0.184 (-0.53)	-0.158 (-0.42)	-0.214 (-0.54)
<i>adj. R<sup>2</sup></i>	0.32	0.33	0.32	0.03	0.02	0.03	0.50	0.49	0.47

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

White heteroskedasticity-consistent standard errors

The dependent variable is the 3-day *CAR*. *UOP* is the use of the proceeds dummy. Static trade-off, information asymmetry, agency and timing variables are defined in Table 3.10. *RIF3* is the industry median adjusted 3-year earnings forecast revision around the SEO announcement. *DIF3* is the industry median adjusted dispersion in 3-year earnings forecasts prior to the SEO announcement. *T*-stat are given in parentheses.

The SEO announcement conveys private information about the future earnings of one issuer type and that information addresses the value of the investment project. This finding contradicts the Gajewski and Ginglinger (2002) argument that announcing a specific use of the proceeds lowers the degree of information asymmetry. In fact, information asymmetry is concentrated in the investment project. Another characteristic of “Financing New Investment” issuers is consistent with that explanation. Panel C of Table 3.5 reports that the business risk of “Financing New Investment” issuers increases after the SEO announcement. The explanation is that the new project contributes to that increase. Accordingly, investors could consider the SEO announcement as a turning point at which the private information is revealed and is transformed simultaneously into a greater uncertainty and lower expected earnings. That rationale presents the investment opportunity as a high risk negative NPV project. In other words, the project could generate very high profits if it succeeds but the probability of success is low. The investment project have many characteristics in common with start-up, including the constraint to be financed with equity.

The dispersion in earnings forecasts prior to the SEO announcement has some limited explanatory power. The significance of the *DIF3* coefficient is restricted to the “Short-term I/B/E/S” sample. It has the predicted negative sign. The greater is the earnings forecasts dispersion, the more severe is the stock price decline. When offerings are split according to the use of the proceeds, the significance of the *DIF3* variable disappears<sup>54</sup>. All in all, investors do not consider that a lower dispersion corresponds to a lower degree of information asymmetry. Not presented here, the variation in the earnings forecasts dispersion around the SEO is not significantly different from zero. The SEO announcement does not lead financial analysts to make more accurate forecasts.

The inclusion of the earnings forecast variables has for consequence to eliminate the significance of the risk specific for the “Short-term I/B/E/S” and the “Financing New Investment” samples. The significance of the stock price runup is also affected. At the “Short-term I/B/E/S” sample level, coefficients of the runup are still significant but at a lower level. However, they become insignificant when both issuers’ types are analysed separately. When information asymmetry coefficients are jointly tested to be equal to zero, the null hypothesis is not rejected (*p*-value of 0.30 for both “Short-term I/B/E/S” and “Financing New Investment” samples). These findings suggest that both specific risk and stock price runup are

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<sup>54</sup> The significance of the “Short-term I/B/E/S” sample could be due to the presence of heteroskedasticity in the standard errors.

appropriate measures of the degree of information asymmetry. They also confirm that the private information is about future earnings and that it is “Financing New Investment” issuer-specific. Indeed, financial analysts use the SEO announcement as a signal to revise their earnings forecasts.

The impact of timing vanishes when earnings forecast variables are tested. The credit spread and the market runup lose their significance. The hypothesis that all three timing variable coefficients are jointly equal to zero is not rejected for both “Short-term I/B/E/S” and “Financing New Investment I/B/E/S” samples,  $p$ -values being equal to, respectively, 0.37 and 0.29. This finding indicates that the revisions in earnings forecasts also integrate the valuation effect of timing.

All in all, earnings forecast revisions around the SEO announcement help to explain the stock price reaction. They substitute for information asymmetry and timing effects. The earnings forecast revision is an ex-post control variable. It cannot be observed before or even at the time of the SEO announcement. It controls that the information conveyed by the announcement is about future earnings. The findings also show that the fraction of the announcement valuation effect explained by the earnings forecast revisions was previously explained by pre-announcement specific risk, stock price runup, past market performance and credit spread. At this point, testing whether financial analysts use information asymmetry and timing measures to adjust their earnings forecasts would be interesting. Consider the following ad hoc model :

$$RIF3_i = \delta_0 + \delta_1 specific_i + \delta_2 runup_i + \delta_3 Mrunup_i + \delta_4 \Delta credit + \delta_5 \Delta term + \varepsilon_i \quad (3.14)$$

If the ex-post earnings forecast revisions are a substitute for ex-ante information asymmetry and timing variables, the  $\delta$  coefficients should be significantly different from zero (negative for information asymmetry variables and  $\Delta credit$ , and positive for past market performance and expected economic conditions). Results are presented in Table 3.13 for the “Short-term I/B/E/S”, “Capital Structure I/B/E/S” and “Financing New Investment I/B/E/S” samples.

**Table 3.13 : Determinants of earnings forecast revisions around the SEO announcement**

	“Short-term I/B/E/S”	“CS I/B/E/S”	“FNI I/B/E/S”
$\delta_0$	-0.002	-0.013	0.008
	-0.35	-1.65	1.71
<i>specific</i>	-6.753 <sup>a</sup>	-4.988	-5.006 <sup>b</sup>
	-2.98	-1.22	-2.05
<i>runup</i>	-0.019 <sup>b</sup>	0.013	-0.038 <sup>a</sup>
	-2.32	0.74	-4.16
<i>Mrunup</i>	0.048 <sup>b</sup>	0.016	0.078 <sup>b</sup>
	1.96	0.44	2.61
$\Delta credit$	-0.491	-0.122	-0.906 <sup>b</sup>
	-1.39	-0.23	-2.17
$\Delta term$	0.672 <sup>a</sup>	1.327 <sup>a</sup>	0.317
	2.92	3.55	1.23
<i>adj. R</i> <sup>2</sup>	0.21	0.16	0.45

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

The dependent variable is the industry median adjusted 3-year earnings forecast revision, *RIF3*. Information asymmetry and timing variables are defined in Table 3.10. *T*-stat are given in parentheses.

At the “Short-term I/B/E/S” sample level, the magnitude of the earnings forecast revisions is explained by the pre-announcement specific risk, stock price runup, market performance and term spread. All coefficients have their predicted sign. It is worth noticing that the expected economic conditions have a significant influence on the earnings forecast revisions. When issuers are split according to the use of the proceeds, revisions after a “Capital Structure” offering are explained only by the term spread, the expected economic conditions. In the case of “Financing New Investment” issues, specific risk, stock price runup, market runup and credit spread are significant. This simple model is meant to explore potential determinants of earnings forecast revisions after a SEO announcement. The results indicate that a link exist between the ex-ante proxies for both information asymmetry and timing and the ex-post revisions in earnings forecasts. This link should explain why the ex-ante variables loose their significance in Table 3.12.

A question remains unanswered. The economic effect of the equity financing decision is measured at the announcement date but what is the fraction of this effect that is not anticipated by the market ? To say it differently, does the SEO announcement really convey

private information ? Or is the market able to anticipate this information ? In this case, what variables do explain the stock price reaction at the announcement ? Answers to these questions could be brought by running a conditional event study.

### ***3.3 A conditional methodology to test announcement effects***

Malatesta and Thompson (1985) define the economic impact of an event as the difference between the firm value knowing the event is occurring and the firm value knowing the event will never occur. The economic impact is equivalent to the present value of the cash flows generated by the event. The announcement of the event eliminates the uncertainty about the event modalities. In that sense, the announcement valuation effect is restricted to the change in firm value directly coming from the elimination of that uncertainty. The economic impact and the announcement valuation effect cannot be equivalent, unless the event is perceived as impossible by investors.

Standard event study methodology involves two problems related to the previous observation. First, following Eckbo, Maksimovic and Williams (1990), standard OLS estimators of the announcement valuation effect are inconsistent when the event is voluntarily decided by managers, as it is the case for SEO. Rational managers initiate the SEO only when it provides some corporate or personal benefit so that they would conduct the equity issue only when their private information has a positive net value. At the same time, rational investors are expected to use both the voluntary event announcement and managers' incentives to infer the net present value of private information.

Second, following abnormal returns are related to the issuers' characteristics not only through the announcement but also through the investors' anticipation of the event. Indeed, investors use the firm characteristics to estimate the event probability of occurrence. As noticed by Campbell, Lo and McKinlay (1997), the link between the firm characteristics and the investors' anticipation of the event introduce a selection bias. Therefore, the residuals of the standard cross-section analysis are not independent from the firm characteristics, represented by the explanatory variables.

Both problems are addressed by Acharya (1988, 1993), Eckbo et al. (1990), and Prabhala (1997). These authors show that the use of a limited dependent variable methodology allows to derive consistent estimators of the event valuation effect.

### 3.3.1 Truncated regression model

The conditional model is derived from Eckbo et al. (1990) and adapted for the specificities of equity issues. The decision that leads managers to realise a SEO is based on the information they possess and that is not fully available to the market. Let  $y_i$  denote firm  $i$  evaluation of the NPV of announcing an equity issue. Managers realise the SEO only when the announcement NPV is non-negative. While investors cannot directly observe  $y_i$ , they know a set of public variables that help them estimate  $y_i$ . The SEO announcement NPV to managers is modelled as follows :

$$y_i = \gamma' \mathbf{X}_i + \eta_i \geq 0 \quad (3.15)$$

where  $\gamma' \mathbf{X}_i$  represents the investors' expectation of  $y_i$  conditional on prior public information  $\mathbf{X}_i$ , with  $\mathbf{X}'_i = (1, x_{i,1}, \dots, x_{i,K})$ , and  $\gamma$  being a vector of coefficients,  $\eta_i$  is the NPV of managers' private information, when the announcement is made. The variable  $\eta_i$  is assumed to be distributed normally,  $N(0, \sigma_\eta^2)$ .

When the SEO is announced, investors infer that  $\eta_i \geq -\gamma' \mathbf{X}_i$ . Then, the expected NPV of the announcement conditional on managers' rationality is given by :

$$E(y_i | \eta_i \geq -\gamma' \mathbf{X}_i) = \gamma' \mathbf{X}_i + E(\eta_i | \eta_i \geq -\gamma' \mathbf{X}_i) = \gamma' \mathbf{X}_i + \sigma_\eta \frac{\phi(z_i)}{\Phi(z_i)} \quad (3.16)$$

where  $z_i = \frac{\gamma' \mathbf{X}_i}{\sigma_\eta}$  is the standardised value of public information,

$\phi(z_i) = \frac{1}{\sqrt{2\pi}} e^{-(1/2)(z_i)^2}$ , the standard Normal density function of  $z_i$ ,

$\Phi(z_i) = \int_{-\infty}^{z_i} \phi(z_i) dz_i$ , the standard Normal cumulative function of  $z_i$ ; in other

words, the probability to issue equity, anticipated by investors.

The ratio  $\phi(z_i)/\Phi(z_i)$  is the expectation of a standardised normal variable that is truncated below at  $-z_i$ . Thus, the announcement abnormal effect ( $AE_i$ ), given that the event is voluntary and given Equation 3.15, can be re-defined as :

$$AE_i = \mathbf{a}'\mathbf{X}_i + q\sigma_\eta \frac{\phi(z_i)}{\Phi(z_i)} + \zeta_i \quad (3.17)$$

where  $\mathbf{a}'\mathbf{X}_i$  is the fraction of the announcement valuation effect imputable to the set of public information  $\mathbf{X}_i$ <sup>55</sup>,  $\mathbf{a}$  being a vector of coefficients,

$\sigma_\eta \frac{\phi(z_i)}{\Phi(z_i)}$  is the unanticipated stock price reaction imputable to managers' private information,

$q$  is a coefficient measuring the sensitivity of the unanticipated stock return to private information.

$\zeta_i \sim N(0, \sigma_\zeta)$  is an error term.

In terms of Equation 3.10,  $\mathbf{a}'\mathbf{X}_i$  corresponds to the list of explanatory variables corresponding to the various theories ( $\alpha_0 + \alpha_1 \times UOP_i + \mathbf{a}'\mathbf{TO}_i + \mathbf{b}'\mathbf{IA}_i + \mathbf{c}'\mathbf{AC}_i + \mathbf{d}'\mathbf{TG}_i$ ). The term  $\varepsilon_i$  represents the non-truncated residuals, replaced in Equation 3.16 by the sum  $q\sigma_\eta \frac{\phi(z_i)}{\Phi(z_i)} + \zeta_i$ . In this conditional methodology, the expected unanticipated valuation effect is assumed to be proportional to the private information released in the event. Two main hypotheses are tested. First, the significance of the coefficient  $q$  indicates that the private information effect is not fully anticipated at the time of the SEO announcement. In other words, the announcement of the financing decision still conveys some private information about the firm value. Second, the significance of the coefficients in  $\mathbf{a}$  shows which theory impacts the announcement valuation effect once the selection bias is taken into account.

### 3.3.2 The estimation procedure

Managers initiate the equity offerings only if the announcement NPV, given their private information, is non-negative. Otherwise, they do nothing. In the cross-section analysis, the managers' behaviour implies that the residuals distribution is truncated. Coefficients corrected for this truncation bias can be estimated with Maximum Likelihood, with Non-Linear Least Squares and with a two-stage procedure. This last estimation method, proposed by Heckman (1979), is used by Acharya (1988 and 1993) and Guo and Mech (2000). It has been

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<sup>55</sup> The set of public information in Equation 3.16 is not constrained to be equivalent to the one in Equation 3.14, see Greene (1984, p. 974 and following).

shown to have nice statistical properties in small samples, which is not the case for Maximum Likelihood and Non-Linear Least Squares, see Prabhala (1997). However, it requires a “Non-Event” sample that includes firms that do not issue equity, for which the announcement NPV is supposed to be negative ( $\eta_i < -\gamma'X_i$ ). This “Non-Event” sample is used in the first stage in order to estimate the probability to issue equity. The two-stage procedure is described below.

### *3.3.2.1 Formation of a non-event sample*

A non-event firm should be one for which the event announcement NPV is negative. The value of managers’ private information is not worth enough. Since private information is not observable, the definition of the non-event firm is reduced to a firm that could conduct a SEO but that does not. French issuers must receive the authorisation to issue equity from the shareholders’ Extraordinary Meeting (hereafter EM). This authorisation runs over five years. The call of the EM and its agenda is published in the “Bulletin des Annonces Légales Obligatoires”. Although it is not legally required, EM are often called on the same date as the Ordinary Meeting. April is the month when most of the Ordinary Meetings are called. From the April’s editions of the BALO between 1984 and 2000, a sample of 730 authorisations to issue equity is collected. The authorisations are asked by 300 different firms in all industrial sectors.

Since it has received the authorisation, the management is free to decide when to issue. It can also decide not to issue during the whole period. I consider firms that received the authorisation to issue but that do not realise the operation within two years after the EM as potential non-event firms. The 2-year period is chosen because 85 % of equity issues occur within this horizon<sup>56</sup>. Furthermore, it is long enough to let managers initiate the operation if their private information is favourable. At the same time, it is not too long so that the market could still anticipate the event. After two years, the issuance probability perceived by the market is assumed to decrease rapidly.

To be included in the final non-event sample, potential non-event firms are matched with issuers on the industry and on the announcement date. For each issuer, firms that are in the no-issue period and that are in the same industry are considered as non-event firms. They receive a “pseudo announcement” date which is the one of their issuing counterpart. This “pseudo announcement” date serves as reference date to fix the non-event in time and allows

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<sup>56</sup> See Table 3.6 for the descriptive statistics about the SEO timeline.

to collect the relevant data concerning the non-event firm. Data requirements for non-event firms are similar to those for issuers (except for the issuing prospectus). Consequently, the final non-event sample (NE) includes 583 observations.

Descriptive statistics of the “Non-Event” sample are presented in Table 3.14 as well as those of the “Short-term” sample. The last column reports the difference in medians between both samples. “Non-Event” firms are significantly larger than issuers (median market capitalisation of 3672 millions FRF vs. 889 millions FRF). This finding is not surprising since it is consistent with the SEO literature indicating that equity issues are realised mainly by small firms<sup>57</sup>. In terms of book-to-market ratio, the difference between issuers and “Non-Event” firms is not significant. One could expect equity issuers to have more growth opportunities than non-event firms. However, almost half of equity issuers realise the operation for non-investing purposes and should not have a different book-to-market ratio. When the comparison is made between “Non-Event” firms and “Financing New Investment” issuers, the median book-to-market is not different either (not shown here). This result is consistent with the fact that “Financing New Investment” issuers are not high growth firms but they finance high-risk investments with equity.

**Table 3.14 : Descriptive statistics of the non-event sample**

	"Non-Event" 583 observations		"Short-term" 198 observations		Difference NE - ST median
	mean	median	mean	median	
Issuer size (millions FRF)	20890	3672	6159	889	2783 <sup>a</sup> (8.97)
Book-to-market ratio	0.67	0.49	0.76	0.52	-0.03 (-0.40)
Debt-to-assets ratio	0.24	0.21	0.28	0.27	-0.06 <sup>a</sup> (-2.58)
Cash-to-assets ratio	0.12	0.08	0.07	0.04	0.04 <sup>a</sup> (5.09)
Cash flow-to-assets ratio	0.07	0.07	0.05	0.06	0.01 (1.34)

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

Wilcoxon rank test statistics are given in parentheses. Variables are defined as in Table 3.6.

Equity issuers are more levered and have less cash than “Non-Event” firms. These differences are mainly due to the “Capital Structure” issuers, since “Non-Event” firms and

“Financing New Investment” issuers have statistically similar debt ratio and liquidity ratio. In terms of cash flow, no difference is noticed between issuers and non-issuers. When issuers are split according to the use of the proceeds, “Financing New Investment” issuers are found to have significantly larger cash flows (median difference of 0.02 with a Wilcoxon rank test statistic of 2.12) than “Non-Event” firms, while “Capital Structure” issuers have significantly lower cash flows (median difference of -0.04 with a Wilcoxon rank test statistic of -4.11). These findings are consistent with the fact that “Financing New Investment” issuers have alternative financing solution to external equity and that “Capital Structure” issuers are more financially constrained.

### 3.3.2.2 *The first stage, the probability to issue*

The first stage of the procedure consists in estimating the probability to issue equity. Variables used to anticipate the equity issue decision are the explanatory variables of the cross-section analysis plus the firm size given by the logarithm of the market value taken at the end of the month prior to the SEO announcement (or pseudo announcement for “Non-Event” firms). The size is added because it underlines a great difference between both samples. Hence, investors could use it as one major variable to anticipate the event. The larger the firm, the lower should be the probability to issue. Other potential explanatory variables are described in Table 3.10. To summarise, the following Probit model is estimated :

$$I_j = \gamma' \mathbf{X}_j + \xi_j = \gamma_0 + \gamma_1 MV_j + \mathbf{a}' \mathbf{TO}_j + \mathbf{b}' \mathbf{IA}_j + \mathbf{c}' \mathbf{AC}_j + \mathbf{d}' \mathbf{TG}_j + \xi_j \quad (3.18)$$

where the subscript,  $j$ , characterises all firms that belong to the union of “Short-term” and “Non-Event” samples,

$I_j$  is a dummy variable equal to 1 for equity issuers and 0 otherwise (for non-event firms),

$\mathbf{X}_j$  is the vector of explanatory variables;  $\mathbf{X}_j' = [1 \quad MV_j \quad \mathbf{TO}_j' \quad \mathbf{IA}_j' \quad \mathbf{AC}_j' \quad \mathbf{TG}_j']$ ,

$MV_j$  is the logarithm of firm,  $j$ , market value taken at the end of the month prior to the SEO announcement,

$\xi_j \sim N(0, \sigma_\xi)$  is an error term.

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<sup>57</sup> See Brav, Geczy and Gompers (2000), Eckbo, Masulis and Norli (2000), Mitchell and Stafford (2000) and Stehle, Ehrhardt and Przyborowsky (2000) among others.

The probability to issue equity for firm,  $j$ , is computed using the maximum likelihood estimators of the  $\gamma$  coefficients such as :

$$\hat{p}_j = \Phi\left(\frac{\hat{\gamma}'\mathbf{X}_j}{\sigma_\xi}\right) \quad (3.19)$$

with  $\Phi$  being the standard normal repartition function.

Without losing generality, the volatility of private information can be set to 1 and thus, the estimated probability is given by  $\hat{p}_j = \Phi(\hat{\gamma}'\mathbf{X}_j)$ . This probability is then corrected for the unequal sampling bias as in Guo and Mech (2000). Indeed, the fractions of firms in both samples relative to their populations are not equal and this could bias the raw probability. The probability is corrected in the following manner :

$$\hat{p}_j^c = \frac{\hat{p}_j}{\hat{p}_j + \frac{S_e/N_e}{S_{ne}/(N - N_e)}(1 - \hat{p}_j)} \quad (3.20)$$

where  $S_e$  is the number of observations in the “Short-term” sample,  
 $S_{ne}$  is the number of observations in the “Non-Event” sample,  
 $N_e$  is the total number of SEO with rights during the period,  
 $N$  is the total number of firms on the French market during the period.

### 3.3.2.3 The second stage, the valuation effect of private information

The Probit equation uses the combined data of the “Short-term” and “Non-Event” samples to estimate the probability to issue equity. In the truncated regression, only the data about the issuers are considered. The probabilities to issue of firms  $j = i$  are retained, where  $i$  indicates that the firm belongs to the “Short-term” sample. The truncation adjustment ratio is computed as follows :

$$private_i = \frac{\phi\left[\Phi^{-1}\left(\hat{p}_{j=i}^c\right)\right]}{\hat{p}_{j=i}^c} \quad (3.21)$$

The  $private_i$  variable can be interpreted as the announcement valuation effect of private information. The greater is the value of private information, the lower the stock price reaction should be. Hence, the sign of the  $private_i$  variable is expected to be negative. In the second

stage of the procedure, the coefficients of the explanatory variables, including  $private_i$ , are estimated with OLS. The regression is the following :

$$CAR(0,+2)_i = \alpha_0 + \alpha_1 UOP_i + \mathbf{a}'\mathbf{TO}_i + \mathbf{b}'\mathbf{IA}_i + \mathbf{c}'\mathbf{AC}_i + \mathbf{d}'\mathbf{TG}_i + q \times private_i + \zeta_i \quad (3.22)$$

If the SEO announcement conveys unanticipated information about the firm value, the coefficient  $q$  should be significant. Otherwise, the announcement valuation effect should not be explained by information asymmetry. Other explanatory variables being significant mean that their influence persists after controlling for the investors' anticipations.

### 3.3.3 Anticipation and valuation of private information

The results of three Probit regressions are presented in Table 3.15. The first model (“agency”) includes the measure of free cash flow, while the second and third use, respectively,  $exfindef$  and  $equitydef$  as proxies for the financing constraints. For the sake of brevity, only the results with the term spread variable are shown<sup>58</sup>.

The smaller is the firm and the higher above the debt target ratio, the more expected is the equity issue. The coefficients of both variables,  $MV$  and  $\Delta target$ , have the expected sign and are significant. The results about the information asymmetry variable are mixed. The degree of specific risk plays no role in the anticipation of the equity financing decision. Conversely, the stock price runup prior to the SEO announcement is positively and significantly related to the probability of issuance. In that sense, the role of the stock price runup has more to do with timing than with information asymmetry. Firms that have experienced a strong stock performance are more expected to issue equity. This timing measure is firm-specific and does not automatically depend on market and macro economic conditions. To pursue with timing, the past market performance does not influence the probability to issue. The  $Mrunup$  variable is never significant. The better are the current global economic conditions, the greater is the probability to issue equity (the coefficient of  $\Delta credit$  is significantly negative). As expected, equity issues are more inclined to be realised when a downturn in the economic conditions is anticipated (the coefficient of  $\Delta term$  is also significantly negative).

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<sup>58</sup> The results with the  $CLI$  variable are qualitatively the same, except for the coefficient of the  $CLI$  variable that is only significant at the 10 % level.

**Table 3.15 : Probit regressions outcome to estimate the probability of issue**

	"agency"	"slack"	"equity"
$\alpha_0$	1.02 <sup>a</sup> (4.39)	1.11 <sup>a</sup> (4.67)	1.08 <sup>a</sup> (4.58)
$MV$	-0.21 <sup>a</sup> (-7.62)	-0.20 <sup>a</sup> (-7.44)	-0.20 <sup>a</sup> (-7.42)
$\Delta target$	0.77 <sup>b</sup> (2.56)	0.62 <sup>b</sup> (2.06)	0.77 <sup>b</sup> (2.59)
$specific$	1.50 (0.09)	-1.48 (-0.07)	-1.22 (-0.06)
$runup$	0.47 <sup>a</sup> (3.02)	0.47 <sup>a</sup> (3.04)	0.47 <sup>a</sup> (3.03)
$BM$	-0.16 <sup>b</sup> (-1.96)	-0.15 (-1.90)	-0.17 <sup>b</sup> (-2.04)
$FCF$	0.08 (0.36)		
$exfindef$		0.83 <sup>b</sup> (2.58)	
$equitydef$			0.64 <sup>b</sup> (2.14)
$Mrunup$	-0.16 (-0.43)	-0.19 (-0.52)	-0.17 (-0.46)
$\Delta credit$	-17.90 <sup>a</sup> (-3.24)	-19.53 <sup>a</sup> (-3.51)	-18.45 <sup>a</sup> (-3.34)
$\Delta term$	-7.49 <sup>b</sup> (-2.30)	-7.30 <sup>b</sup> (-2.23)	-7.33 <sup>b</sup> (-2.25)
$pseudo R^2$	0.12	0.12	0.12

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

The dependent variable is the issue dummy,  $I_j$ , that takes the value 1 when the firm  $j$  belongs to the “Short-term” sample and 0 if it belongs to the “Non-Event” sample. The explanatory variables are the logarithm of the firm  $j$  market value,  $MV_j$  and those included in the **TO**, **IA**, **AC**, **TG** vectors defined in Table 3.10. Z-stat are given in parentheses. The  $pseudo - R^2$  is the McFadden coefficient of determination.

The growth potential of the firm plays a small role in explaining the equity issue decision. The coefficient of the book-to-market ratio is negative but only slightly significant (in the “agency” and the “equity” regressions). The magnitude of free cash flow and the risk of moral hazard that it proxies is not considered as a relevant determinant of the equity financing

decision. On one hand, the results outline the marginal role of the agency theory in explaining the choice of equity as the financing source. On the other hand, the financial constraints variables are found to have a significant explanatory power. The greater the external financing deficit, the greater is the probability to issue equity. A similar relation is observed with the equity financing deficit.

The mean estimated probability of issuance for the “Short-term” sample (measured by the “slack” Probit model) is equal to 40 % while that of the “Non-Event” sample reaches only 27 %. The difference is significant at the 1 % level ( $t$ -stat = 8.77). No difference is noticed according to the use of the proceeds. The mean estimated probability to issue is equal to 39 % for “Capital Structure” issuers and to 41 % for “Financing New Investment” issuers. Results according to the “equity” and “agency” Probit models are not qualitatively different, although the mean probabilities given by the “agency” model are smaller (35 % and 22 % for, respectively, the “Short-term” and the “Non-Event” samples, the  $t$ -stat of the difference being equal to 9.62).

The estimated probability of issuance is corrected for the unequal sample bias. The number of observations in the “Short-term” sample accounts for 198 ( $S_e$ ). The total number of rights offerings realised between 1984 and 2000 equals 436 ( $N_e$ ). The “Non-Event” sample includes 583 observations ( $S_{ne}$ ) and a total of 2201 firms are listed on the French Stock Exchange during the period ( $N$ ). According to Equation 3.19, the correction coefficient is given by :

$$c = \frac{S_e/N_e}{S_{ne}/(N - N_e)} = 1.375 \quad (3.23)$$

Once corrected for the unequal sampling bias, the mean probabilities to issue, according to the “slack” Probit model, equal 28 % for the “Short-term” sample and 18 % for the “Non-Event” sample. The difference is still significant at the 1 % level ( $t$ -stat = 8.26).

From the corrected estimated probabilities,  $\hat{p}_i^c$ , the private information variable (truncation ratio) is constructed for each issuer in the “Short-term” sample, following Equation 3.20. The results of the second-stage OLS regressions are presented in Table 3.16. The first three columns report the coefficients estimated from the “Short-term” sample. Each column corresponds to the Probit model (“agency”, “slack” and “equity”) used to compute the probabilities of issuance in  $private_i$ . Regressions are also run on both uses of the proceeds sub-samples. Results are shown in the last six columns of Table 3.16.

At the “Short-term” sample level, the coefficients of the *private* variable are negative and significant at the 1 % level. These findings support the fact that the SEO announcement conveys unanticipated private information. The negative sign stipulates that the greater private information, the lower is the stock price reaction, which is consistent with the information asymmetry theory. When the sample is split according to the use of the proceeds, the private information variable remains significant, in all cases, for the “Financing New Investment” issuers. Conversely, it is not significant in two of the three regressions at the “Capital Structure” sample level. The fact that the unanticipated effect is restricted to announcements of “Financing New Investment” offerings is not surprising. Indeed, only these operations are shown, in the standard cross-section analysis, to be sensitive to information asymmetry problems. Furthermore, they are the only ones to induce both a revision in earnings forecast and a change in the business risk.

The correction for the selection bias does not dramatically modify the significance of the explanatory variables coefficients. Information asymmetry receives the greatest support as the coefficients of the *specific* and *runup* variables are still significantly negative for both “Short-term” and “Financing New Investment” samples. Their level of significance increases from the one observed in the standard cross-section analysis.

The impact of timing is also confirmed. The past market performance, *Mrunup*, positively influences the valuation effect. It is significant at the 1 % level for the “Short-term” sample, at the 5 % level for “Financing New Investment” issuers but not significant at a convenient level for “Capital Structure” issuers. Overall, the explanatory power of the market momentum increases with the correction for the selection bias. The converse is true about the credit spread. The coefficient of the  $\Delta credit$  variable is still negative and significant at the “Short-term” sample level but the significance is restricted to the “Capital Structure” sample when operations are separated across uses of the proceeds. It disappears at the “Financing New Investment” sample level. The greater the valuation effect of unanticipated information, the lower becomes the influence of current economic conditions. Expected economic conditions, represented by the term spread, do not explain the announcement valuation effect, like in the standard cross-section analysis. However, the sign of  $\Delta term$  coefficients become positive for all samples, which is consistent with theoretical predictions. *Mrunup* has no influence on the probability to issue. Hence, its explanatory power is strengthened when the anticipation of the event is considered. The opposite rationale applies to the credit spread, which is significant in the Probit model.

**Table 3.16 : Anticipation and private information effect on the stock price reaction**

	"Short-Term" sample			CS sample			FNI sample		
	"agency"	"slack"	"equity"	"agency"	"slack"	"equity"	"agency"	"slack"	"equity"
$\alpha_0$	0.060 <sup>a</sup> (2.87)	0.052 <sup>b</sup> (2.48)	0.059 <sup>a</sup> (2.80)	0.040 <sup>b</sup> (2.07)	0.023 (1.08)	0.024 (1.14)	0.074 <sup>a</sup> (2.76)	0.078 <sup>a</sup> (2.78)	0.091 <sup>a</sup> (3.33)
<i>UOP</i>	-0.010 (-1.47)	-0.010 (-1.44)	-0.010 (-1.45)						
$\Delta target$	-0.011 (-0.56)	-0.003 (-0.18)	-0.010 (-0.51)	0.016 (0.84)	0.027 (1.10)	0.021 (0.85)	-0.022 (-0.66)	-0.024 (-0.67)	-0.016 (-0.47)
<i>specific</i>	-14.09 <sup>a</sup> (-3.25)	-12.82 <sup>a</sup> (-2.81)	-13.99 <sup>a</sup> (-3.07)	-6.23 <sup>b</sup> (-2.12)	-4.61 (-1.43)	-4.68 (-1.47)	-18.47 <sup>b</sup> (-2.61)	-20.68 <sup>a</sup> (-2.67)	-24.51 <sup>a</sup> (-3.33)
<i>runup</i>	-0.042 <sup>a</sup> (-3.56)	-0.041 <sup>a</sup> (-3.60)	-0.042 <sup>a</sup> (-3.59)	-0.008 (-0.76)	-0.009 (-0.81)	-0.011 (-0.95)	-0.071 <sup>a</sup> (-4.50)	-0.069 <sup>a</sup> (-4.38)	-0.069 <sup>a</sup> (-4.56)
<i>BM</i>	0.007 (1.47)	0.007 (1.51)	0.007 (1.53)	-0.003 (-0.60)	-0.004 (-0.70)	-0.003 (-0.52)	0.021 <sup>a</sup> (3.05)	0.020 <sup>a</sup> (2.87)	0.020 <sup>a</sup> (2.88)
<i>FCF</i>	-0.013 (-0.32)			-0.189 <sup>a</sup> (-4.12)			0.081 (1.65)		
<i>exfindef</i>		-0.002 (-0.09)		-0.031 (-0.94)			0.031 (0.76)		
<i>equitydef</i>			0.020 (0.84)			-0.031 (-1.05)			0.079 <sup>b</sup> (2.45)
<i>Mrunup</i>	0.080 <sup>a</sup> (3.22)	0.081 <sup>a</sup> (3.29)	0.081 <sup>a</sup> (3.26)	0.057 (1.61)	0.055 (1.60)	0.055 (1.60)	0.092 <sup>a</sup> (2.71)	0.085 <sup>b</sup> (2.39)	0.087 <sup>b</sup> (2.48)
$\Delta credit$	-1.076 <sup>b</sup> (-2.64)	-1.042 <sup>b</sup> (-2.57)	-1.048 <sup>b</sup> (-2.57)	-0.760 (-1.82)	-0.973 <sup>b</sup> (-2.16)	-1.011 <sup>b</sup> (-2.20)	-0.633 (-0.98)	-0.678 (-0.98)	-0.676 (-1.01)
$\Delta term$	0.054 (0.25)	0.034 (0.16)	0.058 (0.26)	0.372 (1.39)	0.207 (0.75)	0.270 (0.98)	0.262 (1.05)	0.173 (0.65)	0.243 (0.91)
<i>private</i>	-0.037 <sup>a</sup> (-3.01)	-0.036 <sup>a</sup> (-2.85)	-0.038 <sup>a</sup> (-3.01)	-0.028 <sup>b</sup> (-2.33)	-0.021 (-1.58)	-0.023 (-1.66)	-0.055 <sup>a</sup> (-3.15)	-0.058 <sup>a</sup> (-3.10)	-0.060 <sup>a</sup> (-3.28)
<i>adj. R</i> <sup>2</sup>	0.30	0.31	0.30	0.25	0.13	0.13	0.51	0.49	0.51

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

White heteroskedasticity-consistent standard errors

The dependent variable is the 3-day *CAR*. *UOP* is the use of the proceeds dummy. Static trade-off, information asymmetry, agency and timing variables are defined in Table 3.10. The *private* variable is the information

asymmetry valuation effect. It is computed as the truncation ratio (Heckman, 1979) :  $private_i = \phi(\Phi^{-1}(\hat{p}_i^c)) / \hat{p}_i^c$

where  $\phi$  is the normal density function,  $\Phi$  is the normal cumulative function and  $\hat{p}_i^c$  is the probability of issuance estimated from the Probit Equation 3.17 and corrected for the unequal sampling bias. The "agency" column corresponds to the use of the *FCF* variable in both Probit and second-stage regression, "slack" to the *exfindef* variable and "equity" to the *equitydef* variable. *T*-stat are given in parentheses.

The explanatory power of static trade-off and agency variables remains unchanged relative to the standard OLS analysis. The coefficients of  $\Delta target$  are not different from zero in all the cases. The book-to-market ratio positively influences the stock price reaction to equity issue announcement involving a specific investment project. On the other hand, the negative impact of free cash flow is restricted to “Capital Structure” operations. The *equitydef* variable, measuring the equity financing deficit has a positive and significant coefficient at the “Financing New Investment” sample level. Issuers in this sample are inclined to face higher degrees of adverse selection and information asymmetry. The significance of the *equitydef* variable is consistent with the pecking order prediction that equity financing should be used only when other sources are extinct.

Correcting for the selection bias in the case of French equity issues appeals one remark. The announcement of equity issues realised to finance a specific investment project conveys unanticipated private information that partially explains the stock price reaction. This finding gives a strong support to the information asymmetry theory as being one of the main determinant of marginal financing decisions.

### ***3.4 Discussion about the stock price reaction to SEO announcements***

The announcement of French rights offerings generates, on average, a negative stock price reaction. When examined in more details, this reaction is not common to all issues. It is restricted to firms announcing a specific investment project at the same time as the financing solution. The average 3-day *CAR* of the “Financing New Investment” sample is equal to -2.16 %. The overall stock price reaction is similar to what is found previously on the French market.

The use of the proceeds should be viewed as a composite indicator that differentiates equity issuers and thus, their announcement valuation effect. It captures the difference between, on one side, the capital structure irrelevancy and, on the other side, the information asymmetry and agency implications on the firm market value. Consequently, the separation of equity issuers according to the use of the proceeds creates an experiment framework able to test what capital structure theory applies and for which issuers’ types.

The stock price reaction to “Financing New Investment” offerings announcement is explained by information asymmetry, proxied by pre-announcement issuer’s specific risk and stock price runup, and by the growth potential, measured by the book-to-market ratio.

However, relevant information is still released at the announcement. “Capital Structure” offerings announcement valuation effect is sensitive to the magnitude of free cash flow and at a lower extend to the deviation from an industry target debt ratio. Timing, when it is considered at the level of the economy, has similar implications on both issuers’ types. Past market performance and current economic conditions explain significantly the 3-day *CAR*. Conversely, no consistent evidence is found that expected economic conditions influence the investors’ reaction to equity issue announcements.

The explanatory power of information asymmetry is further analysed through the work of financial analysts. The revision in analysts’ earnings forecasts around the announcement is positively correlated with the stock price reaction. This relation is restricted to the issuers using the proceeds to finance a specific investment projects. Moreover, the introduction of the revision variable eliminates the explanatory power of previous information asymmetry and timing variables. The earnings forecast revision is computed ex-post. Though, it allows to control for two hypotheses. First, the SEO announcement, when associated with a new investment project, conveys private information about future earnings. Second, the issuer’s specific risk in particular and the stock price runup are relevant in capturing private information effects. The fact that timing variables such as past market performance and the credit spread lose their significance indicates that managers, independently of the use of the proceeds, time the equity issue when an earnings downturn is expected. The negative average earnings forecast revision for the “Capital Structure” issuers support this explanation.

The decision to issue equity is voluntarily taken by managers, depending on their private information. It is also anticipated by investors who estimate the probability to issue from a set of public information that could also explain the announcement valuation effect. The consequence is the emerging of a selection bias. In order to solve this problem, the cross-section model used to explain the stock price reaction must be corrected. A truncated regression is estimated to examine the determinants of the marginal financing decision valuation effect conditionally to the SEO anticipation. The conditional methodology leads to two main results. First, the announcement of “Financing New Investment” equity offerings conveys unanticipated information about the firm value or, more specifically, about the investment project net value. Private information cannot be entirely extracted from a set of pre-SEO public variables. Second, even if the standard cross-section analysis results are biased, they are good estimators of the ones corrected for the selection problem. Significant explanatory variables with the conditional methodology are already significant with the

standard analysis. Small differences exist for the timing variables that could be attributed to the fact that these variables are used by investors to anticipate the event. Therefore, they could lose some of their explanatory power in the conditional framework.

The average negative valuation effect comes from the “Financing New Investment” sample. Information asymmetry seems to be concentrated in the value of the that project. In addition, the project let the issuer’s business risk increase. The choice of equity as the financing source is deliberate since other sources are available to the issuer. These observations considered globally make the investment opportunity look like a high-risk negative NPV project that is expected to generate a very large payoff in case of success but with a low probability. Under these circumstances, the question about the investors’ ability to correctly and entirely adjust their expectations about the firm value at the SEO announcement seems legitimate. In other words, does the investment/financing decision have implications on the firm value that could exceed the short-term analysis horizon ? A long-term event study about the impact of that kind of managerial decisions could bring some pertinent answer.

## **Chapter 4 : The impact of equity issue decisions on long-term stock performance**

Does the stock price reaction at the SEO announcement integrate all the information or does the underperformance persist several years after the issue? Loughran and Ritter (1995) are the first to mention the “New Issue Puzzle”. The overall evidence about the long-term underperformance is mixed and it raises several questions about market efficiency. Theories of capital structure explain why and how a marginal change in the capital structure may affect firm value on the short-term. Indeed, if equity issuers exhibit negative abnormal returns during several years after the event, arbitrageurs could earn abnormal profit regardless of their level of private information. The “New Issue Puzzle” has created a large debate. A strand of the research argues that the long-term underperformance is caused by inference biases introduced by the time aggregation method of abnormal return, by model misspecification and by incomplete adjustment for systematic risk. Long-term anomalies are expected to disappear with reasonable changes in performance measurement. Concurrently, theories based on investors’ cognitive biases reject market efficiency. Behavioural models attempt to define investors’ irrational reaction to information and describe its impact on the long-term stock return pattern. However, behaviourist theories are controversial; i.e. Fama (1998), Brav and Heaton (2002) and Constantinides (2002). They are notably criticized for fact that they do not rely on a new and well-defined economic paradigm.

The first two sections overview the empirical evidence of long-term post-SEO performance and the theoretical debate between behaviourists and defenders of market efficiency. Section 1 addresses to the “New Issue Puzzle”. It reviews selected empirical studies documenting long-term stock and operating performance after equity issues. It also covers the literature that contradicts the existence of a puzzle. In the first part of Section 2, three behavioural models are presented. The aim is to describe what elements of investors’ irrationality cause them to over or underreact to public information. Implications of behavioural theories on the long-term stock performance after SEO are also exposed. Section 2 ends with examples where apparent deviations from rationality can be reconciled with the rational economic paradigm.

Section 3 contains an empirical study that analyses the long-term stock performance of French equity issuers. Consistent with the short-term evidence, the use of the proceeds constitutes a discriminating variable to separate average poor performers from good ones. The anomaly is restricted to “Financing New Investment” issuers. Some evidence is given to the

“window of opportunity” hypothesis since equity offerings of both types are realised after a period of abnormal positive performance. However, only “Financing New Investment” issuers experience a reversal in the long-term post-SEO abnormal returns. A cross-sectional analysis is realised to test the influence of “timing”, “irrational investors” and “inefficient use of the proceeds” hypotheses on the long-term abnormal stock performance. “Inefficient use of the proceeds” seems to be the most relevant explanation although “timing” and “underreaction” are credited of some marginal influence. The section ends with concluding remarks about the impact of SEO on the long-term stock performance.

## ***4.1 Long-term abnormal stock performance after securities issues***

### **4.1.1 The “New Issue Puzzle”**

The puzzling results of Loughran and Ritter (1995) about the long-term stock underperformance of US equity issuers inaugurate a long stream of academic research in this area. The selected studies reviewed in this sub-section are ordered into three groups: 1) studies about US equity issuers, 2) studies about non-US equity issuers, and 3) studies about other securities issuers. The main findings are summarised in the first three panels of Table 4.1, at the end of the section.

#### *4.1.1.1 The long-term stock underperformance of US equity issuers*

Loughran and Ritter (1995) determine the long-term post-SEO abnormal stock performance according to a matching firm methodology over an analysis horizon of sixty months after the issue. To be selected as a matching firm, the potential candidate must not have issued equity during the last five years. If the matching firm offers stocks (or is delisted) within the analysis horizon, it is replaced by the next closest firm at the time of the issue. This procedure eliminates the survivorship bias. The matching criterion in Loughran and Ritter (1995) is the firm market capitalisation. The abnormal performance is measured by the wealth relative ratio; i.e. the buy-and-hold return (BHR) of the issuer at a given horizon divided by the BHR of its matching firm. Five years after the SEO, the average wealth relative ratio is equal to 0.69. This result is robust when the matching firm is replaced by a value-weighted market index as benchmark. The abnormal performance is not dependent on the issuer's age. A positive relation is found between the monthly performance of SEO firms and the book-to-market ratio, showing that high book-to-market firms tend to have higher returns. However,

the magnitude of the book-to-market effect appears to be small relative to the total underperformance.

The findings of Loughran and Ritter (1995) have been challenged by changing the matching methodology, the matching criteria, and the time aggregation of abnormal returns. Instead of a single matching firm, several authors use a control portfolio of matching firms. The abnormal performance relative to a single matching firm could be imputed to the control and not to the event firm. In other words, factors other than the matching criteria could be responsible for the anomaly. With a portfolio of matching firms, the firm-specific factors of the benchmark is reduced and the influence of the matching criteria should be strengthened. However, this methodology introduces new listing and rebalancing biases. Matching criteria are expected to control for risk factors common to both event and matching firms. Size, book-to-market ratio, industry and stock return momentum are the most commonly used matching criteria. They can be employed separately or in combinations, which introduces distance measurement problems. Long-term event studies are based on monthly returns. Monthly abnormal returns can be cumulated over the analysis horizon. This method, Cumulative Abnormal Return [*CAR*], implies a monthly rebalancing of the portfolio of event and matching firms. The alternative aggregation method is the buy-and-hold process. It measures the return on an unbalanced portfolio over the analysis horizon. The Buy-and-Hold Abnormal Return [*BHAR*] corresponds to the buy-and-hold return on the event firm minus the buy-and-hold return on the benchmark over a given analysis horizon. Both *CAR* and *BHAR* being equal to zero, on average, constitute the  $H_0$  hypotheses to be tested. The mean *CAR* and *BHAR* can be computed using equal weights or relative market capitalisation weights (value weights). Equal weights exacerbate the economic impact of the event on the firm value while value weights aim to outline the wealth effect of a well-diversified investor. The role of the weighting scheme is further discussed in Section 4.1.1.2.

Spiess and Affleck-Graves (1995) examine the long-term stock performance after primary equity offerings. Unlike Loughran and Ritter (1995), they exclude combined offerings (primary and secondary). In order to improve the matching procedure, they use industry and size, and size and book-to-market (BM) ratio as matching criteria. Their sample exhibits similar results to Loughran and Ritter (1995). Furthermore, they detect long-run stock underperformance according to the *CAR* methodology as well (-31 % after 60 months). The results are not sensitive to the year of issuance, the age of the issuer and to size and book-to-market ratio. The trading location has no influence : firms listed on the Nasdaq, on the NYSE

and the AMEX significantly underperform their benchmarks. Finally, the average wealth relative ratios of 13 out of 16 industry groups are inferior to one, showing that poor post-SEO stock performance is not driven by industry factor. Beside Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995), equity issuers are found to underperform their matching firm or control portfolio on the long-run in most of the studies realised on the US market; see Panel A of Table 4.1 for a list of empirical works. The underperformance is reduced in the value-weighting scheme but it does not disappear systematically. Utilities are documented to overperform their benchmark; see Kahle, 2000.

Loughran and Ritter (1995) attribute the underperformance to the managers' ability to issue overvalued securities. Lee (1997) examines the insider trading before the equity issue and its relation with the long-run post SEO stock performance. Consistent with the timing hypothesis, he observes that the ratio of purchases to sales made by insiders is lower than the one documented in studies not focusing on SEO. Primary issuers underperform their benchmark regardless of the insider trading pattern (wealth relative ranging between 0.86 and 0.88 depending on the insider trading strategy: pure purchases, mixed or pure sales). Conversely, firms that realise secondary offerings do not underperform in the exception of the insider pure sales group. Therefore, insider trading is a useful signal for the future performance of secondary offerings, if insiders are unbiased in their future prospects forecasts. In the case of primary offerings, managers are able to time their issue strategically but top executives are not able to time their personal trades appropriately.

Unlike Lee (1997), Kahle (2000) documents abnormal insider trading in the quarter immediately preceding the issues of equity and convertible bonds. Sales (purchases) by insiders are significantly higher (lower) than their historical levels. Abnormal trading is defined as the actual trading at the SEO minus the expected trading (estimated by the average trading computed over months  $-48$  to  $-13$  relative to the issue). After the issue, sales decrease and purchases increase. A negative relation is found between the abnormal insider selling and the long-run abnormal performance following primary equity offerings. There is a positive relation between abnormal insider purchasing and the long-run performance of straight debt issuers. These results are consistent with the managers issuing overprice equity and timing their personal trades accordingly. They are more incriminating than those of Lee (1997) about the timing strategy of insiders' personal trades.

The existence of a "window of opportunity" to sell overpriced equity is further examined by Clarke, Dunbar and Kahle (2001) who analyse the long-run performance of pure secondary

offerings made by US firms. Secondary sales do not involve the issuance of new stocks. Consistent with the “window of opportunity” hypothesis, only the sample of insider sales exhibit a negative abnormal performance  $-33.3\%$  at a 5-year horizon. In the same line of thought, Marciukaityte and Szewczyk (2001) document that equity issues involving the sales of new stocks (primary and combined offerings) underperform their size and BM matched firms over a 3-year post-issue horizon while the *BHAR* of secondary offerings is positive but insignificant. At the 5-year horizon, the underperformance of primary and combined offerings is no longer significant and the overperformance of secondary offerings becomes significant. The overperformance of secondary offerings is influenced by tax or “window dressing” considerations and it is higher when sellers have strong reasons to sell their shares. In this case, sellers may experience benefits that outweigh the cost of underpricing. No evidence of overperformance is found when sellers in secondary offerings are related to firm management.

The issuance of overpriced securities alone is not sufficient to explain the long-term underperformance pattern. It must be associated with the investors’ inability to correctly adjust the stock price at the time of financing decision announcement. The evidence of earnings manipulations around equity issues given by Rangan (1998) and Teoh, Welch and Wong (1998) supports the explanation of the stock underperformance proposed by Loughran and Ritter (1995). If investors follow the earnings disclosure to form their stock price valuations, they will lower the prices as the earnings decrease after the issue or as the operating performance decreases. In that sense, Clarke, Dunbar and Kahle (2001) notice that, for all issuers, the operating performance increases during the three years preceding the secondary offerings and decline during the three years after. However, the pattern is more accentuated for operations involving insider sales. The change between pre- and post-offering performance is significant for the insider sample only. The argument of investors’ misleading is mitigated by Shivakumar (2000). Moreover, legal disclosures of quarterly turnover, as it is the case in France, could be a way to reduce the impact of accounting misrepresentations. Turnover is less prone to be manipulated. The misleading of investors’ perceptions of future prospects may not be valid in every institutional setting.

#### *4.1.1.2 International evidence of long-term post-SEO stock performance*

Marked differences are noticed between the US and the rest of the world for stock price reaction to equity issue announcements, especially relative to the flotation method. Do the same differences exist about the long-term post-SEO stock performance? Rights offerings in Germany are found to underperform their size-matched control portfolio in both equally and

value-weighting schemes; see Stehle, Ehrhardt and Przyborowsky (2001). Relative to the Frankfurt Stock Exchange top segment market portfolio, the underperformance is restricted to equally-weighting scheme. One interpretation is that the underperformance comes mainly from small issuers. However, the difference between equally and value-weighted 36-month *BHAR* are not significant. Small issuers dominate the composition of the sample. Therefore, matching with a market index including only the largest German firms may not be appropriate. The overall long-term stock underperformance of German equity issuers contrasts with the positive stock price reaction observed at the announcement.

The long-term underperformance after equity issues with rights is supported by the results on the South African market. Affleck-Graves and Page (1996) document significantly negative 3-year *CAR* relative to size-matched and *BM* ratio-matched non-issuing firms. No evidence of timing is found on the South African SEO market. The rights prevent the wealth transfer between new and existing shareholders. Moreover, they are not heavily traded, which means that a large majority of the existing shareholders exercise them. The retained explanation is that equity is raised to compensate for the downturn in the economy and its impact on earnings. However, it does not explain why the negative signal is not fully integrated into the stock prices at the SEO announcement. In Switzerland, the findings of Dubois and Jeanneret (2001) do not indicate that rights issuers (both financial and non-financial firms) experience any long-term abnormal performance. This absence of reaction is consistent with the insignificant announcement effect observed by Caramanolis et al. (1996). Non-financial issuers can be split into three groups: First, firms that issue equity as an alternative to stock dividend (“quasi” SEO) do not perform differently from their benchmark. Second, firms that issue equity because they need cash to invest in new projects significantly underperform their benchmark (36-month *BHAR* equal to  $-27\%$ ). Third, firms that issue equity to repay debt outperform their benchmark (36-month *BHAR* equal to  $+15\%$ ). These results outline the role of the motivations driving the equity issue decision to explain the long-term stock performance.

Kang, Kim and Stulz (1999) have a sample of Japanese cash equity issuers and a sample of Japanese rights issuers. Only the sample of cash offerings underperforms its size and *BM* ratio matched benchmark. The sample of rights offerings exhibit insignificant negative *BHAR*. The “window of opportunity” argument is rejected because, like rights and public offerings, private equity issues experience a pre-issue overperformance and a post-issue underperformance. The private negotiation process is expected to verify whether the firm is

overvalued at the time of the issue. According to that, Japanese managers do not look like voluntarily issuing overpriced securities.

In Australia, Allen and Soucik (2000) observe that direct cash equity issuers significantly underperform their benchmark three years after the offering. Five years after the offering, the abnormal performance is still negative but of lower magnitude and not significantly different from zero. The Australian pattern is only partially supportive of the US evidence where the underperformance of direct cash equity issuers persist over a 5-year horizon. Australian equity issuers are found to spend more money in new investments and R & D expenditures during the post-issue period than their non-issuing counterparts. Though, these efforts have a negative impact on the 3 to 5-year productivity.

The evidence about the subscription rights affecting the long-term post-SEO stock performance is mixed. In Germany and South Africa, issuers abnormal performance is close to the US evidence in spite of the different flotation method. The difference clearly appears in Japan since both flotation methods exhibit opposite results. In Switzerland, the neutral effect of subscription rights may allow some firms to realise SEO for non-financing/investing motives without being penalised on the long-run. Like in the short-term announcement effect framework, the international evidence underlines the influence of the institutional setting, which may prevent a direct comparison of the results.

In order to improve the comparison between foreign and US issuers, Foerster and Karolyi (2000) analyse the long-run stock performance of global equity offerings with US depositary receipts (ADR) tranches from 35 countries. These global offerings are capital raising operations. Through these global offerings, the influence of the domestic institutional setting is reduced. US listing and disclosure requirements as well as US accounting standards must be adopted by foreign issuers on the US market. Two types of benchmark are used. The first one is a domestic matching firm selected on the basis of size and *BM* ratio, not listed on the US market. The second type consists in a US matching firm that issued equity within the same month and with similar size and *BM* ratio characteristics. Foerster and Karolyi (2000) observe that global equity offerings follow a period of strong performance in the domestic market (1-year pre-issue *CAR* equal to +16 %, significant at the 1 % level). The 36-month post-issue abnormal performance is overall negative although it is of a lower magnitude than for US issuers : the *CAR* equals -9 % (-6 % after public offers and -10 % after private offers). These results are not significantly different from zero at all convenient levels. The same pattern is found with the US issuer matching procedure. Private global equity offerings made

by firms from countries with lower accounting standards are more penalised by both US and national investors. Conversely, public global offerings realised by emerging market firms outperform their benchmarks. Furthermore, the post-issue performance is positively related to the ability of the issuer to capture a proportionately larger share of US trading volume (liquidity effect). The findings underline the leading role of the US market especially toward the emerging markets. Listing on the US market constitutes a strong signal of good quality especially when the most severe disclosure requirements are endorsed.

#### *4.1.1.3 Long-term stock performance after other securities issues*

The long-term abnormal stock performance following the offerings of units or convertible debt is similar, if not worse, to the performance following equity offerings. Byoun (2001) documents an underperformance of  $-57.47\%$  for unit issuers in the US over a 5-year horizon after the issue. Issuers of convertible bonds underperform their benchmark; in the US, see Spiess and Affleck-Graves (1999), Lewis, Rogalski and Seward (2001)<sup>59</sup>, and in Japan, see Kang, Kim and Stulz (1999). Dichev and Piotroski (1999) show that US firms that increase the most their convertible debt account on balance sheets underperform both the market and firms that increase the least their convertible debt accounts over a 5-year horizon. Conversely, Ho and Abhyankar (2002) observe that UK issuers of convertible bonds do not underperform their size and *BM* ratio matched portfolios during the three years following the issue. However, UK convertible preference share issues underperform their benchmarks. Consistent with the announcement returns, the long-term abnormal performance following a straight debt issue is not different from zero; see Spiess and Affleck-Graves (1999); Dichev and Piotroski (1999), for the US evidence; Kang, Kim and Stulz (1999), for the Japanese evidence.

### **4.1.2 Controversy of the New Issue Puzzle**

#### *4.1.2.1 About the time aggregation of mono-periodical returns*

The methodology used to determine the abnormal performance in long-term event study is subject to several criticisms. Kothari and Warner (1997) show that test statistics based on cumulative abnormal returns and buy-and-hold abnormal returns are misspecified.

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<sup>59</sup> Lewis, Rogalski and Seward (2001) find a significantly negative market-adjusted annual return during the three years following the issue, respectively  $-4.3\%$ ,  $-7.5\%$  and  $-9.7\%$ . When a matching firm based on industry, size and operating performance is used as benchmark, the annual returns are only significantly negative

Bootstrapping and non-parametric procedures may be promising solutions to eliminate the bias. Conrad and Kaul (1993) indicate that the positive bias on the long-run comes from the cumulating process of returns. Cumulating mono-periodical returns over long time intervals not only cumulates "true" returns but measurement errors as well. Unfortunately, "true" returns are not directly observable. *BHAR* should be preferred to *CAR* since this time aggregation method minimises the measurement errors of mono-periodical returns.

Barber and Lyon (1997) analyse the empirical power and the specification of the tests statistics in long-run event studies (12, 36 and 60-month horizons). Abnormal returns are computed by *CAR* or *BHAR*. The benchmarks are either a control portfolio (equally-weighted market index), a matching firm or the Fama and French [FF] 3-factor model<sup>60</sup>. Random events are simulated. *CAR* results are positively biased according to the market index because of the new listing bias. They are well specified for matching firms at a 5 % level, except for the 36-month horizon. The new listing bias is reduced because the firm must be listed for at least one year to be selected as control. *CAR* are negatively biased according to the 3-factor model especially for the 12 and 36-month horizons. *BHAR* results are negatively biased according to the market index because of the rebalancing bias and the skewness bias. When the benchmark is a matching firm selected according to size and *BM* ratio, the tests statistics are well specified at a 1 % level. The Wilcoxon sign test gives good results as well according to the matching firm methodology (Barber and Lyon, 1997; p. 369). *CAR* are bad predictors of *BHAR*.

#### 4.1.2.2 About the independence of the events

With the matching firm methodology, events are assumed to be independent. Though, SEO are decided by managers and "timing" has been shown to be a relevant variable to influence this decision. Consequently, events are likely to be cross-sectionally dependent. The abnormal returns may be cross-correlated and the statistical tests could be overstated. A calendar time approach solves this dependence problem. The calendar time portfolio of event firms is formed by 1) including the issuer at the event month, 2) holding it over the analysis horizon (unless it is delisted or engages itself in the event before the end of the horizon), and 3) removing it at the end of the analysis horizon. The calendar time portfolio is rebalanced every

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during the two years following the issue. Because only annual abnormal returns are computed, the results of Lewis et al. (2001) do not figure in Table 4.1.

<sup>60</sup> FF 3-factor model is introduced in Fama and French (1993). The risk factors are the market, size and the *BM* ratio. Refer to the original text for the detailed explanation of the risk premia computation.

time a firm is added or removed. Individual firm returns inside the portfolio may be equally or value weighted. The time series of the portfolio return in excess of the risk free rate is then regressed on a pricing model. The intercept of the regression (Jensen's alpha) measures the monthly abnormal performance. In order to check the efficiency of the pricing model, the performance of a portfolio formed with the matching firms can be estimated. Zero-investment portfolios long in event firms and short in matching firms can also be used to test the validity of the matching variables. However, one must keep in mind that the adequacy of the Jensen's alpha to measure the abnormal performance is reduced when the portfolio is subject to rebalancing.

Mitchell and Stafford (2000) observe that SEO firms *BHAR* are positively cross-correlated when overlapping in calendar time. After controlling for the positive cross-correlation, there is little evidence of abnormal performance. Using a calendar time approach and the FF 3-factor model as benchmark, they show that the 3-year underperformance after the SEO is restricted to small issuers, the equally-weighted alpha being significant but not the value-weighted alpha. Calendar time performance results are summarised in the first three panels of Table 4.1.

#### *4.1.2.3 About bad model specification*

With the matching firm methodology, the choice of the control variables may not be adequate. Bacmann and Dubois (2002) show that a matching methodology based on arbitrary criteria (randomly selected firms or the next in the CRSP list) has the same statistical power in rejecting the null hypothesis than methodologies based on conventional variables. Under these circumstances, matching should be performed according to characteristics that differentiate event firms from the entire population. In that sense, the matching criteria are not universal. They should depend on the event itself and on the firms that undertake it.

Brav, Geczy and Gompers (2000) argue that the underperformance is mainly due to small issuers. First, they observe that 24.1 % of the equity issuers belong simultaneously to the smallest size and to the lowest *BM* ratio quintiles. Indeed, 40.5 % of the offerings are made by firms in the smallest size quintile while only 7.8 % are made by firms in the largest size quintile. Furthermore, 50.7 % of the issues are done by firms in the lowest *BM* ratio quintile compared to 7.8 % in the highest *BM* ratio quintile. Consequently, the benchmark used to determine the abnormal performance must be well specified, especially in its ability to price the small and high-growth firms.

In order to test the bad model problem, Brav et al. (2000) split the firms population into 25 portfolios based on size and *BM* ratio quintiles. They regress the time series returns of these portfolios on the Carhart (1997) 4-factor model (market, size, *BM* ratio and momentum). The results show that the 4-factor model has difficulty to price the smallest size – lowest *BM* ratio portfolio (intercept equal to  $-0.53\%$  and significant). Almost a quarter of the issuers have returns that strongly covary with those of the mispriced portfolio. If these issuers display a significant underperformance, the cause could be a misspecified model, that is an anomaly with respect to asset pricing model. In fact, using factors decontaminated from the issuers' influence, the intercept of the equally-weighted issuers' portfolio is significantly negative ( $-0.22\%$  per month). The significance disappears with the value-weighted performance ( $-0.07\%$  per month). When the sample of issuers is split into size terciles, the abnormal performance is restricted to the medium and small issuers sub-samples with respectively  $-0.23\%$  and  $-0.50\%$  per month. Large issuers do not exhibit any abnormal performance. The empirical results show that the underperformance is not restricted to the smallest – high growth issuers. It is common to all the firms that share these characteristics.

Brav et al. (2000) replace the standard HML factor (measuring the *BM* ratio risk premium) in the 4-factor model by a portfolio formed exclusively with AMEX and Nasdaq stocks. These stocks are expected to have smaller market capitalisation than NYSE listed stocks. Therefore, the new factor should better price the small firms book-to-market risk. Indeed, the underperformance of issuers is halved although the significance of the equally-weighted alpha remains. Nevertheless, the new model specification seems to better capture general co-variations in returns.

The conclusion of Brav et al. (2000) are challenged by Bayless and Jay (2000) who test two antagonist hypotheses :

1. *In support of the “New Issue Puzzle”, firms underperform only during the post-issue period and do not otherwise.*
2. *In opposition to the “New Issue Puzzle”, (small) firms that underperform during the post-issue period do so otherwise as well.*

Bayless and Jay (2000) form four portfolios of issuers but at different periods relative to the month of the offering (month 0) : a) the pre-issue period (from month  $-24$  to month  $-13$ ), b) the prior-issue period (months  $-12$  to  $-1$ ), c) the issuing period (months 0 to  $+60$ ), and d) the post-issue period (months  $+61$  to  $+120$ ). The performance is measured according to the FF 3-

factor model and the Carhart (1997) 4-factor model. The Jensen's alphas differ across the periods. Underperformance is concentrated in the issuing period, which is significantly different from the overperformance observed in the pre- and post-issue periods. Even for small and medium firms, the performance is significantly different between pre- and post-issue periods. The results are consistent with the "New Issue Puzzle" hypothesis. Issuers that are expected to underperform regardless of the period do not. The results are not sensitive to factor contamination since the alphas are not different whether estimated with purged factors or not.

In accordance with Brav et al. (2000), Jegadeesh (2000) observes that factor models set too low benchmark for the large firms and too high benchmark for the small firms. This pattern generates a negative abnormal performance for small firms (issuers or not) and a positive abnormal performance for large firms (issuers or not). As a large fraction of the issuers are small firms, equally-weighted portfolios are expected to exhibit a significant underperformance that should disappear in the value-weighting scheme. Jegadeesh (2000) addresses the problem by computing the factor model performance for a sample of issuers and for a sample of size and *BM* ratio matched firms. He observes a monotonically positive relation between the firm size and the abnormal performance for both samples. However, when the matching firms portfolio return is subtracted from the issuers' portfolio return, the bias implied by the bad model specification should be eliminated. The portfolio to be regressed is a zero-investment portfolio long in the issuers and short in the matching firms. The abnormal performance of this portfolio is significantly negative regardless of the issuer size. Similar levels of underperformance are found for large, small, growth or value SEO firms. In other words, despite of the bad model argument, issuers underperform their benchmark, even with a calendar time methodology.

The weight attributed to each event firm has an important role in the interpretation of the results. Small stocks are the most likely to be subject to the bad model problem. Weighting the individual abnormal performance by the stock market capitalisation measures the total wealth effect of the anomaly that a representative investor experiences<sup>61</sup>. Fama (1998) favours this weighting scheme because it attenuates the bad model problem. In other words, the average investor can easily reduce his exposure to the potential anomaly by value-weighting his portfolio. However, Jegadeesh (2000) shows that even after adjusting for the model

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<sup>61</sup> The investor is assumed to diversify away some of the small issuers underperformance effect by selecting appropriate weights.

misspecification, underperformance may still be detected. Value-weighting cannot guarantee the elimination of the bad model effect but it could instead cover up some of the economic effect due to the event. Indeed, Loughran and Ritter (2000) refute the ability of the value-weighting approach to capture the real economic effect of the event itself. The experiment framework should not be designed to detect the average investor's wealth effect but to measure the event-specific impact on the firm value. In that sense, equal weights are more adequate.

#### *4.1.2.4 About the incomplete adjustment to systematic risk*

Eckbo, Masulis and Norli (2000) attribute the long-term underperformance to an incomplete adjustment for risk with standard benchmark methodologies. According to a size and *BM* ratio matched firm methodology, they find that US industrial issuers underperform over a 60-month post-SEO horizon in both equally and value-weighting schemes. The poor performers are not uniformly distributed among exchanges as 71 % of them are listed on the Nasdaq. Eckbo et al. (2000) use six pre-specified macro risk factors<sup>62</sup> to show that, on average during the post-offering period, issuers' stocks are less risky and require lower returns than their matching stocks. They argue that the underperformance detected by the matching firm methodology comes from the fact that this technique does not adequately adjust for risk. The overall risk exposure of issuers is lower than the one of non-issuing firms. Indeed, the calendar time abnormal performance measured by the 6-factor model is not different from zero. Issuers' portfolio and matching firms portfolio exhibit insignificant alphas in both weighting schemes. In addition, zero-investment portfolios long in issuers and short in matching firms do not exhibit any abnormal performance. A conditional version of their factor model<sup>63</sup> allows time-varying factor loading to take into account potential changes in the systematic risk. Once again, the alphas are never significant even when Nasdaq issuers are examined separately.

If factor model analysis raises doubt on the existence of a "New Issue Puzzle", one remark can be made about the experiment design of Eckbo et al. (2000). The validity of the macro factor model depends on the factors selection. The results may be sensitive to the choice of

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<sup>62</sup> Risk factors are the market (CRSP value-weighted market index), the change in real per-capita consumption of non durable goods, the default risk (difference between BAA and AAA yield change), the unanticipated inflation rate, the term structure (difference between 20-year and 1-year Treasury bonds return and the return on Treasury bills).

the factors. In addition, no theory proposes which factor should be considered. In that respect, the findings of Bossearts and Hillion (1999) indicate that macro risk factors are not universal. Even the conditional macro factor model can detect cases of significant abnormal performance. Clarke, Dunbar and Kahle (2001) find a significantly negative alpha for their portfolio of insider secondary sales of stocks (-0.83 % per month) using the Eckbo et al. (2000) conditional model. This finding corroborates the result of FF 3-factor model (-0.5 % per month) and Carhart (1997) 4-factor model (-0.43 % per month).

Avramov (2002) addresses to the problem of “model uncertainty”. The “true” variables used to forecast the risk premium are unknown. He uses a Bayesian learning approach to estimate these “true” variables. By doing so, model uncertainty is incorporated into the tests of return predictability. His main findings indicate that a model averaging various return generating processes displays robust properties. The introduction of model uncertainty may weaken the predictive power of economic variables on stock returns. Finally, model uncertainty appears to be more important than estimation risk. Avramov (2002) conclusion suggests that instead of making additional effort to the search for universal macro risk factors, the focus should be put on the inclusion of model uncertainty into performance measurement. Term and market premia look like robust predictors of stock returns once model uncertainty is controlled for.

Overall, the use of factor models as benchmark mitigates the “New Issue Puzzle”. Most of the underperformance found in the equally-weighting scheme tend to disappear in the value-weighting scheme. The cases where the calendar time approach eliminates the abnormal performance detected with the matching methodology are more numerous than the cases where the calendar time approach confirms the presence of abnormal returns. The contribution of factor model to event-related stock performance has been extensively studied on the US market but less outside the US. Dubois and Jeanneret (2001) find no abnormal performance after rights SEO on the Swiss market using FF 3-factor model and a conditional CAPM. Ho and Abhyankar (2002) observe no abnormal calendar time performance for issuers of convertible bonds in the UK and a significant negative performance for issuers of convertible preference shares. These results are consistent with those obtained with the matching firm methodology.

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<sup>63</sup> The conditional factor model includes four time-varying factors in addition to the market risk : the lagged dividend yield on the CRSP value-weighted market index, the lagged 30-day Treasury bill rate, the lagged value of the default risk premium and the lagged value of the term structure premium.

### **4.1.3 Long-run operating performance and financial analysts' over-optimism**

#### *4.1.3.1 Abnormal operating performance of equity issuers*

Equity issues tend to be timed at a peak in the operating performance. The earnings pattern could be provoked by managers that would borrow future income to overstate current one or simply due to the business cycle. Equity offerings are more likely to be realised before a downturn in the economy or in earnings. Miller and Rock (1985) argue is that equity issues are done to compensate for an expected decline in retained earnings. McLaughlin, Safieddine and Vasudevan (1996) analyse the changes in operating performance of US equity issuers from three years before the offering to three years after. The raw operating performance is measured by the pre-tax operating cash flow divided by the book value of assets. The abnormal operating performance is computed by subtracting the industry median performance to that of the issuer. They show that equity issuers outperform firms in the same industry during the year preceding the offering, which is consistent with the pre-issue stock price run-up documented in the studies of the SEO announcement effect. The main results overviewed in this sub-section are summarised in Panel D of Table 4.1.

From the end of the fiscal year preceding the issue to the end of the third year after, the median raw operating performance drops from 15 % to 11.5 %. Over the same horizon, the median industry-adjusted performance decreases from 3.4 % to 1.4 %, showing that issuers are good performers relative to their industry. The overperformance persists during the post-issue period although it decreases significantly. Indeed, the change in the abnormal performance between year  $-1$  and year  $+3$  is about  $-2$  % and significant at the 1 % level. The yearly changes between years 0 and 1 and between years 1 and 2 are also significantly negative. Consistent with Jensen (1986), firms with the highest free cash flow at the time of the issue experience the worst post-issue operating performance. Managers of these firms have a tendency to invest in negative NPV projects. In support of Myers and Majluf (1984) and Miller and Rock (1985), equity issues occur after a period of abnormally positive operating performance and before a significant performance decline. Managers issue the new stocks at their maximum price when the future income is about to decrease. In addition, the post-issue operating performance is positively related to the change in fixed asset between year  $-1$  and year  $+1$ . The more the firm acquire new property, plant and equipment at the time of the issue, the better is its long-run operating performance. This finding suggests that investing in fixed assets mitigates the free cash flow problem. No evidence is found of a relation between the level of growth opportunities and the long-run operating performance.

However, firms with higher growth opportunities have a greater tendency to issue equity, which could explain why the level of investment in fixed assets has a positive influence on the long-run operating performance.

Loughran and Ritter (1997) conduct a study about the long-term operating performance of SEO firms that differs from that of McLaughlin et al. (1996) in three points : First, the sample includes not only pure primary offerings but every seasoned offering that involves a primary sales such as combined offerings. Second, a matching firm selected on the basis of industry, assets size and past operating performance is used in order to compute the abnormal performance. Third, five operating performance measures (instead of one) are used. They include the operating income to assets ratio, the operating income to sales ratio, the profit margin, the return on assets and the capital expenditures and R & D expenses to assets ratio.

The median operating performance of the issuers is significantly inferior to the median performance of the matching firms over a 4-year horizon after the issue. This result holds for all operating performance measures. The difference in the 4-year performance change ranges between  $-1.4\%$  for the operating income to assets ratio to  $-3.2\%$  for the capital expenditures and R & D expenses to assets ratio. The underperformance pattern is also found in three of the issuers size quartiles, the middle-low size quartile being statistically insignificant. The results are not altered when primary and combined offerings are examined separately. Overall, the findings of Loughran and Ritter (1997) are consistent with those of McLaughlin et al. (1996).

Under the “Efficient Market Hypothesis”, the operating performance downturn could be anticipated by the market. It would not necessarily lead to a post-SEO long-term abnormal stock performance. However, Loughran and Ritter (1997) observe that the annual stock performance of issuers, measured over the 5-year post SEO period, is also significantly inferior to the stock performance of the matching firms ( $-7.4\%$  per year). The operating underperformance pattern is not impounded into the stock prices at the time of the issue. Moreover, the post-issue underperformance is reflected in the corresponding stock returns. Issuers are found to be disproportionately fast growing firms. Returns on fast growing firms are expected to be lower than those on slow growing firms. Though, the stock performance of issuers is still significantly lower than that of non-issuers after controlling for the growth rate. Loughran and Ritter (1997) argue that SEO firms manage earnings to intentionally mislead investors and issue over-valued equity. The decline in operating income that follows the offering is reflected in the stock prices over the long-run.

Hertzel, Lemmon, Linck and Rees (2002) analyse the operating performance around private placements of equity. They observe a sharp contrast to public equity issues concerning the pre-issue operating performance. Private equity issues are more likely to follow periods of negative abnormal operating performance (median industry-adjusted). Furthermore, the operating performance continues to decline over the 4-year period starting from the issue year. Similar to the results of public equity issues, private equity issuers experience a significant pre-issue stock price run-up and they have lower *BM* ratios than their control firms (size and industry-matched). Hertzel et al. (2002) attribute some of this pattern to managers and investors' over-optimism about the issuers' prospects. The fact that the ratio of capital and R&D expenditures to total assets for issuing firms is significantly greater than the industry median corroborates this explanation.

In the case of convertible debt issues, Lewis et al. (1999) also document that the operating performance of issuers deteriorates in the years after the offering. This decline is apparently due to industry factors, since the operating performance of matching firms within the same industry is also decreasing. In addition, they observe that the investment-related operating performance diminishes. This effect comes mainly from firm-specific factors, since the non-issuing firms belonging to the same industry do not experience such a decline. The results of Lewis et al. (1999) support the evidence that convertible debt is used as a delayed equity issue and not as quality-signalling financial instrument.

#### *4.1.3.2 Stock price reaction to post-SEO earnings announcement and long-term underperformance*

Jegadeesh (2000), Denis and Sarin (2001) and Brous, Datar and Kini (2001) use announcement returns to earnings disclosure as the source of public information susceptible to explain the post-SEO long-run abnormal performance. Jegadeesh (2000) cumulates the abnormal returns to earnings announcements during 20 quarters following the SEO. On average, the abnormal performance attributable to earnings announcement reaches -4.3 %, which represents 12.5 % of the total 60-month underperformance. The cumulated earnings announcement effect is measured over a period that corresponds to only 6.4 % of the trading days included in the long-term horizon. Therefore, an important fraction of the SEO underperformance can be directly linked to unpleasant earnings surprises. In other words, the long-run underperformance could come from, at least in part, market over-optimism about the SEO firms prospects.

Denis and Sarin (2001) examine earnings announcement returns over a 28-quarter horizon, starting 2 years before the offering. They compute the announcement 3-day *CAR* according to an industry, size and *BM* ratio matched firm. The same matching firm is used to calculate the post-SEO 60-month *BHAR*. Earnings announcement returns are on average significantly positive (+0.72 %) during the pre-SEO period and significantly negative (-0.28 %) during the post-SEO period. The mean abnormal return is negative in seventeen of the twenty quarters after the issue. However, negative earnings announcement returns are concentrated among small issuers. The lowest issuer size quartile return equals -0.87 % and the results of other quartiles are not statistically significant. Negative earnings announcement returns are also concentrated in the two middle market-to-book ratio quartiles. Extreme growth or value issuers do not seem to experience post-SEO earnings surprises. Then, the anomaly seems to be restricted to the smallest issuers. For these firms, the over-optimism hypothesis about future prospects is verified but they represent only a small fraction of the issuers. Furthermore, long-term deviations from the normal price may not be arbitrated for the smallest firms because of higher costs in collecting information and transacting. Consequently, abnormal stock returns may not be considered as contradictory to market efficiency.

The findings of Jegadeesh (2000) and Denis and Sarin (2001) are mitigated by those of Brous et al. (2001). Using an experiment framework close to the one of Denis and Sarin (2001), Brous et al. (2001) observe that earnings announcement returns for glamour issuers, hot market issuers and Nasdaq listed issuers are not significantly different from zero. Though, these firms are the most likely to convey unfavourable information through their earnings announcements. Investors are not systematically disappointed by the earnings announcements that follow SEO as none of the mean or median 3-day announcement returns are statistically different from zero. These results raise doubts about the existence of optimistic expectations by market participants at the time of an equity issue.

#### *4.1.3.3 Financial analysts' over-optimism*

Firms conducting a SEO underperform on the long-run similar firms that are not subject to the event. The underperformance is more severe for small issuers. Following these observations, Ali (1995) shows that the earnings forecasts made by financial analysts about issuing firms are optimistically biased relative to those about non-issuing firms. Moreover, the smaller the size of the issue, the more optimistic are the earnings forecasts. These findings support the hypothesis raised by Loughran and Ritter (1995) stating that the poor long-run

stock performance after a SEO comes from market's overly optimistic earnings anticipations about these firms.

The overall results are not sensitive to the forecasting horizons. However, the shorter the horizon, the smaller is the forecast error. Financial analysts have pessimistic forecasts for the end of the current fiscal year and optimistic forecasts for the next year. The optimistic bias in forecasts is greater for small firms compared to the one about large firms. Managers of small firms have more private information about the "true" value of earnings than managers of large firms, which explains the greater bias for small firms. An alternative explanation to the small firms bias could come from the fact that they are less followed by analysts. Forecasts accuracy is increasing with the number of analysts. Consensus forecasts are used to determine the forecasts errors and individual forecasts are assumed to be iid distributed. From a statistical standpoint, the precision of the consensus forecast is expected to decrease the smaller the number of individual forecasts in the consensus.

The findings of Ali (1995) bring out the fact that analysts are overly optimistic about the issuers prospects during four years after the offering. If investors base their stock price valuation on the analysts forecasts, they have to revise their valuation downward over this horizon, which could explain why the stock underperformance persists on the long-run. One reason that could incline financial analysts to positively bias their earnings forecasts is given by Lim (2001). Analysts try to gain management and information access by overstating earnings predictions. The eager to attract underwriting contracts could induce over-optimistic earnings forecasts coming from affiliated analysts; see Dechow, Hutton and Sloan (2000), Hayward and Boeker (1998), Carleton, Chen and Steiner (1998). However, according to Hansen and Sarin (1998), this over-optimism is not restricted to issuers but it affects all the high growth firms, one characteristic of poorly performing equity issuers.

For IPOs, Rajan and Servaes (1997) observe that firms with the lowest industry-adjusted growth forecasts outperform their benchmarks on the long-run (NYSE/AMEX index adjusted 4-year return of +35.61 % and industry and size-matched 4-year return of +74.13 %). On the other hand, firms with the highest industry-adjusted long-term growth forecasts underperform their benchmarks (-62.82 % for NYSE/AMEX index adjusted return and -35.86 % for the matched firm return). When the analysts are over-optimistic about an issuer, its long-run stock performance tends to be negative while it is positive when analysts predict a low growth rate. The growth forecasts remain above the industry average for at least three years after the event.

Over the same period, the abnormal performance decreases. The over-optimism of financial analysts is not rapidly corrected after the event. The same rationale could apply to SEO.

#### **4.1.4 Summary of security issues on the long-term performance**

In exception of straight debt offerings, the matching firm methodology indicates that issuers underperform their benchmark at 3 and 5-year horizons after the issue. The evidence of the managers issuing securities within the window of opportunity is mixed and not sufficient to explain the long-term pattern of abnormal returns. Indeed, earnings manipulations that mislead investors in their stock price valuation over long horizon may be more convincing. Calendar time performance measurement and value-weighting mitigate the stock underperformance but they do not eliminate it in all the cases. Post-SEO poor operating performance may explain why external financing was needed but, if the “Efficient Market Hypothesis” holds, it should not lead to long-term stock underperformance. Therefore, the behaviour of investors in interpreting the signals about stock prices should have an important role to play in explaining long-run underperformance. Investors may not incorporate into the stock price all the relevant information involved in corporate news announcements (equity issue or earnings disclosure). In that sense, the persistence of stock underperformance after equity issues casts some doubt about market efficiency.

#### ***4.2 Alternative theories to market efficiency***

The persistence of abnormal returns on the long run leads to wonder about investors’ rationality when they form their expectations about stock prices. Their inability to incorporate all relevant information conveyed by corporate events announcements gives raise and support to alternative theories to market efficiency. Investors may be less than fully rational and the stock price valuation may be affected by human biases described in the psychology literature. Over-confidence, self-attribution, conservatism or representativeness heuristic are the main psychological characteristics investors could be subject to. The first sub-section presents three behavioural models that reject market efficiency and attempt to explain anomalies in long-term stock returns. Implications of behavioural theories on the long-term stock performance around equity issues are discussed in the second sub-section. In the third sub-section, behavioural theories are confronted to rational explanations, in particular to rational structural uncertainty models that reach similar outcomes without rejecting market efficiency.

**Table 4.1 : Long-run stock performance following an external financing decision**

Authors	Sample	Matching methodology							Calendar time methodology				
		<i>W</i>	3y/5y	MF/CP	size	BM	ind	mom	<i>CAR</i>	<i>BHAR</i>	FF 3-F	CT 4-F	C-CAPM
<i>Panel A : Post-SEO stock performance of US firms</i>													
Loughran and Ritter (1995)	US	1970-1990	EW	3y	MF	×				<b>-33.0 %</b>			
		3702 SEO, industrials	EW	5y	MF	×				<b>-59.6 %</b>			
		large issuers	EW	5y								<b>-0.27 %</b>	
		large issuers	VW	5y								-0.21 %	
		small issuers	EW	5y								<b>-0.45 %</b>	
		small issuers	VW	5y								<b>-0.34 %</b>	
Spiess and Affleck-Graves (1995)	US	1975-1989	EW	3y	MF	×		×		<b>-18.7 %</b>	<b>-22.8 %</b>		
		1247 primary SEO, industrials	EW	3y	MF	×	×			<b>-17.5 %</b>			
			EW	5y	MF	×		×		<b>-31.2 %</b>	<b>-42.5 %</b>		
			EW	5y	MF	×	×			<b>-31.0 %</b>			
Bayless and Jay (2000)	US	1977-1992											
		721 SEO, industrials	EW	5y								<b>-0.49 %</b>	<b>-0.38 %</b>
		large issuers	EW	5y								-0.09 %	-0.07 %
		medium issuers	EW	5y								<b>-0.63 %</b>	<b>-0.42 %</b>
	small issuers	EW	5y								<b>-1.16 %</b>	<b>-0.98 %</b>	
Brav et al. (2000)	US	1975-1992	EW	5y	CP	×	×		×	<b>-15.3 %</b>	<b>-27.3 %</b>	<b>-0.40 %</b>	<b>-0.28 %</b>
		4526 SEO, industrials, no units	VW	5y	CP	×	×		×	<b>-17.1 %</b>	<b>-23.8 %</b>	-0.17 %	-0.07 %
		large issuers	EW	5y								<b>-0.20 %</b>	-0.10 %
		medium issuers	EW	5y								<b>-0.30 %</b>	<b>-0.23 %</b>
		small issuers	EW	5y								<b>-0.69 %</b>	<b>-0.50 %</b>

Figures in bold are significant at the 5 % level or less. Column titles : *w* for the weighting scheme (equally-weighted = EW and value-weighted = VW), 3y (5y) for 3-year(5-year) post-issue performance, MF for single matching firm and CP for control portfolio of matching firms, size for the market value of equity, BM for the book-to-market ratio, ind for the industry, mom for the pre-issue stock return momentum, *CAR* for cumulative abnormal return, *BHAR* for buy-and-hold abnormal return, FF 3-F for the 3-factor model of Fama and French (1993), CT 4F for the 4-factor model of Carhart (1997), C-CAPM for a conditional CAPM (refer to the original texts for the list of instrumental variables).

**Table 4.1 : continued**

Authors	Sample	Matching methodology						Calendar time methodology					
		<i>w</i>	3y/5y	MF/CP	size	BM	ind	mom	<i>CAR</i>	<i>BHAR</i>	FF 3-F	CT 4-F	C-CAPM
<i>Panel A : continued</i>													
Eckbo et al. (2000)	US 1963-1995 4860 SEO, units excluded nasdaq issuers nasdaq issuers	EW	5y	MF	×	×			-23.2 %		-0.12 %		-0.05 %
		VW	5y	MF	×	×			-10.6 %		-0.17 %		-0.05 %
		EW	5y								<b>-0.42 %</b>		-0.09 %
		VW	5y								-0.12 %		+0.10 %
Jegadeesh (2000)	US 1970-1993 2992 SEO	VW	5y	CP	×	×			<b>-34.3 %</b>				
		EW	5y								<b>-0.45 %</b>	<b>-0.38 %</b>	
Kahle (2000)	US 1981-1992 2014 SEO, industrials utilities	EW	3y	MF	×	×			<b>-14.7 %</b>				
		EW	3y	MF	×	×			<b>+1.3 %</b>				
Mitchell and Stafford (2000)	US 1953-1993 4911 SEO growth issuers growth issuers value issuers value issuers	EW	3y	CP	×	×			<b>-10.2 %</b>		<b>-0.33 %</b>		
		VW	3y	CP	×	×			-4.2 %		-0.03 %		
		EW	3y								<b>-0.32 %</b>		
		VW	3y								-0.19 %		
		EW	3y								<b>-0.31 %</b>		
		VW	3y								-0.24 %		
Brous et al. (2001)	US 1977-1990 1475 SEO, industrials	EW	3y	MF	×	×	×		<b>-12.4 %</b>				
		EW	5y	MF	×	×	×		<b>-21.3 %</b>				

Figures in bold are significant at the 5 % level or less. Column titles : *w* for the weighting scheme (equally-weighted = EW and value-weighted = VW), 3y (5y) for 3-year(5-year) post-issue performance, MF for single matching firm and CP for control portfolio of matching firms, size for the market value of equity, BM for the book-to-market ratio, ind for the industry, mom for the pre-issue stock return momentum, *CAR* for cumulative abnormal return, *BHAR* for buy-and-hold abnormal return, FF 3-F for the 3-factor model of Fama and French (1993), CT 4F for the 4-factor model of Carhart (1997), C-CAPM for a conditional CAPM (refer to the original texts for the list of instrumental variables).

**Table 4.1 : continued**

Authors	Sample	Matching methodology							Calendar time methodology				
		<i>w</i>	3y/5y	MF/CP	size	BM	ind	mom	<i>CAR</i>	<i>BHAR</i>	FF 3-F	CT 4-F	C-CAPM
<i>Panel A : continued</i>													
Byoun (2002)	US 1980-1993	3300 SEO	EW	5y	CP	×	×	×		<b>-21.9 %</b>	<b>-0.97 %</b>	<b>-0.80 %</b>	
		309 units offerings	EW	5y	CP	×	×	×		<b>-57.5 %</b>	<b>-3.11 %</b>	<b>-3.22 %</b>	
Clarke et al. (2001)	US 1980-1996	424 secondary offerings	EW	3y	CP	×	×	×		+5.9 %	-0.22 %	0.00 %	-0.27 %
		89 sales by insiders	EW	5y	CP	×	×	×		+2.0 %			
		89 sales by insiders	EW	3y	CP	×	×	×		<b>-15.7 %</b>	<b>-0.50 %</b>	<b>-0.43 %</b>	<b>-0.83 %</b>
		89 sales by insiders	EW	5y	CP	×	×	×		<b>-33.3 %</b>			
		335 sales by non-insiders	EW	3y	CP	×	×	×		+11.7 %	-0.18 %	-0.08 %	-0.14 %
		335 sales by non-insiders	EW	5y	CP	×	×	×		+11.4 %			
Denis and Sarin (2001)	US 1982-1990	1213 SEO, industrials	EW	5y	MF	×	×	×		<b>-30.3 %</b>			
Marciukaityte et al. (2001)	US 1974-1997	1917 primary SEO	EW	3y	MF	×	×			<b>-23.0 %</b>			
		1528 combined offerings	EW	5y	MF	×	×			-22.9 %			
		1528 combined offerings	EW	3y	MF	×	×			<b>-21.8 %</b>			
		1528 combined offerings	EW	5y	MF	×	×			-19.5 %			
		758 secondary offerings	EW	3y	MF	×	×			+13.0 %			
		758 secondary offerings	EW	5y	MF	×	×			<b>+39.4 %</b>			
Hertzel et al. (2002)	US 1980-1996	619 private equity offerings	EW	3y	MF	×		×		<b>-38.2 %</b>	<b>-1.18 %</b>		
			EW	3y	MF	×	×			<b>-23.8 %</b>			
			VW	3y							<b>-1.23 %</b>		

Figures in bold are significant at the 5 % level or less. Column titles : *w* for the weighting scheme (equally-weighted = EW and value-weighted = VW), 3y (5y) for 3-year(5-year) post-issue performance, MF for single matching firm and CP for control portfolio of matching firms, size for the market value of equity, BM for the book-to-market ratio, ind for the industry, mom for the pre-issue stock return momentum, *CAR* for cumulative abnormal return, *BHAR* for buy-and-hold abnormal return, FF 3-F for the 3-factor model of Fama and French (1993), CT 4F for the 4-factor model of Carhart (1997), C-CAPM for a conditional CAPM (refer to the original texts for the list of instrumental variables).

**Table 4.1 : continued**

Authors	Sample	Matching methodology							Calendar time methodology				
		<i>w</i>	3y/5y	MF/CP	size	BM	ind	mom	<i>CAR</i>	<i>BHAR</i>	FF 3-F	CT 4-F	C-CAPM
<i>Panel B : Post-SEO stock performance of non-US firms</i>													
Affleck-Graves and Page (1996)	RSA	1980-1990	EW	3y	MF	×				<b>-21.6 %</b>			
		149 SEO with rights	EW	3y	MF		×			<b>-20.7 %</b>			
Kang et al. (1999)	JPN	1980-1988	EW	3y	MF	×	×				<b>-14.7 %</b>		
		727 cash SEO	EW	5y	MF	×	×			<b>-69.4 %</b>			
		51 SEO with rights	EW	3y	MF	×	×				-2.5 %		
		51 SEO with rights	EW	5y	MF	×	×				-18.2 %		
Allen and Soucik (2000)	AUS	1984-1993	EW	3y	MF	×		×		<b>-47.7 %</b>			
		102 SEO	EW	5y	MF	×		×		<b>-39.5 %</b>			
Stehle et al. (2000)	D	1960-1992	EW	3y	CP	×					<b>-6.0 %</b>		
		584 SEO with rights	VW	3y	CP	×					<b>-6.2 %</b>		
Dubois and Jeanneret (2001)	CH	1984-1994	EW	3y	CP	×	×			+1.6 %	+2.8 %	-0.07 %	+0.01 %
		231 SEO with rights	VW	3y	CP	×	×			+3.0 %	+4.9 %	+0.18 %	+0.11 %
		80 financials	EW	3y	CP	×	×			+6.7 %	+5.1 %	+0.15 %	+0.10 %
		80 financials	VW	3y	CP	×	×			+1.0 %	+3.4 %	+0.15 %	+0.05 %
		151 non-financials	EW	3y	CP	×	×			-0.9 %	+1.7 %	-0.12 %	-0.02 %
		151 non-financials	VW	3y	CP	×	×			+6.2 %	+7.3 %	+0.24 %	+0.024 %

Figures in bold are significant at the 5 % level or less. Column titles : *w* for the weighting scheme (equally-weighted = EW and value-weighted = VW), 3y (5y) for 3-year(5-year) post-issue performance, MF for single matching firm and CP for control portfolio of matching firms, size for the market value of equity, BM for the book-to-market ratio, ind for the industry, mom for the pre-issue stock return momentum, *CAR* for cumulative abnormal return, *BHAR* for buy-and-hold abnormal return, FF 3-F for the 3-factor model of Fama and French (1993), CT 4F for the 4-factor model of Carhart (1997), C-CAPM for a conditional CAPM (refer to the original texts for the list of instrumental variables).

**Table 4.1 : continued**

Authors	Sample	Matching methodology							Calendar time methodology				
		<i>w</i>	3y/5y	MF/CP	size	BM	ind	mom	<i>CAR</i>	<i>BHAR</i>	FF 3-F	CT 4-F	C-CAPM
<i>Panel C : Stock performance after debt issues</i>													
Dichev and Piotroski (1999)	US	1964-1991	EW	5y	CP <sup>a</sup>						+4.3 %		
		17370 increases in annual straight debt account	VW	5y	CP						-6.7 %		
		1193 increases in annual convertible debt account	EW	5y	CP						<b>-71.7 %</b>		
			VW	5y	CP						<b>-52.8 %</b>		
Spiess and Affleck-Graves (1999)	US	1975-1989	EW	5y	MF	×	×				-14.3 %	<b>-0.26 %</b>	
		392 straight bonds	VW	5y								+0.17 %	
		400 convertible bonds	EW	5y	MF	×	×				<b>-36.9 %</b>	<b>-0.31 %</b>	
		400 convertible bonds	VW	5y								-0.25 %	
Kahle (2000)	US	1981-1992											
		577 straight bonds	EW	3y	MF	×	×				-9.5 %		
		527 convertible bonds	EW	3y	MF	×	×				<b>-18.1 %</b>		
Kang et al. (1999)	JPN	1980-1988	EW	3y	MF	×	×				<b>-38.4 %</b>		
		708 convertible bonds	EW	5y	MF	×	×				<b>-44.6 %</b>		
Ho and Abhyankar (2002)	UK	1982-1996	EW	3y	CP	×	×				-11.9 %	-0.29 %	-0.05 %
		152 convertible bonds	VW	3y	CP	×	×				-7.6 %	-0.23 %	-0.16 %
		147 conv. preference shares	EW	3y	CP	×	×				<b>-18.4 %</b>	<b>-0.69 %</b>	-0.61 %
		147 conv. preference shares	VW	3y	CP	×	×				<b>-28.4 %</b>	<b>-1.18 %</b>	<b>-1.12 %</b>

<sup>a</sup>The benchmark is the return on a portfolio long in the highest debt increase quintile and short in the market index.

Figures in bold are significant at the 5 % level or less. Column titles : *w* for the weighting scheme (equally-weighted = EW and value-weighted = VW), 3y (5y) for 3-year(5-year) post-issue performance, MF for single matching firm and CP for control portfolio of matching firms, size for the market value of equity, BM for the book-to-market ratio, ind for the industry, mom for the pre-issue stock return momentum, *CAR* for cumulative abnormal return, *BHAR* for buy-and-hold abnormal return, FF 3-F for the 3-factor model of Fama and French (1993), CT 4F for the 4-factor model of Carhart (1997), C-CAPM for a conditional CAPM (refer to the original texts for the list of instrumental variables).

**Table 4.1 : continued**

<b>Authors</b>	<b>Sample</b>	<b>w</b>	<b>3y/5y</b>	<b>Matching methodology</b>	<b>Average annual abnormal performance</b>
<i>Panel D : Long-term operating performance</i>					
McLaughlin, Safieddine and Vasudevan (1996)	US 1980-1991 1296 SEO, industrials	EW	3y	Industry median operating performance	<b>-1.7 %</b>
Loughran and Ritter (1997)	US 1979-1989 1338 SEO, industrials	EW	3y	Matching firm, industry, assets size and past operating performance	<b>-1.4 % to -3.2 %</b> depending on the operating performance measure
Lewis et al. (1999)	US 1979-1990 566 convertible bonds offers	EW	3y	Industry median operating performance	-0.2 % to -0.7 % depending on the operating performance measure
Hertzel et al. (2002)	US 1980-1996 619 private equity offerings	EW	3y	Industry median operating performance	<b>-7.6 % to -11.06 %</b> depending on the operating performance measure

Figures in bold are significant at the 5 % level or less. Column titles : *w* for the weighting scheme (equally-weighted = EW and value-weighted = VW), 3y (5y) for 3-year(5-year) post-issue performance.

## 4.2.1 Behavioural theories

### 4.2.1.1 Investors' overconfidence and self-attribution

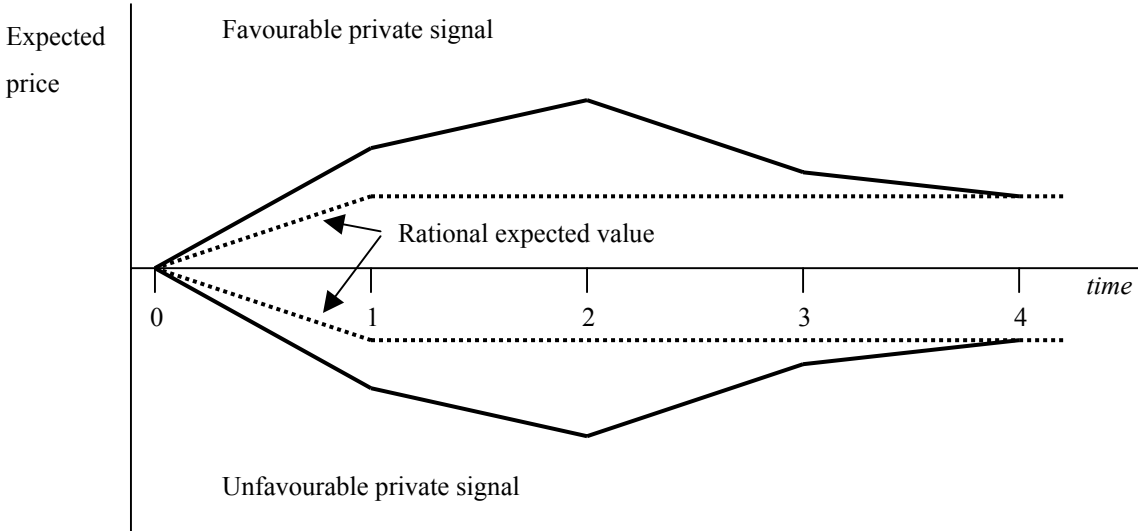
Daniel, Hirshleifer and Subrahmanyam (1998) [hereafter DHS] develop a theory based on investors' overconfidence and on changes in confidence resulting from biased self-attribution of investment outcomes. The model implies that investors overreact to private information signals and underreact to public signals. It offers a joint explanation to both short-term momentum and long-term reversal in stock returns. The model also explains why the stock price reaction to public announcements of selective events have the same sign as the post-event long-term performance. The population of agents is divided between the informed ones who receive a private signal and the uninformed who only receive public signals. The informed agents are risk neutral and they over-estimate the precision of the private signal (overconfidence). In addition, the transaction price is set according to their expectations. The uninformed agents are risk averse. The model entails a time-varying investor's confidence and has five dates :

- Date0, no information is released. Individuals have identical prior beliefs. They trade only for optimal risk transfer purposes.
- Date1, a noisy private signal about the underlying security value arrives to the informed investors. Then, informed investors trade with the uninformed according to their private information.
- Date2, a second private signal is transmitted to informed individuals, causing managers (a category of informed individuals) to decide on the undertaking of corporate events. These events are publicly observed and they convey private information to the uninformed investors. Further trades occur between informed and uninformed investors.
- Date3, noisy public information is released.
- Date4, conclusive public information is released. The securities pay a liquidating dividend.

Figure 4.1 illustrates the average stock price path following a positive (upper curve) or negative (lower curve) private signal released at Date1. The bold lines are driven by the overconfident and self-attributed reaction of informed investors while the dotted lines represent the rational expected value of the security. Overconfidence in the private signal

causes the Date1 security price to overreact to this new information. At Date2, informed agents receive a second private signal. Among them, managers observe the stock price deviation from the rational expected value and selectively decide on the corporate event to undertake. A corporate event is said to be selective when its decision process is driven by the Date2 mispricing. All investors observe the event which announcement is public. They partially correct the stock price which causes a reversal in the stock price path. Because of overconfidence in private signals, informed investors underreact to public news and the deviation between the current stock price and its fully rational value persists. At Date4, the flow of public information is sufficient to convince the investor on the “true” value of the stock. The post-event underreaction phase is over.

**Figure 4.1 : Average price response as a function of time with irrational investors**



The Figure is taken from DHS (1998, p. 1847). The bold lines show the price response of an overconfident self-attributed investor and the dotted lines represent the expected price response of a fully rational investor.

In the model, the level of investor’s confidence is allowed to be outcome dependent. The main implication is the appearance of a short-run momentum pattern. A public signal confirming the private signal increases the informed investors’ level of confidence. A public signal disconfirming the private information reduces their confidence. However, self-attribution causes the decrease in confidence to be relatively lower than the increase in confidence, depending on the sign of the public information. On average, the arrival of public information increases the individual’s confidence and intensifies the overreaction to

private information. Therefore, the correction phase driven by the flow of public signals is expected to persist during long periods.

Returns are expected to be positively autocorrelated between Date1 and Date2 because of a momentum effect implied by overconfidence in the private signal. The momentum effect is accentuated if public signals corroborate the private signal during the period. Between Date2 and Date3, the autocorrelation in returns should reverse to become negative. This reversal is caused by the corporate event public announcement made at Date2. From the announcement, investors infer that the stock price is misvalued but they underreact since they are underestimating the pertinence of public information. Their level of confidence in the public information increases with the number of disclosures. Yet, returns between Date3 and Date4 should be positively autocorrelated, due to the post-event underreaction pattern. In other words, the DHS model predicts unconditional short-lag positive autocorrelation in stock returns (momentum) and long-lag negative autocorrelation in stock returns (reversal).

#### *4.2.1.2 Investors' conservatism and representativeness heuristic*

To explain both under and overreaction patterns in stock returns, Barberis, Shleifer and Vishny (1998) [hereafter BSV] propose a switching-regime model based on psychological characteristics of a representative investor. The first regime describes the underreaction pattern (Model 1). News is incorporated slowly into prices which tend to exhibit positive autocorrelations on short intervals. The investor's psychological characteristic is conservatism. He puts more weight on his prior beliefs about the stock price than on recent information. In that sense, he underreacts to the latest news and the prices tend to exhibit short-horizon momentum.

The second regime represents overreaction (Model 2). Stocks should become overpriced after a stream of good surprises and underpriced after a stream of bad surprises. Overreaction is attributed to representativeness heuristic. The investors gives more attention to the strength of a particular and recent evidence instead of taking into account all the data available (prior beliefs and longer-lagged earnings). For instance, if the investor observes a stream of good surprises in earnings, he would become a trend chaser in spite of the low probability that the trend will last much longer. He focuses on recent information and forgets about his prior beliefs or earlier earnings. He overreacts to recent information.

The investor is assumed to be risk neutral. Earnings are supposed to follow a random walk but the representative investor, who sets the price, is not able to realise it. Most of the time,

he considers earnings as more stable than they really are (Model 1). In this model, prices are mean-reverting. A positive shock is expected to be followed by a negative shock to stabilise the earnings stream. The investor underreacts to an unexpected shock (earnings surprise) because of his conservatism bias. However, if subsequent earning surprises are of similar sign, the investor thinks that the earnings generating process has changed to a model based on earnings trend (Model 2). When the investor believes in Model 2, he becomes subject to the other psychological bias, representativeness heuristic and focuses only on recent prices to form his expectations.

Transition probabilities are associated to the switching from one model to the other. Two consecutive news with similar sign imply that more weight is given to the earnings trend model. Conversely, when consecutive news have opposite sign, more weight is given to the mean-reverting model. The revisions in the probability that the current underlying model is of type 1 or 2 are made according to a fully rational Bayesian rule. The investor forms his expectations about the stock prices according to the probabilities of earnings continuation or reversal in each model and to the probabilities of switching from one model to the other. The entire model explains both short-term underreaction and long-term overreaction in stock returns.

Empirical evidence in event studies shows pervasive underreaction which supports the concept of conservatism and the specification of Model 1. Overall, the stock price reaction to an event announcement is followed by a period during which the returns are drift in the same direction<sup>64</sup>. Some events occur after periods of trending returns that are of opposite sign relative to the post-event returns pattern. Firms could take advantage of overreaction to time events when they have the opportunity to do it. This outcome is consistent with the selective event argument of DHS (1998).

#### *4.2.1.3 Newswatchers and momentum traders, with limited rationality*

Hong and Stein (1999) [hereafter HS] develop an alternative model. Instead of having one set of representative agents whose psychological characteristics are responsible for the stock price deviation, they build their theory on the interactions between two groups of limited rational agents : the newswatchers and the momentum traders. Each type of agents is limited rational in the sense that they are only able to process some subset of the available

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<sup>64</sup> This argument is refuted by Fama (1998) and in several empirical articles that are reviewed in the next sub-section.

information. The newswatchers make predictions about the future stock price based exclusively on private signals. They do not know what information is observed by other newswatchers and they do not get any information from current or past prices. The information they get diffuses gradually into the stock price so that underreaction appears. Momentum traders base their forecasts about future prices only on past price changes. However, they are limited, by assumption, in their use of past information to simple forecasts functions.

The sequence of the model is as follows : First, only newswatchers are active as they get private information but they underreact because they have only access to a restricted part of the information. This underreaction leaves an arbitrage opportunity to momentum traders to make money. Indeed, since newswatchers are partially informed, the price moves gradually toward its long-term fundamental value. Momentum traders observe the price changes and act, which accelerates the initial price move and induces more momentum actions. Because momentum traders do not observe information about the fundamental value of the stock, late traders let the stock price overreact in the sense that they take positions when the stock price has already gone beyond its long-term value. The model of HS (1999) proposes then a unified theory of under and overreaction. In a first step, one shock (the private information arrival) generates underreaction and in a second step, because of excessive momentum trading, the stock price overreacts relative to the initial information.

When public information is added to the model, the overreaction pattern tends to disappear. The theory lacks some generality. Public information is revealed to all investors at the same time and thus, it is less subject to slow diffusion. However, the public news is processed with private information to make judgement about the expected value of the security. Therefore, the market response to public news involves the aggregation of private signals and underreaction may continue to apply. The problem of overreaction is different because now momentum traders are informed of the public news arrival. They know when the underreaction period starts. In consequence, they can figure easily whether they act as early traders who will make a profit or as late traders that are subject to the overshooting problem. This distinction is impossible to make in the case of pure private information, which arrival date is unknown to the momentum traders. In the case of public news, momentum traders could have incentives to concentrate their actions nearly after the public announcement in order to avoid overshooting and overreaction would be reduced if not eliminated.

#### **4.2.2 Implications on the long-term stock performance**

Implications of behavioural theories on the long-term stock performance is a delicate subject. Indeed, such theories have been developed upon the empirical evidence to explain long-term pattern of stock returns. In that sense, their predictions are set to match the observed long-term anomalies. However, underreaction and overreaction imply testable hypotheses about stock price behaviour around equity issues.

If investors underreact to equity issue announcements, the average long-term post-SEO abnormal returns is expected to have the same sign as the announcement valuation effect. In addition, the short-term stock price reaction should be positively correlated with the long-term stock performance after the issue. Consistent with the overreaction argument, pre-SEO stock returns should be negatively correlated with post-event abnormal performance. This long-term reversal in stock returns should be larger when the SEO occurs during periods with few public information disclosures. The size and the number of SEO should be greater when potential mispricing is high. In the same line of thought, the probability of occurrence of a SEO is expected to increase with the probability that equity is overpriced. Several of these behavioural predictions are consistent with the timing hypothesis. For instance, DHS (1998) argue that managers select corporate events according to the direction and the magnitude of stock mispricing. In addition, mispricing should be stronger for stocks that need more attention to be evaluated and for which feedback on the valuation is not clear in the short-term. Growth stocks are good examples of this phenomenon. Their valuation strongly depends on the option that growth opportunities will be profitable in the mid or long-term future. Daniel and Titman (1998) find that momentum effect is strong for growth stocks but weak or insignificant for value stocks. In the same way, stocks with high R&D expenditures or intangible assets should face more short-term momentum due to valuation difficulties and overconfidence in private information.

Consistent evidence of momentum has been found in the US and in Europe but weak and insignificant momentum has been detected in Japan during the nineties; see Haugen and Baker (1996) and Daniel, Titman and Wei (2001). Daniel et al. (2001) argue that the self-attribution bias is less important in Japan than in the US. For instance, Kitayama, Takagi and Matsumoto (1995) do not find conclusive evidence of self-enhancing biases in attribution among Japanese investors. However, momentum effects are more important when the market is bullish than when it is bearish; see Conrad, Cooper and Hameed (1999). Since

1990, the Japanese market has been essentially bearish, which could explain why momentum effects have not been detected.

The overconfidence theory suggests three further implications. First, firms are expected to issue securities when they are overpriced. If investors are overconfident, such overvaluation could be measured by recent increases in firm, industry and aggregate stock market prices. The opposite is true for stock repurchases. Thus, if managers act to exploit mispricing, there should be both general and industry specific financing and repurchase booms. Second, if managers act in the existing shareholders' interest, they tend to realise rights offerings instead of cash direct offerings when the stock is underpriced or they will choose debt financing to avoid the capital dilution of existing shareholders. Third, as observed by Daniel and Titman (2001), investors react appropriately to objective information such as information extracted from financial statements but they overreact to subjective information such as news or rumours about future cash flows that are not reflected in current accounting based growth numbers. Investors are overconfident in their ability to interpret fuzzy information. Consequently, SEO realised soon after earnings disclosures and publication of the annual report should be less subject to investors' irrational reactions.

The HS (1999) model predicts that momentum strategies should earn more profit with stocks for which information diffuses slowly. Small stocks or the ones followed by few analysts relative to what is expected from their firm size should exhibit longer positive autocorrelation patterns. Such stocks should also be subject to more pronounced overshooting and stronger reversals in the long-run. Less liquid assets or stock classes with high trading costs should also have longer horizon of momentum trading because high trading costs slows down the information diffusion process. The adjustment in stock value due to marginal private information could be offset by the trading costs and news watchers do not adjust their holdings frequently. Moreover, high trading costs themselves lengthen the time it takes for the stock value to exceed the initial fees. This implies momentum strategies to last longer.

#### **4.2.3 Rational versus behavioural models**

Fama (1998) criticises the rejection of market efficiency by the behavioural finance. He argues that apparent overreaction is about as common as underreaction and post event continuations of pre-event abnormal returns is about as frequent as post-event reversal. Furthermore, most long-term anomalies in stock returns are likely to disappear with

reasonable changes in the methodology to compute the abnormal performance. Events subject to overreaction involve initial public offerings, seasoned equity offerings and exchange listing. Underreaction characterises spin-offs, stock splits, stock repurchases, dividend initiations or omissions. Mergers and proxy contests are events difficult to classify.

As Fama (1998) puts it: “A good behavioural theory must satisfy three criteria : First, it should rest on plausible assumptions about investors’ behaviour or consistent with casual observations. Second, it should explain the existing evidence in a parsimonious and unified way. Last, it should make further testable predictions”. He points out that behavioural theories do not propose well specified alternative hypotheses to market efficiency (prices fully reflecting all available information). Any alternative hypothesis must clearly expose the biases in the information process that cause the same investor to underreact to given events and to overreact to others. In that sense, behavioural models fit well with the anomalies they are designed to explain but they have difficulties to address to other anomalies. BSV (1998) and DHS (1998) explain short-term underreaction and long-term overreaction. However, events that do not experience a long-term reversal in their long-run abnormal returns pattern are not considered by those theories.

Instead of investors’ irrationality, Fama (1998) underlines the “bad model” problem as the main source of anomalies. Testing market efficiency cannot be separated from testing a model for normal returns. Different models for expected returns produce different estimates of long-term abnormal returns. He concludes that market efficiency should not be abandoned in favour of behavioural theories. Anomalies are chance results that are fragile since they greatly depend on the model specification. Constantinides (2002) argues that rational economic model is greatly enhanced by relaxing some of its assumptions. For instance, consumers could face uninsurable, idiosyncratic and persistent income shocks like loss of employment that limit their participation to the stock market. In turn, these shocks, which are more likely to occur during economic downturns, may impact the equity premium. Taking these facts into account helps understanding variations of assets returns unconditional moments along the business cycle. Life-cycle phases of investors and their corresponding borrowing constraints also could influence the equity premium and the demand for bonds.

The empirical evidence does not systematically support the behavioural explanation to long-run stock underperformance. If investors underreact to public news, the long-run abnormal stock returns following a SEO should be positively correlated with the

announcement returns. Kang, Kim and Stulz (1999) find that both horizon returns are negatively and insignificantly correlated ( $\rho$  between  $-0.09$  and  $-0.06$ ) regardless of the flotation method. The underreaction hypothesis is thus rejected in Japan. Both short and long-term results in Germany appear to have opposite signs, at least at the macro level; see Gebhardt et al. (2001) for the positive stock price reaction to SEO announcements and Stehle et al. (2001) for the overall long-term underperformance. No further conclusion can be drawn because the correlation between the announcement effect and the long-term abnormal returns cannot be estimated from these different studies.

Marciukaityte and Szewczyk (2001) reject the underreaction hypothesis using samples of pure primary, combined and pure secondary offerings made by US industrial firms. They observe a significant negative 2-day announcement effect ( $-1.55\%$ ,  $-1.33\%$  and  $-0.62\%$  respectively). According to a size and *BM* ratio matched firm, the 36-month abnormal performance is significantly negative for primary and combined offerings while it is not significant for secondary offerings. The short and long-term pattern of secondary offering returns is not consistent with the behavioural models of BSV (1998) and DHS (1998). When the horizon is extended to 60 months, the underperformance of the first two groups becomes insignificant and secondary issuers significantly outperform their benchmark, which extends the rejection of underreaction to all samples.

Behavioural models reviewed in the previous sub-section present underreaction and overreaction as embedded. Firms underreact to a given event but when the analysis horizon is extended to the pre-event period, the same firms overreact and a mean-reverting returns should be observed. Fama (1998) argues that the under or overreaction pattern depends on the event. Kadiyala and Rau (2001) test the two behavioural biases one against the other. They use four events : SEO and stock-financed acquisitions as overreaction events and share repurchases and cash-financed acquisitions as underreaction events. They consider three variables : the last earnings surprise prior to the event (the last piece of public information common to all firms and to all events), the announcement abnormal returns and the 36-month post-event *CAR* computed relative to size and *BM* ratio matched portfolios. If investors underreact to information, a sample of firms announcing a corporate event after a negative news should underperform relative to a sample announcing the event after a positive information release. Conversely, if investors overreact to information, a sample of firms announcing a corporate event after a positive news should underperform relative to a sample announcing the event after a negative information release. The hypotheses of under

and overreaction are set to be conflicting. For each event, the firms are split into two sub-samples according to the sign of the earnings surprise.

No relation is observed between the sign of the earnings surprise and the announcement returns with the exception of stock repurchases. Conversely, long-term adjusted *CAR* are strongly related to the sign of the earnings surprise, which is consistent with the underreaction hypothesis. Positive surprise sub-samples outperform their corresponding negative surprise sub-sample except for SEO where both 36-month *CAR* are not statistically different. No evidence of overreaction is found even when the firms are sorted according to pre-event *CAR* instead of earnings surprise. The results hold when the long-term performance is measured by the FF 3-factor model alphas. For SEO, the evidence of underreaction is sensitive to the measure of pre-event information. Investors underreact to earning surprise but not to the SEO announcement. This finding highlights the importance of identifying the exact stimulus the investors respond to. In addition, Kadiyala and Rau (2001) do not find any evidence of a negative correlation between pre-event trends and post-event long-term performance.

Brav and Heaton (2002) compare competing theories of financial anomalies. A behavioural switching regime model as in BSV (1998) is compared to a rational structural uncertainty model based on rational investors and on their ignorance about the stability of the asset expected payoff. In the behavioural model, the stream of pay-offs follow a random walk but irrationality let investors infer that the pay-off generating process changes from mean reverting to trend following. In the rational structural uncertainty model, the pay-off generating process may effectively be subject to changes but investors have insufficient information to correctly notice it. Thus, in both models, the expected value of the asset payoff depends on the mean of the most recent payoff realisations and on the investors' prior beliefs.

In a world of rational expectations, investors make optimal statistical decision because they possess all relevant structural knowledge. If the assumption of rational expectations is relaxed, rational investors still make optimal statistical decision but they lack critical structural knowledge. In this case, rational structural uncertainty models, as they are referred to, generate financial anomalies from mistakes about risk premium resulting from incomplete information. There are two sources of uncertainty: 1) model uncertainty with the true variables used in order to forecast the risk premium being unknown (Avramov, 2002), and 2) learning that helps discovering the true value of the parameters.

In the behavioural model, conservatism implies underreaction and representative heuristic implies overreaction. The rational structural uncertainty model also predicts both under- and overreaction. The difference in the weighting of prior beliefs relative to recent observations is imputed to the occurrence of the structural change. If the change does not occur, too much weight will be put on recent observations and overreaction will appear. When a structural change occurs within the horizon, the difficulty for the rational investor to actually observe it causes him to underreact to the following payoff realisations, like it is the case with conservatism. Therefore, the outcomes of the two models are very close and even indistinguishable. One can consider it as an advantage arguing that under and overreaction pattern are not due to investors' irrationality and that market efficiency still holds up to a certain degree. However, one model cannot reject the other, meaning that no theory can be falsified. This weakness comes from the fact that the models are designed to produce similar outcomes even though they are not based on similar sets of hypotheses.

Investors use data incorrectly in behavioural models because they are subject to cognitive biases. In rational structural uncertainty models, investors use data incorrectly because they are mistaken about the structure of the environment. In both cases, anomalies could be corrected either by learning or by arbitrage actions made by rational investors. However, with rational structural uncertainty, the correcting power of arbitrage depends on the rational investors' ability to become better calibrated to the structural features of the data. Learning in such a context is also difficult because structural changes could occur at short-term intervals, before the rational investors are able to correctly identify the regime. In the case of irrational behaviour, rational arbitrageurs should be confident that mispricing exists and should be able to explain it to their providers of funds. For learning to be efficient in a behavioural context, the outcome must be immediate and the feedback clear. With financial markets, the feedback is noisy and the outcome is delayed for several periods. Thus, learning from experience is unlikely to occur.

Public information disclosures that follow a corporate event should influence investors in their stock price valuation. If investors are psychologically biased, the sign and the magnitude of the public news could accentuate or reverse their abnormal reaction. In the case of incomplete information about the economic structure, additional public information should help rational investors to sharpen their knowledge of the effective pay-off generating process. Furthermore, selective corporate events are not occurring by chance. They are decided by the managers, conditioned by the financial situation of the firm and the economic

environment. If corporate events have implications on the long-run deviation from the normal stock price, the market reaction to public news within the post-event period should be related to the post-event long-term abnormal performance.

### ***4.3 Long-term stock performance of French SEO with rights***

This section is dedicated to a long-term event study about the stock performance following rights offerings of French companies. According to the stock price reaction to SEO announcements, the long-term abnormal performance is analysed separately for “Capital Structure” and “Financing New Investment” issuers. Implications of the “New Issue Puzzle” on the long-run pattern of stock returns are tested in order to examine the contribution of potential explanations such as “timing”, “investors’ irrationality” and “inefficient use of the proceeds”.

The first sub-section states the motivations to run a long-term event study and it defines the hypotheses to be tested. The design of the event study is presented in the second sub-section. It includes the description of the “Long-term” sample of French equity issuers and the methodology to compute the abnormal performance, matching firm and calendar-time. Empirical results are shown in sub-sections 4.3.3 to 4.3.6. The impact of the “use of the proceeds” argument on the long-term abnormal returns appears in sub-section 4.3.3. Calendar-time performance are exposed in sub-section 4.3.4 to check the robustness of the matching firm findings. A direct test of the “window of opportunity” is performed in sub-section 4.3.5. Sub-section 4.3.6 entails a cross-sectional analysis of the long-term performance. Abnormal returns are regressed on a set of control variables that proxy for potential explanations to the “New Issue Puzzle”. The last sub-section presents the concluding remarks.

#### **4.3.1 Why long-term stock performance of French equity issuers should matter ?**

The stock price reaction to equity issue announcements of French companies outline the discriminating role of the use of the proceeds. “Financing New Investment” issuers alone experience an average stock price decline. The valuation effect is explained by the revisions in 3-year earnings forecasts. Financial analysts consider the announcement of “Financing New Investment” equity offerings as informative about a downturn in the earnings pattern. According to the debate about the diffusion speed of information into stock prices, it seems relevant to examine the long-run post-SEO performance of French equity issuers. The

downturn in future earnings constitutes the motivation driving the equity issue decision in the Miller and Rock (1985) model. The equity offering announcement should signal a period of poor operating performance but the signal could be noisy so that investors may not fully anticipate its impact on the firm value. The explanatory power of the pre-issue stock price run-up to the announcement valuation effect is a second justification for a long-term event study. The stock price run-up could denote of the existence of the “window of opportunity” suggested by Loughran and Ritter (1995), which implies post-SEO long-term underperformance.

If French equity issuers are found to underperform their benchmark on the long-run, the findings of Loughran and Ritter (1995) would be added some evidence. Moreover, this evidence would come from an institutional setting different from the US context in many regards. For instance, the sample includes only offerings with subscription rights. In that sense, the study also contributes to the analysis of the specificities of such operations, an area that has been less extensively studied than cash offerings. Besides, a wide range of models is employed to determine the long-run abnormal performance. I apply the classic time aggregation of abnormal returns according to an industry class, size and book-to-market matching procedure. Equally- and value-weighting schemes are examined in order to control for a potential size effect, in the sense of Brav et al. (2000) and Stehle et al. (2000). In addition, more sophisticated beta pricing models are employed to check the robustness of the results and the relevancy of the control variables.

The “use of the proceeds” is tested as the discriminating variable to rank equity issuers according to their long-term post-SEO performance. Like in the short-term framework, “Capital Structure” issuers are not expected to exhibit significant abnormal returns on average. Pure capital structure matters should be irrelevant to firm value at both short and long-term horizons, and this for the same reason. Such operations do not involve changes in the assets structure that should affect either the stream of future operating cash flow or their discount factor. Conversely, the impact of “Financing New Investment” issues on the long-run stock performance is more complex to interpret. This is mainly due to the fact that the operation proceeds is directly related to an investment project. Anomalies such as irrational investors’ response to public and private information and over-optimism about the investment outcome are more likely to occur, affecting the long-term pattern of stock returns. Consequently, one could expect both issuers’ types to differ in their long-run post-offering performance.

The aim of the long-run stock performance analysis is to develop a framework in which the influence of three potential explanations to the “New Issue Puzzle” can be tested. First, the “window of opportunity” argument assumes that managers time the equity issues during phases of stock price overvaluation. Second, investors may respond irrationally to equity issue decisions creating underreaction and overreaction patterns in long-term stock returns. Third, the underperformance could come from an inefficient use of the SEO proceeds associated with a general over-optimism about the success of the investment project. The over-optimism is said to be general as it is shared by managers, financial analysts and investors. The implications of all three explanations on the issuers’ performance are summarised in Table 4.2.

The “window of opportunity” argument implies that equity issues are timed, first, after a period of good stock performance but also before a downturn in the firm performance. The first phase of the “timing” argument (pre-SEO good stock performance) could be valid independently of the use of the proceeds. Indeed, managers could be inclined to sell overpriced securities even if their motivation is rebalancing the capital structure. The second phase (post-SEO negative performance) should differ, depending on the use of the proceeds. Following Miller and Rock (1985), equity issue should be realised to compensate for a future decrease in retained earnings. This prediction is verified by Hansen and Crutchley (1990) that document a significant downturn in earnings after US equity issues. In the presence of a momentum effect, the downturn in earnings could be transferred and amplified into a stream of negative stock returns. Therefore, the greater is the momentum effect, the lower should be the average underperformance. In a cross-sectional analysis, the long-term stock abnormal performance should be explained by the magnitude momentum effect through a negative relation. Nonetheless, this relation should be valid only for “Financing New Investment” issuers because they are the only ones expected to experience a negative stock performance on average. For “Capital Structure” issuers, no trend is expected in the average long-term post-SEO abnormal returns. Consequently, the existence of a momentum effect should let the initial negative as well as positive abnormal reaction increase over time. Since both direction should be equivalently distributed among “Capital Structure” offerings<sup>65</sup>, no linear relation should be observed between the magnitude of the momentum effect and their long-term abnormal performance. The presence or absence of a trend in the average abnormal stock performance should differentiate both issuers’ types

relative to the existence of the linear relation between the momentum effect and the post-SEO abnormal returns.

Following DHS (1998), equity issues should be considered as selective events regardless of the use of the proceeds. Therefore, investors should underreact to the announcement of the equity financing decision and long-term underperformance should be observed. The announcement valuation effect should be positively related to the long-term underperformance. In addition, Fama (1998) ranks seasoned equity offerings in the category of events subject to overreaction. It implies that a negative relation should be detected between the pre-SEO stock performance and long-term post-SEO abnormal returns.

The assumption that all equity issues are selective events is mitigated by Cornett, Mehran and Tehranian (1998). In the bank industry, voluntary equity issues (selective events) are separated from involuntary ones (non-selective events). Involuntary offerings are realised in order to respect the minimum required capital standards (Cook ratio). They should not be decided on a current deviation from the stock price “rational” value.

**Table 4.2 : Explanations of the “New Issue Puzzle” and issuers’ stock performance**

	“Capital Structure” issuers	“Financing New Investment” issuers
“Timing” argument	Pre-SEO abnormal returns $\geq 0$ Post-SEO abnormal returns $\geq 0$ Post-SEO abnormal returns not correlated with the magnitude of a momentum effect	Pre-SEO abnormal returns $> 0$ Post-SEO abnormal returns $< 0$ Post-SEO abnormal returns negatively correlated with the magnitude of a momentum effect
“Irrational investors” argument	Post-SEO abnormal returns positively correlated with initial abnormal returns (underreaction) Post-SEO abnormal returns negatively correlated with pre-SEO abnormal return (overreaction)	Post-SEO abnormal returns positively correlated with initial abnormal returns (underreaction) Post-SEO abnormal returns negatively correlated with pre-SEO abnormal return (overreaction)
“Inefficient use of the proceeds” argument	post-SEO abnormal returns not correlated with revisions in earnings forecasts	post-SEO abnormal returns positively correlated with revisions in earnings forecasts

Cornett et al. (1998) examine both announcement returns and long-term stock performance. Abnormal reactions are restricted to the sample of voluntary issuers that experiences an average announcement effect of  $-1.62\%$  and 36-month *BHAR* of  $-14.44\%$ , both significant at the 5% level. No anomaly is detected for the sample of involuntary issuers. Furthermore, both samples long-term average abnormal performance is significantly different. These findings are consistent with the “selective event” argument. Only voluntary

<sup>65</sup> See the short-term results, Table 3.9 in section 3.2.2 of Chapter 3.

issuers present evidence of underreaction. Cornett et al. (1998 ; p. 2149) argue that voluntary issues involve more information than involuntary ones. Moreover, involuntary issues are pure capital structure operations. In that sense, they have similarities with the “Capital Structure” offerings, one of them being the absence of significant stock price reaction to the financing decision announcement. That observation supports the hypothesis that “Capital Structure” and “Financing New Investment” issuers could present different long-term abnormal performance. However, “Capital Structure” offerings, although they could be decided because of a leverage ratio reaching a presumed upper bound, cannot be considered as real involuntary operations. Managers being legally constrained to reduce leverage is not common to the large majority of “Capital Structure” issuers<sup>66</sup>.

The “inefficient use of the proceeds” argument should affect only “Financing New Investment” issuers. It is based on the theory of model uncertainty. The long-term abnormal stock performance should be attributed to a general over-optimism about the outcome of the investment project. To explain that over-optimism, consider the investment opportunity as being an independent project like a start-up. Managers and investors could view it as a bet on the future. If the project is a success, it would contribute to increase consistently the firm value. Conversely, in case of failure, the firm value would be negatively affected (and it would not fall to zero as for a start-up). At the time of the investment/financing decision, the probability of success would generally be overstated because the parameters of the model used to value the net contribution of the project are not known with certainty. As time passes, further information arrives about the partial outcome of the project that, on average, lowers the weights attributed to favourable states of the nature. Thus, expectations about the project should be revised downwardly, causing the stock price to be adjusted downwardly as well. One way to test this learning effect hypothesis is to estimate the earnings forecast revision over the analysis horizon and to control its explanatory power to the long-run stock performance. “Capital Structure” issuers should not exhibit any relation between their long-term post-SEO abnormal returns and revisions of their earnings forecasts.

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<sup>66</sup> Firms subject to the Cook ratio requirement reach only 20 % of the “Capital Structure” issuers.

### 4.3.2 Long-term event study design

#### 4.3.2.1 Characteristics of the “Long-term” sample

In order to allow a 3-year post-SEO analysis horizon, the sample of equity issuers must stop in December 1998. Between 1984 and 1998, the *Société des Bourses Françaises* (SBF) reports in its annual publications (*L'Année Boursière*) 402 seasoned equity offerings with rights<sup>67</sup>. The “Long-term” sample is formed by excluding 1) operations for which the issuing prospectus is not available, 2) those with missing market or book value (not available one year before the issue), and 3) overlapping events. A subsequent offerings is said to be overlapping when it occurs within the 36-month period after the issuer’s preceding operation. The analysis periods of both issues overlap and their abnormal performances are embedded, which would influence the interpretation of the results. As shown in Table 4.3, the “Long-term” sample includes 232 rights offerings of common stocks<sup>68</sup>. A “Long-term I/B/E/S” sample is then formed. It starts in 1987 and is restricted to 95 observations because of analysts earnings forecasts availability.

**Table 4.3 : Formation of the “Long-term” samples**

Sample	Observations
<i>“All rights” sample 1984-1998</i>	402
Operations excluded because of issuing prospectus unavailability	- 150
Operations excluded because of missing market and book data	- 20
<b><i>“Long-term” sample</i></b>	<b>232</b>
Offerings in the Long-term sample realised between 1984 and 1986	- 64
Operations with missing I/B/E/S data	- 73
<b><i>“Long-term I/B/E/S” sample</i></b>	<b>95</b>

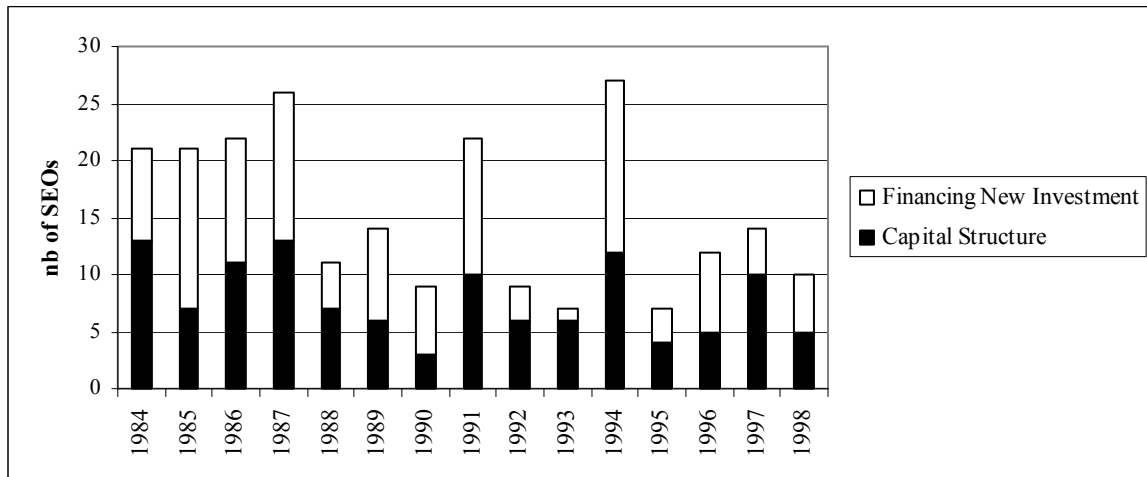
All operations, their type and their dates are identified from the annual SBF report “L’Année Boursière”. Market data are taken from the AFFI database for operations prior to June 1991 and from Datastream for operations realised since June 1991. Book data come from the “Dictionnaire Dafsa Desfossés des Sociétés”. I/B/E/S data are taken from the International History Tape.

According to the “use of the proceeds” argument, the “Long-term” sample is split into two sub-samples : “LT Capital Structure” including 118 observations and “LT Financing New Investment” with 114 offerings. The yearly distribution of the “Long-term” sample of French rights issuers is illustrated in Figure 4.2.

<sup>67</sup> Refer to the Section 3.1.2 of Chapter 3 for more details about the sample formation.

<sup>68</sup> Since less accounting data are required in the long-term sample, less operations are excluded because of data unavailability than for the short-term sample in Chapter 3.

**Figure 4.2 : Rights offerings with stocks made in France between 1984 and 1998**



The “Long-term” includes 232 rights offerings of common stocks – 118 “LT Capital Structure” offerings and 114 “LT Financing New Investment” issues. The use of the proceeds is taken from the issuance prospectuses.

Descriptive statistics of both long-term sub-samples appear in Table 4.4. Panel A presents data about market capitalisation, book-to-market ratio, the offering size and the issuing discount. The first four columns show means and medians of both sub-samples while the last column exhibits their difference in median. The issuer size is measured by the pre-SEO market capitalisation of the firm. As it is the case for the “Short-term” samples, the distribution of the size is highly skewed to the right, indicating that small firms are more numerous than large ones. This finding justifies the use of both equally and value weighting schemes in the computation of the abnormal performance. The median characteristics of both sub-samples are not statistically different at convenient levels. According to that, the average issuer in the “LT Capital Structure” sample is similar to its counterpart in the “LT Financing New Investment” sample.

In Panel B of Table 4.4, data about issuers’ financial structure are exposed. “Capital Structure” issuers appear to be significantly more levered than “Financing New Investment” firms. They also have less cash and less cash flow. These findings are similar to the “Short-term” samples pattern. They are consistent with the “voluntary SEO” argument of Cornett et al. (1998) and with the “window of opportunity” argument of Loughran and Ritter (1995). The difference in leverage ratio between “Capital Structure” and “Financing New Investment” issuers could induce systematic risk mismatching problems. Abnormal performance measures should take this possibility into account.

**Table 4.4 : Descriptive statistics of the “Long-term” sample, 1984-1998**

	"Capital Structure"		"Financing New Investment"		Difference
	118 observations		114 observations		CS - FNI
	mean	median	mean	median	median
<i>Panel A : General characteristics</i>					
Issuer size (millions FRF)	4118	482	3340	914	-432 (-1.56)
Book-to-market ratio	0.89	0.58	0.76	0.53	0.05 (0.34)
Relative size of the offering	0.52	0.21	0.40	0.16	0.05 (1.46)
Issuing discount	0.21	0.20	0.22	0.22	-0.02 (-0.47)
<i>Panel B : Financial characteristics</i>					
Debt-to-assets ratio	0.32	0.29	0.25	0.21	0.08 <sup>a</sup> (3.01)
Cash-to-assets ratio	0.05	0.03	0.08	0.05	-0.02 <sup>a</sup> (-3.06)
Cash flow-to-assets ratio	0.03	0.04	0.09	0.09	-0.05 <sup>a</sup> (-4.58)
<i>Panel C : Change in systematic risk coefficient</i>					
$\Delta\beta_{E\ OLS}$	-0.18 (-1.00)	-0.11 (-0.32)	0.14 <sup>a</sup> (2.04)	0.03 <sup>b</sup> (1.82)	-0.14 <sup>b</sup> (-1.75)
$\Delta\beta_{E\ calculated}$	-0.16 <sup>a</sup> (-3.77)	-0.06 <sup>a</sup> (-5.90)	-0.09 <sup>a</sup> (-6.69)	-0.05 <sup>a</sup> (-8.04)	-0.01 (-0.76)
$\Delta\beta_{E\ OLS} - \Delta\beta_{E\ calculated}$	-0.02 (-0.12)	0.05 (0.54)	0.23 <sup>a</sup> (3.45)	0.17 <sup>a</sup> (2.04)	-0.12 <sup>a</sup> (-2.01)

<sup>a</sup> significant at the 1 % level, <sup>b</sup> significant at the 5 % level

The issuer size is given by the market value of equity at the pre-SEO month taken from Datastream. The book-to-market (BM) ratio is computed as the last pre-SEO fiscal year book value of equity divided by the market value of equity at the pre-SEO month. The book value of equity is taken from the “Dictionnaire Dafsas-Desfossés des Sociétés”. The relative size of the offering is the raw SEO proceeds divided by the market value of equity at the pre-SEO month. The raw proceeds and their use are taken from the issuing prospectus. The issuing discount is equal to  $1 - \frac{\text{issuing price}}{\text{last market price}}$  and it is taken from the SBF report “L’Année Boursière”.

$\beta_{E\ OLS}$  is estimated over the pre-SEO period [-255;-6].  $\beta_{A\ calculated}$  is computed with the Hamada (1972) relation (without tax).  $\Delta\beta_{E\ OLS}$  is the difference in beta between pre and post-SEO estimation periods.  $\Delta\beta_{E\ calculated}$  is the variation in equity beta implied by the SEO, other things equal. T-stats are given in parentheses below mean values, z-stat appear in parentheses below median values and Wilcoxon rank test statistics are given in parentheses below median differences in the last column.

The Panel C of Table 4.4 reports the changes in issuers’ systematic risk around the equity offerings. Both “Long-term” use of the proceeds sub-samples have similar characteristics as

the “Short-term” samples in Chapter 3, Table 3.5. The equity beta of “Financing New Investment” issuers increases after the SEO. This change is explained by an increase in the business risk that is greater than the reduction in financial risk implied by the SEO. At the “Capital Structure” sample level, no such phenomenon is detected. The difference between the OLS estimated change in equity beta and the change implied by the SEO is not significant. The increase in business risk for the “Financing New Investment” issuers is consistent with the hypothesis that equity is selected to finance high-risk investment (similarity with the financing constraint of start-ups).

The “Long-term” sample is checked not to be different from the “All rights” and “Short-term” samples described in Chapter 3. In Panel A of Table 4.5,  $p$ -values of  $\chi^2$  tests show that no significant differences can be noticed. Issuers’ general characteristics of the various samples are compared in Panel B of Table 4.5. Differences in median values are not found to be significant at a convenient level. Consequently, the “Long-term” sample is not biased relative to the composition of both “All rights” and “Short-term” samples.

**Table 4.5 : Tests of differences across samples**

	<b>All rights vs. Long-term sample</b>	<b>Short-term vs. Long-term sample</b>
<i>Panel A : p-values of <math>\chi^2</math> test</i>		
Yearly frequency (1984-1998)	<i>0.93</i>	<i>0.41</i>
Intra-year repartition	<i>0.60</i>	<i>0.22</i>
Industry repartition	<i>0.60</i>	<i>0.99</i>
<i>Panel B : Differences in median values</i>		
Issuer size (millions FRF)	-91 (-0.96)	193 (0.99)
<i>BM</i> ratio	-0.03 (-0.64)	-0.05 (-1.59)
Relative size of the offering	0.03 (1.45)	0.01 (1.20)
Issuing discount	0.01 (0.10)	-0.01 (-0.12)

“All rights” and “Short-term” samples refer to the samples presented in Section 3.1.1 of Chapter 3. The industries are : Natural resources and construction, Food, Transformation industries, Manufacturing industries, Transports, Communication and internet, Retail, Bank and insurance, Real estates, Other financial companies, Private services, Services to the community. Definitions of firm size, *BM* ratio, offering relative size and issuing discount are similar to those given in Table 4.4. Italic numbers are  $p$ -values and Wilcoxon rank tests are given in parentheses.

#### 4.3.2.2 The matching firm methodology

The selection of the matching firm is based on three criteria : a) it has not undertaken an equity issue within the last 36 months; b) it belongs to the same industry class<sup>69</sup>; and c) it minimises the following distance :

$$d_{i,0} = \sqrt{\frac{(size_{i,0} - size_{c,0})^2}{\sigma_{size}^2} + \frac{(BM_{i,0} - BM_{c,0})^2}{\sigma_{BM}^2}} \quad (4.1)$$

where  $d_{i,0}$  is the distance measure of SEO firm  $i$  and matching firm  $c$  at event month 0,

$size$  is the market value at the beginning of month 0,

$BM$  is the book-to-market ratio at the beginning of month 0,

$\sigma_{size}^2, (\sigma_{BM}^2)$  is the variance of the series of the variable  $size (BM)$ .

Each control variable is standardised in order to prevent one variable to have more weight. Size is measured by the pre-SEO market value of the firm.  $BM$  is determined as in subsection 4.3.2.1, using the pre-SEO market value in order to take into account the current firm valuation. If during the post-SEO analysis horizon a matching firm engages itself into a SEO process or is delisted, it is switched to the next closest firm at the current month on a point forward basis. I retain industry, size and  $BM$  ratio as control variables in order to present results that are comparable with those of previous studies. Beside the fact that they are the most commonly used controls in the literature, these variables match firms which returns are expected to co-vary.

Loughran (1997) mitigates the role of the  $BM$  ratio in explaining the cross-section of stock returns as its effect is restricted to small, young and growth firms. However, these characteristics are shared by an important fraction of the firms that issue equity. Accordingly, matching on  $BM$  ratio could be more appropriate to measure the long-term abnormal performance after a SEO than after other corporate events. Ang and Zhang (2002) examine the matching ability of several variables. They find that the inclusion of pre-event stock returns correlation coefficient in the set of control variables (in addition to size and  $BM$  ratio) improves the benchmark. The correlation coefficient offers a better matching than the pre-event beta. Following Ang and Zhang (2002), I replace, in the set of matching

variables, the industry by the correlation coefficient computed over the 24-month period preceding the issue. Results are not sensitive to this modification in the benchmark selection<sup>70</sup>. Therefore, I concentrate only on the matching according to industry, size and *BM* ratio. The advantage of industry in not being an estimated control. It avoids the error-in-variable problem.

#### 4.3.2.3 The computation of the abnormal returns

The long-run abnormal performance is computed over a 36-month horizon after the issue using monthly returns computed cum-dividend and adjusted for capital structure changes<sup>71</sup>.

First, I compute the average monthly adjusted returns ( $AR_t$ ) up to month 36 after the issue, month 1 being the issue month :

$$AR_t = \sum_{i=1}^{n_t} w_i (R_{SEO,it} - R_{c,it}) \quad (4.2)$$

where  $R_{SEO,it}$  is the return on the seasoned equity offering firm  $i$  in event month  $t$ ,

$R_{c,it}$  is the return on the benchmark over the same period,

$w_i$  is the weight of the firm  $i$  in the sample<sup>72</sup>,

$n_t$  is the number of seasoned equity offering firms.

The negative abnormal performance could be caused by small firms so that the global economic impact is overwhelmed; see Brav et al. (2000) and Stehle et al. (2000). Therefore, in order to control for this phenomenon, the abnormal performance is determined according to both an equally and a value-weighted methodology.

<sup>69</sup> Restricting the set of potential matching firms within the issuer's industry allows to take into account industry effects on the stock returns.

<sup>70</sup> The results of the matching procedure including the correlation coefficient are statistically the same although the magnitude of the abnormal performance is systematically lower.

<sup>71</sup> Data sources are given in sub-section 3.1.2.1 in Chapter 3.

<sup>72</sup> For the equally-weighted average the weight is  $1/n_t$ . For the value-weighted average, the weight of firm  $i$  in the sample is computed in a two-stage method. First, in order to avoid scale problems related to non-synchronous events, the market value of the SEO firms is scaled by the total market capitalisation at the SEO

month :  $av_{i,m_i} = mv_{i,m_i} / \sum_{j=1}^{n_m} mv_{j,m_i}$ , where  $av_{i,m}$  is the adjusted market value of the firm  $i$  at the issuing date  $m$ ,

$mv_{i,m}$  is the market value of firm  $i$  at date  $m$  and  $n_m$  is the number of stocks present in the database at date  $m$ .

Second, the weight is calculated as the proportion of the SEO firm adjusted value relative to the sum of all the

adjusted values in the sample :  $w_i = av_{i,m_i} / \sum_{k=1}^{n_p} av_{k,m_i}$

The cumulative average monthly adjusted return for months 1 to  $T$  ( $T = 6, 12, 24$  and 36 months) is computed as :

$$CAR_T = \sum_{t=1}^T AR_t \quad (4.3)$$

I also compute the average buy and hold abnormal return ( $BHAR$ ) :

$$BHAR_T = \sum_{i=1}^{n_T} w_i \left[ \prod_{t=1}^T (1 + R_{SEO,it}) - \prod_{t=1}^T (1 + R_{c,it}) \right] \quad (4.4)$$

where  $n_T$  is the number of firms at month  $T$ .

The null hypothesis to be tested is the following :

$$H_0 : CAR_T(BHAR_T) = 0 \quad \text{vs.} \quad H_1 : CAR_T(BHAR_T) \neq 0 .$$

Under the null, the standardised cumulated average abnormal returns adjusted for cross-sectional variance and first order autocovariance is distributed as Student-t; see Ritter (1991). Empirically, the buy and hold series are highly skewed. Consequently, I use the skewness adjusted  $t$ -statistic proposed in Lyon, Barber and Tsai (1999). A (non-parametric) sign test based on the proportion of positive abnormal returns ( $CAR_{i,T}$  or  $BHAR_{i,T}$ ) is presented as well to check the results.

#### 4.3.2.4 Alternative models to determine the abnormal performance

Three different beta pricing models are used to check the robustness of the results. The abnormal performance is measured by the Jensen's alpha.

Performance measured with the standard unconditional CAPM (U-CAPM)

$$r_{p,t} = \alpha_p^U + \beta_p (r_{m,t}) \quad (4.5)$$

where  $r_{p,t}$  is the monthly return on a portfolio  $p$  in excess of the risk free rate<sup>73</sup>,

$r_{m,t}$  is the monthly return on the SBF market index<sup>74</sup> in excess of the risk free rate.

The constant term in the regression ( $\alpha_p^U$ ) is the Jensen's alpha of the portfolio  $p$  according to the model used (here  $U$  stands for the U-CAPM).

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<sup>73</sup> The risk free rate is given by the 1-month Euro FRF.

<sup>74</sup> The SBF index is a value-weighted index adjusted for dividend and capital structure operations that contains the firms with the highest market value. The number of firms included in the index increases with the number of companies listed.

Performance measured with the Fama and French three-factor model (FF 3-factor)

$$r_{p,t} = \alpha_p^{FF} + \beta_{p,1}r_{m,t} + \beta_{p,2}SMB_t + \beta_{p,3}HML_t \quad (4.6)$$

where  $SMB_t$  is the difference in return between small firms<sup>75</sup> (bottom half) and large firms (top half) at month  $t$ ,

$HML_t$  is the difference in return between high (top 30 %) and low book-to-market firms (bottom 30 %) at month  $t$ .

Both  $SMB$  and  $HML$  factors can be contaminated by the firms involved in a SEO; see Loughran and Ritter (2000) and Brav et al. (2000) for a justification. Therefore, the factors are purged of those companies. The same incidence affects the market risk premium. Though, Loughran and Ritter (2000) suggest to use a non-purged market index. They base their argument on the fact that the CAPM is an equilibrium model and consequently, the market index containing all the listed companies is the only one appropriate to measure the risk premium. One can object to this rationale that the CAPM is developed under the hypothesis of a perfect market. Moreover, the long-run abnormal stock performance after an event affecting the firm is considered as an anomaly. In that sense, not integrating the firms that cause the anomaly into the benchmark represents a better approximation of perfect market conditions. As the aim of the study is not to focus on the epistemology of long-run abnormal performance determination, the Jensen's alphas are estimated separately with a non-purged and a purged market index<sup>76</sup>.

Performance measured with a conditional CAPM (C-CAPM)

Eckbo and Smith (1998) and Eckbo et al. (2000) show that the abnormal performance is better measured by a conditional Jensen's alpha when the expected returns are time varying. Thus, I use a conditional CAPM with a time-varying beta as defined in Ferson and Schadt (1996, p. 430, eq. 4) :

$$r_{p,t} = \alpha_p^{C1} + d_{0,\beta}r_{m,t} + (\mathbf{d}_\beta' \mathbf{z}_{t-1})r_{m,t} \quad (4.7)$$

where  $d_{0,\beta}$  is the unconditional beta,

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<sup>75</sup> In order to avoid the extreme returns due to the very low market price of companies in financial distress, firms in lowest quintile according to the market capitalisation are not taken into account during the factor formation.

<sup>76</sup> The purged market index is a value-weighted index adjusted for dividend and capital structure operations, from which SEO firms are excluded during their 36-month post-issue period.

$\mathbf{z}_{t-1} = \mathbf{Z}_{t-1} - E(\mathbf{Z})$  is the vector of the set of centred information variables (instruments),

$\mathbf{d}_\beta$  is the vector of coefficients with equal dimension of  $\mathbf{Z}_{t-1}$ .

I examine the explanatory power of the instruments used by Bossaerts<sup>77</sup> and Hillion (1998) as well as other standard instruments employed in previous studies. I retain the three most significant variables as instruments<sup>78</sup> : the long-term bond yield (Datastream France bond yield government 10 years), the price to earnings (MSCI), the inverse of the market price (1 over the SBF market index monthly price).

Construction of the calendar-time portfolio returns ( $r_p$ )

Following Eckbo et al. (2000), I form equally and value-weighted calendar-time portfolios of issuers. A separate portfolio is created for each “use of the proceeds” category. Starting with the initial issuer in the sample, the SEO firms enter the portfolio at their offering month and they are held during 36 months (unless they are delisted before the 36<sup>th</sup> month). The portfolio is rebalanced each time a firm is included or removed (or delisted), using current value weights or equal weights. The same procedure is applied to form the portfolios of matching firms with weights identical to those of the issuers’ portfolios.

In order to test the use of the proceeds argument, a “zero-investment” portfolio is built where the “Financing New Investments” issuers are sold short to finance the long position in the “Capital Structure” issuers. The same procedure is applied to both matching firms portfolios. The Jensen’ alpha is expected to be negative for the first “zero-investment” portfolio and not significantly different from zero for the second one.

One drawback of the matching firm methodology is that it does not specifically control for differences in equilibrium returns between event and matching firms. Eckbo et al. (2000) attribute the underperformance to the incomplete adjustment for risk with standard benchmark methodologies. “Zero-investment” portfolios long in the event firms and short in the matching firms allow to control for such risk adjustment problems. If their alphas are significantly different from zero, the abnormal performance cannot be fully explained by differences in systematic risk.

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<sup>77</sup> I am grateful to Peter Bossaerts for giving me access to his data on the French market.

<sup>78</sup> As the choice of relevant instruments is not the main preoccupation of this study, I do not present the results. However, they are available upon request.

### 4.3.3 Post-SEO abnormal returns and use of the proceeds

The results about the long-run performance according to the matching firm methodology are presented in Table 4.6. Cumulative abnormal returns are shown on the left part of the Table and buy and hold abnormal returns on the right. Each Panel entails the results of the equally-weighting scheme, those of the value-weighting scheme and the non-parametric performance. The abnormal performance of the whole sample (all uses of the proceeds included) is shown in Panel A. The equally-weighted abnormal returns are negative and significant over the 24-month horizon (-15.38 % for the *CAR* and -18.62 % for the *BHAR*). After 36 months, the abnormal returns are no longer significant at a conventional level. When the performance is value-weighted, the *CAR* lose their significance at every horizon while the significance of the *BHAR* persists up to 24 months after the issue. However, the magnitude of the abnormal returns is lower (-11.31 % for the 24-month *BHAR* and -4.63 % for the 36-month *BHAR*), showing that the underperformance is sensitive to the size of the issuer but not sufficiently to drastically alter the results. In that sense, the results of French rights offerings are different from what is observed in Germany; see Stehle et al. (2000). On the long-run, median *CAR* is significantly negative (-12.98 % after 36 months) but median *BHAR* is not. All in all, the results of the whole sample are unclear about a persistent underperformance after SEO with rights. They only give partial support to the underperformance pattern of US equity issuers; see Loughran and Ritter (1995), Spiess and Affleck-Graves (1995) or Jegadeesh (2000).

Panels B and C present the results of respectively the “LT Capital Structure” and “LT Financing New Investments” samples. As expected, “Capital Structure” issuers exhibit no abnormal performance. Equally-weighted *CAR* and *BHAR* over the 36-month horizon are negative but not different from zero (-2.20 % for *CAR* and -6.63 % for *BHAR*). The value-weighted performance is negative on the shorter horizons and turns to become positive after 36 months, without being significant. Median *CAR* and *BHAR* are not significant either at a conventional level. These results support the hypothesis that an equity issue made to improve the capital structure does not affect the firm market value.

**Table 4.6 : Long-run performance based on a matching firm methodology**

	Cumulative Abnormal Returns				Buy and Hold Abnormal Returns			
	6-month	12-month	24-month	36-month	6-month	12-month	24-month	36-month
Panel A : Rights offerings of common stocks, "Long-term" sample (232 observations)								
equally weighted performance								
mean (%)	-8.05 <sup>b</sup>	-9.27 <sup>b</sup>	-15.38 <sup>b</sup>	-12.90	-8.01 <sup>a</sup>	-7.75	-18.62 <sup>b</sup>	-18.22
T stat	(-2.49)	(-2.02)	(-2.33)	(-1.57)	(-2.91)	(-1.75)	(-2.36)	(-1.72)
value weighted performance								
mean (%)	-7.47	-10.41	-13.13	-7.38	-6.90 <sup>a</sup>	-8.23 <sup>b</sup>	-11.31 <sup>b</sup>	-4.63
T stat	(-1.51)	(-1.48)	(-1.30)	(-0.59)	(-3.09)	(-2.34)	(-2.04)	(-0.52)
Non-parametric performance								
median (%)	-9.55 <sup>a</sup>	-7.26	-11.77	-12.98 <sup>a</sup>	-7.46 <sup>a</sup>	-5.89	-8.89	-9.46
sign test	(-3.18)	(-1.86)	(-1.28)	(-2.82)	(-2.95)	(-1.21)	(-1.85)	(-1.66)
Panel B : Rights offerings of common stocks, "LT Capital Structure" (118 observations)								
equally weighted performance								
mean (%)	-5.38	-5.49	-11.31	-2.20	-5.61	-5.58	-12.49	-6.63
T stat	(-1.20)	(-0.86)	(-1.73)	(-0.19)	(-1.50)	(-0.86)	(-1.10)	(-0.41)
value weighted performance								
mean (%)	-6.97	-9.04	3.50	7.37	-5.22	-6.55	4.20	8.98
T stat	(-0.84)	(-0.77)	(0.21)	(0.35)	(-1.86)	(-1.50)	(0.42)	(0.63)
Non-parametric performance								
median (%)	-9.33	-8.82	-9.93	-3.62	-7.19	-8.62	-1.54	-2.28
sign test	(-1.79)	(-1.13)	(-0.48)	(-1.18)	(-1.82)	(-1.15)	(-0.30)	(-0.20)
Panel C : Rights offerings of common stocks, "LT Financing New Investment" (114 observations)								
equally weighted performance								
mean (%)	-10.69 <sup>b</sup>	-13.03 <sup>b</sup>	-17.98 <sup>b</sup>	-23.30 <sup>b</sup>	-10.32 <sup>b</sup>	-9.85	-24.36 <sup>b</sup>	-28.95 <sup>b</sup>
T stat	(-2.46)	(-2.11)	(-2.04)	(-2.11)	(-2.58)	(-1.62)	(-2.27)	(-2.16)
value weighted performance								
mean (%)	-8.11	-10.69	-22.97 <sup>b</sup>	-27.42 <sup>b</sup>	-9.59 <sup>a</sup>	-10.33 <sup>b</sup>	-17.52 <sup>b</sup>	-20.64 <sup>b</sup>
T stat	(-1.47)	(-1.37)	(-2.02)	(-1.97)	(-3.15)	(-2.24)	(-2.57)	(-2.04)
Non-parametric performance								
median (%)	-9.61 <sup>a</sup>	-4.37	-16.25 <sup>a</sup>	-16.11 <sup>a</sup>	-8.61 <sup>b</sup>	-4.39	-9.43 <sup>b</sup>	-12.30 <sup>b</sup>
sign test	(-2.81)	(-1.60)	(-3.32)	(-2.91)	(-2.35)	(-0.57)	(-2.29)	(-2.12)

<sup>a</sup> significant at 1 % <sup>b</sup> significant at 5 %

CAR are computed as :  $CAR_T = \sum_{i=1}^n \sum_{t=1}^T w_{it} [R_{SEO,it} - R_{c,it}]$  where  $T$  is for 6, 12, 24 and 36 months,  $R_{SEO,it}$  is the return on SEO

firm  $i$  at month  $t$ ,  $R_{c,it}$  is the return on the matching firm of  $i$  at month  $t$ ,  $w_{it}$  is the weight of  $i$  in the sample at month  $t$  and  $n_t$  is the number of firms in the sample at month  $t$ . The  $t$ -stat for the CAR is computed as in Ritter (1991) as :

$t \text{ stat}_T = CAR_T \cdot \sqrt{n_T} / [T \cdot \text{var} + 2 \cdot (T-1) \cdot \text{cov}]^{1/2}$  where  $T$  is the horizon considered (number of months), var is the average (over 36 months) cross-sectional variance and cov is the first-order autocovariance of the  $AR_t$  series. The average BHAR is

calculated as  $\sum_{i=1}^n w_{it} \left[ \prod_{t=1}^T (1 + R_{SEO,it}) - \prod_{t=1}^T (1 + R_{c,it}) \right]$  where  $R_{SEO,it}$  is the return on the SEO firm  $i$  at month  $t$ ,  $R_{c,it}$  is the return on the

matching firm of  $i$  at month  $t$ ,  $T$  is the holding period considered (6, 12, 24 or 36 months),  $w_{it}$  is the weight of  $i$  in the sample at month  $t$  and  $n_T$  is the number of the SEO stocks for the  $T$ -month period. The  $t$  stat is the skewness adjusted  $t$

statistic of Lyon, Barber and Tsai (1999) and is calculated as :  $t \text{ stat}_T = ts_T + (1/3) \cdot (ts_T^2 / \sqrt{n_T}) \cdot skew_T + (1/6n_T) \cdot \sqrt{n_T} \cdot skew_T$

where  $ts_T$  is the standard  $t$  stat value computed at month  $T$ ,  $skew_T$  is the skewness of the BHAR series at month  $T$  and  $n_T$  is the number of SEO firms at month  $T$ . The sign test is computed as :  $(p_T - 0.5) / (0.5 \times (1 - 0.5))^{0.5} \times \sqrt{n_T}$  where  $p_T$  is the

percentage of positive abnormal returns at month  $T$  and  $n_T$  is the number of observations at month  $T$ .

The long-run performance of the “LT Financing New Investments” sample is significantly negative at a 5 % level. The 36-month cumulative abnormal returns range from –20.64 % to –28.95 % depending on the weighting scheme and on the computation method. The medians are also significantly negative, –16.11 % for the *CAR* and to –12.30 % for the *BHAR*. The underperformance is significant in most of the horizons less than 36 months, the 12-month horizon showing the least cases of significance (only the 12-month value-weighted *BHAR* is significant). Hence, “Financing New Investments” issuers are poorly performing firms from the time they issue new equity and up to three years after the event. On one hand, firms caring about financial flexibility, that preserve their financing sources, do not underperform their benchmark over a 36-month horizon. On the other hand, firms that voluntarily select equity financing to undertake a specific investment project are penalised on the long-run.

Based on the “use of the proceeds” argument, I compare the 36-month means and medians of both sub-samples. The hypothesis is the following :

$$H_0 : \bar{R}_{FIN,36} > \bar{R}_{CS,36} \quad \text{vs.} \quad H_1 : \bar{R}_{FIN,36} \leq \bar{R}_{CS,36}$$

where  $\bar{R}_{s,36}$  is the mean or median abnormal return (*CAR* or *BHAR*) of sample,  $s = \{CS, FNI\}$ , at the 36-month horizon.

**Table 4.7 : Difference in abnormal performance according to the use of the proceeds**

	36-month <i>CAR</i>			36-month <i>BHAR</i>		
	CS	FNI	CS-FNI	CS	FNI	CS-FNI
mean equally-weighted (%)	-2.20	-23.30	21.10 <sup>b</sup> (1.70)	-6.63	-28.95	22.32 <sup>b</sup> (1.74)
mean value-weighted (%)	7.37	-27.42	34.80 <sup>a</sup> (2.88)	8.92	-20.64	29.56 <sup>b</sup> (1.74)
median (%)	-3.62	-16.11	12.49 <sup>b</sup> (1.71)	-2.28	-12.30	10.02 (1.01)

<sup>a</sup> significant at 1 %    <sup>b</sup> significant at 5 %

CS denotes the “LT Capital Structure” sample and FNI represents the “LT Financing New Investment” sample. The *CAR* and *BHAR* are taken at the 36-month horizon. The tested hypotheses are :  $H_0 : \bar{R}_{FIN,36} > \bar{R}_{CS,36}$  vs  $H_1 : \bar{R}_{FIN,36} \leq \bar{R}_{CS,36}$ , where  $\bar{R}_{s,36}$  is the mean (median) abnormal return (*CAR* or *BHAR*) of sample,  $s = \{CS, FNI\}$ , at the 36-month horizon. The *t*-stat for the difference in means

(given in parentheses) is computed as :  $t\text{-stat} = \frac{\bar{R}_{CS,36} - \bar{R}_{FNI,36}}{\sqrt{\frac{\sigma_{R_{CS,36}}^2}{n_{CS}} + \frac{\sigma_{R_{FNI,36}}^2}{n_{FNI}}}}$  ; where  $\sigma_{s,36}^2$  is the cross-sectional

variance of the 36-month abnormal returns (*CAR* or *BHAR*) of sample,  $s = \{CS, FNI\}$ , and  $n_s$  is the number of observations in sample,  $s$ . The test of the difference in medians (given in parentheses) is a Wilcoxon rank tests.

As it can be seen in Table 4.7, the  $H_0$  hypothesis is rejected in five of the six cases. Only the median *BHAR* of the “LT Capital Structure” sample is not significantly greater than its “LT Financing New Investment” correspondent. Otherwise, for all weighting schemes and abnormal returns aggregation methods, both issuer types are different relative to their long-term stock performance. These findings emphasise the “use of the proceeds” argument.

One reason for the abnormal performance of “Capital Structure” issuers not to be significant could be that the standard deviation of their abnormal returns is greater than that of “Financing New Investment” issuers. I test the following hypothesis about the variance of both samples :

$$H_0 : \sigma_{CS,T}^2 \leq \sigma_{FNI,T}^2 \text{ vs. } H_1 : \sigma_{CS,T}^2 > \sigma_{FNI,T}^2$$

where  $\sigma_{s,T}^2$  is the cross-sectional variance of sample  $s = \{CS, FNI\}$  abnormal returns at horizon  $T = \{6, 12, 24, 36\}$ .

The Table 4.8 shows the *F*-test results of the differences in variance for *CAR* and *BHAR*.

**Table 4.8 : Difference in distributions of abnormal returns**

	Cumulative Abnormal Return				Buy-and-Hold Abnormal Return			
	6-month	12-month	24-month	36-month	6-month	12-month	24-month	36-month
<i>Panel A : Equally-weighted scheme</i>								
$\sigma_{CS}^2$	0.15	0.31	0.74	0.95	0.15	0.45	0.79	2.42
$\sigma_{FNI}^2$	0.18	0.30	0.62	0.79	0.22	0.42	0.73	2.27
<i>p</i> -value	(0.16)	(0.40)	(0.18)	(0.17)	(0.02) <sup>b</sup>	(0.33)	(0.35)	(0.37)
<i>Panel B : Value-weighted scheme</i>								
$\sigma_{CS}^2$	0.11	0.22	0.49	0.44	0.11	0.24	0.61	1.38
$\sigma_{FNI}^2$	0.08	0.19	0.45	0.33	0.10	0.22	0.54	1.28
<i>p</i> -value	(0.09)	(0.21)	(0.36)	(0.08)	(0.67)	(0.54)	(0.26)	(0.35)

The variance in abnormal returns is noted, respectively,  $\sigma_{CS}^2$  for the “LT Capital Structure” sample and  $\sigma_{FNI}^2$  for the “LT Financing New Investment” sample. Unilateral *p*-value of the *F*-test is given in parentheses.

On average, the variance of the “LT Capital Structure” sample is greater than the one of the “LT Financing New Investment” sample but they are not significantly different at the 5 % level for all horizons, except for 6-month *BHAR*. According to these findings, the non-significance of “LT Capital Structure” results does not come from a higher standard deviation of its abnormal performance.

#### 4.3.4 Calendar time abnormal performance

Does the underperformance found with the classical methodology survive the test of other benchmarks? Because the decontamination of the market index does not affect the significance of the results, only Jensen's alphas estimated with a non-purged market index are shown in Table 4.9. The portfolios of issuers and matching firms are presented in the first four columns and the alternative models in rows. Panel A contains the results of the equally-weighted portfolios and Panel B presents those of the value-weighted portfolios.

The first general comment is that the abnormal performance relative to alternative benchmarks support the matching firm results. Beta pricing models also detect a significant underperformance for the "LT Financing New Investments" portfolio while other calendar-time portfolios do not exhibit significant alphas, at the 5 % level. These findings contradict those of Brav et al. (2000) and Eckbo et al. (2000) showing that the calendar-time approach eliminates the underperformance. However, they are in accordance with Jegadeesh (2000). The results also underline the importance of the use of the proceeds as a variable to differentiate the issuers. The introduction of supplementary risk factors emphasises the significance of the "LT Financing New Investments" portfolio results. Another interesting feature is the closeness of the alphas given by both conditional and unconditional CAPM. Consequently, one can reasonably say that the abnormal performance is not time varying.

The alphas of the "LT Capital Structure" portfolio (1<sup>st</sup> column of Table 4.9) range between 0.37 % and 0.46 % per month in the equally-weighting scheme and between 0.16 % and 0.61 % per month in the value-weighting one. They are never significant at the 5 % level. The alphas of the "LT Financing New Investments" portfolio (3<sup>rd</sup> column of Table 4.9) are significantly negative according to all models except for the unconditional CAPM in the value-weighting scheme. They range from -0.47 % to -0.95 %. The alphas of both matching portfolios are never statistically significant (columns 2 and 4 of Table 4.9), which outlines the fact that the abnormal performance cannot be attributed to non-event firms.

**Table 4.9 : Abnormal performance (Jensen's alpha) computed from alternative models**

	CS	Match CS	FNI	Match FNI	CS-Match	FNI-Match	CS-FNI	Match CS-FNI
<i>Panel A : Equally-weighted portfolios</i>								
mean $r_p - r_f$ (%)	0.88	0.41	0.03	0.38	0.48	-0.35	0.85	0.03
std. deviation (%)	6.92	4.92	5.90	5.37	5.76	5.18	5.03	4.93
U-CAPM alpha (%)	0.37	0.11	-0.47 <sup>b</sup>	0.10	0.26	-0.57 <sup>b</sup>	0.84 <sup>b</sup>	0.01
	(1.11)	(0.39)	(-2.03)	(0.30)	(0.72)	(-2.00)	(2.47)	(0.03)
FF 3-factor alpha (%)	0.38	-0.32	-0.75 <sup>a</sup>	-0.25	0.70	-0.50 <sup>b</sup>	1.13 <sup>b</sup>	0.14
	(1.05)	(-1.22)	(-2.57)	(-1.09)	(1.84)	(-1.97)	(2.36)	(0.39)
C-CAPM alpha (%)	0.46	0.13	-0.50 <sup>b</sup>	0.15	0.33	-0.65 <sup>b</sup>	0.96 <sup>a</sup>	-0.01
	(1.32)	(0.47)	(-2.06)	(0.44)	(0.87)	(-1.97)	(2.63)	(-0.04)
<i>Panel B : Value-weighted portfolios</i>								
mean $r_p - r_f$ (%)	0.83	0.32	-0.09	0.93	0.51	-1.02	0.92	-0.61
std. deviation (%)	8.14	6.97	6.81	6.65	9.30	7.60	6.63	8.14
U-CAPM alpha (%)	0.16	0.08	-0.62	0.66	0.09	-1.28 <sup>a</sup>	0.78	-0.58
	(0.47)	(0.16)	(-1.93)	(1.53)	(0.15)	(-2.58)	(1.72)	(-1.01)
FF 3-factor alpha (%)	0.61	-0.47	-0.95 <sup>a</sup>	0.27	1.08	-1.22 <sup>b</sup>	1.56 <sup>a</sup>	-0.74
	(1.78)	(-1.00)	(-2.76)	(0.61)	(1.91)	(-2.14)	(3.15)	(-1.25)
C-CAPM alpha (%)	0.30	0.10	-0.69 <sup>b</sup>	0.78	0.19	-1.47 <sup>a</sup>	0.99 <sup>b</sup>	-0.67
	(0.82)	(0.21)	(-2.07)	(1.76)	(0.32)	(-2.89)	(2.10)	(-1.11)

<sup>a</sup> significant at 1 %

<sup>b</sup> significant at 5 %

The mean  $r_p$  is the mean monthly (equal- or value-weighted) return on the portfolio  $p$  in excess of the monthly risk free rate (1-month Euro FRF). The Jensen's alpha is estimated with three alternative models :

unconditional CAPM (U-CAPM) :  $r_{pt} = \alpha_p^U + \beta_p r_{mt}$

where  $r_{mt}$  is the monthly return on the SBF market index in excess of the risk free rate at month  $t$ ,

Fama and French (1993) three-factor (FF 3-factor) :  $r_{pt} = \alpha_p^{FF} + \beta_{1,p} r_{mt} + \beta_{2,p} SMB_t + \beta_{3,p} HML_t$

where  $SMB_t$  is the difference in monthly return between small and large firms (size is measured by equity market value),

$HML_t$  is the difference in monthly return between high and low book-to-market firms,

$SMB$  and  $HML$  are purged from SEO firms

conditional CAPM (C-CAPM) :  $r_{pt} = \alpha_p^C + (d_{0,p} + d_{1,p} y_{t-1} + d_{2,p} pe_{t-1} + d_{3,p} mi_{t-1}) r_{mt}$

where  $y_{t-1}$  is the one month lagged French government 10-year bond yield,

$pe_{t-1}$  is the market aggregated one month lagged price to earnings ratio,

$mi_{t-1}$  is the one month lagged inverse of the SBF market index price.

The coefficients are estimated using OLS. Numbers in parentheses are  $t$  statistics.

The last two columns of Table 4.9 present the results of “zero investment” portfolios long in “Capital Structure” issuers (matching firms) and short in “Financing New Investment” issuers (matching firms). The portfolio of issuers shows significantly positive alphas according to all models. Firms raising equity for pure capital structure concerns outperform, on the long-run, the ones that use the SEO proceeds to finance specific investment projects. Note that the difference between the portfolios of matching firms is not different from zero. This corroborates the fact that the anomaly is restricted to the “Financing New Investments” issuers.

#### 4.3.5 Test of the window of opportunity

In this sub-section, I extend the analysis of the long-run performance to a 48-month horizon starting one year prior to the issue month. The aim is to examine if the “window of opportunity” argument. In other words, is the long-run underperformance of “Financing New Investments” issuers preceded by a period of overperformance? Does the difference between the two main groups remain when the analysis horizon includes the pre-SEO period? Using the matching firm methodology introduced in sub-section 4.3.2.2<sup>79</sup>, I compute the *BHAR* starting one year prior to the issue month and ending 36 months after. The results are presented in Table 4.10. Panel A concerns the “LT Capital Structure” sample while Panel B addresses the “LT Financing New Investment” sample.

The “LT Capital Structure” sample exhibits a significant overperformance during the pre-SEO period in both weighting schemes (+15.77 % for the equally-weighted *BHAR* and +12.94 % for the value-weighted *BHAR*). The median *BHAR* is also positive but not significant. Over the same horizon, “Financing New Investment” issuers are noticed to outperform their benchmark in proportions similar to the other issuers (equally weighted *BHAR* = +15.96 %; value-weighted *BHAR* = +13.01 %). In fact, the difference in the pre-SEO abnormal performance between the two samples is not statistically significant: the equally-weighted difference equals -0.19 % (*t*-stat = -0.02), the value-weighted difference equals -0.07 % (*t*-stat = -0.01), and the Wilcoxon rank test is also insignificant (-0.38).

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<sup>79</sup> The matching is realised at the SEO month. The selected matching firm should be the same as the one used on the post-issue horizon only. Exceptions could be due to missing data for the matching firm during the pre-SEO period. In that case, the next closest non-issuing firm is selected as the new matching firm for the whole period (or until it is delisted or engages itself into a SEO process). For the “Long-term” sample, twenty-two original matching firms have to be replaced. The introduction of the new matching firms does not affect the significance of the post-issue performance although the underperformance of the “LT Financing New Investment” sample is strengthened.

These results indicate that managers time the equity issue within the window of opportunity independently from the intended use of the proceeds.

**Table 4.10 : The long-run performance around the offering**

Samples	Buy and Hold Abnormal Returns			
	-12 to seo	-12 to+12	-12 to +24	-12 to +36
<i>Panel A : Rights offerings of common stocks, "LT Capital structure" (118 observations)</i>				
equally weighted performance				
mean (%)	15.77 <sup>b</sup>	7.71	8.65	8.03
T stat	2.63	0.65	0.50	0.38
value weighted performance				
mean (%)	12.94 <sup>b</sup>	-4.39	6.74	9.79
T stat	2.39	-0.48	0.47	0.62
Non-parametric performance				
median (%)	7.03	8.85	3.82	10.29
sign test	0.95	0.38	0.10	1.00
<i>Panel B : Rights offerings of common stocks, "LT Financing New Investment" (114 observations)</i>				
equally weighted performance				
mean (%)	15.96 <sup>b</sup>	-10.11	-25.97 <sup>b</sup>	-29.01 <sup>b</sup>
T stat	2.00	-1.00	-1.97	-2.04
value weighted performance				
mean (%)	13.01 <sup>b</sup>	-3.67	-25.76 <sup>b</sup>	-25.41 <sup>b</sup>
T stat	2.11	-0.32	-2.28	-2.02
Non-parametric performance				
median (%)	13.31 <sup>b</sup>	-7.21	-10.13	-17.18 <sup>b</sup>
sign test	2.12	-0.97	-1.19	-2.07

<sup>a</sup> significant at 1 %    <sup>b</sup> significant at 5 %

The computation of the abnormal performance starts 12 before the issue and ends 36 months after. The matching procedure is done at the SEO month. The average BHAR is calculated as  $\sum_{i=1}^{n_T} w_{it} \left[ \prod_{t=1}^T (1 + R_{SEO,it}) - \prod_{t=1}^T (1 + R_{c,it}) \right]$  where  $R_{SEO,it}$  is the return on the SEO firm  $i$  at month  $t$ ,  $R_{c,it}$  is the return on the control portfolio of  $i$  at month  $t$ ,  $T$  is the holding period considered ( $T = 12, 24, 36, 48$ ),  $w_{it}$  is the weight of  $i$  in the sample at month  $t$  and  $n_T$  is the number of the SEO stocks for the  $T$ -month period. The  $t$  stat is the skewness adjusted  $t$  statistic of Lyon, Barber and Tsai (1999) and is calculated as :  $t \text{ stat}_T = ts_T + (1/3) \cdot (ts_T^2 / \sqrt{n_T}) \cdot skew_T + (1/6n_T) \cdot \sqrt{n_T} \cdot skew_T$  where  $ts_T$  is the standard  $t$  stat value computed at month  $T$ ,  $skew_T$  is the skewness of the BHAR series at month  $T$  and  $n_T$  is the number of SEO firms at month  $T$ . The sign test is computed as :  $(p_T - 0.5) / (0.5 \times (1 - 0.5))^{0.5} \times \sqrt{n_T}$  where  $p_T$  is the percentage of positive abnormal returns at month  $T$  and  $n_T$  is the number of observations at month  $T$ .

Over the 48-month horizon, the two samples show different patterns. The positive performance in terms of means and median persists for the “Capital Structure” issuers all through the post-SEO period but without being significant. On the other hand, the abnormal

performance of the “LT Financing New Investment” sample decreases during the post-SEO period to become significantly negative at the two longest horizons. The equally-weighted 48-month *BHAR* is equal to  $-29.01\%$  whereas the value-weighted abnormal return reaches  $-25.41\%$ . These figures are lower than their corresponding 36-month post-SEO *BHAR* in Table 4.5. This is mainly due to the replacement of original matching firms because of pre-SEO missing data; see footnote 29 for more detailed about the matching firm replacement conditions. An additional reason is that firms with the highest pre-SEO overperformance do not experience the worst reversal in abnormal performance during the post-issue period. The 48-month median *BHAR* also becomes significantly negative, showing that the number of underperformers increases with the horizon length.

The evolution of the long-term abnormal performance around the SEO is consistent with the predictions of the “inefficient use of the proceeds” hypothesis and partially with those of the “timing” hypothesis. The pattern presented by the “Financing New Investment” issuers is clear and does not deserve further comments. It gives support to the “window of opportunity” argument and does not contradict both “investors’ irrationality” and “inefficient use of the proceeds” explanations. The case of “Capital Structure issuers is more puzzling. The pre-SEO positive abnormal performance is consistent with the “timing” hypothesis but not evidence of is given to the fact that this overvaluation is temporary (no post-issue underperformance). One reason to this phenomenon could be that managers wait for the stock price to be no longer undervalued before deciding on “Capital Structure” equity offerings. The pre-SEO overperformance could be the correction that brings back the stock price to its “normal” value. If this explanation is true, the pattern of the “LT Capital Structure” still denotes of the presence of timing. However, it is not supportive to the behavioural theories. The timing of “Capital Structure” offerings implies that such events are also selective and thus, according to behavioural models, they should exhibit long-term anomalies in stock returns. One could argue that the adjustment time to the rational value described in Figure 4.1 could be shortened for “Capital Structure” issuers because the event still could be less informative. This period could last less than half a year. Though, the stock price reaction at the announcement would have to be negative, which is not consistent with the findings in Chapter 3.

#### 4.3.6 Irrational investors, timing or inefficient use of the proceeds ?

Up to this point, the long-term post-SEO underperformance is proven to be restricted to “Financing New Investment” issuers. Evidence that managers time their equity issue decisions has been brought up but it could differ according to the use of the proceeds. “Financing New Investment” issues seem to be realised within the “window of opportunity” advanced by Loughran and Ritter (1995). “Capital Structure” offerings could be more likely to occur after a period of stock undervaluation. However, no conclusion can be drawn about the cause or the absence of long-term abnormal performance after equity issues.

To test which hypothesis better explains the long-run stock performance, 36-month  $CAR$ <sup>80</sup> are regressed cross-sectionally on a set of control variables that proxy for “timing”, “investors’ irrationality” and “inefficient use of the proceeds”. The magnitude of the momentum effect is measured by the cumulative return on a “zero-investment” momentum portfolio over the 36-month post-SEO horizon. At the beginning of the first post-SEO month, the zero-investment portfolio is formed. The long position of the portfolio includes the last six months best performers quartile (equally weighted) and the short part the last six months worst performers quartile; the firms being taken from the entire population of listed French companies. The portfolio is held during one month and then liquidated. The procedure is repeated every month in the post-SEO horizon, producing a series of 36 monthly returns for each issuer. These returns are cumulated to form the variable,  $BMW_i$  :

$$BMW_i = \sum_{t=1}^{36} \bar{r}_{best,t} - \bar{r}_{worst,t} \quad (4.8)$$

where  $\bar{r}_{best,t}$  is the mean equally-weighted return of the top last 6-month performers quartile at month,  $t$ ; being the  $t^{\text{th}}$  month after the issue made by firm,  $i$ ,

$\bar{r}_{worst,t}$  is the mean equally-weighted return of the bottom last 6-month performers quartile at month,  $t$ .

The expected sign of the  $BMW_i$  variable is negative for “Financing New Investment” issuers. The greater momentum effect captured by  $BMW_i$ , the lower should be their

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<sup>80</sup> Regression are also run with the 36-month  $BHAR$  as the dependent variable without altering the results qualitatively.

36-month underperformance. The coefficient of  $BMW_i$  should not be significantly different from zero for “Capital Structure” issuers.

The abnormal return computed over the SEO month is used to control for investors’ underreaction to public information, the first implication of behavioural theories. This monthly initial abnormal return,  $AR0$ , includes the announcement stock price reaction and it is determined according to the same matching methodology as the long-term abnormal performance. The sign of the  $AR0$  coefficient is expected to be positive if investors are subject to underreaction. Indeed, they should be able to identify the direction of the event impact on the firm value but not its “rational” magnitude; they are assumed to underestimate it. The second behavioural models prediction is investors’ overreaction. The pre-SEO stock performance ( $runup_i$ ), measured by the  $CAR$  computed over the 12 months preceding the issue<sup>81</sup> is expected to be negatively related to the post-offering abnormal performance. Therefore, the coefficient sign of the overreaction variable,  $runup_i$ , should be negative. Overreaction assumes that the greater deviation from the normal value at the time of the event, the larger should be the reversal in the post-event period.

The “inefficient use of the proceeds” relies on model uncertainty. This uncertainty leads market participants’ over-optimism about the firm prospect and especially about the investment project outcome. One way to control for market uncertainty is to consider the evolution of financial analysts’ earnings forecasts during the post-SEO analysis horizon as a measure of a learning effect. As time passes since the investment decision, financial analysts are assumed to verify the investment outcome and revise their forecasts accordingly. Over-optimism implies a downward revision of earnings forecasts over the 36 months following the investment/financing decision. If the “inefficient use of the proceeds” argument is valid, the earnings forecasts revisions should be positively related to the long-term post-SEO abnormal performance. A second implication of the relation between earnings forecasts revisions and the post-issue stock performance addresses to investors’ rationality. Indeed, if the evolution of the stock price is explained by the revisions of earning forecasts, investors cannot be considered as irrational.

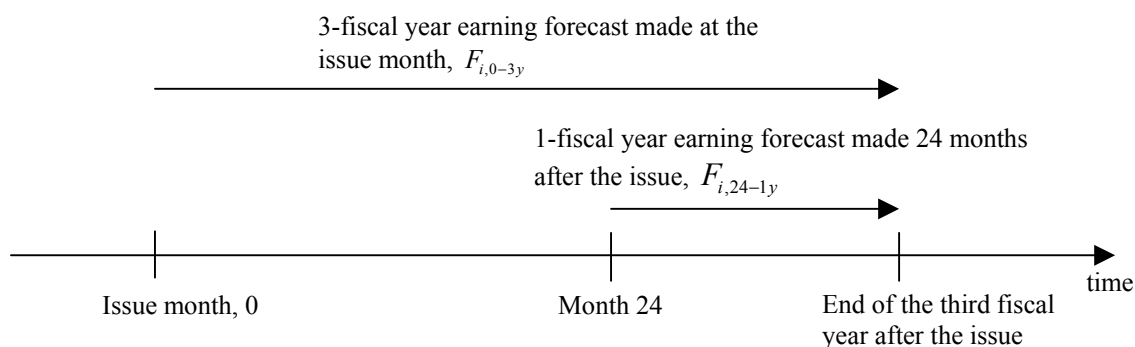
Data about the consensus earning forecasts are taken from the I/B/E/S Summary History File. I define the forecast revision as the difference between two forecasts made at different

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<sup>81</sup> Using the 6-month pre-issue  $CAR$  does not alter the results. It indicates that the pre-SEO stock price run-up is concentrated within the last six months prior to the issue.

times but for the same fiscal year's end. In other words, the forecasted earnings per share is fixed in time. Only the dates the forecasts are realised differ. In order to stick with the performance horizon, I set the end of the forecast horizon to be the end of the third fiscal year after the issue and that for all earnings forecasts considered. The timeline of the forecast revision is illustrated in Figure 4.3.

**Figure 4.3 : Timeline of the earning forecast revision**



Formally, the forecast revision of issuer,  $i$  ( $RF36_i$ ), is computed as :

$$RF36_i = \frac{F_{i,24-1y} - F_{i,0-3y}}{P_{i,0}} \quad (4.9)$$

where  $F_{i,24-1y}$  is the forecast consensus about the next fiscal-year earnings, made 24 months after the issue, about issuer,  $i$ ,

$F_{i,0-3y}$  is the forecast consensus about the third fiscal-year earnings after the issue, made at the issue month, about issuer,  $i$ ,

$P_{i,0}$  is the stock price at the issue month, of issuer,  $i$ .

Earnings forecasts are corrected for currency changes (FRF to EUR) and for capital structure changes. To avoid industry effects, the median forecast revision of all firms within the same industry group is subtracted from each issuer's forecast revision :

$$RIF36_i = RF36_i - RI36_i \quad (4.10)$$

where  $RIF36_i$  is the industry-adjusted forecast revision of issuer,  $i$ ,

$RF36_i$  is given by Equation 4.9,

$RIF36_i$  is the median forecast revision of all firms within the same industry group, computed as in Equation 4.9.

The  $RIF36_i$  variable is designed to cover the same horizon as the abnormal performance measure. Because earnings forecasts are not available each month in the I/B/E/S data file (especially 3-year forecasts), the variable  $F_{i,0-3y}$  takes the value of the 3-year forecast made within the same fiscal year and closest to the issue month. The same procedure is applied to the variable  $F_{i,24-1y}$ ; the closest 1-year forecast to the 24-month anniversary and within the same fiscal year.

The Equation 4.11 defines the complete regression. The “Long-term I/BE/S” sample includes forty-four “Capital Structure” operations and fifty-one “Financing New Investment” issues<sup>82</sup>. In order to control for the “use of the proceeds” argument, a dummy variable,  $UOP_i$ , is added :

$$CAR36_i = a_0 + a_1UOP_i + a_2BMW_i + a_3AR0_i + a_4runup_i + a_5RIF36_i + \varepsilon_i \quad (4.11)$$

where  $CAR36_i$  is the 36-month post-SEO cumulative abnormal return of issuer,  $i$ ,

$UOP_i$  is a dummy variable taking the value 1 when the intended use of the proceeds is financing a specific investment project and 0 otherwise,

$BMW_i$  is the 36-month post-SEO cumulative return on a momentum portfolio,

$AR0_i$  is the monthly initial abnormal return of issuer,  $i$ ,

$runup_i$  is the 12-month pre-issue  $CAR$  of issuer,  $i$ ,

$RIF36_i$  is the industry-adjusted earnings forecast revision over the post-SEO horizon for issuer,  $i$ ,

$\varepsilon_i$  is an error term.

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<sup>82</sup> Reducing the size of the long-term samples does not affect the overall long-term abnormal performance. The fifty-one “LT Financing New Investment I/B/E/S” issues exhibit negative 36-month equally-weighted  $CAR$  (-27.01 %) and equally-weighted  $BHAR$  (-27.00 %), both significant at the 5 % level. The long-term performance of the forty-four “LT Capital Structure I/B/E/S” operations remains insignificantly different from zero with 36-month equally-weighted  $CAR$  of -9.63 % and 36-month equally-weighted  $BHAR$  of -8.88 %.

In some cases, the influence of the explanatory variables is predicted to be different according to the use of the proceeds<sup>83</sup>. Therefore, the following regression is also estimated :

$$CAR36_i = a_0 + a_1 UOP_i + \mathbf{a}_{CS}' \mathbf{X}_i \times CS_i + \mathbf{a}_{FNI}' \mathbf{X}_i \times FNI_i + \varepsilon_i \quad (4.12)$$

where  $CS_i$  ( $FNI_i$ ) is a dummy variable taking the value 1 for “Capital Structure” (“Financing New Investment”) issuers and 0 otherwise,

$$\mathbf{X}_i' = [BMW_i \quad AR0_i \quad runup_i \quad RIF36_i],$$

$\mathbf{a}_{CS}$  and  $\mathbf{a}_{FNI}$  are vectors of coefficients.

The coefficients in  $\mathbf{a}_{CS}$  and  $\mathbf{a}_{FNI}$  outline, respectively, the specific effect on “Capital Structure” and “Financing New Investment issuers. Results of Regressions 4.11 and 4.12 are shown in Table 4.11. Each explanation to be tested induces a different version of the regressions. The “timing” regression includes only the  $FNI_i$  dummy variable and the momentum effect. Both behavioural variables,  $AR0_i$  and  $runup_i$  are added in the “irrational investors” regression. Third, the “inefficient use of the proceeds” regression entails all explanatory variables. For all three hypotheses, the first row entails the coefficients estimates of Equation 4.11 and the second one, those of Equation 4.12 with the separated effect of  $CS$  and  $FNI$ .

The coefficient of the momentum variable,  $BMW_i$ , is significantly negative for the “Long-term I/B/E/S” but its influence is restricted to the “Financing New Investment” issuers. These findings are consistent with the “timing” hypothesis. At the same time, the coefficient of the  $UOP_i$  dummy variable is also significantly negative, showing that financing a new investment project has a negative impact on the long-term abnormal performance even after controlling for the “timing” effect.

The evidence about investors’ irrationality is mixed; see the “Irrational investors rows in Table 4.11. The positive sign of the  $AR0$  coefficient is consistent with the underreaction hypothesis. However, underreaction is confined to “Financing New Investment” issuers, which contradicts behavioural theories prediction. Furthermore, no evidence of overreaction is noticed. The impact of the  $runup_i$  variable is negative overall and for “Financing New Investment” offerings separately but its coefficients  $a_4$ ,  $a_{4CS}$  and  $a_{4FNI}$  are not significant.

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<sup>83</sup> Refer to Table 4.1 for the model predictions.

This result adds evidence against the validity of behavioural theories. It is not consistent with the ranking of SEO as an overreaction event; see Fama (1998). Post-issue abnormal performance not being inversely proportional to pre-issue performance supports the remark that best pre-SEO performers are not the worst post-SEO performers; see the test of the “window of opportunity” in sub-section 4.3.5 of this chapter.

The inclusion of the behavioural variables does not eliminate the significance of the momentum variable overall and for “Financing New Investment” issuers. It indicates that underreaction does not predominate timing but both explanations could rather be complementary. The  $UOP_i$  dummy variable remains negative and significant. As expected, “timing” and “irrational investors” do not explain the difference in long-term abnormal returns across uses of the proceeds.

Investors’ irrationality is further challenged by the results of the “inefficient use of the proceeds” regression; see the last rows of Table 4.11. The earnings forecast revision variable contribute significantly to explain the underperformance of “Financing New Investment” issuers while it is not significantly related to the performance of “Capital Structure” issuers. According to that, evidence is given to the learning effect about the investment project outcome. Model uncertainty prevents investors to value correctly the investment project. They are over-optimistic about the probability of success. In that sense, equity-financed investment projects are confirmed as bets on the future, that are, on average, not worth it. It comes out of the cross-sectional analysis that managers are inclined to inefficiently spend the SEO proceeds, at the expenses of new investors, when financing specific projects.

It is interesting to notice that the  $UOP_i$  dummy variable loses its significance with the inclusion of the  $RIF36_i$  variable, outlining the explanatory power of the latter variable. Furthermore, the adjusted  $R^2$  is at its highest level in the third regressions. The initial investors’ reaction is in the right direction as the variable,  $ARO$ , remains significantly positive but general over-optimism prevents them to correctly adjust their anticipations about the stock price. The significant momentum effect does not contradict the “inefficient use of the proceeds” explanation. It shows that managers not only sub-optimally invest the SEO proceeds but they also time their investment/financing decisions within windows of opportunity.

**Table 4.11 : Cross-sectional analysis of long-term post-SEO abnormal performance**

	$a_0$	$UOP_i$	$BMW_i$		$AR0_i$		$runup_i$		$RIF36_i$		adj. $R^2$
			$\times CS_i$	$\times FNI_i$	$\times CS_i$	$\times FNI_i$	$\times CS_i$	$\times FNI_i$	$\times CS_i$	$\times FNI_i$	
“Timing”	0.06	-0.48 <sup>b</sup>	-0.96 <sup>a</sup>								0.14
	(0.30)	(-2.09)	(-3.42)								
“Irrational investors”	0.15	-0.69 <sup>b</sup>	-0.64	-1.33 <sup>a</sup>							0.17
	(0.64)	(-2.32)	(-1.50)	(-4.12)							
“Inefficient use of the proceeds”	0.05	-0.45 <sup>b</sup>	-1.04 <sup>a</sup>		1.88 <sup>b</sup>		-0.07				0.17
	(0.25)	(-1.99)	(-3.68)		(2.50)		(-0.20)				
“Inefficient use of the proceeds”	0.18	-0.57 <sup>b</sup>	-0.49	-1.14 <sup>a</sup>	-1.09	2.70 <sup>a</sup>	0.58	-0.53			0.22
	(0.79)	(-1.98)	(-1.03)	(-3.42)	(-0.75)	(2.88)	(1.15)	(-1.05)			
“Inefficient use of the proceeds”	0.10	-0.43	-0.91 <sup>a</sup>		1.67 <sup>b</sup>		-0.07		2.51 <sup>b</sup>		0.20
	(0.51)	(-1.74)	(-3.20)		(2.24)		(-0.19)		(2.01)		
“Inefficient use of the proceeds”	0.20	-0.38	-0.45	-0.75 <sup>b</sup>	-1.23	2.80 <sup>a</sup>	0.63	-0.62	0.97	8.53 <sup>a</sup>	0.28
	(0.90)	(-1.25)	(-0.96)	(-2.18)	(-0.87)	(3.11)	(1.28)	(-1.27)	(0.70)	(2.93)	

<sup>a</sup> significant at 1 %      <sup>b</sup> significant at 5 %

The “Long-term I/B/E/S” sample includes 95 operations between 1987 and 1998 for which 3-year earnings forecasts are available in the I/B/E/S Summary History File. The equations to be estimated is the following ( $t$ -stat are given in parentheses) :

$$CAR36_i = a_0 + a_1 UOP_i + \mathbf{a}' \mathbf{X}_i + \varepsilon_i$$

$$CAR36_i = a_0 + a_1 UOP_i + \mathbf{a}_{CS}' \mathbf{X}_i \times CS_i + \mathbf{a}_{FNI}' \mathbf{X}_i \times FNI_i + \varepsilon_i$$

where  $CAR36_i$  is the 36-month post-SEO cumulative abnormal return of issuer,  $i$ ,

$UOP_i$ ,  $FNI_i$  ( $CS_i$ ) are dummy variables taking the value 1 for “Financing New Investment” (“Capital Structure”) issuers and 0 otherwise,

$\mathbf{X}_i' = [BMW_i \ AR0_i \ runup_i \ RIF36_i]$  with  $BMW_i$  being the 36-month post-SEO cumulative return on a momentum portfolio,  $AR0_i$  the abnormal return of issuer,  $i$ , at the issue month,  $runup_i$  the 12-month pre-issue  $CAR$  of issuer,  $i$ , and  $RIF36_i$  the industry-adjusted earning forecast revision over the post-SEO horizon for issuer,  $i$ ,

$\mathbf{a}_{CS}$  and  $\mathbf{a}_{FNI}$  are vectors of coefficients,

$\varepsilon_i$  is an error term.

These observations contribute to indicate that the underperformance of the “Financing New Investment” issuers could be mainly explained by a sub-optimal investment policy combined with a model uncertainty-implied general over-optimism. At the managers’ defence, one must admit that they have no other choice than financing such risky investment projects with equity. The cost of debt would be prohibitive and creditors would have no interest to lend money rather than taking a stake in the firm capital. As shown in Table 4.4, “Financing New Investment” issuers have more cash flow and financial slack than other issuers. In the light of the long-term performance results, they are better off preserving these reserves of cash to finance less risky projects. Following these observations, “Financing New Investment” operations could be considered like start-up financing with all the benefits and risk that they involve.

The three potential explanations of the long-term abnormal returns imply testable relations across the coefficients of Equation 4.12. Panel A of Table 4.12 summarises the hypotheses with the expected result given in parentheses (*A* for accepted and *R* for rejected). The first column entails a “general test” about all the explanatory variables coefficients. In the next columns, specific hypotheses tests are displayed. Consistent with the “timing” explanation, the hypothesis of the momentum variable coefficients,  $a_{2CS}$  and  $a_{2FNI}$ , being equal should be rejected. Behavioural predictions should be similar for both issuers’ types and so should be their  $ARO_i$  and  $rumup_i$  coefficients. The “inefficient use of the proceeds” is restricted to “Financing New Investment” issuers. Thus, the hypothesis about coefficients  $a_{5CS}$  and  $a_{5FNI}$ , being equal should be rejected.

The results of the Wald tests ( $p$ -values of  $F$ -stat and  $\chi^2$ ) about Equation 4.12 coefficients are shown in Panel B of Table 4.12. They confirm that the “inefficient use of the proceeds” is most powerful in explaining the long-term abnormal returns of French equity issuers. Indeed, the hypothesis that the earnings forecast revisions coefficients of both issuers’ types are equal to zero is rejected. It constitutes the only result consistent with Panel A predictions. Furthermore, it adds evidence to the explanatory power of the  $RIF36_i$  variable found in Table 4.11. The hypothesis about the equality of “timing” coefficients is not rejected. Conversely, the equality of “behavioural theories” coefficients is rejected. These findings, opposed to the predictions, confirm that “timing” and “irrational investors” are not powerful in explaining the long-term abnormal returns of French SEO firms.

**Table 4.12 : Test on the coefficients of Regression 4.12**

	general test	“timing” test	“behavioural” test	“underreaction”	“overreaction”	“inefficient UOP”
<i>Panel A : Coefficients expected relations</i>						
“Timing”	$a_1 = 0$ and $a_{2CS} = a_{2FNI}$ (R)	$a_{2CS} = a_{2FNI}$ (R)				
“Irrational investors”	$a_1 = 0$ and $a_{2CS} = a_{2FNI}$ , $a_{3CS} = a_{3FNI}$ and $a_{4CS} = a_{4FNI}$ (A)		$a_{3CS} = a_{3FNI}$ and $a_{4CS} = a_{4FNI}$ (A)	$a_{3CS} = a_{3FNI} > 0$ (A)	$a_{4CS} = a_{4FNI} < 0$ (A)	
“Inefficient use of the proceeds”	$a_1 = 0$ and $a_{2CS} = a_{2FNI}$ , $a_{3CS} = a_{3FNI}$ and $a_{4CS} = a_{4FNI}$ (R)					$a_{5C} = a_{5F}$ (R)
	$a_{5CS} = a_{5FNI}$					
<i>Panel B : Wald tests, CAR</i>						
“Timing”	0.07	0.20				
	<i>0.07</i>	<i>0.20</i>				
“Irrational investors”	0.04 <sup>b</sup>		0.05 <sup>b</sup>	0.03 <sup>b</sup>	0.12	
	<i>0.03<sup>b</sup></i>		<i>0.04<sup>b</sup></i>	<i>0.03<sup>b</sup></i>	<i>0.12</i>	
“Inefficient use of the proceeds”	0.01 <sup>a</sup>					0.02 <sup>b</sup>
	<i>0.00<sup>a</sup></i>					<i>0.02<sup>b</sup></i>

(R) is rejected

(A) is accepted

<sup>a</sup> significant at 1 %

<sup>b</sup> significant at 5 %

Normal numbers are *F*-stat *p*-values and numbers in *italic* are  $\chi^2$  *p*-values of Wald tests. The coefficients are estimated from the following equation :

$$CAR36_i = a_0 + a_1 UOP_i + \mathbf{a}_{CS}' \mathbf{X}_i \times CS_i + \mathbf{a}_{FNI}' \mathbf{X}_i \times FNI_i + \varepsilon_i$$

where  $CAR36_i$  is the 36-month post-SEO cumulative abnormal return of issuer, *i*,

$UOP_i$ ,  $FNI_i$  ( $CS_i$ ) are dummy variables taking the value 1 for “Financing New Investment” (“Capital Structure”) issuers and 0 otherwise,

$\mathbf{X}_i' = [BMW_i \ AR0_i \ runup_i \ RIF36_i]$  with  $BMW_i$  being the 36-month post-SEO cumulative return on a momentum portfolio,  $AR0_i$  the abnormal return of issuer *i*, at the issue month,  $runup_i$  the 12-month pre-issue *CAR* of issuer *i*, and  $RIF36_i$  the industry-adjusted earning forecast revision over the post-SEO horizon for issuer *i*,

$\mathbf{a}_{CS}$  and  $\mathbf{a}_{FNI}$  are vectors of coefficients,

$\varepsilon_i$  is an error term.

Financial analysts being over-optimistic at the time of the SEO is still puzzling. Are they wrong because there is uncertainty about the future earnings or because some of them have an incentive to over-estimate the issuer's growth potential? Analysts that are affiliated to the underwriters of the offerings have conflicting interests. By over-valuing their earning forecasts, they facilitate the placement of new shares, strengthen the business relationship between their bank and the issuer and may contribute to acquire additional investment banking activities in the future. Evidence of the impact of affiliated financial analysts' over-optimism on the long-term post-SEO stock performance is given by Dechow, Hutton and Sloan (2000). In his discussion of the Dechow et al. (2000) paper, Kothari (2000) raises argument that partly discharges affiliated analysts from their influence on underperformance. First, the fact that affiliated analysts are found to produce the most overly-optimistic growth forecasts about the equity issuers does not imply that they do it knowingly to attract more investment banking activities. The direction of the relation could be reversed. Following the assumption that all analysts are on average over-optimistic, equity issuers could select the investment bank which affiliated analysts produce the most optimistic forecasts about the long-term growth. In that case, the bias in affiliated analysts' forecasts cannot be fully attributed to them.

In spite of Kothari (2000), controlling for potential agency bias in affiliated analysts' earnings forecasts is still worth doing. Forecasts made by affiliated analysts are separated from those who are not. The I/B/E/S Detail History File provides the earning forecasts analyst by analyst. An affiliated analyst is identified if he or she works for a bank group that is related to the underwriting syndicate. Analysts working for bank groups that are not members of the underwriting syndicate are divided into two categories: First, when no members of the underwriting syndicate provide earnings forecasts about the issuer, the analysts who follow these firms are considered as "independent". Second, when, among the analysts following an issuer, some are affiliated to the underwriting syndicate, the other analysts are considered as "non-affiliated".

Raw earning forecasts are standardised by the corresponding stock price. For each issuer, the consensus forecast is computed each month by averaging the individual standard forecast across the analysts within the same group ("Affiliated", "Non-Affiliated" or "Independent"). The procedure is applied to the 3-year forecasts,  $F_3$ , and not to the long-term growth

forecasts because of data availability<sup>84</sup> and to keep consistency with the “inefficient use of the proceeds” argument. At the issue month, a consensus forecast is computed for each analysts’ category. Then the different consensus forecasts are averaged across equity issues. If no data are available at the issue month, the group consensus forecast closest to this date and within the same fiscal year is retained. Individual earnings forecast revisions,  $RF36$ , are computed according to Equation 4.9 with the group consensus forecast<sup>85</sup>. They are averaged across issuers to form separate mean and median revisions for “Affiliated”, “Non-Affiliated” and “Independent” analysts.

Figures about the “Long-term I/B/E/S” sample are displayed in Panel A of Table 4.13. Since the over-optimism impact should be restricted to the “Financing New Investment” operations, mean and median forecasts and revisions of the “LT Financing New Investment IBES” sample appear in Panel B of Table 4.13.

The last three columns of Table 4.13 undoubtedly show that “Affiliated” financial analysts on the French market are not subject to any pressure to over-estimate their forecasts relative to “Non-Affiliated” and “Independent” analysts. This evidence is valid for both samples. “Affiliated” and “Non-Affiliated” forecasts or revisions are not different in means or in medians. The same is true between “Affiliated” and “Independent” analysts or between “Non-Affiliated” and “Independent” analysts.

**Table 4.13 : Analysis of the potential conflict of interests among financial analysts**

	Affil.	Non-Affil.	Indep.	Difference	Difference	Difference
	I	II	III	I - II	I - III	II - III
<i>Panel A : "Long-term I/B/E/S" sample (95 operations)</i>						
number of observations	60	60	35			
mean $F3$ (%)	6.55	7.78	7.55	-1.23	-1.00	0.23
t-stat				(-1.35)	(-0.75)	(0.22)
Median $F3$ (%)	7.03	7.54	7.75	-0.51	-0.72	-0.21
Wilcoxon rank test				(-0.55)	(-0.71)	(-0.34)
mean $RF36$ (%)	-1.41	-2.68	-1.57	1.27	0.16	-1.11
t-stat				(1.25)	(0.11)	(-0.72)
Median $RF36$ (%)	-0.96	-0.85	-0.28	-0.11	-0.68	-0.58
Wilcoxon rank test				(-0.75)	(-0.31)	(-1.02)

<sup>84</sup> The number of long-term growth forecasts about French firms is not large enough to run relevant tests.

<sup>85</sup> Group consensus forecasts are also calculated from individual 1-year forecasts taken 24 months after the issue.

**Table 4.13 : continued**

	Affil.	Non-Affil.	Indep.	Difference	Difference	Difference
	I	II	III	I - II	I - III	II - III
<i>Panel B : "LT Financing New Investment I/B/E/S" sample (51 operations)</i>						
number of observations	34	34	17			
mean <i>F3</i> (%)	6.61	7.23	8.81	-0.62	-2.20	-1.58
t-stat				(-0.38)	(-1.41)	(-1.18)
Median <i>F3</i> (%)	7.07	7.32	8.58	-0.25	-1.51	-1.26
Wilcoxon rank test				(-0.15)	(-1.56)	(-1.45)
mean <i>RF36</i> (%)	-2.86	-2.87	-3.68	0.01	0.82	0.81
t-stat				(0.00)	(0.50)	(0.50)
Median <i>RF36</i> (%)	-1.84	-1.25	-2.29	-0.60	0.44	1.04
Wilcoxon rank test				(-0.23)	(0.63)	(0.45)

“Affiliated” analysts (Affil.) are analysts working for a bank affiliated to the underwriting syndicate. “Non-Affiliated” analysts (Non-Affil.) are the analysts working for institutions external to the underwriting syndicate in the case where “Affiliated” analysts are following the issuer. On the other hand, “Independent” analysts (Indep.) are non-affiliated analysts in the case where no affiliated analysts follow the issuer.

Raw earning forecasts are standardised by the corresponding stock price. 3-year forecasts, *F3*, estimate the earnings at the end of the third fiscal year after the issue. For each group of analysts, the standardised individual forecasts are averaged to form a group-specific consensus. At the issue month, group consensus forecasts are averaged across all issuers to form the mean and median forecasts. If no data is available at the issue month, the group consensus forecasts closest to this date and within the same fiscal year is retained. Earnings forecast revisions, *RF36*, are computed as in Equation 4.9 with group consensus forecasts and then averaged within the analysts groups.

These results give credit to the general over-optimism argument to explain the long-term abnormal performance of the “Financing New Investment” issuers. Potential agency conflicts between financial analysts and underwriters do not bias the earnings forecasts of affiliated analysts. One could object that analysts’ over-optimism could be apparent only in long-term growth forecasts and not in shorter-horizons earnings forecasts. However, the aim of this test is not to verify the existence of biased affiliated analysts forecasts in all its aspect. It only checks that earnings forecasts used to compute the *RIF36* earnings forecasts revision variable is not systematically and noticeably affected by affiliated analysts. The answer to that last remark is clearly no.

#### 4.3.7 Concluding remarks

SEOs are initiated by the will of managers and thus, their decisions and their implementations may be subject to timing, information asymmetry and agency conflicts. Two sets of competing theories try to explain the potential long-term impact of SEO on the firm

value. On one hand, behaviourist theories link the anomaly in stock returns to biases in the investors' rationality; see DHS (1998), BSV (1998) and HS (1999). On the other hand, incomplete information structure models attribute the anomaly to the uncertainty about the structure of the economy; see Avramov (2002), Constantinides (2002) and Brav and Heaton (2002). The first step of the empirical study shows that, on a new sample of equity issuers, the presence of long-term abnormal performance is detected and it is robust to various up-to-date benchmarks. Furthermore, the long-term post-offering underperformance is restricted to a sub-sample of issuers characterised by their use of the SEO proceeds. Firms that raise equity in order to finance new investment projects are the only ones to be penalised on the long-run. Issuers that realise seasoned equity offerings to improve their capital structure preserve their financial flexibility and they do not exhibit any anomaly during a 36-month period after the issue. The difference in abnormal performance between both issuer's types is statistically significant.

When the horizon analysis is extended to 48 months, starting one year before the issue, evidence is found that the event occurs after a period of positive abnormal return. No difference in pre-SEO performance exists relative to the use of the proceeds. However, issuers financing a new investment project are the only ones to be over-valued at the time of the issue as their 48-month abnormal performance turns to be significantly negative. Managers seem able to time their equity issue decisions but the timing differ according to the use of the proceeds. "Financing New Investment" offerings are realised with the window of opportunity as argued by Loughran and Ritter (1995). The timing of "Capital Structure" operations is more likely to depend on the managers' ability not to sell undervalued securities. They would be inclined to conduct the issues after the stock price has recovered from a period of undervaluation.

In order to explain the long-term abnormal performance, three hypotheses are tested : a) "timing", b) "investors' irrationality", and c) "inefficient use of the proceeds". The last hypothesis is given more evidence by the cross-sectional analysis. The long-term underperformance of "Financing New Investment" issuers is explained by the revisions in analysts' earnings forecasts. It denotes that managers, investors and financial analysts are over-optimistic about the investment outcome at the time when the investment/financing decision is taken. As financial analysts acquire supplementary information, they revise downwardly their earnings forecasts. Investors incorporate the analysts' earnings forecasts revisions into their stock price anticipations, which explains the long-term stock

underperformance. “Capital Structure” issues are not concerned with this over-optimism since they do not involve a specific investment project. “Timing” is found marginal support as the magnitude of the momentum effect significantly influence “Financing New Investment” issuers’ underperformance. The positive correlation between the initial monthly abnormal return and the long-term abnormal performance is consistent with the underreaction hypothesis but no evidence of overreaction is detected. Moreover, the fact that regression coefficients specific to “Capital Structure” issuers are significantly different from those of “Financing New Investment” issuers lead to reject behavioural theories as one explanation to the long-term abnormal performance of the French equity issuers. Investors show evidence of rationality through their stock price adjustment to the revisions in earnings forecasts. The fact that they are not able to fully integrate the implications of “Financing New Investment” equity offerings at the financing announcement should rather be attributed to their incomplete knowledge of the structure of the economy. In other words, the results are consistent with model uncertainty problems and not with investors cognitive biases.

## Conclusion

The concluding remarks entail a summary of my empirical findings, the broad contributions to the existing literature and discuss their implications on the theory. They also address to some directions to extend the research.

The first observation about the French equity issuing process is that it is more constraining than in the Anglo-Saxon countries. The obtaining of the legal authorisation to issue is more formal and the legal disclosure requirements are not less rigorous. When the repartition across financing sources of French firms are compared to that of other developed countries (US, UK, Japan and Germany), the differences are less noticeable than suggested by the literature about the influence of the legal system origin. For instance, over a 12-year period, the average proportion of equity financing for French listed firms is equal to 6.6 % while it is of 8.3 % for the US, the US firms being reputed to rely the most extensively to outside equity financing. The fraction of public financing equals 27.4 % in France and 27.7 % in the US, which outlines that the breadth of external public financing is very similar between both countries. In that sense, the access to equity financing for French firms does not appear to be more restricted than for US corporations.

An analysis of the equity issue frequency on the French market shows that offerings are concentrated in the first six months of the year. This finding appeal two comments. First, most of the equity offerings occur after the Extraordinary Meetings that are called mainly between April and May. Second, most of the equity issues are realised soon after the release of the audited annual financial statements. Thus, some managers take advantage of a potentially lower degree of information asymmetry. No alternative variables can explain these hot issue periods. Past market performance and expected economic conditions do not have any influence. Financial analysts' over-optimism does not have more explanatory power. Favourable current economic conditions induce managers to issue equity but only if the offering motive is a pure capital structure concern.

The examination of French issuers' characteristics leads to interesting results. When separated according to the intended use of the offering proceeds, French issuers present significant differences in terms of financial structure and systematic risk, while they are similar relative to other general characteristics such as size, book-to-market ratio, offering size and issuing price. Equity issues to finance a specific investment projects are realised by firms that are less levered and that have more cash and cash flow than issuers motivated by

pure capital structure reasons. This finding is opposed to the pecking order and it indicates that these firms deliberately select equity as their financing source. In addition, the joint announcement of the equity issue and the specific investment project generates an increase in the issuer's business risk. This increase let the equity beta inflates as well, although the reduction in the leverage ratio implied by the equity offering should lower the systematic risk, other things equal. Firms tend to finance high-risk project with equity even if alternative financing sources are available.

The announcement valuation effect is negative, -1.26 % on a 3-day interval starting at the announcement day. When computed separately according to the use of the proceeds, announcements of pure capital structure concern offerings do not generate any abnormal reaction while the joint announcement of the offering and the investment project induces a significant stock price decline, 3-day *CAR* of -2.16 %. The announcement valuation effect between both issuers' types is significantly different. These results are consistent with the US evidence, for "Financing New Investment" issuers and with the overall European evidence, for "Capital Structure" issuers. Moreover, the average reaction of the total sample is similar to the previous evidence on the French market.

The stock price reaction to the announcement of "Financing New Investment" offerings is explained by information asymmetry, timing and to a lower extend by agency considerations. The greater is the level of information asymmetry, the more negative is the valuation effect. This finding indicates that private information is conveyed by the announcement. The impact of this private information is consistent with theoretical predictions. Since information asymmetry has no influence on the stock price reaction to "Capital Structure" offering announcements, it is more likely to concern the new investment project. Investors consider that, on average, the stock price is overvalued once information about the new investment project is revealed. The negative impact due to the new project is mitigated by the quantity and quality of the issuer's growth opportunity measured by the book-to-market ratio. The investment outcome is positively perceived the greater the growth potential of the issuer. According to timing considerations, the current economic conditions have the greater explanatory power on the valuation effect. The better the current economic conditions are, the less negative is the market reaction. The influence of the current conditions is common to both issuers' types. At a lower level of significance, past market performance is positively related to the valuation effect but its impact is restricted to "Financing New Investment" issuers. Expected economic conditions do not have any explanatory power, to any sample.

It is interesting to notice that the use of the proceeds no longer differentiates issuers according to the stock price reaction once other explanatory variables are taken into account. In that sense, it can be considered as a composite indicator that aggregates the influences of information asymmetry, agency and timing. Its advantages lie in the facts that it is easily observable and that it is efficient in discriminating issuers relative to the impact on the firm value.

The information conveyed by the joint announcement of the equity issue and the investment project is related to future earnings. The revision in earnings forecasts around the announcement is positively correlated with the stock price reaction of the “Financing New Investment” sample. Furthermore, it substitutes for the other information asymmetry variables. It also captures the influence of timing. Actually, the magnitude of the earnings forecast revisions depends on the degree of information asymmetry and on both past market performance and current economic conditions.

One timing and information asymmetry joint hypothesis is that equity issues are realised to compensate for a downturn in future earnings. This hypothesis is rejected since no relation is observed between revisions in earnings forecasts and the stock price reaction of the “Capital Structure” sample. Lower earnings are expected only in the case of “Financing New Investment” offerings. This finding adds evidence to the negative contribution of the investment project to the firm value.

The last contribution about the stock price reaction to equity issue announcements addresses to the conditional event study. Equity issues are voluntary corporate events decided by managers. On one hand, investors infer from the offering announcement that the net present value of private information is favourable to managers. On the other hand, they can use public information to anticipate the event. Both phenomena introduce a selection bias in the standard cross-sectional analysis of the announcement valuation effect. A conditional methodology takes into account investors’ anticipation of the event and truncates the distribution of the unanticipated valuation effect so that the selection bias is corrected. The estimation procedure used in the research is a 2-stage procedure. First, the probability to issue equity is estimated from a combined sample of issuers and “Non-Event” firms. A “Non-Event” firm enters the sample if it has received the authorisation to issue equity but did not use it during a 2-year period. In addition, it must belong to the same industry as the issuer it controls. The probability to issue equity is increased the larger the firm is, the higher above the debt ratio, the better the past stock price runup, the lower the book-to-market ratio, the

better the current and the expected economic conditions. This probability also depends on the external financing deficit and on the equity financing deficit. Specific risk and past market performance have no influence on the probability of issuance. In the second stage, a private information variable is computed with the estimated probability and it is introduced in the cross-sectional regression of the stock price reaction. The private information variable is found to be significantly related to the announcement valuation effect. It shows that the greater private information is, the lower the stock price reaction. More importantly, it indicates that relevant information is released at the time of the announcement. In other words, all the information about the event is not anticipated by investors before its announcement. Not surprisingly, the significance of the private information variable is restricted to the “Financing New Investment” sample. The contrary would be puzzling since only these offering announcements are expected to convey private information to the market. With the introduction of the private information variable, the significance of information asymmetry variables is strengthened. The explanatory power of timing is also confirmed.

From the short-term results and from the issuers’ characteristics, the investment project can be viewed as a start-up the firm takes a stake in. It has a high expected profit and a low probability of success. This would be the reason why managers choose to finance it with equity. Furthermore, this kind of project is difficult to value because the parameters that define the expected payoff process are not known to investors. Under these circumstances, the investors’ adjustment of the stock price at the announcement could not be entirely correct. The equity financing decision, associated with the investment project could have long-term implications on the stock price. Therefore, the use of the proceeds approach to analyse the influence of financing decisions on the firm value is transposed into a long-term framework. “Financing New Investment” issuers are found to underperform their benchmark up to three years after the equity issue. No abnormal performance is detected for “Capital Structure” issuers. Moreover, the difference between both issuers’ types is significant. These findings are robust as they are not modified by the use of alternative benchmarks.

The final contribution of the long-term event study concerns the explanation of the different long-term pattern in post-issue abnormal returns between issuers’ types. Three hypotheses are tested: “timing”, “investors’ irrationality” and “inefficient use of the proceeds”. The 36-month *CAR* are regressed on proxies for each explanation. Timing is given some slight evidence but the main explanatory power is attributed to the inefficient use of the proceeds. This argument is restricted to “Financing New Investment” offerings because involving an

investment project is a necessary condition for it to hold. It supposes that parameters of the model to value the investment project are uncertain. Investors interpret correctly the financing/investment announcement but they cannot entirely adjust their expectations about the stock price. Revisions in the earnings forecasts over the analysis horizon (three years) is used to measure the learning effect that develops with time, as further information about the investment outcome becomes available. The cross-section analysis of the long-term *CAR* shows that the earnings forecast revision variable explains the “Financing New Investment” issuers’ underperformance. The explanatory power of competing theories is rejected because of the use of the proceeds typology. The selected proxy for timing should be significant for “Financing New Investment” issuers and its influence should be different for “Capital Structure” issuers. However, the hypothesis that it affects both issuers’ types the same way cannot be rejected. Investors’ irrationality should explain both issuers’ types but this hypothesis is rejected. The hypothesis that the inefficient use of the proceeds influences only “Financing New Investment” issuer is not rejected, which is consistent with the prediction. These findings support market efficiency and explain the long-term underperformance of “Financing New Investment” issuers. They also give credit to the use of the proceeds as a discriminating variable that contribute to understand the relation between capital structure choices and the firm value.

Overall, my empirical results have two theoretical implications. First, the “use of the proceeds” argument authorises the co-existence of two competing theoretical branches. Equity offerings realised for pure capital structure motives have no impact on the firm value. This finding is consistent with capital structure irrelevancy. Any change in the capital structure that does not modify the assets structure cannot increase the firm value. Operations that enters that category accounts for almost half of the total sample, which is not negligible. This proportion is consistent with the practitioners’ concern about preserving the financial flexibility. Equity issues made to finance a specific investment project depart from the capital structure irrelevancy context. They address to marginal financing decisions models that all predict a negative stock price reaction to such financing solution announcements. The valuation effect observed on the French market is consistent with this prediction. Indeed, information asymmetry, timing and agency theories are given evidence.

The second implication deals with the long-term framework. Behaviourist models and those based on model uncertainty are developed to explain similar anomalies. Therefore, it is difficult to test one model type against the other. The “use of the proceeds” argument creates

different predictions for both theories. It allows a direct test that would not be possible if offerings are not differentiated. Furthermore, the differentiation benefits from the theoretical justification given in the short-term framework and described previously. It is an advantage in a long-term context that crucially lacks in solid theoretical background.

The “use of the proceeds” argument is based on a simple indication about the broad managers’ intention to use the offering proceeds. The “Capital Structure” category includes many different single purposes (debt repayment, cash increase, capital structure strengthening, etc.). The absence of significant valuation effect could come from that heterogeneity. A more detailed typology would require larger samples and accurate information about the intended use of the proceeds. The French market satisfies the second requirement but for the first one, more time is needed to let the number of equity issues increase.

The “Financing New Investment” category only involves two purposes : acquisitions and internal growth opportunities. However, since the characteristics of the investment projects are important features, comments in the issuing prospectuses are not detailed enough to allow a precise evaluation of the projects. For acquisitions, additional information could be available if the firm is listed but for other targets or internal projects, the task remain impossible. Yet, improved measures of the investment project outcome could constitute a way to precise the learning effect and the net contribution of the investment project to the firm value. An indication whether the new project is related to an existing business line or whether it requires new competences within the firm could bring useful insight about the probability of success and in turn, about the long-term impact on the firm value.

The “use of the proceeds” argument could be tested on a sample of US equity issuers. Direct cash offerings would replace offerings with rights. In France, equity is selected to finance high risk. Would it also be the case in the US ? The stock price decline is stronger in the US than in France. Is the proportion of “Capital Structure” offerings smaller or do these operations also generate a negative market reaction ?

The estimation of the probability of the event occurrence could be further developed to increase the accuracy of the measure of private information in the conditional methodology. This remark addresses to the formation of the “Non-Event” sample. External financing deficit could be used to better match non-issuers with issuers. More sophisticated model could be used to estimate the probability to issue equity such as nested Probit that takes into account

the reliance to debt financing instead of equity. Still related to the conditional methodology, results of the 2-stage estimation procedure could be compared to those obtained with the 1-stage Maximum Likelihood and GMM estimators.

Although the literature about capital structure and firm value is dense, the research can be extended in many ways. For instance, marginal financing decisions are often analysed in the debt vs. equity context. According to the theory of costless signalling, more sophisticated financing solutions should be undertaken to render capital structure choices as neutral as possible to the firm value. Corporations have, at their disposal, a set of various securities. Do they manage their issues of stocks, convertibles, warrants and units according to specific factors. Are these factors related to existing theories? For debt, the choice also exists. Why do managers select private rather than public debt in some countries and the contrary in others? Does the maturity of debt depend on investment project characteristics as it is predicted by given theories? To answer all these questions, the level of analysis should be increased so that the focus would no longer be put on a specific financing decision.

The variety of financing solutions also leads to wonder about the existence of one unique optimal capital structure. When only debt and equity are considered, the problem of the optimal allocation is addressed in relatively simple terms. However, with the inclusion of several different forms of financing, that have all their specificities in terms of signalling and corporate governance, the number of potentially efficient combinations inflates. Under these circumstances, it is legitimated to examine whether different choices could satisfy similar needs. If it is the case, it is reasonable to think that corporations would be able to determine one optimal financing solution among others. However, from the standpoint of investors, recognising the financing solution proposed by the firm as being optimal would become far from trivial. Indeed, if optimal solutions are not unique for one given firm, they cannot be expected to be similar across corporations. The central point of the research would be to relate publicly observable firm characteristics to the financing and investment needs. In other words, the elaboration of a precise typology of firms would be a preliminary research necessary to analyse the interactions between capital structure determinants and firm value through a multiple financing solutions perspective.

A second direction to extend the research, but also based on the idea of global financing, would be to examine the determinants of capital structure choices in a multinational context. Firms that are extensively active in several institutional settings have the possibility to raise funds in many forms and on many markets. Do they face similar market imperfections or are

they subject to different factors when they plan their financing policy? The analysis of corporations in that situation would be an interesting challenge for the universality of capital structure determinants. It would also constitute a direct test for the influence of the institutional setting. Do multinational companies adapt their financing solutions to local specificities or do they raise funds trans-nationally through global offerings of debt, of equity or of any more sophisticated securities. The point that immediately follows would be to examine the way their financing decisions are perceived by investors, globally or on different locations. These studies would require accurate models to measure the abnormal stock response to financing decisions in a global context. Some work has already been dedicated to the valuation effect of equity issues made by foreign companies on the US market. However, the goal of global financing analysis would be to focus on corporations financing strategies and not on markets. The question must be : what are the capital structure determinants of firms active on several markets ? It should not be reduced to : what is the local stock price reaction to foreign firms announcing a financial decision ?

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