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Entrepreneurship, discovery and search

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Abstract
This paper analyzes the theory of the firm by clarifying the relationship between Israel Kirzner's notion 'discovery' and Herbert Simon's notion 'search.' In the problem of ignorance, the paper argues how Kirznerian entrepreneurship differs from Simonian entrepreneurship. Kirzner emphasizes the quality of perception for recognizing a profit opportunity, while Simon emphasizes the search for possibilities. In the paper, ignorance can be classified into two categories: 'lack of information' and 'lack of awareness.' The former is attributable to scarce knowledge in an organization. Agents in search activities know the extent of their ignorance and can be informed about the missing information. On the other hand, the latter corresponds to unnoticed opportunities in the market. Discovery is always accompanied by surprise in disequilibrium where agents are ignorant and are often ignorant of their ignorance. Discovery replaces ignorance with newly identified feasible states.

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Introduction

It is recognized that entrepreneurship is fundamentally the driving force of the market. However, there is little consensus about how the entrepreneurial role should be incorporated into economic analysis. In conventional economic models, entrepreneurs are simply people with low risk-aversion (Milgrom and Roberts, 1992). Entrepreneurs are, in the neoclassical economic approach, described as optimizers in that they act as profit maximizers or cost minimizers.[1] Specifically, conventional economic models define entrepreneurship as self-employment. Kihlstrom and Laffont (1979) describe entrepreneurship in the occupational choice between employment and self-employment. In their model, the random utility derived from running a business is governed by a probability distribution with known parameters. Risk-adverse agents remaining in the firm are designated as laborers. Unlike risk-averse laborers, entrepreneurs bear the risks associated with production and contribute managerial skills. The entrepreneur functions in an equilibrium system incorporating firm formation.

Individuals may differ not only in risk aversion, but also in their access to information. However, an entrepreneur, in neoclassical economic theory, has access to information required initially to perceive all alternative opportunities and all the possible consequences of acting on an opportunity. In fact, the exercise of judgement should involve private information available only to a few. Publicly available information is not sufficient for taking an important business decision. An entrepreneur takes a decision based on information that is not available to others. Profit opportunities are sometimes known to particular entrepreneurs and not known to others due to information dispersion in markets.

An important contribution of Frank Knight's (1921) *Risk, Uncertainty, and Profit* is the distinction between risk and uncertainty. Whereas risk has a probability distribution and allows insurance, uncertainty does not have a probability distribution. Knight (1921) regards uncertainty, rather than risk, as the relevant issue for business decisions. When making important decisions, people rarely know either what options are available or their possible consequences. People differ in their ability to select relevant similarities, and the ability is restricted to some particular field of knowledge. Then, "the existence of a problem of knowledge depends on the future being different from the past, while the possibility of the solution of the problem depends on the future being like the past" (Knight, 1921: 313). Uncertainty can be linked to a form of intuitive estimation in business situations that resist logical and statistical probability assessment. The expected returns to entrepreneurship tend to be low on average but exhibit a high variance. Entrepreneurs exist in running businesses despite low absolute returns. With a subjective basis for processing, optimistic beliefs may help individuals to overcome uncertainty and may, therefore, influence their entrepreneurial activity.

Foss and Klein (2012) argue that entrepreneurial decision-making is about judgement in the face of Knightian uncertainty. Judgment cannot be traded or contracted on; the entrepreneur is required to start a firm in order to take economic

[1] Baumol (1968: 68) originally observes that neoclassical entrepreneurs are "automaton maximizers."

actions based on one's own judgment. Judgement refers to decision-making when the range of possible future outcomes is generally unknown. Entrepreneurial decision-making applies to situations in which there is no obvious rule that can be applied. Under conditions of uncertainty, judgement is the (largely tacit) ability to make decisions that turn out to be reasonable or successful ex post (Langlois, 2005). Market participants have heterogeneous entrepreneurial judgments about future events. Knightian uncertainty is thus consistent with subjectivism of expectations.

From its beginning, the Austrian school of economics has stressed the importance of uncertainty and ignorance in economic decision-making. In the Austrian tradition, subjectivism implies that individuals hold different preferences, knowledge, and expectations, and more specifically, "the presupposition that the contents of the human mind, and hence decision making, are not rigidly determined by external events" (O'Driscoll and Rizzo, 1996: 1). The Austrian theory is unique in its interest in implications of ideas, beliefs, and cognitive processes. As Boettke and Prychitko (1994: 228) argue, "Austrian theory is an analysis of acting minds, of individuals attempting to switch their present state of affairs for imagined better states. This invariably links methodological individualism with the concept of time and genuine uncertainty ..." The Austrians fundamentally agree that economics should make the world intelligible in terms of human action. Economics must explain human action as the individuals' responses to their subjective interpretations of the external environment.

In what follows, this paper analyzes the work of Israel Kirzner, who provides the most extensive attempt in the entrepreneurship field. For Kirzner (1997: 63), "[m]ainstream microeconomics interprets the real world of markets as if observed phenomena represent the fulfillment of equilibrium conditions." The Austrian school of thought views the market as a process, which is never really in equilibrium, but is always tending toward equilibrium. The equilibrating tendencies reside within the profit incentives that originate in the prevalence of unexploited market opportunities. Kirzner (1973) argues that the existence of disequilibrium situations in the market implies profit opportunities. Kirznerian entrepreneurs notice, earlier than others, the changes that have already occurred in the marketplace, taking advantage of information asymmetries.

In organization theory, there are studies based on the behavioral paradigm. Cyert and March (1963) launch into an attack on the orthodox theory by placing an explicit emphasis on the actual process of organizational decision-making.[2] Their model emphasizes the interplay between cognition and action, in which the firm adapts to its environment through learning and experimentation. Simon (1957) hypothesizes that agents search until they find alternatives that are satisfactory enough, given the information available and their ability to compute the consequences. An agent cannot choose an optimal action but, instead, must choose an option that meets some predetermined aspiration level.

This paper stresses the problem of ignorance in entrepreneurship. The paper analyzes the theory of the firm by clarifying the relationship between Kirzner's notion 'discovery' and Simon's notion 'search.' In the problem of ignorance, the paper argues how Kirznerian entrepreneurship differs from Simonian entrepreneurship. Kirzner emphasizes the quality of perception for recognizing a profit opportunity. The crucial role of entrepreneurs lies in their alertness to hitherto unnoticed opportunities. Discovery takes place as entrepreneurs seek to seize the opportunities afforded by market frictions. On the other hand, Simon emphasizes the search for possibilities. Once entrepreneurs choose their problems, they settle on how to search the solution landscape to find sufficiently valuable solutions. In the paper, ignorance can be classified into two categories: 'lack of information' and 'lack of awareness.' The former is attributable to scarce knowledge in an organization. Agents in search activities know the extent of their ignorance and can be informed about the missing information. On the other hand, the latter corresponds to unnoticed opportunities in the market. Discovery is always accompanied by surprise in disequilibrium where agents are ignorant and are often ignorant of their ignorance. Discovery replaces ignorance with newly identified feasible states.

This paper proceeds as follows. The next section examines the Austrian tradition of viewing the market as a process. Section 3 introduces two concepts: Kirznerian entrepreneurship and Simonian entrepreneurship. Section 4 argues that, in the problem of ignorance, how Kirznerian entrepreneurship differs from Simonian entrepreneurship. Section 5 concludes.

Creation and process

Schumpeterian entrepreneurship

Joseph Schumpeter is, without any doubt, the best-known contributor to the entrepreneurship field in economics. Schumpeter ([1911], 1934) considers the role of entrepreneurship in the economic development process. According to Schumpeter ([1911], 1934: 66), entrepreneurial activities consist of the following five items: (1) the introduction of a new good or of a new quality of a good; (2) the introduction of a new method of production; (3) the opening of a new market; (4) the conquest of a new source of supply of raw materials or half-manufactured goods; and (5) the carrying out of the new organization of any industry, like the creation of a monopoly position or the breaking up of a monopoly position. For Schumpeter ([1911], 1934), an entrepreneur is a leader and 'leads' the means of production into new channels.

Entrepreneurship as a form of leadership is to be distinguished sharply from routine. Schumpeter ([1911], 1934) emphasizes the entrepreneur's role as a major innovator who shifts the economy to new equilibrium states by upsetting the routine operation of the market process ('creative destruction' in Schumpeter's term). Experiential and localized knowledge explains firm heterogeneity and various aspects of competitive

[2] Along with Herbert Simon, Richard Cyert and James March are regarded as pioneers of behavioral economics associated with the Carnegie School.

advantage, particularly differential innovation performance. The entrepreneur makes a new combination of already existing resources. The number of possible combinations is nearly infinite, and the entrepreneur intuitively selects a few that are possible. Thus, entrepreneurship tends to be an exceptional occurrence of massive importance. The entrepreneur's leadership qualities enable him or her to see the right way to act. Others will follow in his or her wake. Nelson and Winter (1982: 275), drawing from Schumpeterian insights, argue that "a central aspect of dynamic competition is that some firms deliberately strive to be leaders in technological innovations, while others attempt to keep up by imitating the success of the leaders." The leader-type entrepreneur often stimulates a cluster of innovating and imitating activity by other following entrepreneurs.

Schumpeterian entrepreneurs are described as "leaders that vigorously rise above the masses, personalities that carry the rules of their behavior within themselves" (Schumpeter, [1911], 1934: 100). It is individuals who carry out entrepreneurial activities, no matter how they are defined. Their characteristics (personality, background, skills, etc.) matter. Following Leibenstein (1987: 120), "there are entrepreneurs of unusual talents where modes of operation cannot be captured, described, and taught to others. But in my view, such people are at one end of the talent distribution found among entrepreneurs, which ranges from ordinary capacities, to the ability to slightly modify an existing firm, to the borderline of the great entrepreneurial innovators such as Henry Ford."[3] Entrepreneurial activities can be directed towards the discovery of opportunities to earn profit. These activities are led by a group of people with a particular knowledge.

The Austrian tradition: Mises and Hayek

The Austrian tradition of viewing the market as a process helps us understand the functional role of entrepreneurship in the economy. Kirzner (1997) argues as follows: "[f]rom Mises the modern Austrians learned to see the market as an *entrepreneurially* driven *process*. From Hayek they learned to appreciate the role of *knowledge* and its enhancement through market interaction, for the equilibrative process" (Kirzner, 1997: 67, original emphasis).

Mises ([1949], 1966) prepares the ground for understanding the intrinsic link between uncertainty and human action. For Mises, Austrian economics is a theory of human action, not of economic equilibrium; economic theory has its foundation in 'praxeology' which deals with choice and action. People live in a world characterized by uncertainty in the sense that the likelihood of a particular course of action yielding a particular outcome "is not open to any kind of numerical evaluation" (Mises, [1949], 1966: 113). In such a circumstance, people are unable to assign meaningful probabilities to the consequences of their actions. Dealing with uncertainty is crucial to the theory of human action. Mises' system involves interaction between heterogenous individuals as they may differ with regards to their motivations and in their entrepreneurial capacities in particular directions. In their entrepreneurial capacity, they form expectations of the future and determine their use of current resources based on the anticipation of an expected fact. The decision to switch production techniques available might result from a change in entrepreneurial expectations. Then, "[i]n order to see his way in the unknown and uncertain future man has within his reach only two aids: experience of past events and his faculty of understanding" (Mises, [1949] 1966, p. 337). A science of human action is a science of the struggle of human beings to understand and cope with uncertainty. Mises' focus of the entrepreneurial function is on the market process. Mises ([1949], 1966: 245) argues the idea of a movement toward equilibrium: "[t]he final state of rest is an imaginary construction, not a description of reality ... New disturbing factors will emerge before it will be realized. What makes it necessary to take recourse to this imaginary construction is the fact that the market at every instant is moving toward a final state of rest." As some disequilibrium is dissolved by an action, another one emerges.

Following Hayek's (1968) thought, Kirzner (1973) argues that the existence of disequilibrium situations in the market implies profit opportunities. The knowledge that an individual can possess is dispersed, and each person can just possess a little piece of all the knowledge available in society (Hayek, 1948). Since knowledge varies by time and place, an omniscient knowledge is impossible. Novelty is fundamentally unpredictable. For Hayek (1968), the term 'competition' refers to a discovery procedure that approaches novelty by means of trial-and-error elimination. The market system provides individuals with useful knowledge and enables them to discover such knowledge by means of the competition process.

As Hayek (1976) suggests, the working of the market can be understood best by looking at it as an 'exchange game.' It is a game that "proceeds, like all games, according to rules guiding the actions of individual participants" (Hayek, 1976: 71). The market can be defined as an institutionalized arena for exchange. The reason for the participants to play the exchange game is that it is wealth-creating or positive-sum. Participants can expect to realize better outcomes than they could expect from feasible alternative games. Hayek (1976: 109) defines the notion of 'catallaxy' as "the special kind of spontaneous order produced by the market through people acting within the rules of the law of property, tort and contract." Wealth grows because people can innovate with their own property, and the returns to their efforts accrue to them. As Hayek (1976: 115) suggests, "[t]he best way to understand how the operation of the market system leads not only to the creation of an order, but also to a great increase of the return which men receive from their efforts ... as a game which we may now call the game of catallaxy. It is a wealth-creating game (and not what game theory calls a zero-sum game), that is, one that leads to an increase of the steam of goods and of the prospects of all

[3] According to Baumol (1990), entrepreneurial talent is assumed to be reasonably and equally distributed across time and societies. Innovative entrepreneurship is incremental in nature.

participants to satisfy their needs." Wealth enhancement must be anticipated in order to participate in a positive-sum game.

As Kirzner (1997) argues:

> For Hayek the equilibrating process is thus one during which market participants acquire better mutual information concerning the plans being made by fellow market participants. For Mises this process is driven by the daring, imaginative, speculative actions of entrepreneurs who see opportunities for pure profit in the conditions of disequilibrium. What permits us to recognize that these two perspectives on the character of the market process are mutually reinforcing, is the place which each of these two writers assigns to *competition* in the market process. (Kirzner, 1997: 68, original emphasis)

Individuals pursuing entrepreneurship must perceive profit opportunities more clearly than others. The individual entrepreneur must exploit the opportunities to enter a new market, earlier than others. The opportunity identification represents one of the important questions for the domain of entrepreneurship.

Discovery and search

Kirznerian entrepreneurship

By contrast to Schumpeterian heroic innovator-entrepreneur aspect, Kirznerian entrepreneurship focusses on the ordinary profit-seeking endeavors of market participants to discover and exploit opportunities for improvement.[4] That is, "[f]or Schumpeter the essence of entrepreneurship is the ability to break away from routine, to destroy existing structures, to move the system away from the even, circular flow of equilibrium" (Kirzner, 1973: 127). Schumpeterian entrepreneurship emphasizes the ability to create new combinations beyond the current production possibility frontier. On the other hand, Kirznerian entrepreneurship involves two phenomena – the presence of profit opportunities and individuals who pursue those opportunities. Kirznerian entrepreneur is "routine-resisting" (Kirzner, 1997: 71) only at the stage of perceiving profit opportunities. Schumpeterian and Kirznerian entrepreneurs don't know the extent of their ignorance. Creation and discovery cannot be anticipated. However, Kirznerian discovery view of entrepreneurship can be distinguished from Schumpeterian creation perspective. Kirznerian entrepreneur reacts to exogenously generated changes in the marketplace. Kirznerian entrepreneur might be described as a follower, in Schumpeterian sense, of the leading, originating innovators. Abstracting from the social dimension of entrepreneurial behavior (which is a feature of the Schumpeterian entrepreneur), Kirzner focuses on the pure entrepreneurial function. Kirzner's focus on the entrepreneur is inspired by the objective of enabling us to see the 'inside' workings of the capitalist system, while Schumpeter is concerned to enable us to see, 'from the outside,' what constitutes the essence of capitalism (Kirzner, 1999).

For Kirzner, the role of the entrepreneur is to achieve some kind of adjustment necessary to move markets toward the equilibrium states.[5] In the equilibrium states, economic agents have exploited all the opportunities known to them. Kirznerian entrepreneurs become deliberate coordinators of resources in markets exhibiting disequilibria. Disequilibrium arises from the everyday mistakes market participants make in their investment, production, and distribution decisions. In markets, knowledge is neither complete nor perfect. Markets are constantly in disequilibrium states; for instance, the entrepreneurs could sell for high prices that which they can buy for low prices. Disequilibrium creates market niches, which becomes evident as underpriced products, unused capacity, unmet customer needs, and so on. Thus, it is disequilibrium that gives scope to the entrepreneurial function. For Kirzner (1981: 55), "the innovative role assigned by Schumpeter to his entrepreneur finds its place naturally within the broader Misesian theory." There are three essential aspects of the broader Misesian theory of entrepreneurship, according to Kirzner (1981): (1) the recognition of the entrepreneurial element in each individual market participant; (2) the insight into entrepreneurship as the driving force behind the equilibrating tendencies within the price system; and (3) appreciation for the entrepreneurial basis for the social efficiency achieved by the market economy. Then, "action is the present choice between future alternatives that must, in the face of the foggy uncertainty of the future, now be identified in the very act of choice. It is this aspect of human action that renders it, for Mises, essentially entrepreneurial" (Kirzner, 1992: 128). What is missing in Schumpeterian account is an appreciation of the fact that the ordinary everyday profit-motivated endeavors of market participants to discover and exploit opportunities for improvement keep the market process working.

Kirzner emphasizes the quality of perception for recognizing a profit opportunity. The crucial role of entrepreneurs lies in "their alertness to hitherto unnoticed opportunities" (Kirzner, 1973: 39). Kirzner's concept of 'alertness' is a singular property of individuals.[6] Alertness is "the ability to notice without search opportunities that have hitherto been overlooked" (Kirzner, 1979: 48). An opportunity exists only if it is perceived by the entrepreneur. The entrepreneur has

[4] According to de Jong and Marsili's (2015) empirical study, Schumpeterian opportunities are correlated with an innovative behavior, a strategic emphasis on future needs. In contrast, Kirznerian opportunities are associated with a strategic focus on present needs. They are more frequently pursued by small ventures and by young entrepreneurs.

[5] Kirzner defines the equilibrium state in neoclassical economics as "a state in which each decision correctly anticipates all other decisions" (1979: 110).

[6] For Lachmann, Kirzner's term 'alertness' is considered as a behavioral prerequisite for capital formation which is founded on continuous "alertness to change and a willingness to make frequent changes, the switching "on" and "off" of various output streams as well as reshuffling capital combinations" (Lachmann, 1976: 148, original emphasis).

to overcome mental and behavioral habits and become liberated from the dictation of routine in order to exploit opportunities successfully. As Kirzner suggests, "[t]he successful businessman-entrepreneur "sees" what other market participants have not yet seen (Kirzner, 1992: 129, original emphasis). People possess different information, which allows them to see particular opportunities that others cannot see.

Entrepreneurs perceive external events and formulate business plans according to their knowledge. Knowledge shapes the interpretation of the external environment. Experiences from everyday life are accumulated into a stock of knowledge that can be used to interpret incoming events. The interpretation framework helps an entrepreneur to identify problems. There are market opportunities that are not being exploited simply because they have not been noticed. Disequilibrium exists because economic agents are ignorant and are often ignorant of their ignorance. Lack of awareness regarding the opportunities renders discovery a crucial phenomenon. One can be alert by exposing oneself to potential market opportunities. Discovery takes place as entrepreneurs seek to seize the opportunities afforded by market frictions which are typically not known in advance. The differential awareness becomes more crucial when the opportunity is less straightforward. Some individuals, but not others, recognize and exploit entrepreneurial opportunities. Individuals with more experience see a specific opportunity as more desirable than it is for others, making it more likely that they will exploit it. Competition is a discovery procedure fueled by Kirzneian entrepreneurship relative to hitherto ignored market opportunities. The entrepreneur enjoys the first mover's reward. Thus, the function of Kirznerian entrepreneur is the act of opportunity recognition in market disequilibrium.

Simonian entrepreneurship

In his *Administrative Behavior*, Herbert Simon ([1947], 1997: 14) simply refers to the entrepreneurs "distinguished by the fact that their decisions ultimately control the activities of employees." In the authority view, the firm is defined as an employment relation. For Simon (1951), an employment contract specifies a set of acceptable instructions that the employee has to accept if asked to carry them out by the employer.

Simon ([1969], 1996) argues about Hayek's perspective on the role of the market:

> No one has characterized market mechanisms better than Friedrich von Hayek ... His defense did not rest primarily upon the supposed optimum attained by them but rather upon the limits of the inner environment – the computational limits of human beings. (Simon, [1969], 1996: 34)

Markets are important mechanisms of coordination. However, for Simon, markets cannot fulfill their function if they do not possess "a high degree of economic stability and a low level of externalities" (Simon, 2000: 751).

In modern economies, organizations perform a more relevant role of coordination than the price system does. As March and Simon (1958: 154) argue, "[m]any of the central problems for the analysis of human behavior in large scale organizations stem from the operation of subsystems within the total organizational structure." An organization is a set of regularly interacting individuals who are bound by a set of internal rules. These rules determine the organization's structure.

Simon (1957) hypothesizes that economic agents perform limited searches, accepting the first satisfactory decision. Once entrepreneurs choose their problems, they settle on how to search the solution landscape to find sufficiently valuable solutions. They search until they find alternatives that are satisfactory enough rather than until the marginal expected cost of search equals the marginal expected return. Global rationality refers to the ability of economic agents to make optimal decisions based on information regarding the past, the present, and the future. It is the notion that the agents are able to identify and assimilate all of the available information that is relevant to the problem they face, processing it in order to maximize their given objective function. Rather than assuming that agents are globally aware of all the possibilities and comparatively compute them, Simon (1957) emphasizes the search for possibilities and the localness and limits of rationality.[7] For boundedly rational agents, information gathering is costly. The number of possibilities and combinations is so large that search costs are not known in advance. There is always a trade-off between allocating time and resources to gathering further information and proceeding to act on the basis of current information. Starting from their internal representation of the environment, economic agents cope with a problem by adopting simplifying strategies for its solution.

March and Simon (1958, p. 169) propose an alternative model of rationality with the following simplifying features: (1) optimizing is replaced by satisficing – the requirement that satisfactory levels of the criterion variables be attained; (2) alternatives of action and consequences of action are found sequentially through search processes; (3) repertories of action programs are developed by organizations and individuals, and these serve as alternatives of choice in recurrent situations; (4) each specific action program deals with a restricted range of situations and a restricted range of consequences; and (5) each action program is capable of being executed in semi-independence of the others – they are only loosely coupled together.

Economic agents 'satisfice' rather than optimize: they simplify their decisions primarily through the replacement of the goal of optimizing with the goal of satisficing, of finding

[7] Williamson (1985) introduces the behavioral assumptions of bounded rationality and opportunism. Since boundedly rational actors are unable to completely foresee all the future contingencies that affect the execution and fulfillment of contracts, these contracts are inevitably incomplete and the contractual parties are at risk of being subject to opportunism. Cognitive limitations lead people to implement incomplete contracts in complex environments.

a course of action that is 'good enough' (Simon, 1957). Satisficing is often explained as a procedure of decision-making by which agents search for a solution until they find a satisfactory choice, given the information available and their ability to compute the consequences.[8] Alternatives are generally not fixed in advance but generated or identified. As Simon (1997: 321) points out, "the greater part of the decision-maker's time and effort is devoted to generating or identifying alternatives." The search for alternatives ends when a certain criterion is reached (a 'stopping rule'). Then, the "criteria of satisfaction are closely related to the psychological notion of 'aspiration levels" (March and Simon, 1958: 182). The basic departure from conventional economic theory is described not in terms of optima but in terms of values of targets – profit, inventory, or sales, in the firm's case – which are satisfactory or unsatisfactory. An empirically grounded theory of bounded rationality should extend to situations in which an agent cannot choose an optimal action but, instead, must satisfice, that is, choose an option that meets some predetermined aspiration level. Determination of an aspiration level is based on experience-derived expectations of possible consequences. The search for alternatives is compatible with limited computational resources, and it terminates when an option is identified that exceeds the aspiration level.

The basic idea of the satisficing approach is that people form aspirations, search for alternatives satisficing them, and choose the first option that is good enough. The satisficing approach can be described as a decision-making strategy of the following form:

1. Set an aspiration level such that any option which reaches or surpasses it is good enough.
2. Begin to search and evaluate the options on offer.
3. Choose the first option which, given the aspiration level, is good enough.

Thus, satisficing is a way "of simplifying the choice problem to bring it within the powers of human computation" (Simon, 1957: 204). An aspiration level is the quantity of a particular value the agent would find satisfactory. Searching for more and better knowledge is often motivated by a dissatisfaction with the information they have already obtained. The aspiration levels of goals are not rigid but can be revised in an upward or downward direction according as performance exceeds or falls short of aspiration. For example, sales in a given period greater or less than the target level fixed for that period will lead to higher or smaller targets, respectively, for the next period. The agent is serially evaluating alternatives as to their likelihood of satisfying his or her preferences.

[8] In a search-theoretic choice experiment, Caplin *et al.* (2011) find that many decisions can be understood using Simon's satisficing model: most subjects search sequentially and stop search when an environmentally determined level of reservation utility has been realized.

Ignorance: Lack of information and lack of awareness

Ignorance is understood in relation to knowledge. According to Kirzner (1979), ignorance is associated with two types of knowledge: deliberated acquisition and non-deliberated acquisition. The former can be gained and learnt by deliberated search, while the latter can only be spontaneously absorbed from everyday life experiences. Experiences from everyday life are accumulated into a stock of knowledge. This sort of knowledge is largely "the result of learning experiences that occurred entirely without having been planned nor are they deliberately searched for" (Kirzner, 1979: 142).

For Kirzner, alertness is the essence of entrepreneurial activity. Alertness is distinct from search: alert individuals notice hitherto unexploited opportunities without search. This implies that a better entrepreneur possesses a superior perception of opportunity for profit. All agents cannot be alert to the same opportunities with the same level of proficiency in alertness. People with local knowledge will be alert to particular types of profit opportunities. As Kirzner (1979: 12) suggests, "[i]t would be good to know more about the institutional settings that are most conductive to opportunity discovery." This differential recognition of opportunities for profit raises the important issues in the entrepreneurial market process. Profits are the reward for correctly perceiving and exploiting available opportunities. Individuals are actually ignorant about what they are ignorant about. Opportunity discovery is always accompanied by surprise in disequilibrium. Discovery takes place as entrepreneurs are alert to profit opportunities not known in advance. Discovery replaces ignorance with newly identified feasible states. For Simon, on the other hand, search is the essence of entrepreneurial activity. Individuals start to search for alternatives; the satisficers stop searching. Then, "the means-ends connection between choices and consequences are imperfectly known" (Simon, 1958: 393). Individuals know the extent of their ignorance. That is, to search for something, they are assumed to be endowed with some knowledge regarding the area to be searched. They can take steps through search activities and remedy their ignorance. A need for a process of opportunity discovery is absent in Simon's framework

According to Kirzner (1997: 71), "[a]n opportunity for pure profit cannot, by its nature, be the object of systematic search. Systematic search can be undertaken for a piece of missing information, . . . " Thus, Kirzner (1997) distinguishes discovery from search as follows:

> What distinguishes *discovery* (relevant to hitherto unknown profit opportunities) from *successful search* (relevant to the deliberate production of information which one knew one had lacked) is that the former (unlike the latter) involves that *surprise* which accompanies the realization that one had overlooked something in fact readily available. (Kirzner, 1997: 72, original emphasis)

It is impossible for individuals to search for something that they do not know about. This implies that the searchers must already possess a sense of direction to guide them. Following Penrose's ([1959], 1995) arguments:

> The assumption that firms are 'in search' of profits already implies some degree of enterprise, for it is only in the special case where the profitability of expansion in a given direction is obvious and the decisions to expand almost automatic that no particular quality of enterprise is required. (Penrose, [1959], 1995: 34, original emphasis)

Managerial mental models allow managers to perceive and interpret information. For Penrose ([1959], 1995: 24), the firm is "a collection of productive resources the disposal of which between different uses and over time is determined by administrative decision." Firms differ because of qualitative aspects of their managerial resources, such as creativity, level of ambition, ingenuity in fund-raising, and the ability to exercise their good judgment. The firm's productive opportunity set is itself a cognitive category (Penrose, [1959], 1995).

Nelson and Winter (1982) distinguish between the processes by which present decisions are made and the processes by which decision capabilities are developed. They use Simon's idea of boundedly rational firms that engage in satisficing behavior to build an alternative model of RD decisions. They describe the concept of routines as the regular and predictable behavioral patterns of firms. Routines are patterned, typically in the form of sequences of individuals' actions: the contents are organization-specific. Individual firms have a kind of genetic endowment in terms of technical routines. Routines are considered to be reflective of historically given decisions and behaviors that have come to govern the actions of a firm. However, searching for new routines is itself also a routine. The emphasis is placed on the interactions rather than the individuals that are interacting: routines are collective rather than individual-level phenomena. Cognitively, these routines act as a mechanism to coordinate the skills of employees. Firms compete for market shares on the basis of their specific routines that they built up and improved on in the past. Routines refer to formal as well as tacitly understood rules of behavior. Some routines will be simple habits, easily changed when better techniques become known, while others will be taken-for-granted elements that resist change. Nelson and Winter (1982) describe firms as repositories of knowledge and capacities, embodied in firm-specific routines. These routines are created within the firm and evolve over time in competitive environments. Firm's knowledge and capabilities change as new participants and technologies come and go and the firm gains experience in the market. Nelson and Winter (1982) examine populations of firms with differing routines by addressing the interplay between changing external environments and changing routines. The organizations whose routines are relatively better fit for coping with environmental conditions will thrive. Variations in organizational activities may be conditioned by the nature of the routines, but there is no way to know which of the variations will prove better adapted to the environment.

To the extent that the knowledge structures that were developed in previous organizations shape the perceptions, the entrepreneurs tend to repeat their learned behaviors. This myopic learning process increases the pressures that eventually become codified as institutional practices and may lead to industrial homogeneity. One source of heterogeneity could emerge when entrepreneurs arrive from outside the industry. These entrepreneurs lack the experiences of incumbents and, therefore, may act differently than entrants who have had substantial experiences in the industry. Searching already involves some knowledge of what one is searching for in the industry.

Thus, ignorance can be classified into two categories: lack of information and lack of awareness. For instance, the former is attributable to scarce knowledge in an organization. Then, one can be informed about the missing information through searching. Search is a bounded attempt to find new information related to a specific set of criteria. The entrepreneurs search beyond their own experiences. On the other hand, the latter corresponds to unnoticed opportunities in the market. Then, one does not know what one does not know (i.e., a total lack of knowledge). If organizations devote resources to actively searching for unnoticed opportunities, any search will be difficult due to the total lack of knowledge. Information about profit opportunities may be absent in advance, but it is revealed by alertness. According to Kirzner (1997), without knowing what to look for, the entrepreneur is ready to make discoveries. In such a state of 'sheer ignorance,' discovery includes some element of surprise. Surprise is the signal to sentient individuals that they have been inadvertently ignorant. If people are surprised by something, it is almost certainly the case that they did not know it (or that they thought they knew something that has suddenly turned out to be false). Alertness presupposes that discovery cannot be anticipated. For Kirzner (1979), opportunities exist in the minds of entrepreneurs, and "just around the corner" to be discovered by an alert entrepreneur.

Conclusion

Schumpeterian and Kirznerian entrepreneurs don't know the extent of their ignorance. Creation and discovery cannot be anticipated. However, Kirznerian discovery view of entrepreneurship can be distinguished from Schumpeterian creation perspective. Schumpeterian entrepreneur makes a new combination of existing resources, while Kirznerian entrepreneur reacts to exogenously generated changes in the marketplace. For Kirzner, the role of the entrepreneur is to achieve some kind of adjustment necessary to move the market toward the equilibrium state.

By clarifying two notions of discovery and search in the problem of ignorance, this paper has argued how Kirznerian entrepreneurship differs from Simonian entrepreneurship.

Kirzner emphasizes the quality of perception for recognizing a profit opportunity. Individuals pursuing entrepreneurship need to perceive profit opportunities more clearly than others. Kirzner focusses on the ordinary profit-seeking endeavors of market participants to discover and exploit the opportunities for improvement. On the other hand, Simon emphasizes the search for possibilities and the localness and limits of rationality. Once entrepreneurs choose their problems, they settle on how to search the solution landscape to find sufficiently valuable solutions. They search until they find alternatives that are satisfactory enough.

In this paper, ignorance is classified into two categories: lack of information and lack of awareness. Through searching, agents can be informed about the missing information. It is impossible for agents to search for something that they do not know about. The searchers know the extent of their ignorance (lack of information). They can take steps through searching and remedy their ignorance. Searching for more and better knowledge is often motivated by a dissatisfaction with the information they have already obtained. On the other hand, discovery takes place as entrepreneurs are alert to profit opportunities not known in advance. Then one does not know what one does not know (lack of awareness). Without knowing what to look for, the entrepreneur reacts to the changes in the marketplace. Information about profit opportunities is revealed by alertness in disequilibrium. Disequilibrium creates market niches: the existence of disequilibrium in the marketplace, for Kirzner, implies profit opportunities. Disequilibrium exists because agents are ignorant and are often ignorant of their ignorance. Discovery replaces ignorance with newly identified feasible states.

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