INVESTOR'S PSYCHOLOGY COMMITMENT LEVEL AND ESCALATORY BEHAVIOR IN INVESTMENT DECISION

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Abstract

This study examines the reasons of investor's escalatory behavior in firm's investment decision. It shows the possible influence of three closely related features which are: firm's financial indicators, investor's risk profile, and investor's psychology commitment level, on a firm's investment decisions escalation. This study aims to provide evidence as to whether investor considers the financial and risk's perception features (financial strength and risk profile) in his escalatory behavior while he notes a high psychology commitment level.

The proposed model of this paper uses GLM univariate data analyses to examine this relationship. Investor's risk profile and his psychology commitment level have been measured by means of a questionnaire comprising several items. As for the selected sample, it has been composed of some 360 Tunisian individual investors. Our results have revealed that investors pay more attention to keep their psychology comfort than their financial comfort. It exposed the importance of the investor's commitment bias and its risk perception in explaining his investment decision escalation. Moreover results shows that there is strong and significant empirical relationship linking the investment decision escalation and the interaction effects between the three independent variables. This means that, in practice, investors consider the three factors simultaneously.

Keywords: Commitment Level, Escalatory Behavior, Investor's Risk Profile, Firm's Financial Strength Indicator, Investment Level

JEL Classification: D2, G3, L2, L5, M1

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1. Introduction

Investors should make good decisions, the right decisions in the right way at the right time (Schermerhorn and al, 2011). Essentially, the decision making process involves making choices basing on the accessible information at hand and the alternatives resultant from that information (Gilboa, 2011).

Most investors perceive themselves as rational decision makers. This means that they possess perfect information, distinguish all alternatives, know every consequence, and determine a complete preference scale (March, 2010). However, the reality shows that investors are all subject to *bounded rationality* (Colquitt and al, 2011; Nielsen, 2011). Bounded rationality means that decision makers is unable to know all perfect information and alternatives to make optimal choice (Simon, 1982, 1997, 2009).

Agreed that decision makers habitually do not have all the information and alternatives necessary to make good decisions and, then, are subject to bounded rationality, it is normally that source of error in decision making exist (George and Jones, 2008). "Throwing good money after bad" or the escalation of a failing decision is the major error in decision making, which is a human tendency to persevere a failing course of action. There is an important amount of studies that shows that individuals and groups escalate original decision in a failing course of action in order to rationalize their initial choice (Bobocel and Meyer, 1994; Bragger, 2003; Fai, Wong and al, 2006; Hi and Mittal, 2007; Mullins, 2007; Ross and Staw, 1993; Staw and al, 1997; Street and Street, 2006; Van Putten and al, 2009, 2010)).

The research of explanations of escalatory behavior in investment decision brings us, in the first

time, to be going to consult the traditional theory of rational choice. This theory interprets the inflows or outflows investor's decision in an investment opportunity by the capacity of this opportunity to procure a superior expected utility.

Traditional financial theory of rational choice show that investors pay only attention to the maximization of its utility function in the decision making process. There are two several reasons of investment decision escalation: (1) profitability (Ippolito, 1992; Berk and Green, 2004), and, (2) importance of committed costs (Sirri and Tifano, 1998; huang and al., 2005),

However, today's phenomena show that the observed investor's behavior poses undeniable questions in the measure that is contrary to predictions of the so-called theory.

Consequently, the emergence of behavioral finance approach founded on the hypothesis of the limited rationality, permits to explain better the investment decision escalation while noting the behavioral biases (optimism, Heaton (2002); loss aversion, Mairesse and Mohnem (2005), overconfidence, Baker et al. (2004) ; …) as a determinants of this decision.

In other way, we can also explain the investment decision escalation by referring to contributions of *the theory of commitment.* Thus, an investor faced with negative feedback about a project may feel the need to justify the whole of time and money already sunk into the project (Kundi, 1997; Kundi and al, 2007). White (1986) expresses "commitment to a failing course of action is a need on the part of decision makers to maintain the illusion that they haven't erred". In Staw (1981) word, this happens because, even in the face of negative feedback, decision makers "continue investing commitment to a dying course on the assumption that short term problems are the necessary costs/losses for achieving long term large objectives".

Several, theoretical and empirical studies have tried to express the causes of commitment bias in different ways. Fox and Staw (1979) suggest that manager escalates if "he makes the initial decisions (responsibility pressure)" and/or "is under the pressure of being responsible for the consequences". They also indicate that job insecurity and policy resistance also increase the commitment to an initial chosen decision.

Most of the researchers agree on the four fundamental causes of escalation which are: a) project related; b) human psychology/personality; c) social and d) organizational. (Brockner, 1992; Keil, 1995, 1998, 2000; Hall, 2003; Chee-Wee and al 2006; Kundi and Nawaz, 2006).

She (1991) found that "escalation happens due to the nature of investment, psychological factors and organizational factors".

This study examines the reasons of investor's escalatory behavior in firm's investment decision. It shows the possible influence of three closely related features which are: firm's financial indicators (the traditional financial theory), investor's risk profile (the behavioral finance theory), investor's psychology commitment level (the theory of commitment), on a firm's investment decisions escalation.

It will provide an important contribution to the setting of explanations of investment decision by the calling of the psychology commitment level as a plausible determinant. This study will provide evidence as to whether investor considers the financial and risk's perception features (financial strength and risk profile) in his escalatory behavior while he notes a high psychology commitment level.

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. Literature Review

2.1. Investor's commitment level and investment decision escalation

It is said that "a trapped administrator is one who remains inflexible to change in the face of negatives consequences" (Fox and Staw, 1979). Thus, researchers show that "decision makers may even stick with their bad decision for more than rationally required" (Brockner and al., 1986). In this phase, "projects take a life of their own, thereby eating up more resources and delivering no real value", (Warne and Hart, 1996; Keil and al., 2000; Hall, 2003). Several studies reveals that decisions makers continue to invest in their initial course of action even after receiving considerable negative information concerning its availability (Chee-Wee and al., 2006; Van Putten and al, 2009, 2010; March, 2010).

Meyer and Allen (1991) propose that commitment as a psychological attachment may take the following three forms: affective, normative and continuance types of commitment. These forms may also be seen as bases of commitment, motives engendering attachment (Becker 1992).

Strong commitment depends on the existing of several factors, which are: The context of freedom in which the action was carried out, the public nature of the action, the explicit nature of the action, the irrevocability of the action, the repetition of the action, the consequences of the action, the cost of the action, the reasons for the action (absence of external reasons: promises of a reward, threats of punishment).

According to the circumstances, individuals will feel more or less bound by the act they were encouraged into doing. We can consequently understand why Kiesler (1971) chose to define commitment as the link between individuals and their actions.

H1: A high commitment level will have the greatest influence on the investment decision escalation.

2.2. Investor's risk profile and the investment decision escalation

The analysis of the psychology of the investor provided an important number of advanced that contribute to explain his behavior on investment decision.

In the behavioral finance literature it is documented that investors are more sensitive to losses than to gains. This feature stems from prospect theory and was predictable by Kahneman and Tversky (1979) among others. Thus, investors who present myopic loss aversion are less motivated to invest a greater amount of their wealth into risky assets if they evaluate their investments more frequently.

Samuelson and Zeckhauser (1988) propose in the same setting the bias of statu quo. This bias determines the decision of the investor to maintain the initial investment choice because of the importance of efforts and costs committed in the stage of the hold of position on this choice. He considers these committed costs and efforts like a point of reference. Every time that he is going to change his position on a fund, he is going to commit some similar costs. Of this fact (Mangot, 2005) shows that the agent has a tendency to let the unaltered things because this strategy is considered arbitrarily as the strategy of reference.

Daniel and al. (1998) and Mangot (2005) analyze the bias of conservatism or attribution. According to these authors, the investor keeps his position on his initial choice while granting an important weight on the news that comes to confirm this first choice that to those that come to invalidate it. This bias of attribution maybe in part attached to the phenomenon of cognitive dissonance.

In this setting, Samuelson and Zeckhauser (1988), note that when the investor receives a flow of information to contradictory consequences, he hung a process of selection of information. This process consists to overweight those that go in the sense of the confirmation and to avoid those that come to contradict it. He adopts a strategy aiming to stabilize him psychologically. This strategy is called a confirmation bias.

Thus, in the same order of ideas, we hypothesize in this study that the investor's risk profile influences his investment decision. So, a very defensive risk profile is associated positively with the investment decision escalation.

H2: An investor's defensive risk profile (as opposed to dynamic risk profile) will have positive influence on the investment decision escalation.

2.3. Financial strength and the investment decision escalation

The profitability is traditionally evoked by researches as an important heuristic for the decision making. These researches, generally based on the theory of rational choice, respect the formula of Helmut Schmidt that says "today's profits are tomorrow's investments".

Ippolito (1992) studied the impact of the relative profitability on the nets inflows in funds in the United States. The author verifies a linear and meaningful relationship between these two variables. To the same title, Berk and Green (2004) consider that the increasing slope of the relationship between the relative profitability and the nets inflows in the fund provides a perfect informative signal on the quality of the fund. For this reasons investors choose to invest further in funds to superior profitability.

A number of studies are conducted, lately, while based on the limited rationality hypothesis, aims, on the contrary, to prove a no linear relationship between the past profitability and the investment decision.

Among these works, the survey conducted by Sirri and Tufano (1998) shows, using the different measures of the fund profitability, that for the most funds, the profitability explains positively and meaningfully the inflows in these funds. For funds to moderate profitability the relationship is statistically weak, whereas, for those the underperforming the result shows that these funds don't know any meaningful outflows. Huang and al. (2005) verify an asymmetric relationship between the nets inflows in funds and their relative profitability. These authors verify, that underperforming funds know, for the same reason as those most performing, meaningful inflows.

Thus, in the same way of the traditional financial theory we have the following hypotheses:

H3: company strong financial indicators (Z score) will have a greatest influence on the investment decision level.

3. Methodology

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 three main parts, based on treated areas in theory:

- The first part aims to collect some company's financial indicators from financial annual statement (Operating profit, total assets, current liabilities, long-term debt, current assets, earnings before interest and tax, R&D expense, sales,…).
- The second part focuses on determination of the level of investor's commitment bias.
- Party three aims to knowing the nature of investor's risk profile and the investor's age.

The questionnaire is addressed to investors in Tunisian individual companies. The subjects were each given one case, chosen at random from the list of investors implanted in the region of Sfax in Tunisia provided by "Agency of promotion of industry" in this region. Based on the research design, the study required 360 subjects.

As indicated in Table 1, the majority of companies that participated in the study are smaller firms and all respondents are individual investors.

Table 1. Profile of subjects

	Total	Percentage
Firm's Activity		
Agriculture and crafts	24	7
Industry	221	61
Commerce and Service	115	32
Investor's Experience in entrepreneurship		
3–6 years	76	21
7–10 years	242	67
> 10 years	42	12
Investor's Age		
<46	245	68
>46	115	32
Total	360	100

3.2. Variables' measurement

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

3.2.1. Escalatory behavior: The investment decision escalation (dependant variable)

The purpose of this article is to provide evidence as to whether investors consider the financial and risk perception features (financial strength and risk profile) in his escalatory behavior (investment decision) while he notes a high psychology commitment bias. The appropriate measure in the literature to evaluate investment decision escalation is the investment level which uses the indicators of overinvestment and underinvestment.

In this study, we will use two indicators of investment level which are: overinvestment (low future investment opportunities and free cash flow) or underinvestment (low free cash flow and Future investment opportunities).

- The free cash flow ratio as conceptualized by Jensen (1986) is measured as operating income before depreciation interest expense and taxes, as well as dividends paid (Lehn and Poulsen, 1989; Gul and Tsui, 1998; Jaggi and Gul, 1999) divided by book value of total assets to account for effects related to size (Lang et al., 1991).

Free Cash Flow Rate (FCFR) = Operating profit / total assets.

- Future investment opportunities are measured by Tobin's Q (Skinner, 1993). Tobin's Q is defined as the ratio of market value of a firm to the replacement value of its assets (Lindenberg and Ross, 1981; Griliches, 1981; Cockburn and Griliches, 1988; Megna and Klock, 1993; Skinner, 1993). In our study, we will employ an approximation of Tobin's Q, considered as follows (Chung and Pruitt, 1994):

$$\mathbf{Qit} = \frac{\mathbf{MVSit + Dit}}{\mathbf{Ait}}$$

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.

Based on these indicators, investment level is as follows:

- 1 if the investor decides overinvestment: low future investment opportunities and free cash flow
- 0 if the investor decides underinvestment: low free cash flow and future investment opportunities.

3.2.2. Commitment level:

To measure the investor's commitment level, we takes the same steps than the most of studies have used 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 and *al.*, 2002).

The commitment bias takes 2 follows:

- 2 if the investor has a high level for this bias
- 1 if not

3.2.3. Investor's risk profile

To determinate the nature of the investor's risk profile, we refers to the questionnaire elaborated by Centea organization which is intended exclusively to characterize individual investor's risk profile.

The risk profile takes 2 follows:

- 1 if the investor has a defensive risk profile
- 0 if the investor has a dynamic risk profile

3.2.4. Financial strength indicators

When deciding a choice about where to put their money, savvy investors use ratio analysis. There are three kinds of ratio analysis: Profitability Ratios determine how much profit a company creates, Gearing Ratios evaluate a company's leverage, Liquidity Ratios measure the capacity of a company to meet its debts, and Investment Ratios determine the performance of the overall business. These ratios help investors to get the information they need to make an optimal decision.

Using a model of univariate discriminant analysis, Beaver (1996) envisaged financial distress using thirty financial ratios to evaluate 79 pairs of failed and non-failed companies. Beaver asserted that ratio of current assets to total assets and ratio of net benefits to total assets are capable to distinguish companies that will be bankrupt to those that will not. His model succeeded to predict, respectively, 90% and 88% of cases.

In this study, the financial strength indicator used is Altman's five ratios, which designate three levels of financial strength: strong, moderate, and weak.

Altman (1968) used multivariate linear discriminant analysis (MDA) to determine a cut-off value that enabled him to predict with 95% precision the criteria indicating which companies were in financial distress or vice versa.

The Z score calculated using five of Altman's ratios are as follows.

$$\textbf{Z score} = 1.2\ WC/TA + 1.4\ RE/TA + 3.3\ EBIT/TA + 0.6\ MV/BV + 1.0\ Sales/TA$$

Z score = financial condition of the company (strong, moderate and weak)

WC/TA = working capital/total asset

RE/TA = retained earnings/total asset

EBIT/TA = earnings before interest and tax /total asset

MV/TA = market value of share/book value of debt

Sales/TA = sales/total asset

Based on the Z score, Altman distinguish companies as strong, moderate and weak. In this study, financial strength representing the independent variable measured by Altman's Z score takes the values follows:

1 = weak,
2 = moderate; and
3 = strong.

3.2.5. Control Variables

Our study controls for dept level, R&D intensity and investor's age, as previous research has shown that these three factors do affect investment level.

3.2.5.1. Dept level and investment decision escalation

In corporate finance, the role of liabilities on investment decisions has drawn keen attention. In the first time, the Modigliani-Miller Theorem (MM Theorem) showed that in a perfect market, the level of liabilities does not affect corporate investment behavior. They noted that there is no relationship between fund procurement and the debt ratio. However, as regards the negative effects of liabilities on corporate management, it is noted, that liabilities can influence corporate investment behavior through the following two channels. Firstly, as important liabilities increase bankruptcy risks, corporate managers tend to go in for the limitation of borrowings and/or reducing investments which potentially increase the prospect of underinvestment. Secondly, higher debts level produce larger interest payment weight, which reduces liquidity, thus, debt has a negative impact on the investment level.

Arikawa et al. (2003) adopt the method of estimation used by Lang et al. (1996) and show that the main bank system in Japan facilitated to amplify the disciplinary role of liabilities, principally for low-growth companies. In this setting, Muramatsu (2002), based on the theory of Jensen (1986), asserts that the disciplinary role of liabilities or monitoring by main banks was not significant. Thus, author concludes that overinvestment happened in Japan during the bubble period.

Thus, previous studies have verified the role of liabilities on investment and its effect in restraining overinvestment and facilitating underinvestment. These studies suggest that liabilities limit overinvestment but probably cause underinvestment.

In this study we hypothesize that the importance of the dept level constraints investors to escalate their investment decision by its disciplinary effect.

H5: A high dept level is negatively associated with investment decision escalation.

We observe a number of variables that measure the level of debt. Measures like total debt services ratio has been adopted by several researchers (Hovakimian and al, 2004). While others have envisaged the debt ratio in the medium and long term (Myers, 2001). Titman (1984) has used the debt ratio in the short term.

In this setting we recommend to use the debt ratio as a measure of this variable measured by:

Leverage ratios (LEV) = (total debt / total assets)

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

3.2.5.2. R&D intensity

To investigate the relationship between investment decision escalation and R&D intensity we refer to the notion of entrenchment in terms of manager-specific investments evoked by Jensen and Meckling (1976), and Jensen (1986). Entrenchment is caused by an excessive investment in assets corresponding to managers' skills. These investments enable managers to increase their own return. The degree of entrenchment is described by how specific firm's assets characterize managers' talents.

For these objective managers make too many investments specific to their own skills. The cause is simply that they are investing shareholders' wealth rather than their own. By using shareholders' funds to make manager-specific investments, managers bind shareholders to themselves.

In this study we hypothesize that investor who decide to invest an important sum of his own in specific assets become strongly attached to his project and choose consequently to escalate his initial investment decision.

H6: A high R&D intensity is positively associated with investment decision escalation.

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

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

3.2.5.3. Age

Golec (1996), Chevalier and Ellison (1999) discuss the relation between age and the performance of the fund manager. According to these authors age reflects the manager's capacity to resist in situations of stress. In this case the youngest manager resists better to the pressure and tension that characterize this type of profession. Thus, the relation between age and the performance is negative. Authors consider two other arguments in favor of the youngest manager resistance. The first argument is that the youngest managers are generally the most formed to the modern financial theories, the second is that they are generally motivated.

In this setting, Golec (1996) develops a survey that aims to sketch the portrait of an ideal "manager ". This survey is realized on a sample of 530 managers in American mutual funds and of which the result shows that the manager who displays the best performances is relatively young (less than 46 years).

To this level we hypothesize that the youngest investor resists better on pressures and tensions in situation of stress. So:

H7: investors younger than 46 years escalate more his investment decision than those are older than 46 years.

Table 2. Operational definitions of variables

Class :	Phenomena :	Measure :	Notation	Prediction
Independent Variable :				
Investment decision escalation	Overinvestment/ underinvestment	*Overinvestment:* low future investment opportunities and free cash flow *Underinvestment:* low free cash flow and future investment opportunities.	**IDE**	
Dependent Variables:				
Commitment level	Psychologic link between the investor and his project	The questionnaire obtained score	**CL**	+
Financial strenght	Firm's performance indicators	Z score calculated using five of Altman's ratios	**FS**	+
Investor's risk profile	Qualification of the investor's risk profile	The questionnaire obtained score (defensive : 2/ dynamic :1)	**RP**	+
Control Variables :				
Dept level	Firm's liabilities level	Leverage ratios (LEV)= (total debt / total assets)	**DL**	-
R&D intensity	Firm's specific assets	Firm's R&D expense/ total assets	**RDI**	+
Age	Investor's age		**AGE**	-

3.3. Experimental Design

This study used a 2. 2. 3. factorial design where it is associated only one case for each investor's investment decision. The combination of 3 factors of independent variables resulted in a 12-case combination, where each case was different. The design is shown in Table 3.

Table 3. Factorial design

	Independent variables	
A	B	C
Commitment level	Risk profile	Financial strength
2	**2**	**3**

The indicators of the independent variables are shown in Table 4.

Table 4. Detail on indicators of the independent variables

No	**Commitment level**	**Risk profile**	**Financial strength**
1	High	Dynamic	Strong
2	Law	Defensive	Moderate
3			Weak

The combinations of the 12 cases are shown in Table 5.

Table 5. Case combination

No	**Commitment level**	**Risk Profile**	**Financial strength**
1	High	Defensive	Strong
2	High	Defensive	Moderate
3	High	Defensive	Weak
4	High	Dynamic	Strong
5	High	Dynamic	Moderate
6	High	Dynamic	Weak
7	Law	Defensive	Strong
8	Law	Defensive	Moderate
9	Law	Defensive	Weak
10	Law	Dynamic	Strong
11	Law	Dynamic	Moderate
12	Law	Dynamic	Weak

3.4. Analysis and results

Based on the factorial design, the statistical model of the study can be stated as follows:

$$IDE = \alpha + b1CL + b2\mathrm{RP} + b3\mathrm{FS}$$

Where:

IDE = An investor's investment decision escalation (dummy variable: Overinvestment:1 or Underinvestment: 0)

CL= An investor's commitment level (high: 2, low: 1)

RP=An investor's risk profile (Defensive: 2, dynamic:1)

FS = Financial strength (strong: 3, moderate: 2, weak: 1)

General Linear Model Univariate Analysis of Variance (GLM UNIANOVA) was used to test hypotheses 1, 2, 3 and 4.

4. Results and Discussion

Table 6. GLM univariate test: Tests of between subject effects

Source	Type III sum of squares	Df	Mean square	F	Sig.
Corrected model	55,361[a]	7	7,909	82,512	,000
Intercept	4,013	1	4,013	41,866	,000
CL	6,036	1	6,036	62,971	,000
RP	3,734	1	3,734	38,954	,000
FS	,240	1	,240	2,504	,114
CL*RP	4,889	1	4,889	51,010	,000
CL*FS	2,667	1	2,667	27,822	,000
RP*FS	2,204	1	2,204	22,996	,000
CL*RP*FS	4,538	1	4,538	47,340	,000
Error	33,739	352	9,585E-02		
Total	162,000	360			
Corrected total	89,100	359			

Note: [a] R squared = .621 (adjusted R squared = .614)

The effect of commitment level on investment decision escalation

The study relied on GLM univariate analysis to test the first four hypotheses shows in table 6 that the commitment level has a significant (0.00 at alpha = 0.05) effect on an investor's investment decision escalation.

This result is consistent with the findings of many searchers such as (Kundi, 1997; Kundi and al, 2007).

In this setting White (1986) affirms that "commitment to a failing course of action is a need on the part of decision makers to maintain the illusion that they haven't erred". Moreover Staw (1981) asserts that this happens because, even in the face of negative feedback, decision makers "continue investing commitment to a dying course on the assumption that short term problems are the necessary costs/losses for achieving long term large objectives".

According to the earlier work of Kiesler (1971), and a numerous researches which coming to enrich this work such as Joule and Beauvois (1998), as far as attitudes are concerned, committing oneself to a counter-attitudinal action leads to a change of attitude or rationalization. While, concerning behavior, committing oneself to a decisional action leads the decision maker to bind to it (freezing effect, low-ball effect). Committing first to an inconsistent action increases the possibility of complying to following more demanding requests as long as the course of action becomes consistent (teasing effect and foot-in-the-door).

However, these studies shows that this type of effect on attitudes and behavior can be obtained only when the first action (preparatory act) was contracted in specific commitment contexts. Therefore, the similar action can be more or less binding, and can even be perceived as nonbinding. Researchers have shown that "the stronger the commitment the bigger the effects".

The effect of financial strength on investment decision escalation

The study relied on GLM univariate analysis to test the first four hypotheses shows in table 6 that firm's financial strength indicators (FS) has a non significant (0.114) effect on an investor's decision escalation.

This result is consistent with the findings of Bellando and Trandieu (2008), and, Goetzmann and Peles (1997) whose shown that inflows in fund is not conditioned by a firm's financial condition.

With respect to the task enjoyment question, individuals receiving the lower Z score will report higher levels of enjoyment than those receiving the higher Z score. This follows the earlier literature on cognitive dissonance (Aronson, 1992, 1994; Festinger, 1957).

According to the theory of cognitive dissonance, an individual registers dissonance when her behavior is inconsistent with her cognitions. Generally, it may be easier to change one's cognitions than changing one's actions.

Based on the logic above, investors receiving the low Z score are be in a situation of dissonance shown in the conflict between the cognitions "I exerted effort to earn a large sum of money," and "I received the low Z score". Integrating the cognition "I'm not good at this task" diminishes the difference between an investor's expected utility and their low Z score received. Incorporating the last cognition means that investors receiving the low Z score will be pessimistic in their abilities, so reducing the dissonance resulted from having exerted effort only to obtain a low return to their effort.

In this stage, investors may integrate cognitions associated to her ability to reduce dissonance, thereby committing additional effort to rationalize initial effort they exerted in the first choice.

On the other hand, investors who received a high Z score do not experience the dissonance state. As a result, these investors are more probable to be unbiased regarding their abilities on the initial decision.

Interaction between Factors

There are several important findings in this study. As seen in Table 6, all interactions (CL*RP; CL*FS; RP*FS; CL*RP*FS) have a significant effect (0.00 lest than alpha = 0.05) on investor's investment escalation. These results show that investors examined the factors simultaneously. Thus, H4 is accepted.

In earlier work (Ross and Staw 1993), we proposed that decision escalation may involve the interplay of four sets of forces over time, which are:

a) Project determinants: this category gathers objective aspects of a project, Northcraft and Wolf (1984), Mc Cain (1986), Bateman (1983) give examples of research on project variables (such as: project's closing costs, project's salvage value,…).

b) Psychological determinants: this rubric includes psychological aspects of decision maker, such as reinforcement traps, individual motivation, decision making errors, and biases in information processing. James (2002), Malcolm and all (2004), Zayer (2007) provide examples of research on psychological determinants.

c) Social determinants: this category gathers interpersonal aspects that may lead to increase investor's commitment in its project. Several researches are conducted on social determinants such as Simonson and Staw. (1992), Keil and Robey (1999), and Heng and al. (2003).

d) Organizational determinants: includes variables such as the level of economic and technical incurred by the organization with respect to the project, the level of political support for a project within an organization… (Pfeffer (1981), Goodman, and al. (1980)).

In this study we employ three variables which are: Commitment level (as a social psychological determinants), investor's risk profile (as a psychological determinants), and firm's financial strength indicator (as a project determinant).

This categorization of variables explains its significant interaction effect in the explanation of the investment decision escalation.

Conclusion

This research examines the determinants of firms' investment decision escalation employing an investor's social psychological aspect which is: commitment bias introduced simultaneously with the firm's financial indicators, and, investor's risk profile.

Theoretical analysis indicated that escalation of commitment is the tendency of decision makers to maintain to invest time, money, or effort into a failure decision or unproductive course of action. The expression "throwing good money after bad" because they have "too much invested to quit" captures the real meaning of this frequent decision-making error. Escalation of commitment has managerial consequences. Many organizations have experienced large losses, because the manager was determined to justify his original choice by continuing to commit resources to a non profitable decision. March, declare it this way: "Now that I have made my decision, I need to find good reasons for it."

Empirical analysis presents survey of individual investors in Tunisia. The GLM univariate data analyses revealed the importance of the investor's commitment bias and its risk perception in explaining his investment decision escalation. However, empirical relationship analysis between firm's financial indicators and investment decision escalation shows that, in decision making process, investor pays little attention to firm's financial strength.

There is strong and significant empirical relationship linking the investment decision escalation and the interaction effects between the three independent variables. This means that, in practice, investors consider the three factors simultaneously.

Thus, investor's investment decisions analysis realized by integrating the commitment level and the behavioral dimension in risk perception is not consistent with the traditional financial theory which predicated that investors pay only attention to the maximization of its utility function in the decision making process. While, in this study we asserts that the investor, affected by its psychological commitment level and its behavioral risk perception, escalates his initial investment choices in spite of its failure in this decision.

Like any other, this study has its limitations. Even though investment decision escalation is explained only by project and psychological determinants, other factors discussed in previous literature (Ross and Staw 1993), such as the social and organizational determinants, were not considered. These factors could be taken into consideration in future studies.

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