

CEO EMOTIONAL BIAS AND CAPITAL STRUCTURE CHOICE. BAYESIAN NETWORK METHOD

Mohamed Ali AZOUZI

*Higher Institute of Business Administration (ISAAS), University of Sfax, Sfax, Tunisia
Mohamed_azouzi@yahoo.fr*

Anis JARBOUI

*Higher Institute of Business Administration (ISAAS), University of Sfax, Sfax, Tunisia
anisjarboui@yahoo.fr*

Abstract

This research examines the determinants of firms' capital structure introducing a behavioral perspective that has received little attention in corporate finance literature. The following central hypothesis emerges from a set of recently developed theories: firms managed by loss aversion, optimistic and/or overconfident people will choose more levered financing structures than others, *ceteris paribus*. The article explains that the main cause of capital structure choice is CEO emotional bias (optimism, loss aversion and overconfidence). I will use Bayesian network method to examine this relation. Emotional bias has been measured by means of a questionnaire comprising several items. As for the selected sample, it has been composed of some 100 Tunisian executives. Our results have revealed that the behavioral analysis of financing options implies the presence of pecking order choice (Pecking Order Theory, POT). CEO (optimistic, loss aversion, and overconfidence) prefer to finance their projects primarily through internal capital, by debt in the second hand and finally by equity.

Keywords: Emotional bias; Corporate finance; Optimism; Overconfidence; Loss aversion; Capital structure Choice; Bayesian network.

1. INTRODUCTION

Studies focusing the determinants of firms' financing decisions address the problem from a wide range of perspectives. In many cases, the distinct theoretical approaches are complementary. For instance, the tax benefits of debt and the potential effects of greater financial leverage in mitigating conflicts of interest among outside shareholders and managers in a given firm could be simultaneously weighted in a decision concerning its ideal capital structure. Nonetheless, some of the determinants suggested in this literature are likely to be more relevant than others for explaining observed financing patterns. This empirical question has motivated an increasing number of studies about the actual drivers of firms' capital structure.

Static Trade-off Theory (STT) and Pecking Order Theory (POT) is the body of theory of reference that addressed the issue of the financial structure of the firm. The first (STT) is based on a trade-off between costs (bankruptcy costs explicit or implicit, agency costs of debt related to conflicts of interest between bondholders and shareholders...) and earnings (shields deriving from the deductibility of interest payments) associated with the debt to obtain an optimal financial structure to maximize the value of the firm (Ross,1977 ; Jalilvand and Harris, 1984 ; Myers, 1984; Titman and Wessels, 1998; Stulz ,1990 ; Graham ,2000 ; Booth and al., 2001;...). As against the second ignores the concept of optimal financial structure and argues that the choice of financing is through a hierarchical order. This approach sustains that companies will tend to follow a hierarchy of preference for alternative financing sources motivated by the informational asymmetries between their managers and outside investors. Specifically, because firms will tend to seek financing sources that are less subject to the costs of informational asymmetries, they will prefer to fund their business with internally generated resources. They will only turn to external sources when necessary, preferably contracting bank loans or issuing debt securities (Myers, 1984; Myers and Majluf, 1984; Graham and Hervey, 2001; Fama and French, 2002; Frank and Goyal, 2007; Bushman and al, 2004; Antoniou and al, 2007; Huang and Ritter, 2009;..).

All of the above mentioned approaches hold in common one important point, namely, the implicit assumption that financial market participants as well as company managers always act rationally. However, an extensive and growing literature on human psychology and behavior shows that most people, including investors and managers, are subject to important limits in their cognitive processes and tend to develop behavioral biases that can significantly influence their decisions. Indeed, individual reasons are cognitive shortcuts that influence the position, making irrational and non-optimal in terms of traditional financial theories. These biases have been identified and classified and grouped as follows: The means of representation, reasoning analog bias of conservatism and confirmation, but also emotions such as loss aversion, optimism and the overconfidence.

This study examines the possible influence of three closely related emotional biases that are extensively documented in behavioral research, loss aversion, optimism and overconfidence, on a firm's capital structure decisions. Recent theoretical Behavioral Corporate Finance literature suggests that these biases can substantially influence the investment and financing decisions made by business managers. In fact, one strong prediction emerges from this body of theories: optimistic and/or overconfident (or, for short, "biased") managers will choose higher leverage ratios for their firms than they would if they were "rational" (or not biased). Therefore, these biases could rank among the determinants of capital structure. This study offers one of the first empirical tests of this hypothesis and, at the same time,

presents new evidence about the factors that better explain observed leverage levels, using a sample of Tunisian companies.

The article is structured as follows: Section 2 presents the related literature and the theories which motivate the empirical work and Section 3 discusses the empirical strategies that were adopted. Section 4 discusses the main results and Section 5 presents the concluding remarks.

2. HYPOTHESIS DEVELOPMENT

In this paper, we examine an alternative explanation based on differences in managerial beliefs to shed light on some of the unexplained variation in capital structure decision. We examine the role of CEO behavioral characteristics in the design of capital structure choice. The behavioral finance literature that examines the consequences of behavioral biases of managers has primarily focused on managerial loss aversion, optimism and overconfidence; traits that have been shown to be prevalent in managers (see Malmendier and Tate (2005, 2008) and Ben-David and al, 2007). Heaton's (2002) theory suggests that managers overestimate future performance of their firms that can account for pecking order theory for capital structure and high relation between investment and cash flow. Landier and Thesmar (2009) explored the impacts of optimistic entrepreneur on financial contracting and corporate performance and found that optimistic entrepreneur tend to make decisions under-reacting the negative information. Malmendier and Tate (2008) suggested that overconfident CEOs tend to engage in acquisitions that destroy firm value. Malmendier and al. (2007) indicated that overconfident managers view their firms value be undervalued and do not prefer raising funds through external sources, which echoes pecking order of financing and debt conservatism.

We investigate the influence of managerial bias (loss aversion, optimism and overconfidence) about corporate financial structure choice.

2.1. Optimism and capital structure choice

Heaton (2002) focuses on optimism in a corporate setting. In particular, he discusses lucidly why the arbitrage and the learning objection are weaker in corporate settings. Biased managers in his two-date model perceive risky corporate securities to be undervalued by the market, may reject positive net present value project if (seemingly costly) external funds are needed to finance them, and may invest in negative net present value projects because of biased cash flow forecasts. Optimistic managers believe that the projects available to their firms are better (in terms of expected return) than they actually are. Therefore, they think that the securities issued by the firm, whether bonds or stocks, are systematically

undervalued by outside investors (the model assumes efficient capital markets). By nature, stocks are the securities most subject to the perceived undervaluation. Consequently, the firm will prefer to fund its investment projects with internally generated resources and, secondly, by issuing debt securities, choosing to issue new stocks only as a last resort.

Lin and al (2007), confirm the results obtained by Heaton (2002). With the help of an empirical study, these authors found that Pecking Order Theory (POT) prediction can be explained by optimistic manager. Thus, a leader optimistic that this company is considered undervalued by the market to avoid the most financed by the debt and/or program of action unless it is forced. It promotes self first and last debt and equity issuance.

Malmendier and al (2005), find that the optimistic manager will use a priority on self-financing, then debt and ultimately to the issue of shares. They show the positive relationship between the means of internal financing and managerial optimism.

Gervais and Odean (2001), Bais and al (2005), Chuang and al (2009), show the existence of a positive relationship between overconfidence (and / or optimism) and uncertainty. This uncertainty regarding the adequacy of available information affects decision making. Anderson (1983), emphasizes that uncertainty implies risk aversion (risk of loss of pay or job stability and a brand on the market leaders) pulsing the individual " leader "to take a conservative stance and therefore refuses any decision that could change their current status including the entry of new shareholders. This reflects the negative relationship between managerial optimism and external equity financing.

Dufour and Molay (2010), postulate that the level of corporate debt reduces the risk of hostile takeover. A leader optimistic with the growth opportunities of his business has an interest to limit the risk of hostile takeover. It seeks a debt threshold limiting the risk of failure, the risk of hostile takeover and indicating the health of the business.

It can be seen from these studies that the introduction of the behavioral dimension in the analysis of funding decision confirms the pecking order theory (POT). Or there is a need to propose the following hypothesis:

H1: *Optimistic leader accepts level of cash flow greater than debt (and/or capital increase).*

2.2. Loss aversion and capital structure choice

A nascent literature recognizes that the bias of loss aversion is a significant determinant of manager financing decisions. Psychological studies document that loss aversion causes people to overestimate risk, be more uncertain about forecasts and opt for making it safer to limit the likelihood of his removal.

Helliar and al. (2005), argue that loss aversion leaders seek to avoid the worst-case scenarios. They not only use the tools of risk management to reduce the variance of cash flows but rather to avoid the worst scenarios that influence the risk of bankruptcy or preventing the company to take advantage of profitable investment. They refuse to debt financing (avoided the risk of bankruptcy) and prefer self-financing.

Kisgen (2006), shows that the level of debt affects the credit rating in a negative way. Thus, a downpour in the loss leader that seeks the minimization of the probability of loss for him and are firm to promote his business interests in the financial market. It avoids as soon as possible its use of debt financing to improve the rating and the performance of its business.

Chang and al (2009), assume that the volatility of the securities is an important determinant of ownership structure. Thus, officer loss aversion and aware of the variation in stock returns of the business (or their value on the market) reduces its financing by issuing shares to avoid a loss under evaluation. He opts for the issuance of shares if the market overestimates the business.

Bertrand and Mullainathan (2003), argue that leaders can be encouraged not to invest so as not to be challenged in their "quiet life". This kind of conservatism is a way to counteract the risk of loss of control (Barberis and Thaler, 2002). Thus, the loss aversion of the manager due to a hostile takeover bid (hostile takeover) forces him to not invest in projects with positive returns if financed by issuing shares.

Albouy and Schatt (2010), assume that the dividend distribution is to reduce the equity of the company and, therefore, reduce shareholder value. So an officer-shareholder whose compensation is linked to the change in value of the shares of his company. Aversion loss of a capital gain related to changes in impulse during such officer to avoid payment of dividends negatively correlated with self-interest.

Nosic and Weber (2008), analyze the risk-taking determinants and note that perceptions of risk and expected returns, affect the behavior of risk-taking. They show that uncertainty regarding the expected returns of the company affects the individual risk-taking. Indeed an uncertain leader of productive capacity of his company engages in conduct designed to respect the interests of the firm. It seeks to make themselves heard and be respected by the main shareholders. CEO loss averse that seeks the

maximization of shareholder wealth has an interest to fund growth opportunities through internal funding.

It can be seen from these studies that the introduction of the behavioral dimension in the analysis of funding decision confirms the pecking order theory (POT). Or there is a need to propose the following hypothesis:

H2: loss aversion leader accepts level of cash flow greater than debt (and/or capital increase).

2.3. Overconfidence and capital structure choice

The psychology literature suggests that executives are particularly prone to exhibit overconfidence. Schoar (2007) shows that CEOs who start their career in a recession make more conservative capital-structure choices, e.g., choose lower leverage and internal over external growth.

Gervais and al (2003) provide various reasons for why especially managers are likely to be optimistic and overconfident and study these traits within the capital budgeting process of an all-equity financed firm.

Malmendier and Tate (2008) suggested that overconfident CEOs tend to engage in acquisitions that destroy firm value. Malmendier and al. (2007) indicated that overconfident managers view their firms value be undervalued and do not prefer raising funds through external sources, which echoes pecking order of financing and debt conservatism.

Schrand and Zechman (2010) emphasize that overconfidence is positively associated with the overestimation of the probability of success and the presence of biased financial decisions. The leader overconfidence that overestimates his personal skills tends to choose financial decisions inconsistent with the firm characteristics. It underestimates the risk of bankruptcy of his company and believes the control. These beliefs led him to increase the debt level of the business.

David and al (2006), show that confident managers underestimate the probability of financial distress, and therefore take on higher levels of debt than optimal. This may lead to higher probability of bankruptcy and higher costs of capital. Therefore, in support of this confidence bias we expect a positive relation between manager confidence and leverage. Or in the presence of low funding capacity CEO overconfident prefer debt that equity financing decision.

Ho and Chang (2009) postulate the presence of a positive relationship between the company financial distress and CEO overconfidence level. Thus, overconfidence leads the manager to underestimate the company bankruptcy probability and, therefore, a higher debt.

It can be seen from these studies that the introduction of the behavioral dimension in the analysis of funding decision confirms the pecking order theory (POT). Or there is a need to propose the following hypothesis:

H3: *overconfident leader accepts level of cash flow greater than debt (and/or capital increase).*

3. RESEARCH METHOD

3.1. Data

Our empirical study is based on quantitative research. We use a questionnaire as a method of data collection. Our questionnaire consists of four main parts, based on treated areas in theory:

- The first part aims to identify the company (size, industry, ownership structure, debt levels, level of dividend distribution, ...).
- The second part focuses on presenting the level of loss aversion leaders.
- Party three deals with the level of optimism of the leader.
- Finally, party four seeks to show the level of overconfidence of managers.

The questionnaire is addressed to CEO of Tunisian companies. The selected sample consists of 100 managers of industrial and commercial companies listed on the Tunisian stock exchange in 2010 (28 companies) and other non-listed companies (82 companies).

Our choice of listed companies is justified by the fact that they are supposed to be the most efficient and meet several conditions necessary for the reliability of our study were limited companies which are usually diffuse shareholders, increasing the importance of role of the board and ownership structure and consequently increase the validity of the assumptions.

TABLE 1 – VISITED COMPANIES

VISITED COMPANIES	
Initial BVMT sample for 2007	50
Financial firms	(22)
Other non financial firms	120
Insufficient data to emotional intelligence	(40)
Insufficient data to board of directors compositions	(8)
Final sample	100

We decided to exclude financial firms: banks, insurance companies and investment companies for development and portfolio management ... in fact these companies have different characteristics of non-financial businesses and to avoid correlation effects specific to a specific sector.

To get a representative sample of our Tunisian market we have added other unlisted companies.

3.2. Variables' measurement

The objective of this section is to determine the variables' measurement.

3.2.1. Capital structure choice

The purpose of this article is to show the impact of emotions on the capital structure choice (internally generated resources, debt level, and choosing to issue new stocks). The appropriate measures in the literature to evaluate three methods of financing are:

3.2.1.1. Internally generated resources (The Cash Flow)

Research within the framework of financial theory of investment, have resorted to many measures of internal resources. Cash flow represents the flow generated by the activity of any business, is one of the most appropriate (Lehen and Poulsen, 1989; Molay, 2006; Naoui et al, 2008; ...).

$$CF = \text{Net income} + \text{Depreciation} - \text{Dividend}$$

$$\text{Cash Flow rate (RCF)} = CF / \text{Total Assets}$$

To show that the leader chosen or not internally generated resources, we can use the change in flow rate. A negative change indicates the use of internal resources.

$$\text{Cash flow rate variation} = RCFN - RCFN-1 / RCFN-1$$

3.2.1.2. Debt level

We observe a variety of variables that measure the level of debt in the company. Measures such as total debt service ratio has been selected by several authors (Hovakimian et al, 2004). Others have used the debt ratio in the medium and long term (Myers, 2001). The debt ratio in the short term was also used by Titman (1984).

As part of our analysis we propose to use the debt ratio as a measure of this variable. It should be noted that this ratio is calculated by:

$$\text{Leverage ratios (LEV)} = (\text{total debt} / \text{total assets})$$

This measure is also used by Koh (2003), Demaria and Dufour (2007), Jarboui and Olivero (2008), Ben Kraiem (2008) and Sahut and Gharbi (2008).

To show that the manager uses debt or not, we can use the change in debt ratio. A positive change indicates the use of debt.

$$\text{Leverage ratios variation} = \text{LEV}_N - \text{LEV}_{N-1} / \text{LEV}_{N-1}$$

3.2.1.3. Equity level

This variable is measured by the value of equity in the balance sheet of the company. To show that the leader chosen or not the capital increases, we can use the variation in the percentage of investment. A positive change indicates an increase of capital.

$$\text{Level of Capital Invested (LCI)} = \text{equity} / \text{total assets}$$

$$\text{Level of Capital Invested Variation} = \text{LCI}_N - \text{LCI}_{N-1} / \text{LCI}_{N-1}$$

The financial decision takes 7 follows:

- 1 if the manager chooses the internally generated resources: positive variation in the cash flow rate.
- 2 if the manager chooses debt: positive variation in the leverage ratio.
- 3 if the manager chooses the capital increase: positive variation in the level of invested capital.
- 4 if the manager chooses internally generated resources + debt : positive variation in the cash flow rate and debt ratios.
- 5 if the manager chooses internally generated resources + capital increase: positive variation in the cash flow rate and level of capita invested.
- 6 if the manager chooses debt + capital increase: positive variation in the leverage ratio and level of invested capital.
- 7 if the manager chooses internally generated resources + debt+ capital increase: positive variation in the cash flow rate, leverage ratio and level of invested capital.

3.2.2. Emotional bias

The questionnaire focuses on evaluating and scoring of the three emotional biases (risk aversion, optimism and overconfidence). The questions have been inspired from the questionnaires formulated by the Fern Hill and Industrial Alliance companies.

The emotional bias takes 2 follows:

- 1 if the individual has a high level for each bias.
- 0 if not.

3.2.3. Control variables

Static trade-off theory (STT) and pecking order theory (POT) is the body of theory of reference that addressed the issue of the financial structure of the firm. The factors that explain the financial structure are mainly at the cost, size, level of risk, growth opportunities, the structure of assets and business (Rajin and Zingales, 1995; Booth and al, 2001; Molay and Dufour, 2010).

We include in our model three control variables that explain the effectiveness of choice of financial structure of the company. These variables are proxies for profitability, firm size and growth opportunities.

We include in our study three control variables that explain company capital structure choice. These variables are proxies for profitability, firm size and growth opportunities.

3.2.3.1. Profitability

More profitable firms have, ceteris paribus, more internally generated resources to fund new investments. If their managers follow a pecking order, they will be less likely to seek external financing (Fama and French, 2002). Thus, on average, these firms' leverage ratios will be lower. In trade-off models, on the other hand, this relationship is inverted. More profitable firms are less subject to bankruptcy risks, ceteris paribus. Hence, their expected bankruptcy costs are reduced and they can make more use of the tax shields provided by debt, thus choosing a position of greater leverage.

We will keep the ratio of return on assets ROA to measure this variable:

ROA= Earnings before interest, tax, depreciation divided by total assets, lagged one year period

3.2.3.2. Firm size

Studies suggest that the probability of bankruptcy is lower in larger firms and that, therefore, their debt capacity is higher than that of smaller ones, all else equal. On the other hand, fixed transaction costs can make new stock issues unattractive to small corporations, stimulating them to issue debt (Rajin and Zingales, 1995 ; Hovakimian and al, 2004; Dufour and Molay, 2010).

Indeed, most studies have applied total assets or turnover as a measure for firm size (Bujadi and Richardson, 1997). In this paper, it is measured through the log of the firm's total assets (LNSIZE).

3.2.3.3. Future investment opportunities

It is argued that future profitable investment opportunities can influence corporate financing decisions in different ways. In the context of the pecking order theory, firms that have many investment opportunities and believe that their stocks (and risky bonds) are undervalued by the market, may choose a capital structure with less debt. If they maintained high debt ratios, they would be forced to distribute precious cash flows generated by their business and could face the need to issue undervalued securities to fund new projects. This could, in turn, induce underinvestment. A more static version of the pecking order model, on the other hand, predicts that firms with more future opportunities will be more levered, ceteris paribus, because they need more external financing and issuing debt is preferable to issuing new stock.(Rajin and Zingales, 1995 ; Graham, 2000 ; Booth and al, 2001 ; Dufour and Molay, 2010 ; Naoui and al, 2008).

We will keep the Tobin's Q to measure this variable. The Tobin's Q Estimated with the approximation formula proposed by Chung and Pruitt (1994):

$$Q_{it} \cong \frac{MVS_{it} + D_{it}}{A_{it}}$$

MVS – market value of common and preferred shares; D – book value of debt, defined as current liabilities plus long-term debt plus inventories minus current assets; A – total assets.

For simplification purposes, the summary of each variable extent range in the model, its name as well as its expected impact on the capital structure choice are depicted in the following table (table 2).

Azouzi M. A. and Jarboui A.
CEO EMOTIONAL BIAS AND CAPITAL STRUCTURE CHOICE.
BAYESIAN NETWORK METHOD

TABLE 2 - OPERATIONAL DEFINITIONS OF VARIABLES

CLASS	PHENOMENA	MEASURE	VARIABLES	PREDICTIONS		
Endogenous variables						
Capital structure choice	Internally generated resources (The Cash Flow)	CF = Net income + Depreciation – Dividend Cash Flow rate (RCF) = CF / Total Assets) Cash flow rate variation = RCF _N - RCF _{N-1} / RCF _{N-1}		CF		
	Debt level	Leverage ratios (LEV)= (total debt / total assets) Leverage ratios variation = LEV _N - LEV _{N-1} / LEV _{N-1}		LEV		
	Equity level	Level of Capital Invested (LCI) = equity / total assets Level of Capital Invested Variation = LCI _N - LCI _{N-1} / LCI _{N-1}		EQ		
Exogenous variables						
				CF	LEV	EQ
Optimism	Directors overestimate capacity of their firms	The questionnaire obtained score	OP	+	+	-
Lost aversion	Loss rumination and reputation	The questionnaire obtained score	LA	+	-	+
overconfidence	Directors overestimate their personal competences	The questionnaire obtained score	OVER	+	+	+
Controls variables						
Profitability	Reports on the company's ability to meet its commitments	ROA= Earnings before interest, tax, depreciation divided by total assets, lagged one year period	PF	+	+	-
Firm size	Firms signaled performance	Ln (total assets)	LNSIZE	+	+	+
Future investment opportunities	Indicates the productive capacity of the company	$Q_{it} \cong \frac{MVS_{it} + D_{it}}{A_{it}}$ MVS – market value of common and preferred shares; D – book value of debt, defined as current liabilities plus long-term debt plus inventories minus current assets; A – total assets.	FIO	-	+	+

3.3. Bayesian Network Method

The definition of a Bayesian network can be found in many versions, but the basic form (Pearl, 1986) is stated as follows: a Bayesian network is a directed probability graph, connecting the relative variables with arcs, and this kind of connection expresses the conditional dependence between the variables. The formal definition follows.

A Bayesian network is defined as the set of {D, S, P}, where:

- (1) D is a set of variables (or nodes): in our case it consists of capital structure choice, optimism, loss aversion, overconfidence, profitability, firm size and future investment opportunities.
- (2) S is a set of conditional probability distributions (CPD). $S = \{p(D / \text{Parents}(D) / D \in D), \text{Parents}(D) \subset D\}$ stands for all the parent nodes for D, $p(D/\text{Parents}(D))$ is the conditional distribution of variable D.
- (3) P is a set of marginal probability distributions. $P = \{p(D) / D \in D\}$ stands for the probability distribution of variable D.

In the Bayesian network, variables are used to express the events or objects. The problem could be modeled with the behavior of these variables. In general, we first calculate (or determine from expert experience) the probability distribution of each variable and the conditional probability distribution between them. Then from these distributions we can obtain the joint distributions of these variables. Finally, some deductions can be developed for some variables of interest using some other known variables.

In our study we try to show the evolution of CEO financing choices according to the evolution of his emotions and his company characteristics. Thus, theoretically, have to show that the company capital structure choice (Internally generated resources, debt and Equity) depends on: CEO emotional biases (CEO optimism level, loss aversion and overconfidence), firm profitability, firm size and firm future investment opportunities.

3.3.1. Defining the network variables and their values

The first step in building a Bayesian network expert is to list the variables recursively, starting from the target variable to the causes. In this order we present the variables in the table below (table 3):

TABLE 3 - THE NETWORK VARIABLES AND THEIR VALUES

VARIABLES	TYPE
Capital structure choice	Discrete [1; 2; 3; 4; 5; 6; 7]
Optimism	Discrete: YES/NO
Loss aversion	Discrete: YES/NO
Overconfidence	Discrete: YES/NO
Profitability	Discrete: YES/NO
Firm size	Discrete [1; 2; 3]
Future investment opportunities	Discrete: YES/NO

3.3.2. Graphical model

The second step of Bayesian network the construction is to express the relationships between variables. The BayesiaLab learning of Bayesian network by taking the database as a discrete entry process without sampling data. The Bayesian network constructed is the result for the total database. According to the data that we have received through the questionnaire, we have established relationships following graph (Figure 1).

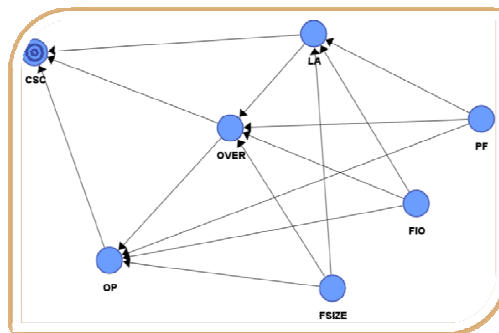


FIGURE 1 – CAPITAL STRUCTURE CHOICE: BAYESIAN NETWORK

The graphical model if it (Figure 1) explains the capital structure choice of Tunisian firms. This decision is affected by the CEO emotional bias (optimism, loss aversion, and overconfidence). These emotional biases originate the firms' financial position (size, growth opportunity and profitability).

In what follows, we describe in detail the various correlations between these variables and their effect on the target variable (capital structure choice: CSC).

4. EMPIRICAL RESULTS

4.1. The relationships discovered analysis

The relationships between the variables in the database are directed at the parent node child node. Each relationship is composed of three different measures: the Kullback-Leibler, the relative weight and the Pearson correlation (direction of relation). Indeed, the Kullback-Leibler and the relative weight are two measures indicating the strength of relationships and the level correlation between variables, in that while the correlation measure of personal meaning and relationship significance.

The relative weight scale of 0 to 1. Thus, the table (Table 4) below shows the relationships analysis results between variables across the network Pearson correlation.

Table 4 examines the relationship (independence and correlation) between networks variables.

Azouzi M. A. and Jarboui A.
CEO EMOTIONAL BIAS AND CAPITAL STRUCTURE CHOICE.
BAYESIAN NETWORK METHOD

TABLE 4 - THE RELATIONSHIPS ANALYSIS

PARENTS NODES	CHILDS NODES	KULLBACK-LEIBLER DIVERGENCE	RELATIVE WEIGHT	PEARSON CORRELATION
OP	CSC	0,629522	1,0000	-0,1060*
LA	CSC	0,320901	0,5098	-0,1237*
OVER	CSC	0,227493	0,3614	0,3136
FSIZE	LA	0,187266	0,2975	-0,3369
FSIZE	OP	0,180655	0,2870	0,1986*
FSIZE	OVER	0,110202	0,1751	0,0556**
FIO	LA	0,047198	0,0750	-0,0331**
FIO	OP	0,094701	0,1504	-0,0650*
FIO	OVER	0,138862	0,2206	0,0293**
PF	LA	0,079766	0,1267	-0,1702*
PF	OP	0,095710	0,1520	0,1768*
PF	OVER	0,132294	0,2101	0,1153*
LA	OVER	0,057432	0,0912	-0,1629*
OVER	OP	0,041499	0,0659	-0,0103***

Notes:

- a. Kullback-Leibler close to 1: important correlation between the variables
- b. Relative weight close to 1: important correlation between the variables.
- c. Pearson correlation: *, **, ***, respectively at 10%, 5%, 1%.

The results show the presence of a important and negative relationship (Kullback-Leibler = 0.62 / weight ratio = 1 / β = -0106) between the CEO optimism of and the firms' capital structure choice. These results affirm the correlation between optimism and capital structure choice (H1).

Relationships analysis present moderately and negative relationship (Kullback-Leibler = 0.32 / weight ratio = 0.5/ β = -01 237) between CEO loss aversion and the capital structure choice. This empirical finding confirms our hypothesis (H2).

CEO overconfidence is positively (β = 0.3136) and medium (Kullback-Leibler = 0.22 / weight ratio = 0.36) correlated with the firms' capital structure choice. This result confirms the presence of a correlation between capital structure choice and overconfidence (H3).

Relationship analysis test says that firm size influence the CEO emotional state. Thus, firms size negatively correlated with CEO loss aversion (β = - 0.3369), positively with the CEO optimism (β = 0.1986) and CEO overconfidence (β = 0.0556).

Future investment opportunities are positively correlated with the CEO overconfidence (β = 0.0293) and negatively with the CEO loss aversion (β = - 0.0331) and optimism (β = - 0.0650).

The profitability is negatively correlated with the CEO loss aversion ($\beta = -0.1702$), negatively correlated with his optimism ($\beta = 0.1768$) and his overconfidence ($\beta = 0.1153$).

The relations analysis shows the presence of a negative correlation between the CEO loss aversion level and his overconfidence level ($\beta = -0.1629$).

Finally, the results also show the negative correlation between CEO overconfidence and his optimism level ($\beta = -0.0103$).

4.2. Target variable analysis: capital structure choices (CSC)

To analyze the capital structure choice, we must choose the variable capital structure choice (CSC) as a target variable in the Bayesian network. Then we can use the function that generates the analysis report of the target capital structure choice. In this report, the relationship between capital structure choice and the other variables are measured by binary mutual information and the binary relative importance. The mutual information of two random variables is a score measuring the statistical dependence of these variables. It is measured in bits.

The target variables analysis shows that 22.55% Tunisian companies are opting to capital increase, 18.25% choose cash flow and debt, 17.53% use three capital structure option (cash flow + debt + equity), 12.01% operating of internal financing (cash flow), 11.15% prefer debt and capital increase, 9.56% fund investments by debt and 8.95% prefer cash flow and equity.

The results show CEO pessimism at 95.24%, CEO loss aversion at 84.86%, a level CEO overconfidence at 52.41%, 60.33% of future investment level, a great size to 48.46% and low profitability to 70.65% implies use of the capital increase to 22.55%.

CEO 100% optimistic, 57.56% no loss aversion and overconfidence 68.99% prefer cash flow and debt to finance their investment projects.

Bayesian networks analysis shows that if the CEO; 87.36% to overconfidence, 51.94% to loss aversion, 57.10% have a optimism high level, belongs to a large company with a probability of 63.70%, 61.43% to work in a high growth opportunities firms, and 56.39% to low profitability firms, it uses all financing capabilities (internal cash flow +debt + capital increase) of its business with a probability of 17.53%.

CEO optimistic to 89.68%, loss aversion to 89.68%, and 71.79% in non overconfidence prefer the internally generated resources to 12.01%. Thus, these CEO belongs from large companies to 52.67%, to low profitability firms at 54.81% and with low growth opportunities firms in 57.94% prefer internally generated resources to reduce their companies risk.

Azouzi M. A. and Jarboui A.
CEO EMOTIONAL BIAS AND CAPITAL STRUCTURE CHOICE.
BAYESIAN NETWORK METHOD

TABLE 5 - TARGET VARIABLE ANALYSIS

CSC= EQ (22,55%)				
Nodes	Binary mutual information	Binary relative importance	Modal value	
OP	0,2883	1,0000	NO	95,24%
LA	0,0520	0,1803	YES	84,68%
FSIZE	0,0377	0,1306	BIG	48,46%
PF	0,0175	0,0606	NO	70,65%
OVER	0,0038	0,0131	YES	52,41%
FIO	0,0020	0,0068	YES	60,33%
CSC=CF+LEV(18 ,25%)				
Nodes	Binary mutual information	Binary relative importance	Modal value	
OP	0,1565	1,0000	YES	100,00%
LA	0,0246	0,1572	NO	57,56%
FSIZE	0,0173	0,1104	BIG	70,61%
PF	0,0086	0,0549	YES	54,94%
OVER	0,0068	0,0434	YES	68,99%
FIO	0,0004	0,0023	YES	53,19%
CSC = CF+LEV+EQ (17,53%)				
Nodes	Binary mutual information	Binary relative importance	Modal value	
OVER	0,0578	1,0000	YES	87,36%
LA	0,0060	0,1046	YES	51,94%
FSIZE	0,0025	0,0427	BIG	63,70%
FIO	0,0022	0,0374	YES	61,43%
OP	0,0004	0,0061	YES	57,10%
PF	0,0000	0,0000	NO	56,39%
CSC = CF (12,01%)				
Nodes	Binary mutual information	Binary relative importance	Modal value	
OP	0,0438	1,0000	YES	89,68%
LA	0,0386	0,8800	YES	89,68%
OVER	0,0384	0,8762	NO	71,79%
FSIZE	0,0088	0,2013	BIG	52,67%
FIO	0,0072	0,1647	NO	57,94%
PF	0,0001	0,0028	NO	54,81%
CSC = LEV+EQ (11,15%)				
Nodes	Binary mutual information	Binary relative importance	Modal value	
LA	0,0008	1,0000	YES	57,12%
OP	0,0006	0,7818	YES	55,39%
OVER	0,0003	0,4191	YES	56,04%
FSIZE	0,0002	0,2103	BIG	62,66%
FIO	0,0002	0,2032	YES	57,65%
PF	0,0000	0,0207	NO	57,23%
CSC = LEV (9,56%)				
Nodes	Binary mutual information	Binary relative importance	Modal value	
OP	0,0766	1,0000	YES	100,00%
LA	0,0613	0,8008	NO	81,95%
FSIZE	0,0155	0,2021	BIG	77,67%
OVER	0,0075	0,0985	NO	56,59%
PF	0,0051	0,0662	YES	56,28%
FIO	0,0000	0,0005	YES	54,44%
CSC = CF+EQ (8,95%)				
Nodes	Binary mutual information	Binary relative importance	Modal value	
OP	0,0103	1,0000	NO	59,45%
LA	0,0074	0,7170	YES	76,88%
FSIZE	0,0025	0,2415	BIG	54,63%
PF	0,0004	0,0359	NO	60,13%
OVER	0,0002	0,0202	YES	61,69%
FIO	0,0001	0,0111	YES	53,56%

Notes:

- a. Mutual information: This is the amount of information given by a variable on the target value.
- b. Relative importance: The importance of this variable with respect to the target value.
- c. Modal value: The average value of the explanatory variable for each the target value.

Network analysis shows that 57.12% of CEO loss aversion, optimistic to 55.39%, 56.04% to overconfidence is positively correlated with 11.15% of the torque debt and equity. These, CEO give up the choice of internally generated resources because of their firm's low profitability (low profitability to 57.23%). They prefer then debt and then use the capital increase to finance these growth opportunities (with a significant probability of 57.65%). This implies that firm characteristics affect CEO psychological state at the time of decision making (including capital structure choice). These, characteristics are the creators of the CEO emotional biases. These, biases affect emotional preferences when CEO choosing.

The results add that the CEO of large companies (77.67%), of firms profitability high level (56.28%), and of firms growth opportunities (54.44%) are optimistic to 100%, no loss aversion to 81.95% , and not overconfidence to 56.59%. These, CEO use the debt with a probability of 9.56%.

Finally, 59.45% CEO pessimism , 76.88% CEO loss aversion and 61.69% CEO overconfidence are positively correlated with 8.95% of the torque internally generated resource and equity. These leaders (pessimistic, loss aversion, and overconfidence) working in large firms (54.63%), non-profitable (60.13%) and have a high growth opportunities (53.56%) prefer the troque internally generated resources and equity.

4.3. Average target maximizing analysis

After presenting all the explanatory variables for each category of the target variable, it is necessary to introduce the variables maximizing each modality of the target variable. Thus, the target dynamic profile capability software (Bayesialab) to query about an a posteriori maximization of the target average. This test shows the case to maximize the target variable value. Table 6 presents the dynamic profile of the capital structure choice (CSC).

Dynamic profile analysis (Table 6) of the capital structure choice presents the following findings:

The decrease in the CEO overconfidence level of 21.05%, increasing its optimism level of 35.03% and reduced the company size of 50% are positively correlated with the increase of the internally generated resource level of 12.01%. This result confirms the positive correlation between cash flow and optimism (H1), contradicts the positive correlation between overconfidence and internally generated resource (H3), shows the firm size role on access to external financing method and rejects the positive effect of

Azouzi M. A. and Jarbouai A.
CEO EMOTIONAL BIAS AND CAPITAL STRUCTURE CHOICE.
BAYESIAN NETWORK METHOD

loss aversion of self-financing (H2 is not checked). This result shows the effect of the CEO emotional biases through their capital structure choices. Thus, optimistic CEO and less overconfidence overestimates firms growth opportunities and underestimate their personal abilities (to keep its place at the head of the company). He has an interest should be choosing internally generated resources.

TABLE 6 - THE TRAGET DYNAMIC PROFILE ANALYSIS

CSC = CF			
Nodes	Optimal modality	Probability	Joint probability
A priori		12,01%	100,00%
OVER	NO	21,05%	40,97%
OP	YESI	35,03%	24,61%
FSIZE	SMALL	50,00%	0,85%
CSC = LEV			
Nodes	Optimal modality	Probability	Joint probability
A priori		9,56%	100,00%
LA	NO	20,45%	38,31%
OP	YES	32,69%	23,96%
OVER	NO	50,00%	7,37%
CSC = EQ			
Nodes	Optimal modality	Probability	Joint probability
A priori		22,55%	100,00%
FSIZE	SMALL	53,16%	10,10%
OP	NO	63,27%	8,41%
OVER	NO	71,43%	3,25%
CSC = CF+LEV			
Nodes	Optimal modality	Probability	Joint probability
A priori		18,25%	100,00%
OP	YES	30,69%	59,47%
LA	NO	43,85%	23,96%
OVER	YES	50,00%	16,59%
CSC = CF+EQ			
Nodes	Optimal modality	Probability	Joint probability
A priori		8,95%	100,00%
FSIZE	SMALL	14,10%	10,10%
PF	YES	15,45%	4,39%
FIO	NO	16,67%	1,95%
CSC = LEV+EQ			
Nodes	Optimal modality	Probability	Joint probability
A priori		11,15%	100,00%
LA	NO	12,48%	38,31%
FSIZE	SMALL	25,00%	0,81%
CSC = CF+LEV+EQ			
Nodes	Optimal modality	Probability	Joint probability
A priori		17,53%	100,00%
OVER	YES	25,94%	59,03%
FSIZE	MEDIUM	29,13%	15,36%
OP	YES	35,30%	10,16%
FIO	NO	41,18%	2,45%

Notes:

- a. Optimal modality: modality is maximizing the traget value .
- b. Probability: the prior probability of each variable.
- c. Joint probability: the probability that the target variable takes the value n given that the explanatory variable takes the value p. For example, the probability of choosing CF by an executive overconfidence is 40.97%.

The increased CEO optimism level of the head of 20.45%, the decrease in the CEO loss aversion level of 32.69% and decreased his overconfidence level of 50% are positively correlated with the increase in leverage ratios of 9.56%. This finding indicates the positive correlation between optimism and debt level (H1), a negative correlation between debt and loss aversion (H2) and contradicts the positive effect of overconfidence on debt (H3). This is explained by the fact that the CEO optimism causes them to make forecasts in absolute terms and seek to confirm them at the expense of building its businesses. It makes use of external capital structure choice including debt. However, if loss aversion bias inherent in a choice capital structure choice. It avoids the choice of methods of financing risk (including debt: the risk of bankruptcy).

Firms size increasing of 53.16%, decreased CEO overconfidence level of 63.27%, and CEO optimism at the head of 71.43% are positively correlated with the capital increase of 22.55%. This result confirms the presence of a negative correlation between optimism and capital increase (H1), contradicts the positive correlation between overconfidence and capital increase (H3), shows the firm size positive impact on the capital increase and rejects existence of a negative correlation between loss aversion and equity (H2). This is explained by the fact that a CEO optimistic (and / or overconfidence) who believes that his company is undervalued by the market avoids the issue of new shares and debt to finance its projects in order to enhance his firm.

CEO optimism level increased of 30.69% (H1, H2), the decrease in his loss aversion level of 43.85% (H5) and increasing her over-confidence of 50% (H7, H8) are positively correlated with the increase in torque internally generated resources and debt of 18.25%. This finding indicates a significant correlation between capital structure choice and CEO motional biases. Thus, CEO overly optimistic and confident chose the internally generated resources to reduce the risk patterns of external financing (risk of bankruptcy and takeover). Thus risk aversion CEO uses debt in a second order to fund growth opportunities remains of his firm. This result confirms the pecking order theory (POT) predictions. However, preference criteria between financing methods is the CEO loss aversion (not agency costs, transaction and / or the premium risk paid).

Size decrease of 14.10%, increasing the profitability of 15.45% and growth opportunities decrease of 16.67% are positively correlated with the increase in torque internally generated resources and capital increase of 8.95%.

CEO loss aversion level decreased of 12.48% (H5, H6) and decreased size of the company 25% are positively correlated with the increase in torque debt and equity of 11.15%. This is explained by the fact that loss aversion leader always seeks the minimization of the probability of losses through its strategic

choices that the financing decision. It therefore had chosen least expensive methods (agency costs, transaction costs, bankruptcy costs ...) and that signals good management. He therefore preferred the internally generated resources and limits its use of debt and capital increase

Finally, increased CEO overconfidence level in the head of 25.94%, an average size of 29.13%, increased CEO optimism level at the head of 35.30% and decrease in growth opportunities of 41.18% are positively correlated with the increase in choice of three means of capital structure choice 17.53%. This result is explained by the fact that any CEO optimistic seeks to show its good management through its financing choices. It issues shares when prices are high, and go into debt or redeem shares when prices are low to benefit from a favorable market.

5. CONCLUSION

This research examines the determinants of firms' capital structure introducing a behavioral perspective.

Theoretical analysis presented CEO emotional biases highlights role (optimism, loss aversion, overconfidence) to explaining his capital structure choice. Thus, quantitative studies devoted to corporate finance practices have therefore seen their object move. This is less interested in the trade-off between equity and debt to analyze the CEO behavior impact on the capital structure choice. Theorists integrate behavioral dimension in capital structure choice analysis. They explain capital structure choice based on CEO psychological and emotional capacities. Psychological dimension introduced in the capital structure analysis has enriched the Pecking Order Theory (POT) and the Static Tradeoff Theory (STT) (Graham and Harvey, 2001; Lin et al, 2007; Heaton, 2002). First, qualifying asymmetric information role, theorists argue that CEO (optimistic, loss aversion and confident ...) are reluctant to ask the market to avoid under evaluation risk. They prefer to fund projects primarily through internal generated resource, in the second order by debt and finally by equity. Next, authors emphasize cognitive costs role in explaining CEO capital structure choices. They argue that the optimal capital structure is one that minimizes cognitive costs.

Empirical analysis presenting a survey CEO large private companies in Tunisia. Data analyses revealed CEO emotional biases importance in explaining his capital structure choice. Indeed, empirical relationship analysis between optimism and capital structure choice shows behavioral dimension role in the explanation. CEO optimism level is positively correlated with a preference for internally generated resources and debt but negatively associated with capital increase. CEO optimistic is reluctant to ask the market to avoid the being evaluated risk. They prefer to fund projects primarily through internal capital debt and then finally external equity.

We also note that CEO loss aversion level is negatively correlated with firms' leverage ratios and capital increase. CEO recognizes firms' operational risk level and loss aversion seeks to reduce its firms' total risk by using low of external funding including debt. CEO of high operational firms risk try to control the total risk by limiting the financial risk introduced by debt and the issuance of new shares. He prefers to finance its investment projects through internal funds.

CEO overconfidence negatively affects internally generated choice, debt and equity but it is positively correlated with the choice of debt and cash flow couple, and with the cash flow and debt and equity combination choice. Overconfidence implies CEO alignment their choice with the shareholders interests. Thus, CEO overconfidence overestimates his skills to reduce risk. This led him to choose high projects risk which is in the interest of shareholders and increases firms value (Gervais et al, 2007). To finance its investment choices, this overconfidence leader considers his company undervalued by the market limits its emissions securities risky. He prefers first internally generated resource (cash flow) and uses capital structure combinations to minimize its firm's risk (including internally generated resource and debt combination).

Finally, CEO capital structure choice analysis by integrating the behavioral dimension is consistent with the Pecking Order Theory, CEO funding priority preferred is internally generated resource. CEO (optimistic, loss aversion, and overconfidence) prefer to finance their projects primarily through internal capital, by debt in the second hand and finally by equity.

REFERENCES

- Albouy, M., and Schatt, A. (2010), *La politique de dividende permet-elle de discipliner les dirigeants ?*, LEG UMR Cnrs 5118 – FARGO, Centre de recherche en Finance, Architecture et Gouvernance des Organisations, Cahier du FARGO n° 1100603.
- Anderson, J. R. (1983), Decision Making by Objection and the Cuban Missile Crisis, *Administrative Science Quarterly*, 28, 201-222.
- Antoniou, A., Guney, Y. and Paudyal, K. (2007), The Determinants of Capital Structure: Capital Market Oriented Versus Bank Oriented Institutions, *Journal of Financial and Quantitative Analysis*, 43.
- Ben Kraiem, R. (2008), The Influence of Institutional Investors on Opportunistic Earnings Management, *International Journal of Accounting Auditing and Performance Evaluation*, 5(1), 89-106.
- Ben-David, I., Graham, J. and Harvey, C. (2006), *Managerial Overconfidence and Corporate Policies*, AFA 2007, Chicago Meetings Paper, retrieved from <<http://ssrn.com/abstract=890300>>.
- Bertrand, M. and Mullainathan, S. (2003), Enjoying the Quiet Life? Corporate Governance and Managerial Preferences, *Journal of Political Economy*, 111(5), 1043-1075.

Azouzi M. A. and Jarbouai A.
CEO EMOTIONAL BIAS AND CAPITAL STRUCTURE CHOICE.
BAYESIAN NETWORK METHOD

- Biais, B., Hilton, D., Mazurier, K., and Pouget, S. (2005), Judgmental Overconfidence, Self-Monitoring, and Trading Performance in an Experimental Financial Market, *Review of Economic Studies*, 72 (25), 287-32.
- Booth, L., Aivazian, V., Demirguc-Kunt, A. and Maksimovic V. (2001), Capital Structure in Developing Countries, *Journal of Finance*, 56, 87-130.
- Bujadi, M. L. and Richardson, A. J. (1997), A Citation Trail Review of the Uses of Firm Size in , Accounting Research, *Journal of Accounting literature*, 16, 1-27.
- Bushman, R., Piotroski, J., and Smith, A. (2004), What Determines Corporate Transparency?, *Journal of Accounting Research*, 42, 207-252.
- Chang, C., Lee, A. C., and Lee, C. F. (2009), Determinants of Capital Structure Choice: A Structural Equation Modelling Approach, *The Quarterly Review Of Economics and Finance*, 49, 197-213.
- Chung, K.H. and Pruitt, S.W. (1994), A Simple Approximation of Tobin's Q, *Financial Management*, 23(3), 70-74.
- Demaria, S. and Dufour, D. (2007), Les choix d'options comptables lors de la transition aux normes IAS/IFRS : quel rôle pour la prudence?, *Comptabilité-Contrôle- Audit*, 195, 195-218.
- Dufour, D. and Molay, E. (2010), *La Structure Financière des PME Françaises: Une Analyse Sectorielle sur Données de Panel*, Manuscrit auteur, publié dans Crises et nouvelles problématique de la valeur, Nice, hal-00479529, version 1.
- Fama, E. F. and French, K. R. (2002), Testing Tradeoff and Pecking Order Predictions about Dividends and Debt, *Review of Financial Studies*, 15, 1-33.
- Frank, M., and Goyal, V. (2007), *Trade-off and Pecking Order Theories of Debt*, Working Paper, Tuck School of Business at Dartmouth.
- Gervais, S., Heaton, J. B. and Odean, T. (2002), *The Positive Role of Overconfidence and Optimism in Investment Policy*, Mimeo, University Of California, Berkeley.
- Graham, J. R. (2000), How Big Are the Tax Benefits of Debt ?, *Journal of Finance*, 55, 1901-1940
- Green, W.11., 1997, *Econometric analysis* 3rd ed., Prentice-Hall international.
- Graham, J. R. and Harvey, C. R. (2001), The Theory and Practices of Corporate Finance. Evidence from the Field, *Journal of Financial Economics*, 60, 187-243.
- Heaton, B. (2002), Managerial Optimism and Corporate Finance, *Financial Management*, 31(2), 33-45.
- Helliar, C., Power, D. and Sinclair, C. (2005), Managerial "Irrationality" in Financial Decision Making, *Managerial Finance*, 31(4), 1-11.
- Ho, C. R. and Chang, Y. (2009), CEO Overconfidence and Corporate Financial Distress, retrieved August 15, 2009, from <<http://ssrn.com/abstract=1659440>>.
- Hovakimian, A., Hovakimian, G. and Tehranian, H. (2004), Determinants of Target Capital Structure: The Case of Dual Debt and Equity Issues, *Journal of Financial Economics*, 71, 517-540.
- Huang, R. and Ritter J. R. (2009), Testing Theories of Capital Structure and Estimating the Speed of Adjustment, *Journal of Financial and Quantitative Analysis*, 44, 237-271.
- Jalilvand, A. and Harris, R. S. (1984), Corporate Behaviour in Adjusting to Capital Structure and Dividend Targets: An Econometric Study, *Journal of Finance*, 39, 127-145.
- Jarboui, A. and Olivero, B. (2008), Le couple Risque/ Horizon temporel des investissements est-il gouverné par les institutionnels et les actionnaires dominants ?, *Banque et Marchés*, 93, Mars-Avril, 20-34.

- Kisgen, D.R. (2006), Credit Ratings and Capital Structure, *Journal of Finance*, 61(3), 1035–1072.
- Koh, P.S. (2003), On the Association between Institutional Ownership and Aggressive Corporate Earnings Management in Australia, *The British Accounting Review*, 35, 105-128.
- Landier, A. and Thesmar, D. (2009), Financial Contracting with Optimistic Entrepreneurs, *Review of Financial Studies*, 22(1), 117-150.
- Lehn, K. and Poulsen, A. B. (1989), Free Cash Flow and Stockholder Gains in Going Private Transactions, *Journal of Finance*, 44, 771-787.
- Lin, Y. H., Hu, S. Y. and Chen, M. S. (2007), Testing Pecking Order Prediction from the Viewpoint of Managerial Optimism: Some Empirical Evidence from Taiwan, *Pacific-Basin Finance Journal* 16, 160-181, retrieved from <www.sciencedirect.com>.
- Malmendier, U. and Tate, G. (2005), CEO Overconfidence and Corporate Investment, *Journal of Finance*, 60(6), 2661-2700.
- Malmendier, U. and Tate, G. (2008), Who Makes Acquisitions?, CEO Overconfidence and the Market's Reaction, *Journal of Financial Economics*, 89, 20-43.
- Malmendier, U., Tate, G. and Yan, J. (2007), *Corporate Financial Policies with Overconfident Managers*, Working Paper, UC Berkeley.
- Molay, E. (2006), *Un test de la théorie de financement hiérarchique sur données de panel françaises*, Document de travail, Université de Nice IAE .
- Myers, S. and Majluf, N. (1984), Corporate Financing and Investment Decisions when Firms Have Information Those Investors Do Not Have, *Journal of Financial Economics*, 13, 187-221.
- Myers, S. C. (1984), The Capital Structure Puzzle, *The Journal of Finance*, 39(3).
- Myers, S. C. (2001), Capital structure, *Journal of Economic Perspectives*, 15, 81-102.
- Naoui, K., Elgaied, M. and Bayouhd, F. (2008), *Financement Interne et Investissement : Asymétrie d'Information vs Discrétion Managériale*, retrieved from <<http://ssrn.com/abstract=1118416>>.
- Nosic, A. and Weber, M. (2008), *How Risky Do I Invest: The Role of Risk Attitudes, Risk Perceptions and Overconfidence*, Working Paper, University of Mannheim.
- Pearl, J. (1986), Fusion, Propagation, and Structuring in Belief Networks, *Journal of Artificial Intelligence*, 29, 241-288.
- Rajan, R. and Zingales, L. (1998), Power in a Theory of the Firm, *Quarterly Journal of Economics*, 387-432.
- Ross, S. (1977), The Determination of Financial Structure: The Incentive Signaling Approach, *Bell Journal of Economics*, 8, 23-40.
- Sahut, J. M. and Gharbi, O. (2008), *Investisseurs institutionnels et valeur de la firme*, Papier de travail, Université de Poitiers et Université Paul Cézanne.
- Schoar, A. (2007), *CEO Careers and Style*, retrieved from <www.mit.edu/~aschoar/CEOCareersStyle_v2.pdf>.
- Schrand, C. and Zechman, S. (2010), *Executive Overconfidence and the Slippery Slope to Fraud*, Working Paper, University of Chicago.
- Stulz, R. (1990), Managerial Discretion and Optimal Financing Policy, *Journal of Financial Economics*, 26, 3-27.
- Titman, S. and Wessels, R. (1998), The Determinants of Capital Structure Choice, *The Journal of Finance*, 43(1).
- Titman, S. (1984), The Effect of Capital Structure on a Firm's Liquidation Decision, *Journal of Financial Economics*, 13, 137-151.