

The role of board independence on R&D investment' choice decided by committed managers: The cognitive management of executives' discretion

Fadhila Hamza^{a*} and Anis Jarboui^b

^aPhd Student in Finance and Accounting Methods, University of Sfax, ISAAS 3018, Tunisia

^bDoctor and HDR financial and accounting, Associate Professor of Universities, Higher Institute of Business Administration (ISAAS), University of Sfax, Tunisia

CHRONICLE

Article history:

Received June 5, 2015
Received in revised format
August 16 2015
Accepted December 21 2015
Available online
December 24 2015

Keywords:

Commitment Bias
Board Independence
Innovation Decision
Managerial Discretion
Bayesian Network Methods

ABSTRACT

This study deals with appreciating the role of both governance system and executives cognitive and attitudinal aspects in the innovation decision-making. After discussing the theoretical relationship between board independence and CEOs attitude and behavior, we are advancing an empirical model testing the correlation between the managers' attitude and behavior towards innovation and his psychological commitment level. The CEOs commitment bias and attitude constituent were measured using questionnaire. The data analysis was performed using the Bayesian network method on 220 Tunisian executives. Empirical results confirm the theoretical prediction and shows that processing with persuasive mechanism does not have an effective role on the alignment of the manager's attitude and behavior in key tasks such innovation decision. CEOs authentic behavior was more related to an important manager involvement in this behavior rather than to persuasive effort committed by outside directors to make him contract this action. CEOs attitude and behavior towards innovation are shown related to commitment link "manager-task" and suggests that the board of directors plays no role in the CEOs discretion management. We argue that persuasive approach is not a sufficient path in behavior and interests alignment; yet, it should be applied with the commitment approach for understanding manager decision-making.

© 2016 Growing Science Ltd. All rights reserved.

1. Introduction

Innovation, as managerial decisional latitude, which requires optimistic attitude, long term horizon (James, 1999), risk-taking culture (Olivero & Jarboui, 2006), overconfidence (Chen et al., 2011) and specific expertise (Musteen et al., 2006), was managed, for a long time, through ensuring persuasive communication using discipline, motivation, empowerment, and by building structure that enhance learning. Many researchers address the problematic that what makes some executives more willing to initiate innovation as compared to other executives (Chouaibi & Affes, 2010; Ata & Jabeen, 2011). Although, researchers and theorists who are interested in evoking the human inventiveness in initiating

* Corresponding author. Tel: + 216 74 680 460
E-mail address: fadhila.hamza@yahoo.com (F. Hamza)

the innovation; have developed a stream of literature within the perspective of strategic choice theory initiated by Hambrick and Mason (1984). These researchers in strategic choice theory tend to reveal the role of managerial latitude as the force of action within the firm but it proceeds upon the pressure of environment. The need to seek the most effective corporate governance mechanisms is motivated by the agency problem which sees that sound corporate governance makes it more likely for owners of capital to monitor the activities of managers either directly through voting on crucial matters or indirectly through the board of directors (Levine, 2005).

The board of directors is mainly considered as a central corporate governance mechanism for aligning the CEO's interests with the rest firms' stakeholders' interests. Walker (2009) argues that efficient board is one of the key drivers of effective corporate governance. The presence of efficient board, simultaneously, protects shareholders' interest and promotes savings, investment and economic growth by enhancing innovations. Therefore, Oman et al. (2004) argue that well-governed firms are better capable to raise innovation and achieve economic growth. While, in the wake of grave collapse and scandals occurred in 2001 and 2002, analysts focused on governance mechanisms' effectiveness and, particularly, independent directors. As an optimal solution, companies were encouraged to amplify the proportion of independent directors on their board.

Consequently, several studies (Weisbach, 1988; Hermalin & Weisbach, 1991; Adams et al., 2010) reveal that an independent board, that dominated by outside directors, is more likely to be effective than one with a predominance of inside directors. As demonstrated previously, the importance of outside directors has been, also, considered at the policy level, with codes of corporate governance which pay a particular attention to the necessitate to have a considerable proportion of outside on the board of listed firms. Additionally, empirical papers have confirm that appropriately constituted boards with the outside non-executive directors tend to increase more the firm performance than boards dominated by insider directors (John & Senbet, 1998; Bhagat & Black, 2001). Therefore, Charreaux (2009) develop an overview based on the Simons (1995)' model of levers of control. This overview accord to the board of directors, four principal functions exerted by four levers of control which are: Beliefs Systems, Boundary Systems, Diagnostic Control Systems, and, Interactive Control Systems.

This literature approaches direct influence of the disciplinary mechanism on the manager's investment behavior. While by referring to theories of behavior changing (the theory of persuasion (Eagly & Chaiken, 2005 ; Girandola et al., 2008), the theory of commitment (Kiesler, 1971; Joule & Beauvois, 1998; Girandola 2005), theory of reasoned action (Fishbein & Ajzen, 1975), theory of planned behavior (Ajzen, 1987), the existence of a cause-effect relationship between persuasion (discipline/incitation) and behavioral change is profusely challenged. Accordingly to these theories, persuasion may conducts, consistently, to an attitude changes, rarely, to a behavioral intention, but, not necessarily, to authentic behavior.

Persuasion has a great role on the attitude conception toward the authentic behavior. Its role is essentially at the cognitive, emotional, social and moral level (Girandola, 2003; Girandola et al., 2008). To obtaining the authentic behavior, studies in the paradigm of "*free will compliance*" advance techniques of influence that may drive someone to freely change their behavior. In this paradigm behavior changing comes after the implementation of preparatory acts and acts of commitment. Much research has been done in this setting, the main ones are: Michelik and Girandola, (2008); Deschamps and Joule, (2005); Girandola and Roussiau (2003).

Consistently to this paradigm, our interest here is to mediate CEO's cognitive characteristics (attitude) in the relationship between the board independence (persuasion) and decisional latitude on investment (authentic behavior). However, in our study we are interested in reconsidering the role of board independence in the alignment of managerial behavior in investment decision in R & D through their impact on CEO's cognitive characteristics (optimism, myopia, loss aversion, expertise power and overconfidence). This impact of board independence on the CEO's mental patterns and consequently on their behavior is conditioned by the existence or not of the cognitive commitment.

This article is structured as follows: Section 1 presents the related literature and the theories which motivate the empirical work, section 2 discusses the empirical strategies that were adopted and section 3 presents the main results and discussion.

2. Literature review

2.1. Board Independence, CEO's Commitment Bias, CEO's Optimism and Innovation Decision

The main mission of directors is the control, the guidance and the revocation, when necessary, of the executives, thus, managers try to justify their performance in specific investment. Fleton et al. (2003) affirm that the presence of high level of firm asset specificity reflect the executive's optimism. This optimistic manager enhances assets specificity level in order to limit the likelihood of its revocation.

Numerous studies realized recently (Azouzi & Jarboui 2013) note a great influence of board independence on effective management of executives' optimism. This effect resulting from the impact of directors' optimism level on the optimistic attitude of CEOs, in this fact managers perceive specific investment as way to persevere their employment and reputation.

As illustrated by Jensen (1983), independent directors are assumed to perform effectively because they are external experts. They will execute well their mission in order to gain further terms. Therefore, given their expertise and assiduity they are considered as optimistic directors. Consequently the presence of an efficient independent board affects greatly the optimism of executives and, so, his innovative behavior.

By referring to some evidences derived from social psychological research as well advanced by the theory of persuasion (Eagly & Chaiken, 2005; Girandola et al., 2008), menace and discipline can engender attitude change and beliefs normalization by increasing level of consciousness and the sense of fear (white, 1998; Girandola et al., 2008). Thus, the presence of outside directors arise the manager's optimistic cognitions by the revocation threat and menace. CEO perceives R&D investment as an action which protects them from losing their job. However, the theory of persuasion's evidence affirms that changing attitudes and beliefs don't leads to changing behaviors (Joule et al., 2007; Girandola, 2005). So, firstly we hypothesize as follow:

H1: *The board independence increases generally the CEO's optimism attitude.*

Therefore, theoretical overview conducted by the theory of commitment, (Joule et al., 2007; Girandola, 2005, Girandola et al, 2008) finds that if persuasive mechanisms can lead to disseminate new knowledge or attitudes, they are rarely efficient in changing actual behavior. Their effort in information and argumentation helps over time to change cognitions, concepts, attitudes, and, absolutely, to awaken consciousness. But awareness of the advantages (e.g; reputation) of optimism and innovation decision does not mean arising investment in R&D or reducing opportunism. Similarly, knowledge of the importance and the necessity of innovation do not cause the CEO's engagement in specific assets. This finding of the failure of information and argumentation force in behavior changing, improves several studies showing the gap that can exist between ideas and actions (Sheeran, 2002; Webb and Sheeran, 2006). This gap is reduced with the influence of commitment link between individual and the key action (Katzev & Wang, 1994; Roussiau & Girandola, 2002; Girandola & Roussiau, 2003; Joule et al., 2007; Girandola, 2005, Girandola et al., 2008).

Based on this affirmation, we hypothesize that if the manager is cognitively and psychologically committed in innovation decision, the pressure of outside directors on the CEO's optimistic attitude, affect consequently his behavior. In the other hand, with the absence of commitment link between manager and innovation decision, outside directors' effort have not influence on CEO's optimistic investment behavior. We hypothesize further the follow:

H1': *With the presence of commitment bias the impact of board independence on CEO's optimism leads to an effective behavior in favor of R&D investment.*

2.2 Board Independence, CEO's Commitment Bias, CEO's Myopia and Innovation Decision:

One of main causes of conflict between CEOs and firms' stakeholders is that CEOs' decision-making horizons are shorter than shareholders' investment terms (Jensen and Smith, 2000). CEO's myopic attitude derives from belief that long-term investments which do not generate benefits in the short-term should be avoided, because they being only advantageous for their successors (James, 1999).

Executives' investment decision horizon is limited to their terms; although a firm's existence is much longer. They are myopic in the sense that they have a tendency to less considerate the weight of cash flows occurring after their employment time horizon. A consequence of CEO's myopia is that some successful projects may be avoided. While, outside directors aim to obtain further terms in their mandate, therefore, they monitor executives to perform long term investment like innovation actions. In fact, outside directors oppose to executive's opportunism which guides to abandon decision making in the long-term. As delivering rapid results is a deviation from directors' interests; outsider intend to alter the manager myopic attitude and behavior by implementing a solid monitoring and disciplinary system such using the famous threat of revocation.

However, according to the theory of persuasion (Girandola et al., 2008), menace and discipline can produce attitude change by rising level of activation and the feeling of fear (White, 1998; Girandola et al., 2008). Consequently, the executive attitude toward decision horizons is conditioned by the board composition. Managers' attitudes become less "myopic", in the sense that they tend to more performing investment with long term horizon, when the board of directors is independent. So, firstly we hypothesize as follow:

H2: The board independence decreases generally the CEO's myopia.

The research conducted within the paradigm of free will compliance of the theory of commitment (Joule et al., 2007; Girandola, 2005) aims to show that the achievement of expected behavioral changes is more likely when the information and persuasive process is preceded by obtaining a preparatory act. The accomplishment of a preparatory act made subjects more influenced by the arguments and information later disseminated in the persuasive message.

Relate to the lack of correlation between attitudes and behaviors and the polemic role of the persuasion and the commitment bias on the attitude alignment and the behavior choice changing, we hypothesize further the follow:

H2': With the presence of commitment bias the impact of board independence on CEO's myopia leads to an effective behavior in favor of R&D investment.

2.3. Board Independence, CEO's Commitment Bias, CEO's Loss Aversion and Innovation Decision

The specific expertise of directors is considered as vital for firm performance especially while investing in risky activities. Kirkpatrick (2009) and Defond et al. (2005) affirm that outside experts offer a better comprehension of information which is key for efficient board assignment. Furthermore, Francis et al., (2012) show that the existence of outside experts rather than inside experts impels the constructive link between experts on boards and CEO's performance in risky tasks, and, generally, entire firm performance. These evidences are also reliable to more topical works (Agrawal & Knoeber, 2001; Adams & Ferreira, 2007; and Coles et al., 2008) which highlight the importance of the counseling task that outside directors perform. The trivial role of inside experts in promoting R&D investment emphasizes the importance of board independence on firm performance. This philosophy results from the view which indicates that being an insider limit the CEO's monitoring efficiency.

Essentially, in performing its mandate, a principal role of the board is reviewing and directing the firm's risk-management strategy. While CEO's high risk-taking behavior has been mentioned as one of the major sources of the financial crisis, it identifies that in many firms, either financial or non-financial,

boards failed to build suitable risk policies and control managers' loss-aversion behavior in a timely and efficiently way (Kirkpatrick, 2009). Consequently, weak corporate board's performance it may not be the direct cause of crisis, commonly, its practices might influence the extent to which companies are susceptible to the financial crisis.

Or, biased decisions is, mainly, the result of affect, visceral factors (Schelling, 1984), pressures towards conformity (Asch, 1952; Janis, 1972), and divergence from utility maximization over time (Laibson, 1997). These causes can guide to systematic deviations of the normative directives central to the rational model of decision-making. Therefore, number of studies on the persuasion paradigm (Steptoe, 1991; Girandola et al., 2008) statute that face to a high level of pressure and discipline, individual don't have, usually, a passive reaction. He might implement an active strategy of " *coping* " in order to neutralize and alleviate the cognitive destabilization produced by the sentiment of fear and stress.

Moreover, Fernback et al. (2014) suggest that self-deception is caused by the high menace exerted by authority in order to changing individual behavior. When self-deceiving, individuals are obviously manipulating their behavior in a self-serving mode; however, this does not mean that their behavior is completely determined by their self-control. Consequently, if we apply this reasoning in firm with independent board, outside directors' risk tolerance may decrease the CEO's loss aversion attitude, but, the large pressure exerted by outside directors have not positive effect on managers' risk investment behavior. Thus, managers can distort firm's investment because of their risk aversion. So, initially we hypothesize as follow:

H3: *The board independence reduces generally the CEO's loss aversion attitude.*

Consistently, as individual's attitude don't, certainly, determinate their behavior, the researchers of the theory of commitment, (Joule et al., 2007; Girandola, 2005, Girandola et al., 2008), announce that the link between attitude and behavior is activated by means of commitment bias (Deschamps & Joule, 2005). Based on this affirmation, we hypothesize that if the relationship between manager and risk investment decision is qualified by a high level of cognitive and psychological commitment, the pressure of outside directors on the CEO's loss aversion attitude, affect consequently his behavior. In the other hand, with the absence of commitment link between manager and risk investment decision, their effort has no influence on CEO's risk investment behavior.

H3': *With the presence of commitment bias the impact of board independence on CEO's loss aversion leads to an effective behavior in favor of R&D investment.*

2.4. Board Independence, CEO's Commitment Bias, CEO's Expertise Power and Innovation Decision

Concerning the managers' expertise power and its impact on innovation decision, Erhardt et al. (2003) confirm that there is a strong relationship between CEO's functional background and financial decision-making, especially strategic decisions. Therefore, the presence of managers with expertise in R&D is linked to improvement and innovation (Wiersema & Bantel, 1993).

The board of directors, as a cognitive and disciplinary governance mechanism, plays a main role in decision-making process: defining long term objectives; assigning resources; insuring control, direction, and cognitive guidance. Thus, topical literature in cognitive corporate governance suggests that the main role of the board is to generate firms' creativity, innovation and performing decision-making (Minton et al., 2012).

As shown by Berger et al., (1998) and Groyberg et al. (2011) the expertise tasks is the main predictor for executives' performance in workgroups and is described as a specific performance attribute. To attain high performance within groups, managers need to hold specific knowledge associated to all difficulties faced by the group (Anderson & Kilduff, 2009). Correspondingly, a groups' expertise affects a CEO's task performance (Hillman & Dalziel, 2003). For this reason, directors, especially outsider directors, are normally selected for their level and nature of expertise.

Numerous studies focus on two sources of directors' expertise that are important to managers' decision making which is financial expertise and industrial expertise (Davis, 2009; Haynes & Hillman, 2010; Kor & Sundaramurthy, 2008).

The second source of directors' task-based expertise is very important in directors' monitoring function (Fama & Jensen, 1983). Thus, Lorsch and MacIver's (1989) precise that directors' control "is a difficult task, because outside directors often have no intimate knowledge of the specific business that will be discussed during the meeting". Therefore, Carpenter and Westphal (2001) note that holding industrial expertise allows outside directors to better understand the specific work of the firm, and so, better monitoring executives. Similarly, Kroll et al. (2007; 2008) and Haynes and Hillman (2010), show that outside directors with industrial expertise are more efficient in guiding and monitoring executives.

As the role of outside directors is the persuasive communication; we focus on researches in theory of persuasion (Girandola et al., 2008) which was interested by what action individual has taken and his subjective involvement to choosing under a persuasive effort. Naturally, people suppose their behavior to be decided liberally and under their personal control. Thus, environmental pressures may affect individual attitude, but, a given behavior is chosen independently to pressure and attitude conception. So, initially we hypothesize as follow:

H4: The board independence increases generally the CEO's expertise power.

Although, Michelik and Girandola, (2008); and Girandola, et al., (2008) show that people express more favorable attitude and intention to be engaged in activity after completing a preparatory act and read a persuasive message about the benefits of the key task (bending communication), rather than, only reading the message (persuasive communication).

Therefore, relate to the argument of the theory of commitment, (Joule et al., 2007; Girandola, 2005, Girandola et al., 2008), preparatory act (commitment bias) guide individual to freely contracting an authentic behavior. Similarly, Deschamps and Joule (2005) note that person's behavior is conform only when person attain a high level of commitment bias.

Consequently, we hypothesize that if the relationship between manager and innovation decision is qualified by a high level of cognitive and psychological commitment, the role of outside directors' expertise on the CEO's expertise power, affect generally his behavior. In the other hand, with the absence of commitment link between manager and innovation decision, it have not influence on CEO's innovation behavior. So, we hypothesize further the follow:

H4': With the presence of commitment bias the influence of the board independence on CEO's expertise power lead to an effective behavior in favor of R&D investment.

2.5. Board Independence, CEO's Commitment Bias, CEO's Overconfidence and Innovation Decision

The relationship between CEO's overconfidence and board independence was recently studied (Azouzi & Jarboui 2013). Researchers demonstrate that when the CEO appears to be over-confident, it's necessary that the board of directors be independent. Thus, the role of outside director is to evaluate the real context of decision and asking perfect questions before key decisions are made. Still, numerous others studies (Chen et al., 2011; Malmendier & Tate, 2008) consider that the bias of overconfidence may have some advantageous results. Overconfidence would positively persuade managers to overestimate their projects' potentiality of success. Moreover, and according to Azouzi and Jarboui (2013), managers tend to consider that they have a control over their investment choices. In fact, overconfident manager tend to habitually under-estimate investment risks. Such bias could, potentially, diminish agency cost, and, consequently, arise firm value (Hackbarth, 2008). Really, consciousness and understanding of overconfidence bias would permit the CEOs to decide on the more appropriate choices and improve the board of directors' efficiency as a corporate governance mechanism. Thus, as advanced by the theory of persuasive communication (Girandola et al., 2008; Chappé et al., 2007), pressure and discipline might induce changing in person's beliefs. While, Paulhus (1998) pose a

question to what happens to someone if people intervened to manage their overconfidence. Although, groups that primarily overestimate their skill (Moore & Healy, 2008), may refuse to allocate excessive resources to actions that they would perform successfully (Vancouver & Kendall, 2006). In this reason strong individual effectiveness attitude can guide to rigid persistence with some strategies that reduce motivation to investigate beyond proven results (Audia & Goncalo, 2007) and less vigilant decision making (Tasa & Whyte, 2005). Otherwise, overconfident groups are less expected to plan ahead and to predict difficulties in comparing with groups that have some uncertainty regarding the probability of success (Bandura & Locke, 2003). Contrary, when individual group members are less confident in the appropriateness of the group's decision, they are more forced to process available choices profoundly and intentionally (De Dreu et al., 2008). A connotation of this study is that exaggerated levels of early group efficacy may really be disadvantageous to group performance.

Therefore, board directors and executives being considered as a work groups. While, outside directors are, naturally more confident in their performance on R&D investment related to their expertise, information, position in the formal organizational hierarchy (Yu, 2013). In this fact, CEO's overconfidence is conditioned by the outside directors' confidence level. Their objective is to persuade and influence executive's overconfidence regarding innovation actions. So, firstly we hypothesize as follow:

H5: The presence of outside directors influences greatly the CEO's overconfidence.

Although, theorists of commitment such Deschamps and Joule (2005), Michelik and Girandola, (2007), and Girandola et al. (2008) show that people communicate more positive attitude and intention to be committed in key behavior after completing a preparatory act. Therefore, relate to the argument of the theory of commitment, (Joule et al., 2007; Girandola, 2005, Girandola et al., 2008), preparatory act (commitment bias) guide individual to freely contracting an authentic behavior. Similarly, Deschamps and Joule (2005) note that person's behavior is conform only when person attain a high level of commitment bias. It can be concluded from the above discussion that the decision to develop innovativeness which enhances corporate changes rests with the CEOs commitment. CEOs that are committed to perform innovation are more likely to develop a behavior that can support change and R&D investment (Ata & Jabeen, 2011). Consequently, psychological commitment represents person investment of his mental and emotional skills on specific actions in order to satisfying needs for self-sufficiency, ability, and expertise. Thus, psychological commitment engenders individual's overconfidence towards challenged action because of his positive evaluation of the tasks involvement. Commitment to key action represents the degree to which individual considers this action as a vital task in which he should invests all his cognitive competences (Gagne & Deci, 2005; Ryan & Deci, 2000). Accordingly, we hypothesize that if the link between CEOs and innovation decision is qualified by a high degree of cognitive and psychological commitment, the effect of outside directors' overconfidence on the CEO's overconfidence level, influence naturally his behavior. Contrary, with the absence of commitment link between manager and innovation decision, it have not influence on CEO's innovation behavior. So, we hypothesize further the follow:

H5': With the presence of commitment bias the influence of the board independence on CEO's overconfidence lead to an effective behavior in favor of R&D investment.

3. Methodology

3.1. Data Sample Selection:

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 collect some company's information from firm's statute and financial annual statement: CEO's incentives, total assets, R&D expense, etc.

- The second part focuses on determination of the level of CEO's commitment bias.
- The third part focuses on determination of the CEO's emotional bias.
- Part four aims to knowing the level of CEO's executive power.

The questionnaire is addressed to managers in 220 non-financial Tunisian companies during the revolution period (2010-2011 fiscal year), 29 are listed companies and 191 are non-listed companies chosen from the list of firms implanted in the region of Tunis and Sfax provided by "Agency of promotion of industry" in these region (Table 1). All financial firms were eliminated to the fact that this sector is regulated and have particular governance system and characteristics. Firms with insufficient data regarding about CEO's emotional bias are also excluded.

Table 1

Visited Companies

	Total	Number
Initial BVMT sample		50
Financial firms		(22)
	28	
Other non financial firms		270
	298	
Insufficient data to emotional biases		78
Final sample	220	

The selected sample correspond to firm managers or CEO's representing ranging in age from 30 to 70 (Fig. 1). In some firms questionnaires have been distributed by the method of door to door to been delivered to the concerned person, few among them have been mailed and most of them have been contacted via two accounting firm with which we have a great relationship.

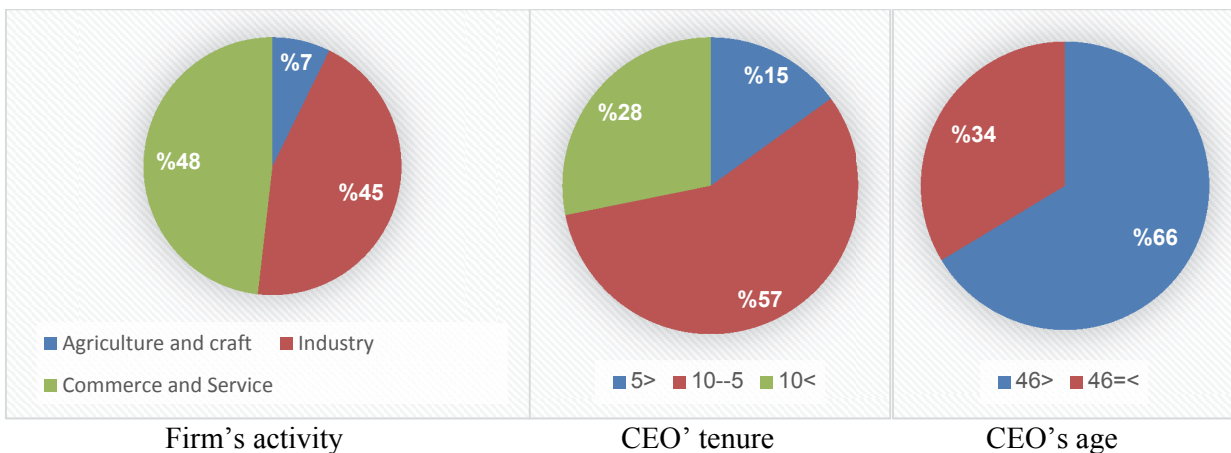


Fig. 1. Profile of subjects

3.2 Variables' Measurement

On this context we aim to determine the endogens and exogenesis variables' measurement.

a. Managerial latitude: innovation decision

We use the research and development (R&D) intensity as a proxy for firm specific assets.

As Francis and Smith (1995), Cho (1988), Abdullah et al. (2002), Azouzi and Jarboui (2012), and Hamza and Jarboui (2012), we evaluate innovation decision by the ratio of a firm's R&D expense divided by total assets.

The R&D intensity takes 2 follows:

- 1 if this ratio > 50%;
- 0 if not.

b. Board Independence

In this setting we choose to operate the boards independence by the following variable: BIND which is defined as the percentage of the directors members who are simultaneously independent and non-executives, it is equal to the number of outside directors divided by the total board members (Chtourou et al., 2001; Wright, 1996; Haniffa & Cooke, 2000; Azouzi & Jarboui, 2013).

$$BIND = \text{number of outside directors} / \text{total board members}.$$

Based on this ratio, BIND is as follows:

- 1 if outsiders directors represent more than 50% in the board;
- 0 if insiders' directors represent more than 50% in the board.

c. CEO's Commitment bias

To measure the CEO's commitment bias, we takes the same steps than the most of studies have using an adaptation of the original questionnaire elaborated by Meyer and Allen (1991) to evaluate organizational commitment (Organizational Commitment Scale). This instrument is chosen because of its validity and its multidimensional character shown by several researches (Meyer et al., 2002), Hamza and Jarboui (2012), and, Hamza, Azouzi and Jarboui (2013). The commitment bias takes 2 follows:

- 2 if the manager has a high level of this bias
- 1 if not

d. CEO's emotional bias

To determinate the CEO's three emotional biases (optimism, loss aversion, myopia and overconfidence). The questions have been inspired from the questionnaires formulated by the Fern Hill and Industrial Alliance companies (Azouzi & Jarboui, 2012).

The emotional bias takes 2 follows:

- 2 if the manager has a high level of each bias
- 1 if not

e. CEO's executive power

To determinate the CEO's executive power we elaborate questionnaire with 9 items in order to calculate a score that indicate the level of CEO's expertise power (Hamza et al., 2013).

Based on this ratio, the CEO's expertise power is as follows:

- 1 if it is high;
- 0 if it is low.

4. Methods

The objective of this part is to test the diverse correlations between the innovation investment decision and the above variables. The employed methodology is a probabilistic graphical model called Bayesian network. This methodology is inserted on the artificial intelligence explanatory method. Bayesian network is used in this paper to explain quantitatively the effect of commitment bias on the CEO's behavior in innovation investment decision. The basic definition of a Bayesian network is given by

(Pearl, 1986) who is declared that a Bayesian network is an explicit probability graph, which joins the estimated variables with arcs. This type of association articulates the conditional relationship between the variables. The formal description of Bayesian network is expressed as the set of $\{D, S, P\}$, where

- D is a designation of variables or “nodes”: in our case it refers to Firm’s innovation decision, CEO’s commitment level, CEO’s optimism, CEO’s myopia, CEO’s loss aversion, CEO’s overconfidence, CEO’s expertise power, and, Firm board independence.
- S is a designation of “conditional probability distributions” (CPD). $S = \{p(D / \text{Parents}(D) / D \in D)\}$, $\text{Parents}(D) \subset D$ means that for all the parent nodes for D, $p(D/\text{Parents}(D))$ is the conditional distribution of variable D. Firm’s innovation decision.
- P is design the “marginal probability distributions”. $P = \{p(D) / D \in D\}$ refers to the probability distribution of variable D.

In the Bayesian network method, the problematic may be modeled with the actions of all variables. In general, three levels in modeling process are applied: initially we approximate the probability distribution of each variable and the conditional probability distribution between them. Secondly, basing on these estimations we can acquire the combined distributions of these variables. Finally, we can exercise some deductions for some variables in the objective to use some other important variables.

4.1. Model construction and parameterization

The idea of this paper is to determine the importance of CEO’s commitment bias as a first-order feature of firm’s innovation decision. Also we aim to prove that, the presence of an independent board (persuasive communication), has a great effect on manager’s innovation attitude but not on manager’s innovation behavior. The relationship between board independence, CEO’s innovation attitude (optimism, myopia, loss aversion, expertise power and overconfidence) and CEO’s innovation behavior may be activated only with the existence of commitment bias. Thus, it has been shown theoretically that the firm innovation decision depends on:

- Board independence
- CEO’s commitment bias
- CEO’s optimism
- CEO’s myopia
- CEO’s loss aversion
- CEO’s executive power
- CEO’s overconfidence

4.2. Definition of network variables and values

The initial step in constructing a Bayesian network model is to list all variables respectively, classified from the target variable to the causes. The variables definition is presented in the Table 2 as follows,

Table 2

The network variables’ definition and mesures

Variables	Type
Innovation decision	Discret : YES/NO
Board independence	Discret : YES/NO
Commitment bias	Discret : YES/NO
CEO’s optimism	Discret: YES/NO
CEO’s myopia	Discret: YES/NO
CEO’s loss aversion	Discret : YES/NO
CEO’s executive power	Discret : WEAK/MODERATE/STRONG
CEO’s Overconfidence	Discret : YES/NO

5. Results analysis and discussion

5.1. Graphical Model

The second step in constructing a Bayesian network model is to test the relationships between variables. The Bayesian network constructed using the BayesiaLab program is the result of the total variables database. The graphical relationship established between variables attaching to the data that we have obtained through the questionnaire, is shown in Fig. 2 as follows.

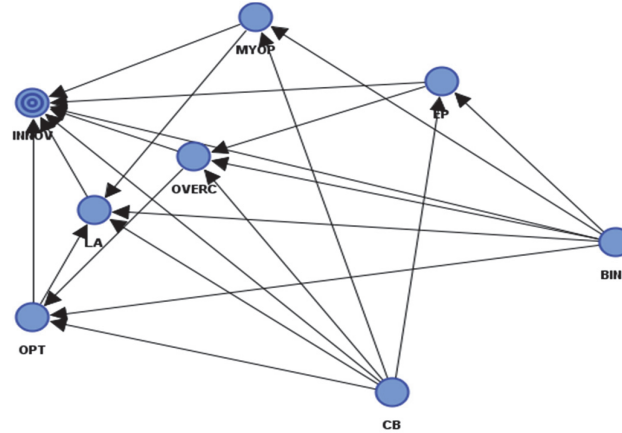


Fig. 2. Graphical model presentation: Firm's innovation decision determinants: Bayesian Network

6. Analysis of the discovered relationships

The relationships between the variables in the parent node and child node are measured using three indicators: the Kullback-Leibler, the relative weight and the Pearson correlation. The Kullback-Leibler and the relative weight are two indicators that show the concreteness of relationships and the importance of correlation between variables. Whereas the Pearson correlation, which progresses from 0 to 1; indicates the significance of variables relationship. Thus, the Table 4 shows the relationships analysis between variables across the Bayesian network.

Table 4

The relationships analysis

PARENTS NODES	CHILDS NODES	KULLBACK-LEIBLER DIVERGENCE ^(a)	RELATIVE WEIGHT ^(b)	PEARSON CORRELATION ^(c)
BIND	INNOV	0,1633	0,7634	-0,0423**
EP	INNOV	0,2139	1,0000	-0,1550
OVERC	INNOV	0,2040	0,9535	0,0089***
LA	INNOV	0,1994	0,9321	-0,0097*
MYOP	INNOV	0,1901	0,8888	-0,0209**
OPT	INNOV	0,1675	0,7830	-0,0028***
CB	INNOV	0,1208	0,5647	0,0188***
BIND	OPT	0,0087	0,0408	0,0463**
BIND	MYOP	0,0133	0,0621	0,0029***
BIND	LA	0,0287	0,1341	-0,0605**
BIND	EP	0,0108	0,0507	0,1008***
BIND	OVERC	0,0123	0,0577	-0,0543**
CB	OPT	0,0187	0,0875	-0,1003*
CB	MYOP	0,0667	0,3119	0,2781
CB	LA	0,0167	0,0780	0,0238**
CB	EP	0,0197	0,0922	-0,0035***
CB	OVERC	0,0109	0,0511	-0,0131**
OPT	LA	0,0213	0,0994	0,0936*
LA	MYOP	0,0199	0,0933	-0,0873*
EP	OVERC	0,0153	0,0715	0,0158**
OVERC	OPT	0,0115	0,0540	-0,0728*

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%, and 1%.

Concerning the influence of board independence on the innovation decision, analysis advanced in table 4 shows the presence of direct, strong (Kullback-Leibler = 0,1633/ relative weight= 0,7634), negative and significant ($\beta = -0,0423^{**}$) relationship. This negative relationship contradicts some evidences in the setting of agency theory (Ingley & Wu, 2007; Minton et al., 2012; Alexandre & Paquerot, 2000) that verify a positive and significant relationship between the level of firm innovativeness, firm performance and board independence. These studies note that the presence of outside directors monitors executives' decisions in order to promoting long-term firm's performance and strategic choice. Thus, the presence of outside directors influences positively managers' strategies in investing on specific assets with high rate of risk and return. However, our results confirm some other studies (Baysinger et al., 1991) which attests that innovation as a long-term and risky decision is a source of conflicts between directors and managers based on divergences in loss aversion and horizon attitudes and, specially, in the functional background. In fact, innovation may be not required by managers who have short term preferences, thus, he recurs to paralyzing the role of outside directors.

Therefore, number of researchers on the persuasion paradigm (Stephoe, 1991) show that face to a high level of threat and discipline, individual don't have, habitually, a passive reaction. He might build an active strategy of "*coping*" in order to neutralize and alleviate the cognitive destabilization produced by the sentiment of fear and stress.

Moreover, Fernback et al., (2014) suggest that self-deception is caused by the high menace exerted by authority in order to changing individual behavior. When self-deceiving, individuals are obviously manipulating their behavior in a self-serving mode; however, this does not mean that their behavior is completely determined by their self-control.

Furthermore, results in table 4 show an indirect influence of board independence on the innovation decision via the managerial discretion determinants. Board independence has a weak (Kullback-Leibler = 0,0087/ relative weight= 0,0408), positive and significant ($\beta=0,0463^{**}$) effect on CEO's optimism. It has a weak (Kullback-Leibler = 0,0133/ relative weight= 0,0621), positive and significant ($\beta = 0,0029^{***}$) effect on CEO's myopia. Also, board independence has a weak (Kullback-Leibler = 0,0287/ relative weight= 0,1341), negative and significant ($\beta=-0,0605^{**}$) effect on CEO's loss aversion. It has a weak (Kullback-Leibler = 0,0108/ relative weight= 0,0507), positive and significant ($\beta = 0,1008^*$) effect of CEO's expertise power. Finally, board independence has a weak (Kullback-Leibler = 0,0123/ relative weight= 0,0577), negative and significant ($\beta= -0,0543^{**}$) effect on CEO's overconfidence.

In term of the theory of persuasion (Girandola et al., 2008; Chappé et al, 2007), discipline (board of directors) only cannot lead to the desired attitude (positive and significant effect on CEO's myopia, negative and significant effect on CEO's overconfidence). As a recommendation, authors demonstrate that discipline should be associated with motivation in order to playing a great role on changing subject's attitude by inserting the sight of the "efficacy" of the risky behavior. In the prospect theory, Kahneman and Tversky, (1979); Tversky and Kahneman, (1992) present the notion of "framing" which consists to present simultaneously information concerning risk and others motivation consequences (the presence of gain or absence of loss). The "framing" affects the individual risk's attitude. Referring to Rothman and Salovey (1997), motivation activates relationship between expected behavior and the attitude toward the task.

Concerning the influence of CEO's attitude on the innovation decision, analysis advanced in table 4 shows the presence of strong (Kullback-Leibler = 0,2139/ relative weight= 1,0000), negative and insignificant ($\beta = -0,1550$) effect of CEO's expertise power. It shows also, a strong (Kullback-Leibler = 0,2040/ relative weight= 0,9535), positive and significant ($\beta = 0,0089^{***}$) effect of CEO's overconfidence. Moreover, there is a strong (Kullback-Leibler = 0,1994/ relative weight= 0,9321), negative and significant ($\beta = -0,0097^*$) effect of CEO's loss aversion. Analysis shows also, the presence of strong (Kullback-Leibler = 0,1901/ relative weight= 0,8888), negative and significant ($\beta = -0,0209^{**}$) effect of CEO's myopia. Finally, CEO's optimism has a strong (Kullback-Leibler = 0,1675/ relative weight= 0,7830), negative and significant ($\beta = -0,0028^{***}$) effect on innovation decision.

By referring to evidence advanced by the persuasive communication theory (Girandola et al., 2008) attitude change do not effectively stimulates new behaviors especially in situations where the discussed issues don't require high involvement from the part of subjects. The author proposes to reconsider the idea commonly accepted that the individual attitudes would be perceived as the main motivation of his behavior.

Concerning the influence of CEO's commitment bias on the innovation decision, analysis advanced in Table 3 shows the presence of direct, strong (Kullback-Leibler = 0,1208/ relative weight= 0,5647), positive and significant ($\beta = 0,0188^{***}$) relationship.

Additionally there is an indirect influence of CEO's commitment bias on the innovation decision via the managerial discretion determinants. Commitment bias has a weak (Kullback-Leibler = 0,0187/ relative weight= 0,0875), negative and significant ($\beta = -0,1003^*$) effect on CEO's optimism. It has a moderate (Kullback-Leibler = 0,0667/ relative weight= 0,3119), positive and insignificant ($\beta = 0,2781$) effect on CEO's myopia. Also, commitment bias has a weak (Kullback-Leibler = 0,0167/ relative weight= 0,0780), positive and significant ($\beta=0,0238^{**}$) effect on CEO's loss aversion. It has a weak (Kullback-Leibler = 0,0197/ relative weight= 0,0922), negative and significant ($\beta = -0,0035^{***}$) effect on CEO's expertise power. Finally, commitment bias has a weak (Kullback-Leibler = 0,0109/ relative weight= 0,0511), negative and significant ($\beta= -0,0131^{**}$) effect on CEO's overconfidence.

This result confirms the theoretical prediction of the theory of commitment (Joule and Beauvois, 1998) which advances that, on the behavioral level, commitment leads to the perseveration of key behavior and the generation of new behaviors going in the same direction (e.g.: the foot-in-the-door effect).

7. Analysis of the Firm's innovation decision (INNOV)

To analyze the firm's innovation decision, we express, firstly, the innovation decision variable as a target in the Bayesian network. Secondly, we use the function that produces the analysis report of the target firm's innovation decision. According to this report, the correlation between firm's innovation decision and other variables are approximated by binary mutual information and the binary relative importance.

Table 5
Target variable analysis

INNOV = YES (57,0132%)					
Nodes	Binary mutual information ^(a)	Binary relative importance ^(b)	Modal value(c)		
EP	0,0177	1,0000	AVERAGE		58,3520%
BIND	0,0013	0,0733	YES		69,7031%
MYOP	0,0003	0,0179	NO		54,1682%
CB	0,0003	0,0143	YES		75,7050%
LA	0,0001	0,0038	YES		58,9240%
OVERC	0,0001	0,0032	NO		73,3355%
OPT	0,0000	0,0003	YES		54,2845%
INNOV = NO (42,9868%)					
Nodes	Binary mutual information ^(a)	Binary relative importance ^(b)	Modal value(c)		
EP	0,0177	1,0000	AVERAGE		72,6389%
BIND	0,0013	0,0733	YES		73,5660%
MYOP	0,0003	0,0179	NO		56,2700%
CB	0,0003	0,0143	YES		74,0649%
LA	0,0001	0,0038	YES		59,8851%
OVERC	0,0001	0,0032	NO		74,1230%
OPT	0,0000	0,0003	YES		54,5661%

Notes:

(a) Mutual information: is the amount of information given by a variable on the target value. It is calculated in bits.

(b) Relative importance: presents the importance of a variable with respect to the target value.

(c) Modal value: is the average value of the explanatory variable for each target value.

The target variable analysis « Firm's innovation decision » show that 57,0132% of Tunisian companies decide innovation in the post revolution period (2010-2011). Moreover, results show, for each value of the target, the list of nodes that have a probabilistic dependence with the target, sorted by descending order according to their relative contribution to the knowing of the target value.

In the case of innovation the most important nodes in term of informational relative contribution is, consecutively, the CEO's moderate expertise power (Binary relative importance=1.000), the board independence (Binary relative importance=0,0733), the CEO's long-term attitude (myopia=no) (Binary relative importance=0,0179), the CEO's commitment bias (Binary relative importance=0,0143), the CEO's loss aversion (Binary relative importance=0,0038), the absence of CEO's overconfidence (Binary relative importance=0,0032) and, finally, the CEO's optimistic attitude (Binary relative importance=0,0003).

While, in the case of no innovation the most important nodes in term of informational relative contribution is, consecutively, the CEO's moderate expertise power (Binary relative importance=1.000), the board independence (Binary relative importance=0,0733), the CEO's long-term attitude (myopia=no) (Binary relative importance=0,0179), the CEO's commitment bias (Binary relative importance=0,0143), the CEO's loss aversion (Binary relative importance=0,0038), the absence of CEO's overconfidence (Binary relative importance=0,0032) and, finally, the CEO's optimistic attitude (Binary relative importance=0,0003).

Additionally, the profile for each value of the target is described by the modal value of each influencing nodes. These profiles are compared with the a priori modal values of the nodes i.e. when the target variable is unobserved.

In the case of innovation the most important modal value is given by the node of the CEO's commitment bias (modal value =75,7050%), the absence of CEO's overconfidence has a considerable effect on the target profile (modal value =73,3355%), the board independence has a great influence on the target profile (modal value =69,7031%), the CEO's loss aversion describe well the target profile (modal value =58,9240%), the CEO's moderate expertise power determinate the target profile (modal value =58,3520%), , also, CEO's optimism explain greatly the target profile (modal value =54,2845%), finally, the CEO's long term attitude (myopia=no) describe mainly the target profile (modal value =54,1682%). While, in the case of no innovation the most important modal value is given by the absence of CEO's overconfidence which has a great influence on the target profile (modal value =74,1230%), the CEO's commitment bias has a considerable effect on the target profile (modal value =74,0649%), the board independence (modal value =73,5660%), the CEO's moderate expertise power determinate the target profile (modal value =72,6389%), the CEO's loss aversion describe well the target profile (modal value =59,8851%), also, the CEO's long term attitude (myopia=no) describe mainly the target profile (modal value =56,2700%), finally, the CEO's optimism explain greatly the target profile (modal value =54,5661%).

Our results confirm those achieved by Ata and Jabeen (2011) which shows that in Pakistan's export sector CEO's commitment is primordial in initiating potential of firms' innovativeness. Also, it confirms the Donaldson (1996)' earlier findings in European and North American replications studies where it is noted that managerial decision accounts for 30% of influence in organizational change. The author finds that CEO affects up to 28% in developing causes of innovation. Wholly, CEO commitment is powerfully linked with all nine factors of innovation.

8. Maximization of the target average (INNOV)

The target dynamic profile capability software is a test enhanced by BayesiaLab program to provide the percentage of explanatory variable to maximize the target variable value. Table 6 presents the dynamic profile of the Firm's innovation decision (INNOV).

The target dynamic profile analysis presented in table 6 show two following results:

First, with the 57,0132% augmentation in innovation decision it is associated to an augmentation, respectively, of: board independence (100,0000%), CEO's commitment bias (85,7662%), and, CEO's loss aversion (72,7950%). In the other hand this augmentation is associated with the decrease on CEO's

overconfidence, CEO's optimism, and, CEO's expertise power, respectively with (92,8194%, 77,7930%, 67,5063%).

Table 6

Target dynamic profile analysis

INNOV = YES			
Nodes	Optimal modality	Probability	Joint Probability
<i>A priori</i>			
EP	WEAK	57,0132%	100,0000%
LA	YES	67,5063%	34,6362%
OPT	NO	72,7950%	20,7522%
CB	YES	77,7930%	8,9592%
OVERC	NO	85,7662%	6,8100%
BIND	YES	92,8194%	5,0971%
		100,0000%	3,4212%
INNOV = NO			
Nodes	Optimal modality	Probability	Joint Probability
<i>A priori</i>			
EP	STRONG	42,9868%	100,0000%
LA	NO	58,2601%	0,8703%
MYOP	YES	66,8535%	0,4265%
OPT	YES	83,5202%	0,2844%
		100,0000%	0,1906%

Secondly, with the 42,9868% decrease in innovation decision it is associated to an augmentation, consecutively, of the: effect of CEO's optimism (100,0000%), effect of CEO's myopia (83,5202%), and, effect of CEO's strong expertise power (58,2601%). In the other hand this decrease is associated with the decrease of CEO's loss aversion with (66,8535%).

9. Conclusion

Our interest to studying the relationship between the board independence and decisional latitude on innovativeness does not stem from a scarcity of work dealing with this relationship. However, the originality of our survey was revealed in both the theoretically and empirically level.

Theoretically, our study scrutinizes the relationship between board independence, as an organizational managerial discretion's determinants, and firms' innovation decision. The originality of this research is that we examine this relationship in the vision of both psychological theory of persuasion and theory of commitment. For that, we mediate the manager's attitude variables (optimism, myopia, loss aversion, executive power and overconfidence) in the relationship between board independence and firms' R&D investment decision. For this target we have realize a survey conducted around a number of executives of large private companies in Tunisia in the post revolution period.

Empirically, the data analysis has confirmed the theoretical prediction which indicates that persuasive impact exerted by outside directors on CEO's attitude, don't affects CEO's innovation behavior. This trial relationship "persuasion/attitude/behavior" designed by board independence/CEO's attitude (optimism, myopia, loss aversion, executive power and overconfidence)/innovation decision is the result of high commitment linkage existing between executives and innovation tasks.

Furthermore, the empirical analysis of the relationship between board independence, CEO's attitude and CEO's behavior show that executive's expertise power influence negatively his firm innovativeness. This analysis confirms the prediction of UET theory which advances personal and social psychological dimensions, and going beyond the arguments commonly used in the perspective of agency models to defend greater or lesser the efficiency of disciplinary systems related to the task controllability "locus of control". The introduction of the notion of «EJD Executive Job Demand» (Hambrick et al., 2005) and its behavioral consequences guides to the conclusion that the construction of a system that aims to exercise too much pressure for managers to maximize shareholders' interests, could, in certain contexts, provokes, contrary, a degradation in the shareholders wealth. Nonetheless, the main aspect that influences the CEO's behavior in innovation decision is the commitment bias which connects executives to innovation decision. Mainly, we can conclude that the key lesson of this research for Tunisian companies is to including the emotional commitment factor in the persuasive

approach by introducing the binding communication in order to align both the CEO's and shareholders' interest and managing efficiently the managerial discretionary space.

References

- Abdullah, F., Guo, W., & Mande, V. (2002). The relation of managerial holdings with Tobin's Q and R&D expenditures: Evidence from Japanese firms. *Multinational Business Review*, 10(1), 66.
- Adams, R. B., & Ferreira, D. (2007). A theory of friendly boards. *The Journal of Finance*, 62(1), 217-250.
- Adams, R., Hermalin, B. E., & Weisbach, M. S. (2008). *The role of boards of directors in corporate governance: A conceptual framework and survey* (No. w14486). National Bureau of Economic Research.
- Agrawal, A., & Knoeber, C. R. (2000). Do some outside directors play a political role?. Available at SSRN 224133.
- Ajzen, I. (1987). Attitudes, traits, and actions: Dispositional prediction of behavior in personality and social psychology. *Advances in Experimental Social Psychology*, 20(1), 1-63.
- Alexandre, H., & Paquerot, M. (2000). Efficacité des structures de contrôle et enracinement des dirigeants.
- Anderson, C., & Kilduff, G. J. (2009). The pursuit of status in social groups. *Current Directions in Psychological Science*, 18(5), 295-298.
- ANIS, J., & Ali, A. M. (2012). CEO emotional bias and dividend policy: Bayesian network method. *Business and Economic Horizons*, 7, 1-18.
- Asch, S. (1952). Effects of group pressure on the modification and distortion of judgments. Reprinted in GE Swanson, TM Newcomb, & EL Hartley (Eds.)(1965). *Readings in social psychology*.
- Ata, G., & Jabeen, N. (2011). CEO commitment and organizational innovativeness: A study of Pakistan's export organizations. *Pakistan Economic and Social Review*, 187-210.
- Audia, P. G., & Goncalo, J. A. (2007). Past success and creativity over time: A study of inventors in the hard disk drive industry. *Management Science*, 53(1), 1-15.
- Azouzi, M. A., & Jarboui, A. (2013). CEO emotional intelligence and board of directors' efficiency. *Corporate Governance: The international journal of business in society*, 13(4), 365-383.
- Bandura, A., & Locke, E. A. (2003). Negative self-efficacy and goal effects revisited. *Journal of applied psychology*, 88(1), 87.
- Baysinger, B. D., Kosnik, R. D., & Turk, T. A. (1991). Effects of board and ownership structure on corporate R&D strategy. *Academy of Management journal*, 34(1), 205-214.
- Berger, L., Speare, R., Daszak, P., Green, D. E., Cunningham, A. A., Goggin, C. L., ... & Hines, H. B. (1998). Chytridiomycosis causes amphibian mortality associated with population declines in the rain forests of Australia and Central America. *Proceedings of the National Academy of Sciences*, 95(15), 9031-9036.
- Bhagat, S., & Black, B. (2001). Non-Correlation between Board Independence and Long-Term Firm Performance. *The Journal of Corporation Law*, 27, 231.
- Carpenter, M. A., & Fredrickson, J. W. (2001). Top management teams, global strategic posture, and the moderating role of uncertainty. *Academy of Management journal*, 44(3), 533-545.
- Chappé, J., Verliac, J. F., & Meyer, T. (2007). Optimisme et pessimisme comparatifs consécutifs à l'exposition à plusieurs messages menaçants. *Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology*, 57(1), 23-35.
- Charreaux, G. (2009). *Droit et gouvernance: l'apport du courant comportemental* (No. 1091001). Université de Bourgogne-CREGO EA7317 Centre de recherches en gestion des organisations.
- Chen, C. X., Lu, H., & Sougiannis, T. (2012). The Agency Problem, Corporate Governance, and the Asymmetrical Behavior of Selling, General, and Administrative Costs*. *Contemporary Accounting Research*, 29(1), 252-282.

- Chen, S., Zheng, H., & Wu, S. (2011). Senior manager overconfidence, managerial discretion and dividend policy: A study of Chinese listed companies. *African Journal of Business Management*, 5(32), 12641-12652.
- Cho, M. H. (1998). Ownership structure, investment, and the corporate value: an empirical analysis. *Journal of Financial Economics*, 47(1), 103-121.
- Chouaibi, J., Affes, H., & Boujelbene, Y. (2010). La Structure De Propriété Et L'Innovation: Étude Empirique Dans Le Contexte Tunisien. In *Crises et nouvelles problématiques de la Valeur* (pp. CD-ROM).
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics*, 87(2), 329-356.
- Davis, G. F. (2009). *Managed by the markets: How finance re-shaped America*. OUP Oxford.
- De Dreu, C. K., Nijstad, B. A., & van Knippenberg, D. (2008). Motivated information processing in group judgment and decision making. *Personality and Social Psychology Review*, 12(1), 22-49.
- DeFond, M. L., Hann, R. N., & Hu, X. (2005). Does the market value financial expertise on audit committees of boards of directors?. *Journal of accounting research*, 153-193.
- Deschamps, J. C., Joule, R. V., & Gumy, C. (2005). La communication engageante au service de la réduction de l'abstentionnisme électoral: Une application en milieu universitaire. *Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology*, 55(1), 21-27.
- Donaldson, L. (1996). *For positivist organization theory*. Sage.
- Eagly, A. H., & Chaiken, S. (2005). Attitude Research in the 21st Century: The Current State of Knowledge.
- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate governance: An international review*, 11(2), 102-111.
- Fadhila, A. M. A., & Jarboui Anis, H. (2013). CEO's Commitment Bias and its Firm R&D Level Bayesian Network Method: Evidence Form Tunisia. *Global Journal of Management And Business Research*, 13(11).
- Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *Journal of law and economics*, 301-325.
- Fernbach, P. M., Hagmayer, Y., & Sloman, S. A. (2014). Effort denial in self-deception. *Organizational Behavior and Human Decision Processes*, 123(1), 1-8.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*.
- Francis, B. B., Hasan, I., & Wu, Q. (2012). Do corporate boards matter during the current financial crisis?. *Review of Financial Economics*, 21(2), 39-52.
- Francis, J., & Smith, A. (1995). Agency costs and innovation some empirical evidence. *Journal of Accounting and Economics*, 19(2), 383-409.
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational behavior*, 26(4), 331-362.
- Girandola, F. (2003). Psychologie de l'engagement et de la persuasion.
- Girandola, F. (2005). Action and commitment theory. *French and other perspectives in praxeology*, 12, 117-130.
- Girandola, F., & Michelik, F. (2008). Engagement et persuasion par la peur: Vers une communication engageante dans le domaine de la santé. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 40(2), 69.
- Girandola, F., & Roussiau, N. (2003). L'engagement comme source de modifications à long terme. *Cahiers internationaux de psychologie sociale*, 57(1), 83-101.
- Girandola, F., Michelik, F., & Joule, R. V. (2008). Promouvoir la pratique physique chez les étudiants: communication et communication engageante. 4ème Journées de la prévention INPES. *Paris, France*, 10-11.
- Groysberg, B., Polzer, J. T., & Elfenbein, H. A. (2011). Too many cooks spoil the broth: How high-status individuals decrease group effectiveness. *Organization Science*, 22(3), 722-737.

- Hackbarth, D. (2008). Managerial traits and capital structure decisions. *Journal of Financial and Quantitative Analysis*, 43(04), 843-881.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of management review*, 9(2), 193-206.
- Hambrick, D. C., Finkelstein, S., & Mooney, A. C. (2005). Executive job demands: New insights for explaining strategic decisions and leader behaviors. *Academy of management review*, 30(3), 472-491.
- Hamza, F., & Jarboui, A. (2012). Investor's Commitment Bias and Escalation of Firm's investment decision. *Economia. Seria Management*, 15(2), 328-345.
- Haniffa, R., & Cooke, T. (2000, August). Culture, corporate governance and disclosure in Malaysian corporations. In *Presented at the Asian AAA World Conference in Singapore* (Vol. 28, p. 30).
- Haynes, K. T., & Hillman, A. (2010). The effect of board capital and CEO power on strategic change. *Strategic Management Journal*, 31(11), 1145-1163.
- Hermalin, B. E., & Weisbach, M. S. (1991). The effects of board composition and direct incentives on firm performance. *Financial management*, 101-112.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management review*, 28(3), 383-396.
- Ingle, C., & Wu, M. (2007). The board and strategic change: A learning organisation perspective. *International Review of Business Research Papers*, 3(1), 125-146.
- James, H. S. (1999). Owner as manager, extended horizons and the family firm. *International Journal of the Economics of Business*, 6(1), 41-55.
- Janis, I. L. (1972). Victims of groupthink: a psychological study of foreign-policy decisions and fiascoes.
- Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, 48(3), 831-880.
- Jensen, M. C., & Smith, C. W. (2000). Stockholder, manager, and creditor interests: applications of agency theory. *Theory of the Firm*, 1(1).
- John, K., & Senbet, L. W. (1998). Corporate governance and board effectiveness. *Journal of Banking & Finance*, 22(4), 371-403.
- Joule, R. V., & Beauvois, J. L. (1998). *La soumission librement consentie: comment amener les gens à faire librement ce qu'ils doivent faire?*. Presses universitaires de France.
- Joule, R. V., Girandola, F., & Bernard, F. (2007). How can people be induced to willingly change their behavior? The path from persuasive communication to binding communication. *Social and Personality Psychology Compass*, 1(1), 493-505.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263-291.
- Katzev, R., & Wang, T. (1994). Can commitment change behavior? A case study of environmental actions. *Journal of Social Behavior & Personality*.
- Kiesler, C. A. (1971). *The psychology of commitment: Experiments linking behavior to belief*. Academic Press.
- Kirkpatrick, G. (2009). The corporate governance lessons from the financial crisis. *OECD Journal: Financial Market Trends*, 2009(1), 61-87.
- Kor, Y. Y., & Sundaramurthy, C. (2008). Experience-based human capital and social capital of outside directors. *Journal of Management*.
- Kroll, M., Walters, B. A., & Le, S. A. (2007). The impact of board composition and top management team ownership structure on post-IPO performance in young entrepreneurial firms. *Academy of Management Journal*, 50(5), 1198-1216.
- Kroll, M., Walters, B. A., & Wright, P. (2008). Board vigilance, director experience, and corporate outcomes. *Strategic Management Journal*, 29(4), 363-382.
- Laibson, D. (1997). Golden eggs and hyperbolic discounting. *The Quarterly Journal of Economics*, 443-477.

- Levine, R. (2005). Finance and growth: theory and evidence. *Handbook of economic growth, 1*, 865-934.
- Lorsch, J. W., & MacIver, E. (1989). Pawns or potentates: The reality of America's corporate boards: Harvard Business School Press. *Boston, MA*.
- Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of financial Economics*, 89(1), 20-43.
- Marrakchi Chtourou, S., Bedard, J., & Courteau, L. (2001). Corporate governance and earnings management. *Corporate Governance and Earnings Management (April 21, 2001)*.
- Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human resource management review*, 1(1), 61-89.
- Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of vocational behavior*, 61(1), 20-52.
- Minton, B. A., Taillard, J., & Williamson, R. G. (2012). Board composition, risk taking and value: Evidence from financial firms. *SSRN Working Paper Series*.
- Moore, D. A., & Healy, P. J. (2008). The trouble with overconfidence. *Psychological review*, 115(2), 502.
- Musteen, M., Barker, V. L., & Baeten, V. L. (2006). CEO attributes associated with attitude toward change: The direct and moderating effects of CEO tenure. *Journal of Business Research*, 59(5), 604-612.
- Olivero, B., & Jarboui, A. (2006). Influence des actionnaires institutionnels et dominants sur le comportement des dirigeants en matière de choix d'investissement: Une étude dans le contexte français de 1994 à 1998. In *COMPTABILITE, CONTROLE, AUDIT ET INSTITUTION (S)* (pp. CD-Rom).
- Oman, C., Fries, S., & Buitter, W. (2004). Corporate Governance in Developing, Transition and Emerging-Market Economies.
- Paulhus, D. L. (1998). Interpersonal and intrapsychic adaptiveness of trait self-enhancement: A mixed blessing?. *Journal of personality and social psychology*, 74(5), 1197.
- Pearl, J. (1986). Fusion, propagation, and structuring in belief networks. *Artificial intelligence*, 29(3), 241-288.
- Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: the role of message framing. *Psychological bulletin*, 121(1), 3.
- Roussiau, N., & Girandola, F. (2002). Utilisation des technologies comportementales dans les économies d'énergie et dans la protection de l'environnement. *Psychologie sociale appliquée: Environnement, santé et qualité de vie*, 39-57.
- Ryan, R. M., & Deci, E. L. (2000). The darker and brighter sides of human existence: Basic psychological needs as a unifying concept. *Psychological Inquiry*, 11(4), 319-338.
- Schelling, T. C. (1984). *Choice and consequence*. Harvard University Press.
- Sheeran, P. (2002). Intention—behavior relations: A conceptual and empirical review. *European review of social psychology*, 12(1), 1-36.
- Simons, R. (1995). Control in an age of empowerment. *Harvard business review*, 73(2), 80-88.
- Steptoe, A. (1991). Psychological coping, individual differences and physiological stress responses.
- Tasa, K., & Whyte, G. (2005). Collective efficacy and vigilant problem solving in group decision making: A non-linear model. *Organizational Behavior and Human Decision Processes*, 96(2), 119-129.
- Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and uncertainty*, 5(4), 297-323.
- Vancouver, J. B., & Kendall, L. N. (2006). When self-efficacy negatively relates to motivation and performance in a learning context. *Journal of Applied Psychology*, 91(5), 1146.
- Walker, D. (2009). A review of corporate governance in UK banks and other financial industry entities.
- Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological bulletin*, 132(2), 249.

- Weisbach, M. S. (1988). Outside directors and CEO turnover. *Journal of financial Economics*, 20, 431-460.
- Wiersema, M. F., & Bantel, K. A. (1993). Top management team turnover as an adaptation mechanism: The role of the environment. *Strategic management journal*, 14(7), 485-504.
- Witte, K. (1998). Fear as motivator, fear as inhibitor: Using the extended parallel process model to explain fear appeal successes and failures.
- Wright, D. W. (1996). *Evidence on the relation between corporate governance characteristics and the quality of financial reporting* (No. 9601). University of Michigan.
- Yu, C. F. (2013). *Roles of CEOs and information in financial reports, contracts, organizations, and markets* (Doctoral dissertation, Monash University. Faculty of Business and Economics. Economics).