# BEHAVIORAL ENTREPRENEURSHIP THEORY: A SURVEY AND FUTURE DIRECTIONS

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## ABSTRACT

*The aim of this paper is to present a comprehensive literature review around the transition from rational to behavioral entrepreneurship theory, and its implications. In fact, it discusses in some depth the origin and the behavioral aspects of this new theory. It presents also a review of the most documented biases and their effect on entrepreneurial decisions. At the end of this paper, we propose some future directions of research around this new behavioral theory.*

**Keywords:** Entrepreneurship Theory, Rational Entrepreneurship Theory, Behavioral Entrepreneurship Theory.

## INTRODUCTION

The entrepreneurship theory constitutes one important pillar of the economic theory, and it has an increased interest in these last years. Departing from an economic point of view, entrepreneur is defined as a super-calculator who always essays to maximize his/her utility function which has a concave form reflecting his/her risk aversion. The rational investor assumption in the economic theory has a direct implication in various related theories such as the financial and entrepreneurship theories.

At an aggregate level, we can talk about a revolution in the economic and entrepreneurship theories. We insist on a transition from rational to a behavioral framework. According to Kondo (1990), in economics, it is usually assumed that people are rational and egoistic, and Muthoo (1996) argues that the rationality is taken an egoistic behavior in which a person maximizes his/her expected utility and as an opposite to social or even "*Human*" behavior. In a rational framework, we can draw a "*Homo-economicus*" model that describes the rational behavior of economic agents. Fontela et al. (2006) argue that entrepreneurial behavior is mainly characterized by rationality. In fact, the successful modern enterprise is based on the existence of rational decision makers operating in relatively predictable micro-economic market. They argue also that rationality is in pursuit of profit maximization which supposes a rational optimization of technologies, a rational optimization of financial structures and a rational optimization of all others firm policies.

The rational theory of entrepreneurship rises upon the basic assumptions that entrepreneur is like a super-calculator who tries always to maximize his/her utility function. He is someone who respects a methodological rational process when making decisions. As is described by Fairchild (2005, 2007) the rational theory supposes also that entrepreneurs and economic agents are emotionless and that they act in a fully rational way.

However, the simple economic models are in the most of time poor predictors of human behavior (Harbaugh, 2003). Thaler (1999) concludes that real financial markets do not resemble the ones we would imagine if we only read financial textbooks. He evokes the case of investors' sentiment and behaviors in the financial markets. Investors are governed by their sentiment and so their investment decisions do not respect the rationality axioms.

For this, it is the time to reconstitute the economic models in order to integrate some new variables that may affect the decision-making process. People are never rational as described in the standard finance (Haugen, 2000). In reality, investors were normal before Miller and Modigliani described them as rational, and they remain normal today (Statman, 2005).

Investors' choice can be affected by cognitive biases and emotions in contrary to the rational investors' assumption. The behavioral finance is considered as an alternative approach that can complete the standard approach. It is the paradigm where financial markets are studied using models that are less narrow than those based on Von Neumann-Morgenstern expected utility theory and arbitrage assumptions (Jay, 2003).

The origins of the behavioral approach begin with the adhesion of economists who had reacted to the imperfections of rational models and had inaugurated a new field of studies (Bernstein, 1996). It studies the influence of economic agents' psychology on the behavior of financial practitioners and the subsequent effect on markets. It is of interest because it helps explain why and how markets might be inefficient.

The behavioral economic approach has a great influence on the entrepreneurship theory. The recognition of the role of personal psychology of entrepreneur contributes to the development of a new theory that is commonly called "*Behavioral Entrepreneurship Theory*". In fact, there is a recognition on the potential effect of psychological, cognitive and emotional factors on entrepreneurial motivation and on entrepreneurial process and decisions (Hayward et al., 2006).

This means that the new venture success or failure, opportunities identification and pursuit and all others related activities are rational. This is will not be the case regarding results from cognitive and experimental psychology which insist on the fact that entrepreneur as well as others economic agents suffer from some psychological, emotional and cognitive biases (Baron, 2007).

In this paper, we essay to pursuit the transition from rational to the behavioral economic framework and their implications on entrepreneurship theory. The review of the literature was carried out according to the systematic review process defined by Pittaway et al. (2004, 2007) and Centobelli et al. (2016, 2018) that are well-known in the field of literature reviews concerning entrepreneurial and managerial topics.

The remainder of this paper is organized as follows: section one deals with definitions of central concepts: the entrepreneur and the entrepreneurship. Section two provides a literature review around the transition from rational to behavioral theory. Section three discusses the implications of the transition from rational to the behavioral theory on entrepreneurship. This section also offers a discussion of some well documented psychological biases and theories that belong to the behavioral approach. Section four provides a review around the effect of two special and most documented psychological biases on entrepreneur's decisions: optimism and overconfidence. Section five offers a discussion and future directions of research around the behavioral entrepreneurship theory. Finally, section sixth concludes.

## THE EVOLUTION OF THE CONCEPT OF ENTREPRENEUR AND ENTREPRENEURSHIP

The concept of entrepreneur includes many special meanings and sometimes having little connections between them (Cunningham & Lischeron, 1991). There is currently no clear agreement on what is really the definition of the entrepreneur (Bygrave & Hofer, 1991; Cunningham & Lischeron, 1991). This is because each author refers to one or more specific criterion to advance a clear definition of entrepreneurs. This section aims to discuss the evolution of the concept of entrepreneur and entrepreneurship.

The analysis of the evolution of the perception of entrepreneurship in economic thought can help us to identify, in the best way, this central concept. In fact three visions can be adopted as reference to draw the entrepreneur's definition. Especially, we can refer to three pillars in this subject, mainly, Cantillon, (1755); Say, (1803) and Schumpeter, (1934, 1947). These authors as pioneers in entrepreneurship have largely influenced the concept of entrepreneurs.

From an economic point of view, Cantillon (1755) is the first one who proposes to define the profile of entrepreneur which is unpredictable and uncertain (Lemesle, 1988). It makes the contractor the centerpiece of economic dynamics (Lawrence, 1989). The entrepreneur is defined as someone who exercises judgment to cope with uncertainty.

From this definition, we can learn that entrepreneur should have the ability to predict the future economic events. He/she would be able to apply his/her knowledge in order to reduce the effect of the economic uncertainty and then to succeed his/her venture.

In fact, the entrepreneur has been defined according to his/her function which is the risk prediction (Laurent, 1989). This is because entrepreneurship is a risky adventure and the entrepreneur should be able to confront the uncertainty that can appear during this venture (Van-Lemesle, 1988). As a counterpart of this risky activity, entrepreneurs should benefit from a fair compensation.

From this first definition, we can see that Cantillion concentrates on the function and not on the personality of an entrepreneur to draw the definition of the concept of the entrepreneur (Link, 1989). This definition supposes implicitly that entrepreneur is rational enough so that he/she can predict risk with certainty.

Another important definition was initiated by Say, (1803). He argues that entrepreneurs have a real contribution to their organizations (Lemesle, 1988). An entrepreneur is supposed to be a centerpiece of the economic exchange (Lawrence, 1989). These authors extract a definition of entrepreneur from the production and distribution theory. The entrepreneur is someone who applies a coordinating role at these levels (Shailer, 1994). As is mentioned by Lemesle (1988), the entrepreneur is a coordinator since he/she should combine the production factors in order to create and maximize the output. This definition can be used to include all entrepreneurs, who are owners or not and also it can be extended to include all responsible of organizations (Bruyat, 1993).

It is clear so that the crucial mission of an entrepreneur in the economy is the combination between different tasks: entrepreneur, productions director, he/she also will be the responsible for providing not only the production but also its funding and profitability, he/she organizes, command, coordinate and control.

The third definition is that of Schumpeter (1934, 1947). He draws a definition of the meaning of entrepreneur. In fact, the entrepreneur is someone who should recognize the dynamic economic problems where the rule changes (Lawrence, 1989). In the expression of Buryat (1993), the entrepreneur is someone who essays all times to introduce and led innovation. This definition completes the previous definition because the entrepreneur is defined as one who creates a combination between the production factors in order to innovate in the process of economic development.

These definitions can be combined in order to understand the concept of the entrepreneur. In fact, we can use the risk and innovation as advanced by Say and Schumpeter. An entrepreneur is someone who collects and employs in a rational way a set of various assets in order to achieve an opportunity. He/she should apply risk and innovation in order to achieve his/her goals. From an economic point of view, entrepreneur has been identified as a useful construction for understanding economic development.

However, these definitions are from economists who think that only the industrial and technical skills of individuals could be considered as fixed quantities. But, this is a very restrictive assumption because these skills are the product of circumstances of the environment where they live.

From the 1960s, the entrepreneur analyzing has extended to other disciplines (Gartner, 1988). The economic analyzes are extended to take into account the psychology, sociology and others disciplines in entrepreneurship. With the evolution of entrepreneurship, the definition of entrepreneur should also evolve. As a result, many studies have been conducted in order to give others definitions of the concept of entrepreneur. Mainly two approaches can be advanced: the deterministic approach and the behavioral approach.

The deterministic approach, or trait approach (Gartner, 1988), argues that entrepreneurs are considered as the unit of analysis. It brings together research in order to identify the personal characteristics of entrepreneurs. The ultimate goal of such theory is to define the entrepreneur by establishing his/her profile type.

Under this deterministic approach, an entrepreneur can be defined regarding his/her characteristics. In fact, Litzinger (1965) defines the entrepreneur using his/her preference for risk, independence, leadership, recognition, compliance, volunteer structure, and consideration. Another work by Hornaday & Abdou (1971) highlights that the most relevant characteristics to be an entrepreneur are mainly the need of achievement, intelligence, creativity, energy when taking initiative, leadership, greed for money, the desire for recognition, power, and tolerance of uncertainty.

The entrepreneurial profile is a moving conception. In fact, Barden (1977) introduces the motivation as a new component of the entrepreneurial profile. The propensity for risk- taking is introduced by Brockaus (1980). While Welsch & Young (1982) demonstrate that the most relevant characteristics are the self-esteem, risk taking and the openness to innovation. Finally, Gill (1985) proposes a profile based on entrepreneurial motivation and skill level.

The behavioral approach, which is the less developed approach, considers that the entrepreneur is a central key element in the complex process of business creation. An entrepreneur is more than a set of individual characteristics and he/she is different from an economic function. In contrast, he/she is a coherent set of management attitude (Stevenson et al., 1993).

However, the behavioral approach is imposed now and its aim is large than the old conception of this approach. We talk now about a theory of behavioral entrepreneurship which should be analyzed and its implications should be explored and discussed (Baron, 2007). In the second section of this paper, we will draw the transition from the rational to the behavioral entrepreneurship theory. Then, implications and future research directions will be proposed.

## FROM RATIONAL TO BEHAVIORAL ECONOMIC THEORY

The aim of this section is to draw and explain the transition from rational to behavioral economic theory and it offers a comparison between these theories. In fact, it has largely been assumed that economic agents are fully rational and they are able to act in an optimal way since they are supposed to behave as "super calculators". The rationality of economic agents, including entrepreneur, is an old concept that was begun with the utility function of Von-Newman and Morgenstern (1947). In the standard economic theory, the entrepreneurship theory was dominated by the rational entrepreneurship theory. According to this theory, entrepreneurs are rational. They act in a rational way and, they will decide in an optimal manner. They repose to the classical decision theory when making corporate decisions.

The classical decision theory postulates that entrepreneurs arrive to maximize their utility functions and the value of the firm is under their control since they follow in their making process a rational process which is mainly based in some steps that he/she will follow. Oliveira (2007) affirms that the classical decision theory is a normative theory which is based on some axioms. He talks about "*Fundamentals axioms*". Entrepreneurs make their decisions according to these fundamentals axioms and, they respect a rational decision process which began with the generation of alternatives, the analyses of the feasibility of each alternative and finally, they choose the best alternative by a combination between the desirability and the feasibility as described by Rubinstein (1998).

The rational decision process is based on these fundamentals and entrepreneurship are supposed to arbitrate between alternatives (Hoch et al., 2001) according to a scientific criterion that maximizes their own value as well as the firm value.

The risk aversion hypothesis and the form of entrepreneurship utility function are in the center of a debate. According to the risk aversion hypothesis, entrepreneurship will never present a risk-seeking attitude toward risky events and so the utility function will be always concave. Khaneman & Tversky (1979), departing from experimental psychology, find that when making their decisions under uncertainty, people are not always risk averse. In their work, they run an experiment via two questions. In fact, People are asked to choose between alternative (A): A sure gain with the probability of 75% and alternative (B): A chance to gain more but with the probability of only 25%. Then, they are asked to choose between two other prospects (C) a sure loss of only 25 000 dollars or (D) a loss of 100000 dollars with the probability of 25%. Running their experiments, Khaneman & Tversky (1979) find that people choose prospect (A) under (B), while they choose prospect (D) under (C) in the second case. They conclude that in the first case, people decide to prefer a sure gain even if they can earn more but this potential income is a risky one. This means that people (entrepreneurs here) act as if they are risk averse in the domain of gains. However, they find that they choose alternative D under C showing a risk-seeking attitude in the domain of losses.

The first attitude is in coherence with the rational theory of decision making because, economic agents are risk averse. The second behavior, in the domain of losses, show an exception to the traditional theory, economic agents can present a risk-seeking behavior when the prospect is a potential loss.

The new utility function, as it introduced by Khaneman & Tversky, is an S-shaped function which is composed by a concave part in the gain zone while it has a convex form in the losses zone reflecting a risk seeking attitude. This new utility function represents the begun of a new economic theory which is commonly called "*Behavioral Economic Theory*".

The behavioral economic theory postulates that economic agents do not act in a fully rational way and, they are also affected by their psychological, cognitive and emotional biases. Statman (2005) interrogates about the nature of a special category of economic agent "*Investors*" and, he poses the question around the rationality of investors. Statman (2005) proves that economic agents are never rational in the sense of “*A super calculator*”. He argues that investors are “*Normal*”. The concept of normality means that investors combine when making their decisions, between the rational decision process where they should use some scientific criteria and also their personal psychology. The behavioral economic approach has appeared with the revision of the market efficiency hypothesis and the relaxation of rational economic man assumption. According to Camerar et al. (2002), the behavioral economics increases the explanatory power of economic models by providing more realistic psychological foundations. This means that the emergence of behavioral economic theory aims to find more realistic determinants of why we can observe distortions at the market and firm levels. Hence, the behavioral economic theory will essay to explain reasons of deviations of decisions makers from optimal decisions.

The behavioral theory is oriented to study the effect of psychological, cognitive and emotional biases at different markets, institutions, and levels. At a macroeconomic level, this approach studied the effect of psychological biases and the investors’ sentiments, emotions and other behavioral variables at the market level such as the study of investors’ overconfidence on explaining financial crisis. The behavioral microeconomics theory is mainly entrenched at the firm level.

This evolution of the economic theory has direct implications on the decision-making theory. Oliveira (2007) synthesis this evolution when he talks about a new concept “*Psychological Decision Theory*”. Camerar et al. (2002) affirm that the research in the domain of behavioral economic theory pass through the relaxation of the rationality hypothesis by introducing the effect of decision makers’ psychology. This can increase the realism degree of the classical decision theory. This prospect theory constitutes one pillar of behavioral theory. It cuts off with the classical concavity assumption of the utility function, which reflects the risk aversion attitude of economic agents. Their results can largely influence the whole economic theory whose models are based on the risk aversion assumption.

The recognition of the existence of limits and critics to the traditional economic theory opens the door to a new original approach: “*The Behavioral Economic Theory*”. In their article “*Behavioral Economics*”, Mullainthan & Thaler (2000), define this field as a combination of the psychology and economics in order to investigate what happens in markets in which some agents display human limitations and complications. This definition can be enlarged to include not only markets but also firms.

The behavioral economic approach can be extended at the firm level. This means that we can talk about a behavioral corporate economic and financial theory. Such theory will be oriented to test the effect of CEOs and entrepreneurs psychological, cognitive and emotional biases in their decisions making. The emergence of this approach which is relatively young (Fairchild, 2007, Backer, 2012) can find its origin at Heaton (2002) paper. In fact, his paper opens a debate on the potential effect of CEOs optimism bias on explaining distortions in corporate firm’s decisions. His theoretical predictions are empirically validated by a wave of papers by Malmendier & Tate (2005a, 2005b) and Lin et al. (2005).

In sum, the behavioral economic approach is based on the critics around the “*Economic men*”, rationality and the prospect theory’s utility function. This approach recognizes that psychological biases can have great impact on decision-making and, can so explain observed distortions in markets and corporate levels.

## NORMAL ENTREPRENEURS AND ENTREPRENEURIAL DECISION MAKING

Baumol (1968) argues that the interest for entrepreneurs is justified by the fact that they are at the center of decisions making and they determine the behavior of their firms. Schumpeter himself recognizes that entrepreneurs find their definitions from their places in their firms as decision makers. In sum, this interest in the economic theory for entrepreneurs is also highlighted by Schoar (2003).

Schoar (2003) in a paper entitled "*Managing with style*" argues that CEOs personal characteristics can affect firm performance and its efficiency. Heaton (2002) initiates a debate around the effect of optimism bias on explaining corporate investment distortions. Departing from a simple model of corporate finance, Heaton (2002) demonstrates that an optimistic CEO will run an investment cash-flow sensitivity phenomenon.

The entrepreneurship theory isn't far from these influences, in this section, our aim will be to retrace and develop the story of behavioral entrepreneurship theory. A special attention will be oriented to discuss the effect of entrepreneurship psychological biases on their decision making. Regarding the existent literature in behavioral entrepreneurship theory, we will namely focus in depth on two psychological biases: entrepreneur's optimism bias and his/her overconfidence bias.

Regarding the fact that the behavioral entrepreneurship theory is a new emergent field of the behavioral theory, it is crucial to review the psychological, cognitive and emotional biases as they are at the center of this new theory (Baron, 2007). Since this theory is new, we do not find a number of empirical works that can be reviewed. Only a few theoretical papers exist and the most of them are unpublished works. So, our aim in this survey paper is to review the psychological biases that can influence entrepreneurial decisions in different level of the new venture.

The scarcity of empirical works in this field can be mainly due to the problems attached to the psychological, cognitive and emotional biases measures. We will here discuss some possible alternatives to overcome the measurement problems by reviewing these measures in other fields such as the behavioral corporate finance.

### Entrepreneurs Psychological Biases

The economic and management literature insist on the normality of economic agents (Statman, 2005). Beyond the rational "*Economic man*" assumption, the cognitive psychology literature advances some psychological biases that seem to have a great impact on decisions making process. The recognition of the role of such psychological biases affects the majority of fields of economic theory including finance, behavioral corporate finance, risk management, entrepreneurship and other related domains. In this section, we review some biases and we predict their potential effect on entrepreneurial decisions.

Behavioral economists, over the past few decades, have identified that decision makers exhibit a number of systematic biases both in the lab and in their daily decisions. This field has received a substantial amount of empirical attention, from both economics and neighboring disciplines such as psychology and sociology. We focus on some of these biases and we try to determine their effect on the decision-making process.

According to Gudmundsson & Lechner (2012), the entrepreneurial cognitive biases have emerged as central themes that aim to explain the performance of entrepreneurial firms. They argue that, especially, the overconfidence and optimism biases can help to firm creation but these biases also can negatively influence new venture in the phase of creation and development and so can contribute to firm failure.

Other studies focus on the effect of other bias such as heuristics, framing, prospect theory and some biases that are related to entrepreneurial decisions under risk and uncertainty (Cueto & Zhang, 2011). In fact, since the prior work of Tversky & Kaheneman (1973), an increasing number of studies had focused on the study of the effect of a huge number of heuristics, and biases on managerial decision-making. Especially, some biases should be evoked such as availability, anchoring and adjustment, representativeness, overconfidence, optimism, etc.

The studies of these biases, as well as the cognitive and emotional dimensions, are of interest in order to advance the research in the behavioral entrepreneurship theory. In fact, the quality of entrepreneurial decision-making can be critically for firm success and survival (Carr and Blettner, 2010). These psychological, cognitive and emotional biases are critical variables that can affect entrepreneurial decisions and all activities related to new ventures (Baron, 2007; Fairchild, 2005).

**Overconfidence**

Psychologists find that people tend to be overconfident about their abilities. They especially tend to overestimate their abilities and the precision of their information. The overconfidence bias manifests itself in a number of ways. In term of portfolio choice, it may lead to little diversification. People tend to invest too much in what one they are familiar with. It affects the quality of the decision-making.

A theoretical demonstration of the effect of this bias on the decision-making is introduced by Odean (1998). He demonstrates that overconfident investors trade more than those who are not overconfident and, as a result of excessive trading, lower their expected utilities. An overconfident investor will choose to increase his/her trading activity because he/she will be too certain about their opinions and not consider sufficiently the opinions of others. The overconfidence bias can push an investor to make an under optimal decision. An overconfident investor may do not use all information that exists on the market because he/she is simply overconfident about his/her abilities to predict the market fluctuations.

The overconfidence bias is one of the most dominated psychological biases in the entrepreneurship literature (Everet & Fairchild, 2015). According to Baron (1998), it can be defined as a distorted view of the world where an entrepreneur has expectations about his/her personal performance that exceed the level of other entrepreneurs. The overconfidence bias is defined in different ways in the existing literature. Hayward et al., (2006) propose three main categories of overconfidence; the first one is the overconfidence in knowledge, the second one is the overconfidence in prediction and the third one is the overconfidence in abilities.

The first category of overconfidence, which is related to knowledge, supposes that entrepreneurs have a view that is more knowledgeable than is truly the case (Everet & Fairchild, 2015). This form of overconfidence is grounded with the work of Bazerman, (1994) who talks about the effect of overconfidence on entrepreneurial estimations. Entrepreneurs feel that they have a great knowledge which can help them to decide in a correct way.

The overconfidence in prediction can be defined as an underestimation of the risk associated with the new venture creation (Cooper et al., 1988). This form is the most dominated by the entrepreneurship theory. This form of overconfidence is also at the center of the behavioral corporate finance (Malmendier & Tate, 2005a; Ben Mohamed & Shehata, 2017).

Finally, the third category is the overconfidence in ability (Everet & Fairchild, 2015). This form is common in professions that are known by their complexity. In sum, we can conclude that the overconfidence bias, in the expression of DeBondt & Thaler (1995), "*Perhaps the most robust finding in the psychology of judgment is that people are overconfident*". In general, this overconfidence induces individuals to undertake ventures that more rational individuals might not undertake (Bernardo and Welch, 2001).

**Optimism Bias**

Another important entrepreneurial psychological bias is the optimism bias. In fact, the human inference and estimations are subject to systematic biases (Landier & thesmar, 2009). Prior works by Weinstein (1980) show that entrepreneurs have the tendency to be over-optimistic about the future events. A wave of studies by Fiske & Taylor, (1991); Baumeister, (1988); Duval & Silvia, (2002); indicate that entrepreneurs attribute success to their own actions. The optimism bias can be seen in entrepreneurial overestimation to their contribution in joint projects as demonstrated by Ross & Sicoly (1979). Optimistic entrepreneurs will also overestimate the degree associated with their ability to control their outcome as mentioned by Langer, (1975). We can also refer to an old research by Oskamp (1965) who demonstrates that optimistic entrepreneurs overestimate the precision of their estimates.

Puri & Robinson (2013) conduct a survey using 6000 American entrepreneurs. They report that they are more likely to be optimistic compared with other people with similar demographic, financial and educational background. Similar previous works in the same field corroborate this result (Dawson et al., 2012; Fraser & Greene, 2006). Another study by Forbes (2005) demonstrates that entrepreneurs have optimistic predictions.

For this, the effect of entrepreneurial optimism should be explored in different levels including the decision of new venture and other entrepreneurial activities and decisions related to his/her project.

**Dispositional Optimism Bias**

One other important bias that can govern the entrepreneurial behavior is the dispositional optimism bias (Himieleski & Baron, 2009). The prior works of Scheier & Carver (1985) and Scheier et al. (1994) demonstrate that entrepreneurs suffer from a dispositional optimism bias which can be defined as generalized positive expectations about future events.

Studies from other disciplines such as psychology and medicine consider this bias as a crucial factor that can affect individual decisions and their life in general. The majority of result reports a positive effect of this bias (Schulz et al., 1996; Scheier et al., 1989). More recently, a study by Carver & Scheier (2003) documents that a high level of dispositional optimism will encourage individual to approach challenges with enthusiasm and persistence.

In contrast, there is another point of view on the effect of the dispositional optimism bias. In fact, the study of Geers & Lassiter (2002) demonstrates that a high level of dispositional optimism in the majority of case cause unrealistic expectation, discount negative information and it can also push individuals to mentally reconstruct experiences in order to avoid contradictions. In the same line of research, a study by Spirrison & Gordy (1993) shows that even a moderate level of dispositional optimism bias can make entrepreneurs more sensitive to negative information.

This bias should be explored in order to see its impact on new venture creation and development. This can help to advance research in this new emergent field of entrepreneurship.

**Mental Accounting**

The mental accounting bias is the tendency to separate decisions that should be, in principle, combined. Jay (2003) illustrates the mental accounting bias by the next examples:

"*Many people have a household budget for food and a household budget for entertaining. At home, where the food budget is present, they will not eat lobster or shrimp because they are much more expensive than a fish casserole. In a restaurant, however, they will order lobster and shrimp even though the cost is much higher than a simple fish dinner. If they instead eat lobster and shrimp even though the cost is much higher than a simple fish dinner. If they instead ate lobster and shrimp at home, and the simple fish in a restaurant, they could save money. However, because they are thinking separately about restaurant meals and food at home, they choose to limit their food at home*".

In term of portfolio choice, Shefrin & Statman (2000) affirm that people consider their portfolios not on a whole but into different mental accounts. They use an account for the risk-free security and another mental account for the risky assets. In the same manner, entrepreneurs under this bias can separate between entrepreneurial decisions.

**The Disposition Effect**

Shefrin & Statman (1985) define the disposition effect as "*The tendency to sell winners too early and ride losers too long*". Weber et al. (1998), demonstrate that the disposition effect can be explained by investors judging gains and losses relative to their initial purchase price and being risk-averse toward gains and risk-seeking toward losses.

The disposition effect bias can influence negatively the quality of decision making. For example, when an investor holds an asset and after a given moment of time it declines in value. The act that this investor still keeping this asset although this declining in value is not a rational decision. It is just an act to avoid losses that can affect negatively the psychology of investor. This bias can also be studied in order to see how it can affect entrepreneurial decisions and activities.

**The Framing**

Studies in psychology show that when entrepreneurs face a complex problem, they try to divide it into different sub-problems. In psychology, this phenomenon is commonly called the framing bias. This bias can affect entrepreneurial decisions and activities related to new ventures. In fact, Teversky & Khaneman (1986) approve that a decision varies according to framing. The quality of entrepreneurial decision can be so largely affect if an entrepreneur is attacked by this bias. Gonzales et al. (2004) argue that the framing effect can be observed when entrepreneurs risk tolerance is related to the manner in which a set of options is described. Their results indicate that the framing has a contrasting effect on decision making.

The framing bias, can strongly affect the decision-making process since people tries to frame (divide) the whole problem. The framing bias may affect the quality of decision which can deviate from that predicted by the rational theory.

### The Prospect Theory

The traditional economic theory assumes that individuals' utility function is concave and so it implicitly supposes that entrepreneurs, as well as other economic agents, are risk-averse. However, the experimental psychology shows that this assumption is far from the reality and an individual can present at the same time a risk-aversion and risk-seeking attitudes (Khaneman & Tversky, 1979).

For this reason, Khaneman & Tversky (1979) introduce the utility function that reflects the reality of entrepreneurial attitudes when making their risky decisions. The prospect theory utility function is S-shaped. The function is concave in the domain of gains, a form that reflects that investors are risk-averse in this domain. In opposition, they are risk-seeking in the domain of losses. So, the utility function is convex in this region. This function has the origin as a reference point for all individuals.

### Emotions

In behavioral framework of decision making, emotions may play a central role (Ben Mohamed et al., 2012a). Emotion was viewed only as a negative and hindrance to the rational decision process (Gutnik, 2006). Emotions (namely the Hope and Fear) are in the center of Lopez two factors theory.

The link between goals and choices in the presence of uncertainty is at the center of Lopes' (1987) two factors theory of risky choice (Shefrin & Statman, 2000). We mean by the two factors theory; the factor of security, potential and the second factor is the Aspiration level. In 1987, Lopes published an article entitled Between Hope and Fear: The Psychology of Risk ", where she notes that, and at the most of the cases, the human being is governed by two emotions: Hope and Fear, and they exist in some strength in all people. This theory implies that the goals of security and potential exist also in all people.

Normally the aim of risk-averse people should be the security in opposition to the risk-seeking people's aim is potential. This will be completely in contradiction of the classical financial theory and especially the portfolio theory that teaches us that investors are risk- averse. The other factor in this theory is Aspiration level. Lopes (1987), defines the Aspiration level as a general notion that is related to a general desire to rich high level of wealth. She claims that the aspiration level varies among people. For example, every people aspire to be rich, but the definition of the amount that they think it will be necessary for becoming rich differ among people.

## THE EFFECT OF ENTREPRENEURS' PSYCHOLOGICAL BIASES ON THEIR DECISIONS MAKING

The aim of this section is to offer a review of literature and discussion around the potential effect of entrepreneurial psychological biases and their decisions making. In fact, the cognitive psychologists have documented many patterns regarding how people make their decisions under some psychological biases (Ritter, 2003). There is a full recognition of the effect of psychological biases on decision making at the firm's level (Malmendier & Tate, 2005a, 2005b, 2008; Hackbarth, 2004; Forles, 2005; Everett et al., 2006; Khachatryan et al., 2005; Dell'Era & Pinto, 2011; Dushnitsky, 2010; Baccar et al., 2016).

The impact of psychological biases on market level are widely studied regarding the wave of research papers that treat the effect of investors sentiment, herding behavior and overconfidence on explaining the volatility puzzle (Scharfstein & Stein, 1990). The effect of decision makers' psychological biases at the firm level has been initiated at a prior literature by Roll (1986). Then, we find an extension on a new original approach called "*Behavioral corporate finance*". In this approach, Heaton (2002) initiates a debate concerning the potential effect of CEOs optimism or/and overconfidence in affecting firm's policies. In his paper, he talks about what happened if CEOs are under optimism or overconfidence biases. Using a simple model of corporate finance, he theoretically predicts that these managerial psychological biases can explain some observed distortions in corporate decisions and behaviors.

## THE OPTIMISM BIAS AND ENTREPRENEURIAL DECISIONS MAKING

The optimism bias constitutes the center of a recent debate in the economic literature and other related sciences. Optimism is a well-documented bias in the economic and financial literature (Malmendier & Tate, 2005a). This bias is firstly introduced by Keynes (1936) in his general equilibrium theory. A surprising thing is that this bias still unexplored since this date. This is because the traditional economic theory at this time was firstly oriented to macroeconomic problems, while the central objective was how to overcome these problems.

Weinstein (1980) talks about unrealistic optimism. He argues that people systematically adopt a new rosy point of view. Under optimism bias, the majority of people in his study seem affected by an optimism bias that he called also comparative optimism.

An individual will be described as optimistic when he/she overestimates the probability according to it a favorable outcome will occur or underestimate the probability of bad things. In a more general manner, we can define an optimistic individual someone who overestimates the probability of good events while he/she underestimates the probability of bad events.

Roll (1986), in his hubris theory, predicts that the optimism bias can serve as a solid factor that can explain why firms run corporate takeovers. The optimism bias attracts a special interest in these last years with the emergence of what we called "*Behavioral corporate finance*".

Heaton (2002) in a theoretical paper develops some potential effect of CEOs optimism bias in their corporate policies. The main finding in his research is that managerial optimism can be used as a determinant that can explain corporate distortions such as over or under investment phenomenon.

Beyond the effect of optimism bias on the economic and financial theories, we can talk about a new approach in entrepreneurship theory: the behavioral entrepreneurship. According to this approach, entrepreneurs are "*Normal*" and so they can present psychological biases, emotions and cognitive biases (Dushnitsky, 2010; Taylor & Brown, 1988; Camarer & Lovallo, 1999; Forbes, 2005; Hayward et al, 2006; 1998; Wu & Knott, 2006; Ben Fatma et al., 2015).

Liang (2008) poses a special question, "*Are entrepreneurs optimistic, realistic, both or fuzzy?* ". In his paper, he presents a new approach to measure entrepreneurial optimism bias and realism and their relationship to entrepreneurial characteristics and learning reflections on new venture creation. He concludes that many entrepreneurs where both optimistic and realistic when making their decisions. A key feature in his research is that entrepreneurs are in the most of case optimistic and the optimism bias is not a revolutionist story in entrepreneurship but it is a reality.

Dushnitsky, (2010) argues that entrepreneurs are characterized as overly optimistic because they are not deterred by the abundant evidence of unfavorable returns to entrepreneurship. A similar result by Landier & Thesmar, (2008) reports that a significant fraction of entrepreneurs holds expectations of future sales that systematically overshoots realized growth. This means that entrepreneurs are attacked by an optimism bias. Asterbo (2003) finds also that entrepreneurs exhibit an unrealistic optimism.

In sum, we can conclude that entrepreneurial optimism bias is a truth that exists and persists among entrepreneurs. Such recognition by the entrepreneurship theory of the existence of entrepreneur's psychological biases should push the research to a new direction where it should investigate the effect of optimism bias on entrepreneurs' decisions and especially in the investment- financing decisions.

The effect of optimism bias on corporate policies is documented by Heaton (2002) as it developed above here. By analogy, an entrepreneur presents a high probability to make sub-optimal decisions. Under his/her optimism bias, an entrepreneur can overestimate the return of his/her investment projects and so he/she will see that the market undervalue his/her firm value a thing that makes him/her prefer internal funds to finance his/her investment projects. This is because when entrepreneurs are optimistic, they will see external financing sources as high costly than internal sources. This will cause distortions in their investment policy since they will overinvest when they have sufficient level of internal cash flow while they will under invest in the case of short internal financing sources.

Entrepreneurs will run investment cash flow sensitivity and so they will never invest in an optimal way. Optimism bias can be considered as strong determinants of distortions in entrepreneurial decisions, as it the case with optimistic CEOs (Heaton, 2002). At the same line of research, the role of managerial optimism in firm's investment and financing decisions has been the subject of an ongoing debate in the behavioral corporate finance literature and it is still an open debate in the center of entrepreneurship literature.

Landier & Thesmar (2008) study the financial contracting with optimistic entrepreneurs. They propose a model when the contract space is restricted to debt. They theoretically predict that optimistic entrepreneurs will choose short term debt, while rational entrepreneurs prefer long term debt. They establish an empirical positive and robust correlation between entrepreneurial optimism bias and the use of short term debt as a financing source.

They affirm that long term debt is optimal for rational entrepreneurs while short term debt is optimal for optimistic one. Their predictions derive from two reasons: (i) bridging the gap in beliefs by letting entrepreneur takes a bet on his/her project's success and (ii) letting the investor impose adaptation decisions in bad states. They validate their theoretical predictions departing from a sample of large data set of French entrepreneurs. Their study provides that entrepreneurial optimism bias can be considered as one of the factors that can explain small business capital structure choice.

Dai & Ivanaov (2010) raise a question about the ability of entrepreneurial optimism on affecting the financing decisions of small firms. Departing from a large sample of United States small business and, using new measure of entrepreneurial optimism, they find that optimistic entrepreneurs are more likely to use more short term debt. These findings corroborate previous findings by Landier & Thesmar (2008).

De Meza & Southey (1996) provide that the capital structure of a startup is a result of entrepreneurial optimism. Their model contributes to the entrepreneurship theory by predicting that entrepreneurs prefer internal cash flow or risk free debt to risky debt while they prefer risky debt to equity. In a more general way, the implication of entrepreneurial optimism bias on financing decision is summarized by Heaton (2002) model. He suggests that small firms managed by optimistic entrepreneurs should prefer debt to outside equity financing and this will be under the optimism bias effect.

Hayward et al. (2006) advance a hubris theory of entrepreneurship in order to explain why so many new ventures are created in the shadow of high venture failure rates. They argue that optimism bias not only leads to an increased number of startups in the first place, but it also results in higher venture failure rates.

In a recent paper, Simon & Shrader (2012) discuss the effect of optimistic entrepreneurs on entrepreneurial actions. When entrepreneurs exhibit extremely high levels of optimism as it demonstrated by Hmieleski & Baron (2009), optimism may lead to conducting inadequate research, over-investing in resources, failing to make needed adjustments as it demonstrated Mahajan (1992) and when they have lower performance (Hmieleski & Baron, 2009) a thing that makes it the first reason for startup failure.

In sum, we can conclude that as it summarized by Busenitz & Barney (1997), the optimism bias may have some benefits for entrepreneurs and society but it has also its dangers as it described by Griffin & Varey (1996). In their paper, Hayward et al. (2006) argue that optimism may lead to limiting research, underestimating resources needs, and making decisions that increase the likelihood of venture failure.

## THE OVERCONFIDENCE BIAS AND ENTREPRENEURIAL DECISIONS MAKING

Among a large number of psychological and cognitive biases, the overconfidence bias is the most documented psychological biases in the economic, management and financial literature (Malmendier & Tate, 2005a). According to Ben-David et al., (2007) and Malmendier and Tate (2008) it has received a lot of attention in academic research. Hackbarth (2007) argues that overconfidence as one of CEOs personal characteristics can affect firm policies and decisions.

The relationship between overconfidence and optimism is flue since we can find different definitions that don't converge into the same meaning. In their works, Ben-David et al. (2007); Hackbarth (2007) define optimism as an overestimation of a mean. It is defined as the belief that good future events have a high probability to occur than they are in reality. This distinction between overconfidence and optimism can be also provided in Heaton (2002) model where he demonstrates that an optimistic managers will see actual cash flows fall systematically short of their forecast under optimism bias effect. He defines so optimistic manager as those who attach too much probability to good future outcomes and too little bad future outcomes.

The overconfidence bias is always associated with a miscalibration phenomenon and an underestimation of the variance which means an underestimation of risk. This is because according to Ben David et al., (2007); Hackbarth (2007), people have a future event distribution probability that is too tight.

We can find also more others definitions of overconfidence bias by referring to De Bondt & Thalar (1994) who insist that the miscalibration phenomenon is one of the most robust and the best documented findings in psychology. Gervais et al. (2003) define overconfidence as the tendency of people to overestimate the reliability of their knowledge and information.

In sum, we can affirm that, overconfidence has been defined differently in different disciplines. It has been defined as an overestimation of one's own ability to make accurate forecasts, or, alternatively, as an overestimation of one's own ability relative to others (often referred to as the 'better -than- average' effect) or relative to one's actual ability (Moore & Kim, 2003). In the study of Camerer & Lovallo (1999), overconfidence is defined as an overestimation of one's own abilities relative to others.

Entrepreneurial overconfidence is usually thought to be of interest in connection with entrepreneurs' initial decisions to start new ventures. Simon & Houghton (2003), for example, show that managers who exhibit higher levels of overconfidence were more likely to make product introductions that were riskier and less likely to succeed.

More confident entrepreneurs are more likely to persist with their confident judgment in a manner that will overcome their emotional loss from a failed venture and their sense of dread about a further loss (Seligman, 1998). Because such entrepreneurs are less likely to perceive business failure as a traumatic event that undermines their fundamental assumptions, they are also more likely to persevere with more confident beliefs about prospective ventures (Seligman, 1998).

Cognitive biases are subjective or predisposed opinions that may emanate from specific heuristics (Busenitz & Lau 1996). Although biases help individuals cope with their cognitive limitations, they may result in less rational, less comprehensive decision-making (Barnes 1984). These biases often arise when making complex and uncertain decisions (Schwenk 1984), and maybe especially prevalent among entrepreneurs (Busenitz & Barney 1997).

Prior research has demonstrated that entrepreneurs are prone to cognitive biases in their decision making (Palich & Bagby, 1995). This observation has raised a question of interest in entrepreneurship theory as to whether entrepreneurial individuals are more prone to cognitive biases than non-entrepreneurs (Buzenitz & Barney, 1997).

Hence, we can conclude that the existing literature in economics, finance and management agree that the overconfidence bias can affect firm policies and the quality of decision making (Fairchild, 2007; Baker et al., 2012). The effect of this bias should be explored in different level of the new venture creation and on entrepreneurial decisions.

## ENTREPRENEURIAL OPTIMISM AND OVERCONFIDENCE MEASURES

The challenge in this new behavioral theory of entrepreneurship and in the behavioral theory in whole is how to quantify entrepreneurial psychological biases? This is a central question that needs an urgent solution in order to advance research in this new field. We essay in this section to review the measurement of the most relevant entrepreneurial biases. In fact, we refer to the behavioral corporate finance theory where we can find the prior essays to quantify these biases among CEOs.

Regarding the fact that previous works focus only on managers' overconfidence and optimism bias; we review the method of measurement of these variables. According to Campbell et al. (2011) the measurement of such bias is difficult because we aim to measure a non-observable variable. The solution can be to construct proxies for these variables.

In order to empirically test the effect of managerial overconfidence on corporate investment, Malmendier & Tate (2005a) propose the first method to measure overconfidence. They are the pioneers in constructing proxies of overconfidence in a corporate framework. They measure CEOs' overconfidence based on the CEO' net stock purchases and their stock option holding and exercising decision.

The first measure is developed around the stock options behaviors. They compare the benchmark predictions to the actual exercise behavior of CEOs. They use the next rule: an overconfident CEO is someone who persistently exercises his/her options later than suggested by the benchmark rules. They suggest that overconfident managers are those who never held an option until the last year of its duration.

The second measure can be derived using CEOs stock purchase in their own firms. A manager is classified as overconfident if he/she is a net buyer of his/her company stock more year than they were a net seller during the last five years.

In fact, there is no reason why managers should increase their equity position by purchasing new shares. For this, the habitual purchases of stocks can serve as overconfidence measure. However these two measures are not applicable in entrepreneurship because we talk about small projects or entrepreneurial firms where stock options are absent. The application of the net buyer criterion is also inappropriate because the nature of these small projects do not allow as talking about such measure.

The third measure is present at the work of Malmendier and Tate (2005b). They use the manger portrayal in the media in order to classify CEO as overconfident or not. They handily collect data on how the press portrays each of the CEOs during the sample period.

For each manager, they try to find articles referring to him/her in different journals. Namely, they use The New York Times, Business Week, Financial Times, The Economist and The Wall Street Journal. Then, they record the number of articles containing the words "confident","*Confidence*"; "*Optimistic*", "optimism"; and the number of articles containing the words "reliable", "*Cautious*", "*Conservative*", "*Practical*", "*Frugal*", or "*Steady*". They check if the terms are used to describe the CEO in question and separate out articles describing the CEO as "*Not confident*" or "*Not optimistic*". Finally, they construct an indicator TOTAL dummy, equal to 1 if a CEO is more often described as "confident" and "optimistic" or as "*Reliable*", "*Cautious*", "*Conservative*", "*Practical*", "*Frugal*", or "*Steady*".

Even if this method can be applied to measure entrepreneurial overconfidence, it is very difficult since it supposes that the media should take care of entrepreneurs and their personality. Especially, we cannot apply this method to the emergent markets' context. This is due to the absence of specialized media that concentrates on entrepreneurs and their activities.

The optimism bias measure can be found in the work of Huang et al. (2011). They construct a proxy for entrepreneurial optimism bias. It is obtained by calculating the difference between entrepreneurial forecasted earning and his/her actual earning.

The criterion for classified entrepreneurs as optimistic is only if the number of times of over-forecast is more than that of under-forecast during the entire sample forecast. They define over-forecast as the case where forecasted earnings are greater than actual earnings, while under-forecast as the case where forecasted earning are smaller than actual earnings.

This measure is similar to that of Lin et al. (2005) who propose a managerial optimism measure on CEOs personal estimation of firms earning. Departing from managerial earnings forecasts, and accepting that all forecasts are equally weighted, they classified CEOs as optimistic managers or not. They classify a CEO as optimistic if he/she has at least two forecasts, and define a CEO to be optimistic if there are more upwardly-biased forecasts than downwardly-biased forecasts during the CEO's tenure. They defined a forecast as upward biased if the forecast error is positive. This error is simply defined as the difference between managers' earnings forecasts and the actual earnings before tax.

As an alternative to measure entrepreneurial psychological biases, we can simply use surveys and interviews especially if you would like to test the impact of such bias in an emergent context. Some biases can measure using the psychometric tests such as that used by Himielseki

& Baron (2009). In fact they use the Lot-R test to construct a proxy for entrepreneurial dispositional optimism. This can help to overcome the measurement problem.

## DISCUSSION AND FUTURE RESEARCH DIRECTIONS

In this paper, we discuss the origin of the emergence of behavioral economic theory and its implications on the entrepreneurship level. We have documented that a new theory of entrepreneurship is imposed by the experimental results of cognitive and experimental psychology. These disciplines highlight that people are governed by their psychological biases, cognitive biases and their emotions when making their decisions.

A direct implication on the entrepreneurship theory was the emergence of behavioral entrepreneurship theory. This new theory adopts an implicit recognition of the normal behavior of entrepreneurs. The concept of normal entrepreneurs should be interpreted with prudence; it doesn't mean that those entrepreneurs are fully irrational as results of their personal psychology effects, but it should be interpreted as follows: entrepreneurs try always to be rational but their cognitive, psychological and emotional biases prohibit them to act in a fully rational way as is described by the classical rational theory of entrepreneurship.

In this paper, we analyze also the potential implications of entrepreneur's optimism and overconfidence biases in their decision making. We argue that the literature in the domain of behavioral entrepreneurship is young and the number of research paper in this field of research is still less developed.

Entrepreneur's optimism and overconfidence biases can succeed to explain distortions in corporate policies. A wave of research papers demonstrates that the entrepreneur personal psychology influences the capital venturing and other financial decisions. Heaton (2002) predictions can be applied to a behavioral entrepreneurship theory. This can be an interesting future direction of research according to it optimistic and overconfident entrepreneurs will run an investment-cash flow sensitivity a thing that can explain why a firm or a small business can't arrive in its optimal value since it doesn't invest in optimal way.

After this literature reviews, that documents that the entrepreneurship theory should be now enlarged in order to include the behavioral approach, we can propose some future directions of research:

Regarding this transition from rational to behavioral theory of entrepreneurship, an important question should be discussed: How these biases affect new venture success? In fact, it is crucial to explore the effect of entrepreneurial psychology on his/her venture success.

Especially, we can concentrate on the effect of well documented biases on new venture success in the Tunisian context in order to see if this new behavioral dimension can explain entrepreneurial success and so to include these variables when drawing policies around new ventures in Tunisia.

We can study the effect of both traditional and behavioral factors on new venture success in order to see the potential interactions between them.

We can discuss the effect of entrepreneur psychological biases on small business performance and efficiency. This will be for example discussed using a stochastic frontier model that aim to determinate the sign and level of psychological effect on small business efficiency.

We can then study the inefficiency terms and so we can see how these psychological biases contribute to explain the distortions in small firms.

It will be an interesting way to investigate the effect of entrepreneur's optimism and overconfidence biases effect on small firms. How personal psychological biases contribute to firm value? Does optimistic or overconfident CEOs increase or distract firm value?

We can also investigate the effect of entrepreneurs' psychological biases on explaining small firms' inefficiency by jointly analyzing the effect of rational and behavioral factors.

We can also explore the effect of entrepreneurs' psychological biases on entrepreneurial opportunity process. This is can be achieved by studying the possible effect of entrepreneurial psychology in the step of opportunity identification and then we can see the effect of the same biases on opportunity pursuits.

Finally, it is important to study the effect of entrepreneurial psychology on new venture creation and development in different context in order to generalize results.

## CONCLUSION

The literature review demonstrates that there is a transition from rational to behavioral approach in the economic theory. Such transition is accompanied by a similar transition in the entrepreneurship theory. We present here the origin of this passage and we discuss in some depth the implications of this transition from rational to behavioral theory on entrepreneurial decision making.

We argue that entrepreneurs are normal and that they may be affected by their psychological, cognitive and emotional biases. As the behavioral entrepreneurship theory is a new approach, we show that the implication of entrepreneur normal behavior is only investigated for the capital venture and in a few relative domains.

At the end of this paper, we propose some future directions of research around the potential effect of entrepreneur's personal psychology on explaining new venture success, small firms 'technical inefficiency and how entrepreneurial psychological biases can affect entrepreneurial opportunity.

It should also be mentioned that this study suffers from some shortcomings. in fact, it is difficult to identify all studies in this area. New studies that have not yet been officially published must also be taken into account. It is also possible to use a methodology based on meta-analysis.

This study can be for interest to the policy makers, in fact they should be aware about the potential effect of entrepreneurial psychology especially on new venture success and small firms technical efficiency. Policy makers should provide a based psychology strategy in order to encourage entrepreneurs and to avoid the potential bad effect of some psychology biases.

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