

Chapter 3

An Update to the Individual-Opportunity Nexus

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Introduction

In their efforts to define a distinctive domain for the field of entrepreneurship, researchers have shifted attention away from person-centric approaches, which focus on identifying those people in society who prefer to become entrepreneurs, and towards understanding the nexus of enterprising individuals and valuable opportunities (Venkataraman, 1997). This new focus has been prompted by the need for scholars to explain the existence, identification, and exploitation of opportunities.

In this chapter, we provide an overview of the individual-opportunity nexus, which is a developing theory of entrepreneurship. First, we broaden the treatment of the topic. Second, we clarify dimensions of the organizing framework that were unclear in these earlier efforts. Third, we update the earlier works by reviewing more recent contributions.

Following Venkataraman (1997), we define entrepreneurship as the discovery, evaluation, and exploitation of future goods and services. This definition suggests that, as a scholarly field, entrepreneurship incorporates the study of the “sources of opportunities; the processes of discovery, evaluation and exploitation of opportunities; and the set of individuals who discover, evaluate and exploit them” (Shane & Venkataraman, 2000, 218).

Our perspective does not require several features common to other theories of entrepreneurship. First, we do not view the creation of new organizations as a defining characteristic of entrepreneurial activity. Although entrepreneurship can include firm formation, it can also occur within previously established firms or through market mechanisms such as contracting (Amit et al., 1993; Casson, 1982; Shane & Venkataraman, 2000). In later sections of the chapter, we explore the implications of this possibility for discovery and exploitation within and outside existing firms, as well as the role of markets as a mode of opportunity exploitation.

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Second, our perspective does not assume that the same person or firm engages in all parts of the entrepreneurial process. One person may discover an opportunity and sell it or lose it to others. The discoverer may also enlist the help of others in the exploitation parts of the process, making varied the set of people involved in the different stages of the process.

Third, our perspective does not assume that any consistent relationship exists between effort or skill at discovery and exploitation, and entrepreneurial profits earned. For example, people who engage frequently in entrepreneurial discovery could be more likely to discover opportunities, but less likely to reap entrepreneurial profits from those discoveries than those who engage less frequently in discovery.

Fourth, our perspective assumes that entrepreneurial opportunities exist independent of human cognition. As Baron and Ensley (2006, 1333) write, “Opportunities, as a potential, come into existence as a result of changes in knowledge, technology, markets, and a wide range of political and social conditions; however, they remain merely a potential until they emerge in specific human minds as the result of active cognitive processes.” In other words, as opportunities are created by fundamental social and technological processes involving the interaction of multiple actors, they exist independent of the cognitive perception of any given individual. For example, advances in science can foster commercial applications that are often quite different from those that were perceived by the initial inventor, and therefore they can be used to alter terms of exchange in ways that are not immediately apparent.

Fifth, our perspective acknowledges that the exploitation of opportunities requires human creativity. Opportunities are not businesses, business models, organizations, or products. Opportunities are an economic circumstance where if the correct good or service were to be properly organized and offered for sale that the result would be profitable. To exploit an opportunity, entrepreneurs must create physical products or processes to provide services, devise business models, and in some cases construct new organizations. These are risky and uncertain activities that generally require significant creativity on the part of entrepreneurs (Knight, 1921).

Sixth, our perspective recognizes that not all successful entrepreneurs earn economic rents. Rents are different from profits, as rents refer to financial profits paid to the owner of a factor of production that exceed that which is necessary to keep it in its present employment (Pearce, 1992). In other words, rents represent payments that more than compensate an entrepreneur for the costs of exploitation, including the costs of risk and uncertainty. Successful entrepreneurs do not necessarily earn rents, as the reasons why individuals engage in entrepreneurship are highly idiosyncratic (Venkataraman, 1997). While some individuals engage in entrepreneurship to pursue financial rewards, others select into entrepreneurship for other non-financial benefits, such as personal independence and control. As a result, an entrepreneur may view themselves as highly successful, even if their total financial returns from entrepreneurship are lower than what they would receive if they pursued an occupation as an employee of a larger firm (Shane, 2008).

As Fig. 3.1 indicates, our perspective suggests that entrepreneurship involves a sequential process. While this process may have feedback loops and certainly is not linear, we theorize that it is directional. In general opportunities exist prior to their



Fig. 3.1 The direction of the entrepreneurial process

discovery and opportunities are discovered before they are exploited. The opposite direction is not possible because opportunities cannot be exploited before they exist.

This chapter proceeds as follows: In the second section, we discuss the existence of entrepreneurial opportunities. The third section offers some typologies of entrepreneurial opportunities. The fourth section discusses the identification of opportunities. The fifth section considers the locus of that identification. The sixth section discusses the exploitation of opportunities. The seventh section considers the locus of exploitation. The final section offers a conclusion.

Existence of Opportunities

In this section, we discuss the presence of entrepreneurial opportunities. To do this, we first define entrepreneurial opportunities and contrast them with other opportunities for profit. We then explain why prices are incomplete indicators of profitable opportunities. We finish the section with an exploration of the lifecycle of entrepreneurial opportunities.

Entrepreneurial Opportunities Defined

Following Casson (1982) and Shane and Venkataraman (2000), we define entrepreneurial opportunities as situations in which new goods, services, raw materials, markets, and organizing methods can be introduced for profit. As entrepreneurial opportunities are situations in which goods and services can be sold for profit, not all technologies are opportunities. This is the case, because not all scientific and technological advances have commercial applications. Therefore, important social, political, and technological change that are important antecedents to the process of entrepreneurship yet occur outside the commercial system are not directly addressed by the IO-nexus.

Opportunities have specific characteristics. These characteristics influence almost all aspects of the entrepreneurial process. For example, some opportunities—such as those based on novel science—may be sufficiently complex such that only a limited number of individuals will be able to formulate conjectures about their potential existence (Zucker et al., 2002). Characteristics of opportunities also

influence the organizing processes. For example, capital-intensive opportunities—such as the creation of a car manufacturer—require the raising of significant capital to bring a product to market whereas a t-shirt marketing company that requires less capital might not. Therefore, the capital-intensive venture is likely to require contracts with funding providers, the creation of specific policies and procedures, and a path to market that will differ significantly from the organizing process of the t-shirt marketing company. In addition, the characteristics of opportunities also influence their economic value. The economics of some opportunities may be sufficiently large that they can fund the creation of a Fortune 500 company in just a few years, while other opportunities may ultimately provide for the financial welfare of only a single individual.

The decision-making context for opportunities is uncertain. Alvarez & Barney (2007) describe the decision-making context of an opportunity as risky if entrepreneurs can assign probabilities to possible outcomes for the opportunity. The context is uncertain, if feasible outcomes cannot be identified, or if corresponding probabilities cannot be assigned (Knight, 1921). For entrepreneurs seeking to accomplish specific ends with an opportunity, it is not possible to identify all possible outcomes and the associated probabilities. Much of the uncertainty is derived not from the opportunity itself, but instead it arises from the lack of objective information about the opportunity from which they form conjectures. However, two other dimensions of opportunities render the decision-making context uncertain, time and selection criteria. As the exploitation of an opportunity is rarely instantaneous, a given opportunity that is being pursued by an individual may not exist by the time the entrepreneur is able to complete organizing activities that are necessary to bring a product or service to market. Secondly, until an opportunity is successfully exploited, the characteristics of market selection criteria are unknown. This fundamental lack of information regarding the value of the opportunity, the nature of the organizing process, the inability the actions of other entrepreneurs who may be organizing the same or substitute opportunities, as well as the characteristics of demand, render the decision environment to be uncertain.

Why Prices are Incomplete Indicators of Opportunity

The market system is a powerful means of coordinating economic activity because prices simultaneously coordinate the production plans, resource availability, and resource requirements of market participants in a way that limits the cognitive demands on any individual agent. By efficiently transmitting information, the invisible hand of the market coordinates the actions of millions of people who never have to interact, or even know why or how others produce goods and services (Smith, 1776).

As valuable as the price system is to the coordination of economic activity, it has one major weakness. Prices do not accurately convey all information necessary to coordinate economic decisions. In particular, prices do not accurately guide the discovery and exploitation of entrepreneurial opportunities.

For entrepreneurial opportunities to exist, people must not all agree on the value of resources at a given point in time. For an entrepreneur to exploit an opportunity, he or she must believe that the value of resources, recombined according to a new means-ends framework, would be higher than if exploited in their current form. In addition, profits are limited if the belief is universally shared and resources are scarce (Casson, 1982). If all of the current resource owners and other potential entrepreneurs shared the entrepreneur's belief in the correctness of the proposed new means-ends framework, then they would hold the same beliefs about the value of resources as the focal entrepreneur. If they based their decisions on these beliefs, this situation would preclude the focal entrepreneur from obtaining the resources at a price that would allow profitable recombination (Shane & Venkataraman, 2000).

But why, in a market economy, should people hold different beliefs regarding the value of resources if the price system provides an efficient means of transmitting information about changes in beliefs between disconnected individuals? The answer is that prices fail to provide all of the necessary information to make all decisions about resources.

First, prices convey only part of the information necessary to direct opportunities to serve markets. Producers are unable to make production decisions and allocate resources simply by producing quantities that set prices to marginal cost, as costs are unknown and must be estimated (Gordon, 2004). Prices also fail to provide information on how new markets could be served, how a new technology could be used to improve a production process, or how a new way of organizing will generate value. In addition, prices do not contain information about prior failures at that effort, or articulate how one's approach to recombining resources would stand vis-à-vis the approaches of potential competitors.

Second, prices convey even less information to direct opportunities to serve markets that do not yet exist. While market participants might be satisfied today, a future condition might emerge that would lead them to desire a new good or service. However, as Arrow (1974) explained, there are no contingent prices for future goods and services. In the absence of futures markets for goods and services, there is no way to use current prices to determine if there would be an opportunity to serve a market that is not yet in existence. Similarly, there is no way for current prices to guide the allocation of resources in the current period in anticipation of resource needs of markets that will exist in the future, but that do not currently exist.

Evidence of the latter problem is most prevalent during periods of technological change, which do not appear to be well-anticipated by markets. As Rosenberg (1976) explains, after the introduction of superior products, improvements often continue to be made to products that are ultimately replaced by new products. For example, improvements were made to sailing ships after steam-powered iron-hull ships were introduced, and improvements were made to the steam engine in response to the arrival of the internal combustion engine (Rosenberg, 1976).

Given that prices do not convey what future demand will be, they provide limited information about marginal costs or revenues. Similarly, because markets set

prices on known technology, not new methods that may be discovered in the future, prices do not reflect the relative benefits of different innovations if they would be introduced in the future. However, the appropriateness of resource allocation decisions in the current period, such as investments in durable plant and equipment, are contingent on the characteristics of future markets for goods and services.

Thus, even Hayek's (1945, 526) important example of the value of the price system in the tin market shows the limitations of the price system for allocating resources for entrepreneurial opportunities. He wrote, "assume that somewhere in the world a new opportunity for the use of some raw materials, say tin, has arisen, or that one of the sources of supply of tin has been eliminated. It does not matter . . . which of these two causes has made tin more scarce. All that the users of tin need to know is that some of the tin they used to consume is now more profitably employed elsewhere, and that in consequence they must economize tin." To Hayek, producers need only to look at the prevailing price of tin when making production decisions.

However, Hayek's account only describes how prices guide the decision process of tin producers who are selecting what quantity of a standardized good currently under production to produce. Prices provide little information to guide producers who have developed a novel use for tin or even if they should invest resources in developing such novel uses.

To the entrepreneur seeking to profit from this change by supplying tin, which of the two causes makes tin scarce is of fundamental importance. If an entrepreneur believes that the shortage of tin has resulted from the new use of tin, she may conjecture that the increase in price is likely to be permanent and therefore believe that costs she would need to incur to meet demand would be recovered. Therefore, purchasing the tin, creating a new product, and then selling it would result in a profit. On the other hand, if the true cause of the tin shortage were a temporary elimination of a source of supply, then she may experience losses if she incurs costs to produce tin at higher prices if the prices return to a lower equilibrium price after the temporarily disabled producer returns to market. The difference between entrepreneurial profit and loss in this case lies not in the information about the shortage of tin indicated by the price change, but in the entrepreneurial conjecture as to the *cause* of that shortage.

Discovery Defined

Although price coordination has its shortcomings, the market system remains an extremely efficient means of simultaneously coordinating the unique production plans and preferences of millions of individuals. However, situations arise in which prices provide insufficient information to allocate resources. In these situations, individuals must make decisions based on information not incorporated in prices. Entrepreneurial discovery defined as the definitive confirmation that an opportunity exists.

Entrepreneurs bring new decision-making frameworks into the price system by forming perceptions and beliefs about how to allocate resources better than they are currently allocated or would be allocated in the future on the basis of information other than prices. By leading entrepreneurs to buy resources, recombine them, and sell the outputs, these perceptions create new markets or update old ones. The prices that are updated or created through this process of recombination increase the accuracy of decisions of others who coordinate resources by optimizing within the price-based market system.

Formulating a profitable conjecture about an opportunity is far from the trivial exercise of optimizing within existing means-ends frameworks because it requires forming expectations about the prices at which goods and services that do not yet exist will sell (Arrow, 1974; Venkataraman, 1997). When these conjectures prove correct, entrepreneurs earn profits, but when they prove incorrect, entrepreneurs incur losses (Casson, 1982).

The process of discovery describes how individuals acting alone, or within firms, prove the existence of a previously unseen or unknown way to create a new means-ends framework. Although we have used the term “discovery” to maintain consistency with prior literature, individual discovery is a misleading concept, as it implies that sufficient information exists at the moment of initial perception to assess whether an opportunity does in fact exist. Instead, individuals *perceive* that they have become aware of a profitable opportunity. Whether in fact they have discovered such an opportunity is unknowable at the time of initial perception, as it involves the ability to predict factors such as the characteristics of future market demand, the actions of potential competitors, or the extent to which individuals can be convinced to commit resources sufficient to sustain the effort to pursue the opportunity.

Suppose an individual has perceived, or discovered, that she can produce a new item by a previously unknown means. To establish if the opportunity has value in the first case, the individual must conjecture that a positive probability exists that the future price of the item will exceed its costs and that future demand will exist. In the latter case, the individual will need to conjecture that once others are presented with the actual product, they will respond positively to it. In both cases, the individual must attempt to foresee the characteristics of future markets to determine *ex ante* if the opportunity has potential value.

Predicting such things with certainty is not possible, as it requires individuals to possess information that does not yet exist at the time of individual discovery. For example, current customers are unlikely to provide accurate forecasts of their own future demand for new products even when working prototypes exist (Christensen & Bower, 1996). In addition, individuals may be mistaken in their analysis of the characteristics of the usefulness of new items. Therefore, individuals, operating alone or within firms, lack sufficient information to establish if a discovery has been made.

In the process of the exploitation of opportunities, individuals acquire resources and engage in market-making activities that change prices and provide information to others. The process of exchange and interaction provides information that increases the mutual awareness among market participants about the characteristics

of the opportunity (Arrow, 1974; Jovanovic, 1982; Venkataraman, 1997). This information may either encourage, or discourage the individual pursuing the opportunity from continuing.

However, the only reliable confirmation that a previously unseen or unknown valuable opportunity has in fact been discovered occurs when a product has been sold and market has been created for the new item. This is the hypothesis test of the existence of an opportunity (Harper, 1996). In the absence of market confirmation, the validity of the entrepreneur's perception is unknown; no knowledge is recorded in prices, and therefore the production plans and preferences of individuals are not updated.

The Life Cycle of Opportunities

If an entrepreneur does discover a valuable opportunity and that opportunity generates profit, that profit is transient due to external and internal factors. First, the disequilibrating shocks that initially generated the opportunity are often replaced by other shocks that open up new opportunities and close up the existing ones (Schumpeter, 1934). Second, even when new shocks are not triggered, the opportunities become exhausted by entrepreneurial competition. The information asymmetry that creates the opportunities in the first place is subsequently reduced by the diffusion of information about the opportunity. When entrepreneurs exploit opportunities, they transfer information to others about what the opportunity is and how to pursue it. Although this imitation might initially legitimate an opportunity, it also generates competition that exhausts the discrepancy (Schumpeter, 1934; Shane & Venkataraman, 2000). Third, information about the opportunity diffuses to resource owners, who seek to capture profits by raising the price of their resources in response to information generated by the actions of the entrepreneurs about the new value of their resources (Kirzner, 1997).

However, the opportunity half-life can last longer or shorter depending on a variety of factors. First, mechanisms that limit imitation by other entrepreneurs, such as trade secrecy, patent protection, or monopoly contracts prolong the life of the opportunity (Shane & Venkataraman, 2000). Second, mechanisms that slow the transmission or recognition of information about the opportunity hinder imitation, thereby extending the life of the opportunity. The latter include the concepts of causal ambiguity commonly discussed in the resource-based view of strategy (Barney, 1991). They also include situations in which few parties have the requisite knowledge to copy a way of exploiting an opportunity, despite its demonstration (Junkkunc & Eckhardt, 2009; Zucker et al., 1998).

Types of Opportunities

Entrepreneurial opportunities manifest themselves in a variety of different ways. We believe that the prior literature has offered three valuable ways of categorizing

opportunities: By the locus of the changes that generate the opportunity; by the source of the opportunities themselves; and by the initiator of the change. In the sections below, we consider these different dimensions.

Locus of Changes

Although most entrepreneurship research implicitly assumes that entrepreneurship involves changes in products or services, entrepreneurial opportunities can, in fact, occur as a result of changes in a variety of parts of the value chain. Schumpeter (1934) suggested five different loci of these changes: those that stem from the creation of new products or services, those that stem from the discovery of new geographical markets, those that emerge from the creation or discovery of new raw materials, those that emerge from new methods of production, and those that are generated from new ways of organizing.

Certainly, the creation of a new good or service can create an opportunity for entrepreneurial profit, as is the case when the development of accounting software or a surgical device makes possible a recombination of resources that can be sold for greater than its cost of production. However, as we have seen from the development of the Internet, new modes of organizing that do not require bricks and mortar locations also generate opportunities for entrepreneurial profit. Similarly, the discovery that seaweed could be sold as a food in the United States as well as Japan generates the opportunity for entrepreneurial activity, as did the discovery that oil provided a better fuel than many other raw materials previously discovered. Finally, new methods of production, such as the assembly line or computer-aided drug discovery, have provided opportunities for entrepreneurial profit.

In Fig. 3.2, we show that Schumpeter’s loci of changes can be arrayed along the value chain. We suggest that considering the relationship between these types of changes and the parts of the value chain would provide an interesting domain for entrepreneurship researchers to explore. For example, are the relationships one-to-one, as our figure suggests, or are they overlapping? If they are overlapping, are

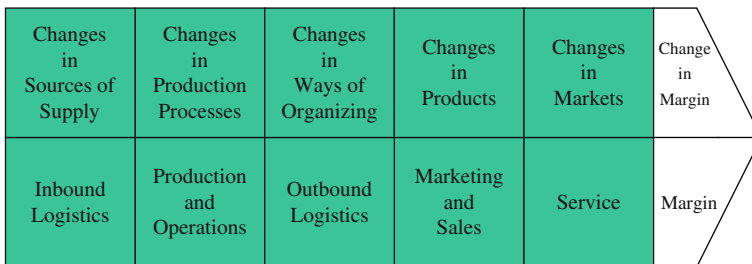


Fig. 3.2 The relationship between types of Schumpeterian opportunities and the value chain
 Source: Adapted from Porter, M. 1985. *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press

some Schumpeterian changes more powerful instigators of changes on certain parts of the value chain than on others?

In addition, we think that documenting the frequencies of different types of opportunity-creating changes and their relative causes and effects would be useful. For example, researchers should examine whether the opportunities generated by some types of changes are more long lasting or valuable than others and whether the factors that lead to them are different. Furthermore, researchers may find that the processes by which opportunities are discovered, evaluated, and exploited differ across loci. Exploration of the potential contingencies between these loci of changes and the three parts of the entrepreneurial process would be a valuable addition to the field of entrepreneurship.

Sources of Opportunities

Opportunities also vary as to their source. We believe that prior research suggests four important ways of categorizing opportunities by sources: First, considering differences between opportunities that result from asymmetries in existing information between market participants and opportunities that result from exogenous shocks of new information; second, comparing supply and demand side opportunities; third, comparing productivity-enhancing and rent-seeking opportunities; and fourth, identifying the agents that initiate the change which generates the opportunity.

Information Asymmetry vs. Exogenous Shocks

Kirzner (1973) and Schumpeter (1934) disagreed over whether exogenous shocks of information are the primary catalyst of entrepreneurship. In what Venkataraman (1997) termed the strong form of entrepreneurship, Schumpeter (1934) held that periods of market efficiency are punctuated by periods of upheaval. Changes in technology, regulation, and other factors generate new information about how resources might be recombined into more valuable forms. This information changes the equilibrium price for resources, thereby allowing economic actors who have early access to the new information to purchase resources at below-equilibrium prices, use the information to recombine them into a more valuable form, and sell them at an entrepreneurial profit (Schumpeter, 1934; Venkataraman, 1997).

In contrast, Kirzner (1973, 1985, 1997) holds that opportunities exist even in the absence of this new information. In the absence of prices, he argues, people form beliefs in response to information they possess. Because those beliefs are influenced by a wide variety of ceaselessly changing factors, they are never 100% accurate. As a result, market actors make mistakes in their decisions, creating shortages and surpluses of resources (Gaglio & Katz, 2001). People alert to these mistakes can buy, recombine, and resell resources for a profit (Shane & Venkataraman, 2000).

Supply vs. Demand Side Changes

Opportunities can also be classified on whether the changes that generate them exist on the demand or on the supply side. In general, the entrepreneurship literature implicitly focuses on supply side changes. For example, most discussions of opportunity concern changes in inputs, ways of organizing, production processes, or products (Schumpeter, 1934). But changes in demand alone can generate opportunities. Customer preferences influence the allocation of resources because producers need to respond to the preferences and purchasing habits of consumers. Thus, demand changes from exogenous shifts in culture, perception, tastes, or mood can open up opportunities (Kirzner, 1997; Schumpeter, 1934), as in the case of demand for American flags in response to a terrorist attack. The opportunity is created if the increase in demand outpaces investments in production capacity, generating opportunities to add more capacity, perhaps on more economic terms (Drucker, 1985). In addition, growing markets might create new niches as well as the opportunity to specialize (Geroski, 2001).

To the extent that observed entry corresponds with the existence of opportunities, some empirical support exists for the existence of opportunities in growing markets. For example, Romanelli (1989), Shankar et al. (1999), and Highfield and Smiley (1987) all find a positive correlation between market growth and firm entry. However, the research to date addresses this topic only indirectly and more studies should explore demand-driven entrepreneurial opportunities.

Productivity-Enhancing vs. Rent-Seeking Opportunities

Much of what researchers imply when they discuss entrepreneurship is productive entrepreneurship. In the standard view, the pursuit of entrepreneurial opportunity has productivity-enhancing outcomes, as economies are made more efficient. However, it is also possible to think of entrepreneurial actions as rent seeking, which Baumol (1990) has defined as opportunities that generate personal value, but no social value. He points out several types of entrepreneurial opportunities that are not productivity enhancing, including crime, piracy, and corruption.

Merger activity provides a good example of the potential for both productive and unproductive entrepreneurship. The recombination of resources through the merger or break-up of firms can create productive opportunities as new customer relationships or economies of scale are generated. However, mergers may also generate unproductive opportunities, as would be the case if a merger merely shifts wealth from consumers to producers by reducing competition.

Researchers would provide a valuable contribution to understanding entrepreneurship by examining several facets of this categorization of opportunities. Venkataraman (1997) suggests that researchers investigate the social, legal, and political factors that influence the relative distribution of productive and unproductive opportunities across locations. Baumol (1990) suggests that researchers

also examine relative distribution over time, arguing that, in the same location at different points in time, the potential to add value from new combinations of resources might be higher or lower than the potential to shift value from others via new combinations of resources.

Initiator of the Change

A final dimension on which opportunities have been classified is by the actor that initiates the change. Different types of entities initiate the changes that result in entrepreneurial opportunities, and the type of initiator is likely to influence the process of discovery and evaluation as well as the value and duration of the opportunities. Among the different types of actors that researchers have identified are non-commercial entities, such as governments or universities; existing commercial entities in an industry, such as incumbents and their suppliers and customers; and new commercial entities in an industry, such as independent entrepreneurs and diversifying entrants (Klevorick et al., 1995).

Although researchers have not often examined the actors that generate opportunities outside the area of technological opportunities, work in that area is instructive. Researchers have shown that two sets of actors are very important to the creation of technologies opportunities: specialized knowledge creating agencies, such as universities or research laboratories, that lie outside the industrial chain, and firms within the industrial chain, including suppliers and customers (Klevorick et al., 1995). The two sets of actors have a different likelihood of generating opportunity-creating changes under different industry knowledge conditions. Researchers have also examined the conditions under which the actors within the industrial chain that generate opportunity-inducing changes are most likely to be users (Von Hippel, 1988), upstream suppliers, or the incumbent firms themselves (Klevorick et al., 1995). Additional research in this area would increase our understanding of the factors that influence the prevalence of economic opportunities in market economies.

Identification of Opportunities

To profit from the existence of an entrepreneurial opportunity, a person must first develop a conjecture that such an opportunity exists (Shane & Venkataraman, 2000). The information asymmetry that under-girds entrepreneurship assumes that only a portion of the population will identify a particular opportunity at a specific moment (Hayek, 1945; Kirzner, 1973). This observation begs the question: why do some people and not others identify particular entrepreneurial opportunities at a particular point in time? Separate streams of research about access to information and cognitive properties offer insight into this question.

Access to Information

Information is unevenly distributed across economic actors (Hayek, 1945) because of limits in the ability of prices to transmit information (Akerlof, 1970), because people specialize in information (Becker & Murphy, 1992), and because the codification of information is not costless. As a result, only some portion of the population will possess information about errors in market processes or exogenous shocks to equilibrium conditions at any moment in time. For example, only scientists at MIT might know about the creation of new technology in biologically based computing, while only housewives in Topeka, Kansas might know about unmet demand for bakery goods on the north side of the city.

Three mechanisms appear to underlie the variation across people in access to information: Knowledge corridors, search processes, and social networks. We review the implications of these three mechanisms for entrepreneurial discovery in the subsections below.

Knowledge Corridors

Much of the ability to gather information about opportunities “is acquired through each individual’s own circumstances including occupation, on-the-job routines, social relationships and daily life” (Venkataraman, 1997, 122), or occurrences termed knowledge corridors (Ronstadt, 1988). These experiences allow people to know about resources that are unused, new technological developments, regulatory changes, or other information before others know about them. Hayek (1945) explained that everyone has superior information over others about some dimension of time and place that provides an advantage in discovering entrepreneurial opportunities. For example, the shipper knows which vessels are half empty before the real estate agent, whereas the real estate agent knows which houses are for sale before the shipper. Because this information advantage allows certain people to learn about the disequilibrium that makes an entrepreneurial opportunity possible before other people can see it, the advantage facilitates the discovery of that opportunity.

Search

People might also possess information before others because they search for it. Search theories argue that an individual searches for information as long as the marginal benefit of searching is anticipated to exceed the marginal cost of search (Stigler, 1961). Because individuals possess different information as a result of experiences transacting in diverse markets, some people can search for specific information more inexpensively than others. Moreover, searching for information closer to what one already knows increases the likelihood of gathering that information. Because information influences the probability of entrepreneurial discovery, and because local search is cheaper than distant search, individuals are likely to discover opportunities within a close proximity to their knowledge base.

Social Ties

Social network theorists postulate that individuals uncover information through the structure and content of the relationships with other members of society (Burt, 1992; Granovetter, 1973). The structure of social relationships determines the quantity of information, the quality of information, and how rapidly people can acquire information necessary to discover opportunities for profit. Further, social capital theorists believe that people are able to purposefully design the structure of their social relationships to enhance their chances of discovering opportunities.

Social relations are depicted as clusters of frequently interacting groups of individuals linked by weaker ties to other clusters of individuals. The interconnectedness of relationships within clusters of individuals leads to redundant ties where information from a single source can be received from a variety of individuals. As a result, information flows rapidly among members of these groups, thereby providing all members with access to the same information.

However, non-redundant social ties with members of other social clusters provide people with information not available to others lacking these ties. These non-redundant ties allow people access to information not broadly shared with others in their group, thereby facilitating the discovery of opportunities (Johannisson, 2000; West & Meyer, 1997).¹

Although the use of social networks to discover information that facilitates the identification of opportunities is detailed in the theoretical research on social capital, research attempting to measure the connection between the structure of social networks and the discovery of entrepreneurial opportunities is limited. However, in an analysis of 308 responses of a survey of 1,402 founders of IT consulting firms, Singh et al. (1999) find that the structure of social networks influences the number of new ideas identified by entrepreneurs.

Cognitive Abilities Including Prior Knowledge

Access to information is likely to be an incomplete explanation of the identification of opportunities, because opportunities are identified only when people formulate a conjecture regarding the existence of an opportunity in response to that information. As a result, recognizing opportunities from information about changes also involves determining the meaning of that information (Baron, 2002). This raises the question, are some people better able than others to create new means-ends frameworks from information about changes?

¹Social network theories differ from search theories about access to information. In the latter, individuals who gather information search locally for it; whereas, in the former, individuals who build connections to information possessed by individuals with market experience much different than their own are more likely to gather novel information. Therefore, social capital theory implies that local search is of little value for entrepreneurs seeking to discover opportunities for profit that are not yet reflected in market prices.

One factor that is likely to explain why some individuals in specific situations will develop a conjecture that an opportunity may exist while others will not in the same situation is differences in knowledge between two individuals. As prior knowledge is derived in part from heterogeneous life experiences including education and employment, individuals are unlikely to each have the same prior knowledge. For example, individuals acquire an understanding of specific intellectual domains through study and experimentation. As a result, two individuals who possess the same academic degree may have acquired very different stocks of knowledge (Junkunc & Eckhardt, 2009; Pellmar & Eisenberg, 2000).

Another answer might lie in relative superiority across individuals in this cognitive process. Gaglio and Katz (2001) suggest that alertness to opportunity is a function of variation across people in their ability to deconstruct causal relationships; to see cross-linkages between pieces of information; to understand the workings of economic, social, and physical processes; to critically evaluate information; to challenge assumptions; to re-label categories; to use analogies; to identify counterintuitive patterns; or to engage in counterfactual thinking. Sarasvathy, Simon and Lave (1998) suggest that it is a function of variation in people's cognitive schema so that some people view new information in terms of opportunities rather than risks. Shackle (1982) suggests that it is a function of variation in people's creativity or imagination.

However, very little empirical research has supported these arguments. In a pilot study of 20 managers and small business owners, Gaglio and Taub (1992) found evidence that managers approached the evaluation of a series of business case studies differently from owners. Although they interpreted the results as an indication that the cognitive process of trained business managers differs from that of small business owners, the authors did not detect a difference in their construct of alertness between the two sets of individuals.

One reason for this null finding may be that alertness is not an attribute of specific people. Rather, everyone may be alert to certain kinds of information, but not other kinds of information, according to the circumstances. Prior knowledge about a topic might generate an absorptive capacity that allows people to recognize the value of information on that topic (Cohen & Levinthal, 1990). Specifically, prior knowledge about such things as markets, technologies, production processes, industries, and customers influences the ability of people to comprehend or interpret new information as it relates to other information.

Shane (2000) provides empirical evidence in support of this argument. He shows that, in response to a single MIT invention, eight individuals discovered different opportunities that were related to their prior knowledge and experiences, but each did not recognize the opportunities identified by the others.

Another potential reason for this null finding is that there might be a contingency between types of opportunities and the cognitive schema that generate alertness. For example, Gaglio and Katz (2001, 100) suggest that "mental models for detecting the 'herd mentality' of other market actors and for developing contrarian positions as the initial reference point" will be likely to identify opportunities that result

from information asymmetry between market actors. But, would such dimensions of alertness help to identify opportunities based on new knowledge? A valuable area for future research would be to map the relationship between cognitive schema and types of opportunities.

Locus of Opportunity Discovery

Our earlier discussion suggested that new firm creation is not a necessary characteristic of entrepreneurial activity. Individuals within existing firms could also discover opportunities. In fact, we expect that individuals within existing firms frequently discover opportunities.

To date, no research explores whether people within organizations are more or less likely than people outside those organizations to identify particular opportunities. Moreover, we know nothing about the types of opportunities that might be more or less likely to be discovered by people within organizations. However, information flows are likely to influence the probability of entrepreneurial discovery, and people within existing organizations receive different information than those outside of organizations. Therefore, the opportunities that people within organizations will discover likely will differ from the opportunities that people outside organizations discover. Similarly, if filters in the hiring process lead people within organizations to have a different distribution of cognitive properties than people outside organizations, then people within organizations are likely to discover different opportunities than those outside organizations.

Another important issue about the locus of opportunity discovery concerns its effect on other stages of the entrepreneurial process. If people within existing organizations are more likely to identify certain opportunities, and mechanisms exist to deter those individuals from exploiting those opportunities on behalf of a new entity (e.g., intellectual property or labor constraints), then the exploitation process becomes path dependent. Exploitation processes that are more common within established organizations will become associated with certain opportunities, and the range of observed approaches to exploitation outside of existing firms will become truncated.

Exploitation

After an entrepreneur has discovered an opportunity, he or she may decide to exploit it, which we define as taking action to gather and recombine the resources necessary to pursue an opportunity, as opposed to the mental activities of recognition and evaluation. This exploitation process depends on several factors, including the attributes of both entrepreneurs and the opportunities that they pursue.

The attributes of opportunities are themselves important to the exploitation process because the asymmetric information that makes entrepreneurial opportunities

possible influences the process of exploitation (Venkataraman, 1997). To exploit an opportunity, an entrepreneur must gather and recombine resources to pursue a perception of an opportunity that may or may not prove valuable. As a result, resource owners must provide resources to the entrepreneur despite significant uncertainty about the accuracy of the entrepreneur's conjecture. Moreover, because the identification of opportunities is influenced by the possession of information that others do not possess, significant asymmetries of information exist between entrepreneurs and resource providers (Venkataraman, 1997).

These information asymmetries raise the threat of moral hazard and adverse selection problems that could undermine markets for resources (Amit et al., 1990). Moreover, these problems are exacerbated by the behavior of entrepreneurs. To reduce the likelihood that others will imitate their approach to pursuing opportunities, entrepreneurs seek not to disclose the information that allowed them to identify their opportunities or their strategies for pursuing them. This reluctance to disclose requires resource providers to make decisions about supporting the opportunity with less information than the entrepreneur possesses (Shane & Cable, 2002), making it difficult for resource providers to avoid problems of adverse selection.

The entrepreneurs' reluctance to disclose information about their opportunities or exploitation strategies also makes it difficult to monitor them against opportunistic behavior (Cable & Shane, 1997). Therefore, the information asymmetry between entrepreneurs and resource providers raise the potential for moral hazard on the part of entrepreneurs. These conditions suggest three very important factors in the exploitation of opportunities: access to financial capital, contracting solutions, and social capital. We discuss these factors below.

Financial Capital

One solution to the problem of information asymmetry between entrepreneurs and resource providers is for entrepreneurs to invest their own capital in their ventures. By self-financing, entrepreneurs can overcome the information asymmetry problem by placing the financing decision in the hands of those people who have all the information about the opportunity. Thus, people with greater financial capital are more likely to exploit opportunities than people with lesser financial capital (Evans & Leighton, 1989).

The question of whether or not entrepreneurs need to self-finance provides an important distinction between the entrepreneurship theories of Schumpeter (1934) and Knight (1921). Schumpeter (1934) did not consider the importance of information asymmetry to resource acquisition, and thus argued that entrepreneurship involved only the identification and exploitation of opportunity. To Schumpeter (1934), entrepreneurs do not have to provide capital, and thus, do not bear uncertainty. Knight (1921), however, presaged modern finance theory when he recognized the information problems that would occur if entrepreneurs formulated their opportunities on the basis of information that resource providers did not have. Given

these problems, Knight (1921) explained that entrepreneurs must provide capital to exploit their own opportunities, thereby making them bearers of uncertainty.

Contracting Solutions

Another way to mitigate the problems of information asymmetry and uncertainty lies in the allocation of ownership rights between entrepreneurs and resource providers (Gompers & Lerner, 1999; Kaplan & Strömberg, 2003). Because entrepreneurial opportunities are uncertain, much of the information necessary to separate successful from unsuccessful ones is not available at the time that the entrepreneur identifies the opportunity. Under these circumstances, resource providers want to make only those investments that are necessary to gather needed information and postpone other investments until later (Dixit & Pindyk, 1994). Thus, resource providers supply resources in stages. These investment options give them the right, but not the obligation, to continue their financial support (Sahlman, 1990).

Resource providers also protect themselves against problems of information asymmetry and uncertainty by limiting entrepreneurs' control rights. Gompers (1999) explains that venture capitalists often write covenants that preclude the entrepreneur from receiving compensation until the investors have earned their return. Hoffman and Blakely (1987) point out that many resource providers force entrepreneurs to lose part of their ownership if the venture does not meet investor return targets. Resource providers also contractually require entrepreneurs to bear a significant portion of the risk in their ventures (Gompers & Lerner, 1999; Kaplan & Strömberg, 2003).

Social Capital

Unfortunately, explicit contracts can rarely completely eliminate the problems engendered by information asymmetry and uncertainty (Arrow, 1974). Therefore, investors also use social capital to manage these problems (Aldrich & Zimmer, 1986; Venkataraman, 1997). Social ties provide two benefits that mitigate adverse selection and moral hazard. First, social ties link the provision of resources to social obligation and social norms of fairness and trustworthiness (Gulati, 1995). This leads parties to avoid exploiting information asymmetries that might exist in their favor. Social ties also provide a way to gather information quickly and cheaply, thereby reducing the information asymmetry itself (Aldrich & Zimmer, 1986; Gulati & Gargiulo, 1999).

Some empirical support currently exists for the importance of social capital in the resource acquisition process. Shane and Cable (2002) show that investors are more likely to make seed stage investments if they have direct or indirect social ties to the entrepreneurs who bring them the investment. Shane and Stuart (2002) show that

spin-offs from MIT are significantly more likely to have raised venture capital if they had pre-existing social ties to investors at the time of firm formation. Larson (1992) shows that other resource providers, such as strategic alliance partners, are also more likely to provide those resources if social ties exist between the entrepreneur and the resource provider.

The Characteristics of the Opportunity

Another factor that influences opportunity exploitation is the characteristics of the opportunity itself. The exploitation of opportunities is endogenous to their identification because people discover opportunities of varying value in response to a given change. For example, in response to a single MIT invention, entrepreneurs identified opportunities with markets as small as a few million dollars and as large as several billion (Shane, 2000). The perceived value of the opportunity will influence the exploitation decision because entrepreneurs have other options for their time, such as wage employment. As a result, empirical research has shown that opportunities will be more likely to be exploited when markets are larger (Schmookler, 1965; Schumpeter, 1934), profit margins are higher (Dunne et al., 1988), levels of competition are lower (Hannan & Freeman, 1984), and capital is cheaper (Shane, 1996).

Another factor that influences the perceived value of opportunities is the appropriability regime related to a given opportunity. Appropriability is the condition under which one party can prevent others from capturing the returns from the exploitation of an opportunity (Levin et al., 1987). If the entrepreneur cannot appropriate the returns from exploiting an opportunity, the entrepreneur will likely abandon that opportunity or fail to initiate exploitation.

The Fit with the Person

Several characteristics of the entrepreneur will also influence the exploitation process. Venkataraman (1997) points out that entrepreneurs do not evaluate opportunities on the basis of relative performance. Rather, they evaluate opportunities relative to their personal alternatives. In particular, entrepreneurs look at their opportunity cost, and their premia for uncertainty and illiquidity, and compare those factors to their conjecture of the expected value of their opportunity.

This process of opportunity evaluation has important implications for opportunity exploitation. Given variation in the characteristics of the discoverer of opportunity, not everyone will be willing to exploit a given discovery. For example, the discovery of a need for a hot dog stand on a particular corner in Manhattan might lead an unemployed and illiterate individual to exploit it, but is unlikely to lead an investment banker on Wall Street to act. The magnitude of the opportunity cost will likely be a major deterrent to entrepreneurial exploitation by the investment banker (Venkataraman, 1997).

In addition, the fit with the person extends to skills necessary to exploit an opportunity that has been discovered. An individual may have the ability to recognize that a given opportunity exists, but may lack the managerial ability or social connections necessary to implement a business based on the concept. As a result, a particular opportunity that has been discovered may not be exploited, or a different person may exploit it.

Psychological Differences

Psychological differences between people also influence their decisions to exploit opportunities. For example, McClelland (1961) argued that individuals high in need for achievement will be more likely to exploit entrepreneurial opportunities because they prefer to take responsibility for finding solutions to problems, master complex tasks, take risks based on goals and skills, and seek financial rewards for success. In fact, Collins et al. (2004) conducted a meta-analysis of 63 need for achievement studies in entrepreneurship and found that individuals high in need for achievement appear to be more likely to be entrepreneurs than the general population.

People higher in internal locus of control are more likely to exploit entrepreneurial opportunities. Individuals with a strong internal locus of control believe that they can understand and control the outcome of events, while individuals with a strong external locus of control perceive the outcomes of events as beyond their personal control (Rotter, 1966; Spector, 1992). Individuals with a greater internal locus of control are more likely to exploit entrepreneurial opportunities because it leads them to believe that their actions to recombine resources will have positive outcomes.

People higher in risk-taking propensity are more likely to exploit entrepreneurial opportunities (Khilstrom & Laffont, 1979; Knight, 1921). Entrepreneurs must make decisions that involve bearing true uncertainty (Knight, 1921) because they must invest resources before they know the outcome of those investments (Venkataraman, 1997), in the absence of insurance, futures markets, or strategies for diversification (Arrow, 1974). Begley (1995) as well as Sexton and Bowman (1996) found differences in risk preferences between entrepreneurs and managers, and Brockhaus (1980) reported differences in risk preferences between entrepreneurs and the overall population. Stewart and Roth (2001) conducted a meta-analysis of risk-taking propensity and found that entrepreneurs have a higher risk-taking propensity than managers.

People higher in tolerance for ambiguity are more likely to exploit entrepreneurial opportunities. Tolerance for ambiguity is the tendency for individuals to accept ambiguous circumstances as attractive in contrast to intimidating (Budner, 1982). As the process of entrepreneurship is uncertain and fraught with alternatives without clear solutions, individuals with higher tolerance for ambiguity will be more likely to become entrepreneurs. For example, in a review of

four studies, Sexton and Bowman (1996) reported that entrepreneurs have a higher tolerance for ambiguity than managers. Further, Begley and Boyd (1987) and Miller and Drodge (1986) similarly find evidence that entrepreneurs have higher tolerance for ambiguity than managers.

People higher in self-efficacy are more likely to exploit entrepreneurial opportunities. Self-efficacy is a measure of individual task-specific confidence, formally defined as the degree to which an individual believes he or she has the ability to achieve a certain level of achievement for a given task (Bandura, 1997). Those high in self-efficacy will have a greater probability of exploiting opportunities because that activity demands such confidence in one's ability to execute the exploitation successfully (Chen et al., 1998).

Locus of Opportunity Exploitation

What modes of exploitation will be used to exploit entrepreneurial opportunities? Because only individuals are capable of discovering opportunities, the locus of decision-making about exploitation of discovered opportunities lies with people. As Audretsch (1997) has argued, this means that decisions about the locus of opportunity exploitation can be attributed to decisions that entrepreneurs make about how best to appropriate the returns from their discovery. Two dimensions of this choice appear to be important. First, can the opportunity be effectively pursued through markets? Second, are new or established firms better entities for undertaking the opportunity exploitation process? In the sections below, we review factors that might influence these decisions.

Markets or Firms?

Sometimes entrepreneurial opportunities are pursued through market mechanisms, as in the case of franchising and licensing. However, much of the time, entrepreneurial opportunities are pursued through firms. The exploitation of entrepreneurial opportunities through market mechanisms is influenced by three sets of factors: cost, timing, and information (Venkataraman, 1997).

Entrepreneurial opportunities are often pursued through market mechanisms because such mechanisms prove less expensive than hierarchical arrangements. New organizations lack existing cash flow, which requires them to raise capital from external entities to pursue opportunities. Not only capital that must be raised through market mechanisms more costly than internal capital, the rationing of financing for new entities makes it difficult for entrepreneurs to raise the total amount of capital they need (Evans & Leighton, 1989). As a result, capital strapped entrepreneurs often seek to use market mechanisms to pursue opportunities. Not only does the use of franchising and licensing allow them to use others' capital (Shane, 1998), but also exploitation through markets requires the ownership of fewer

assets, reducing capital intensity (Martin, 1988). This argument suggests that the use of market-based mechanisms to pursue opportunities increases with the capital constraints of entrepreneurs, as well as with the capital intensity of the opportunities themselves.

Entrepreneurial opportunities are often pursued through market mechanisms because such mechanisms prove faster to implement than hierarchical arrangements. Because entrepreneurial opportunities are often short-lived, the rapid establishment of the infrastructure necessary to pursue those opportunities depends on the quick implementation of the value chain necessary to pursue the opportunity (Venkataraman, 1997). This argument suggests that the use of market-based mechanisms to pursue opportunities increases with the shortness of the life span of the opportunity. In addition, it suggests that market-based mechanisms will be more common when the entity pursuing the opportunity needs to create the value chain from scratch, as is the case with independent entrepreneurs.

Entrepreneurial opportunities are also more likely to be pursued through market-based mechanisms when information conditions suggest that such approaches are effective. As the literature on franchising suggests, when shirking problems are more severe than free-riding problems in the exploitation of opportunities, market-based mechanisms will be preferred (Shane, 1998). In contrast, when hold-up problems plague market-based transactions, entrepreneurs will be more likely to use hierarchical arrangements (Azoulay & Shane, 2001).

Several characteristics of the opportunities themselves also influence the use of markets. First, markets are more likely to be employed when the opportunity can be well-codified, as is the case for the economic sectors in which franchising typically occurs (Michael, 1996). An inability to describe the characteristics of an opportunity in written form will make the opportunity much harder to sell through markets because of the difficulty of executing contracts.

Second, markets for opportunities are facilitated when patents are effective means of protecting intellectual property. Patent protection mitigates the disclosure problem for opportunities by ensuring that the buyer will have to pay for the opportunity once its value is demonstrated (Arrow, 1962). Moreover, patent protection mitigates moral hazard problems, in which the buyer shirks in their commitment to pay the seller, by making the opportunity and its exploitation process more easily verified by third parties (Anand & Khanna, 2000). Finally, patents mitigate hold-up problems by codifying information about opportunities, thereby facilitating the writing of explicit contracts about them (Teece, 1981).

Third, market mechanisms are more likely to be used to exploit routine opportunities. When different parties are more likely to agree on the value of opportunities, transactions are less likely to break down due to disagreements over price (Audretsch, 1997). However, when knowledge conditions increase the variance in people's perception of the value of an opportunity, as is the case when the opportunity is technically radical, market-based mechanisms may fail because transactors cannot agree on value.

New or Established Firms

Another question about the locus of opportunity concerns whether new or established firms are the entities that exploit those opportunities. To date we have several types of evidence about factors that influence whether opportunities are better exploited by new or established firms. We categorize this evidence in three sets: those that are a function of industry characteristics, those that are a function of opportunity characteristics, and those that are a function of firm characteristics.

Industry-Level Factors

Several industry conditions increase the likelihood that new firms will be a mode of opportunity. First, new firms are more common models of exploitation when industries have more capital available for start-up activity, as is the case when they have easier access to venture capital or angel financing (Cohen et al., 1987). Second, new firms are more common models of exploitation when industries do not have high economies of scale or powerful first mover advantages, because these factors favor established producers (Shane & Venkataraman, 2000). Third, new firms are more common modes of exploitation when the opportunities are less reliant on complementary assets in manufacturing, marketing, or distribution, because established firms can compete with innovators more easily when the basis of competitive advantage lies in assets other than the innovation itself (Teece). Fourth, new firms are more common modes of exploitation when industries are new, because new markets are generally initially too small to interest established firms with a higher opportunity cost (Shane, 2001a) and a focus on serving their major customers (Christensen & Bower, 1996), and because learning curve advantages do not yet exist (Nelson, 1995). Fifth, new firms are more likely to be a mode of opportunity exploitation when patents are effective means of preventing competition, because patents allow entrepreneurs to establish an organization and value chain before the means of opportunity exploitation is imitated (Teece, 1987); because effective patents will give the entrepreneur time to adjust the product or service to market needs (Shane, 2001b); and because strong patents will allow competition on the basis of factors other than cost, in which established firms will be advantaged due to the benefits of size and experience.

Opportunity-Level Factors

Several dimensions of an opportunity itself may make opportunities more likely to be exploited by new firms. First, radical opportunities will be more likely to be exploited by new firms because such opportunities undermine the competence advantages of existing firms (Tushman & Anderson, 1986), because established

firms do not like to invest in opportunities that cannibalize their existing operations (Arrow, 1962), and because the routines of established firms focus their attention away from new information and new activities (Henderson, 1993). Second, low capital demands to exploit an opportunity will increase the likelihood that a new firm will be used to exploit the opportunity as new firms lack existing cash flow necessary to finance capital-intensive projects. Third, stronger intellectual property protection for an opportunity, as is the case with broad scope patents, will facilitate exploitation by a new firm because that protection allows the entrepreneur to get the value chain in place before the means of exploiting the opportunity are imitated by others (Shane, 2001b).

Firm-Level Factors

Several firm-level factors also influence the locus of opportunity exploitation. The first is structure of the organization. The exploitation of entrepreneurial opportunities often requires organizational flexibility to manage their uncertainty. However, established organizations often seek to minimize flexibility in order to enhance their monitoring of existing operations, thereby undermining the willingness to engage in entrepreneurial exploitation within the firm (Holmstrom, 1989). Thus, organization design will influence the willingness of people to exploit opportunities within the confines of an existing organization, especially when managers are monitored closely and held strictly accountable for variance from their targets.

Second, organization scholars assert that institutional arrangements and organizational structures within mature firms spawn inertial forces that inhibit the ability for these firms' to rapidly respond to changes (Hannan & Freeman, 1977, 1984). Because the exploitation of entrepreneurial opportunities often demands speed, organizations that have high levels of inertia will be less likely to be exploiters of such opportunities.

Third, the stronger the reputation of an existing firm, the less likely it will be to exploit entrepreneurial opportunities. Because the established firm has a reputation that it might not want to risk losing, it will be unwilling to make necessary decisions about entrepreneurial opportunities for fear that those decisions would prove incorrect and hinder the firm's reputation (Holmstrom, 1989).

Fourth, the greater the importance of existing customers to the organization, the less likely it will be to exploit entrepreneurial opportunities. Christensen and Bower (1996) argue that industry incumbents respond to contemporary expectations of established customers. They provide evidence that established customers do not seek new products or services, because those products or services are initially inferior to prevailing alternatives. As a result, established firms cede new market niches to new firms.

Fifth, the organizational reward structure might influence the locus of exploitation. An entrepreneur might perceive a greater expected value from exploiting the opportunity independently, rather than through a firm, if the incentive structure in

the firm would not let the entrepreneur share as fully in the potential returns. This would be the case if the organization did not allow the individual sufficient stock ownership to replicate that of independent firm ownership (Audretsch, 1997).

The Relationship Between the Locus of Discovery and Exploitation

In Fig. 3.3, we consider a matrix that compares the discovery and exploitation of opportunities by new and established firms. This figure identifies four different types of efforts to pursue opportunity that depend on whether the discoverer was within or outside an existing firm and whether the exploiter is within or outside an existing firm.

Fig. 3.3 Types of entrepreneurial efforts as a function of the locus of discovery and exploitation

		Discovery	
		Independent Individual	Corporation Member
Exploitation	Independent Individual	Independent Start-up	Spin-off
	Corporation Member	Acquisition	Corporate Venturing

This matrix provides several issues for researchers to consider. First, it raises the question of whether entrepreneurship researchers should focus their attention on the independent start-up cell, as they tend to do. The absence of research on the demographics of this matrix means that we do not know how common the different cells are. Without information on what proportion of efforts to pursue opportunities fall in each of the four cells, we do not know whether concentrating research efforts on explaining independent start-ups makes sense.

Second, we do not know how the processes of pursuing these opportunities differ across each of the four cells. Casual empiricism alone indicates that pursuing opportunities through independent start-ups must differ in fundamental ways from pursuing them through corporate venturing. But we lack systematic empirical evidence that explains how these processes differ. For example, are resources acquired in the same way? Are the tools to evaluate the opportunities different? Future research is necessary to explain the ways in which independent start-ups, corporate venturing, acquisitions, and spin-offs are similar and different.

Third, we lack information on what factors lead opportunities to be pursued in each of the four ways described in the cells. Most of the problem lies in our lack of

information about the locus of discovery. So far, we have information only about new firm vs. existing firm exploitation, regardless of the source of opportunity discovery. To compare opportunities across the four cells, we need the additional information about discovery.

Nevertheless, some researchers have considered the relationship between the corporate venturing cell and the spin-off cell, both theoretically and empirically. When the opportunity depends more on human capital than on physical assets, spin-offs are more common, because entrepreneurs cannot move physical assets with them when they exit a firm.

In addition, several authors have attributed an increase in spin-offs to characteristics possessed by the firms in which the discovery was made. When innovations are architectural and therefore reconfigure the way in which products are developed, spin-offs will be more common because established firms have a hard time exploiting such innovations (Henderson & Clark, 1990). Similarly, when a new product or service is appropriate primarily to a small market niche, spin-offs are more common because an existing customer base will restrict an incumbent firm from focusing attention on the new niche (Christensen & Bower, 1996).

A third line of reasoning attributes the frequency of spin-offs to characteristics of the discoverer. For example, Bankman and Gilson (1999) attribute the variance in the locus of exploitation between corporate venturing and spin-offs to the nature of the person discovering the opportunity. More risk-averse people will not launch spin-offs to pursue the opportunity.

Conclusion

The purpose of this chapter was to extend and elaborate on the individual-opportunity nexus framework on entrepreneurship presented in Shane and Venkataraman (Shane, 2000) and Venkataraman (1997). We discussed the existence of entrepreneurial opportunities, particularly as they relate to the limits of the price system. The chapter also reviewed several typologies of opportunities. We discussed the process of opportunity discovery and explained why some actors are more likely to discover a given opportunity than others. We considered the opportunity exploitation process from the perspective of the individual-opportunity nexus. Finally, we considered the locus of opportunity discovery and exploitation. For all of these topics, we presented the logical arguments for the individual-opportunity approach to entrepreneurship and the empirical evidence gathered to date in support of the dimensions of this approach. Given the limited empirical evidence to date, we suggested many areas for future research. We hope that this chapter stimulates other scholars to join the effort to refine this framework and gather robust empirical evidence to examine the validity of it.

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References

- Akerlof, G. 1970. The market for lemons: Quality, uncertainty and the market mechanism. *Quarterly Journal of Economics*, 84: 4889–5000.
- Aldrich, H., & Zimmer, C. 1986. Entrepreneurship through social networks. In D. Sexton, & R. Smilor (Eds.), *The Art and Science of Entrepreneurship*. Cambridge, MA: Ballinger Publishing Company.
- Alvarez, S. A., & Barney, J. 2007. Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, 1(1–2): 11–26.
- Amit, R., Glosten, L., & Muller, E. 1990. Entrepreneurial ability, venture investments, and risk sharing. *Management Science*, 36(10): 1232–1245.
- Amit, R., Glosten, L., & Muller, E. 1993. Challenges to theory development in entrepreneurship research. *Journal of Management Studies*, 30(5): 815–834.
- Anand, B., & Khanna, T. 2000. The structure of licensing contracts. *Journal of Industrial Economics*, 48(1): 103–135.
- Arrow, K. 1962. Economic welfare and the allocation of resources for invention. In R. Nelson (Ed.), *The Rate and Direction of Inventive Activity: Economic and Social Factors*: 609–619. Princeton, NJ: Princeton University Press.
- Arrow, K. 1974. Limited knowledge and economic analysis. *American Economic Review*, 64(1): 1–10.
- Audretsch, D. 1997. Technological regimes, industrial demography, and the evolution of industrial structures. *Industrial and Corporate Change*, 6(1): 49–82.
- Azoulay, P., & Shane, S. 2001. Entrepreneurs, contracts, and the failure of young firms. *Management Science*, 47(3): 337.
- Bandura, A. 1997. *Self-efficacy: The Exercise of Self Control*. New York, NY: W. H. Freedman & Company.
- Bankman, J., & Gilson, R. 1999. Why start-ups? *Stanford Law Review*, 51: 289.
- Barney, J. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17(1): 99–121.
- Baron, R. A. 2002. OB and entrepreneurship: The reciprocal benefits of closer conceptual links. *Research in Organizational Behavior*, 24: 225–269.
- Baron, R. A., & Ensley, M. D. 2006. Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs. *Management Science*, 52(9): 1331–1344.
- Baumol, W. J. 1990. Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy*, 98(5): 893–921.
- Becker, G., & Murphy, K. 1992. The division of labor, coordination costs and knowledge. *Quarterly Journal of Economics*, 107: 1137–1160.
- Begley, T. 1995. Using founder status, age of firm, and company growth rate as the basis of distinguishing entrepreneurs from managers of smaller businesses. *Journal of Business Venturing*, 10: 249–263.
- Begley, T., & Boyd, D. 1987. A comparison of entrepreneurs and managers of small business firms. *Journal of Management*, 13: 99–108.
- Brockhaus, R. 1980. Risk taking propensity of entrepreneurs. *Academy of Management Journal*, 23: 509–520.
- Budner, S. 1982. Intolerance of ambiguity as a personality variable. *Journal of Personality*, 30: 29–50.
- Burt, R. 1992. The social structure of competition. In N. Nohria, & R. Eccles (Eds.), *Networks and Organizations*. Cambridge, MA: Harvard Business School Press.
- Cable, D., & Shane, S. 1997. A prisoner's dilemma approach to entrepreneur-venture capitalist relationships. *Academy of Management Review*, 22(1): 142–176.
- Casson, M. 1982. *The Entrepreneur*. Totowa, NJ: Barnes & Noble Books.

- Chen, C., Greene, P., & Crick, A. 1998. Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing*, 13(4): 295–316.
- Christensen, C. M., & Bower, J. 1996. Customer power, strategic investment, and the failure of leading firms. *Strategic Management Journal*, 17: 197–218.
- Cohen, W., Levin, R., & Mowery, D. 1987. Firm size and R&D intensity: A re-examination. *Journal of Industrial Economics*, 35(4): 543–565.
- Cohen, W., & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35: 128–152.
- Collins, C., Hanges, P., & Locke, E. 2004. The relationship of achievement motivation to entrepreneurial behavior: A Meta-Analysis. *Human Performance*, 17(1): 95–117.
- Dixit, A., & Pindyk, R. 1994. *Investment Under Uncertainty*. Princeton, NJ: Princeton University Press.
- Drucker, P. 1985. *Innovation and Entrepreneurship*. New York, NY: Harper Business.
- Dunne, T., Roberts, M., & Samuelson, L. 1988. Patterns of firm entry and exit in U. S. manufacturing industries. *Rand Journal of Economics*, 19(4): 495–515.
- Evans, D., & Leighton, L. 1989. Some empirical aspects of entrepreneurship. *The American Economic Review*, 79(3): 519–535.
- Gaglio, C. M., & Katz, J. 2001. The psychological basis of opportunity identification: Entrepreneurial alertness. *Small Business Economics*, 16: 95–111.
- Gaglio, C. M. & Taub, R. P. 1992. Entrepreneurs and opportunity recognition. In N. C. Churchill, et al. (Eds.), *Frontiers of Entrepreneurship Research*: 136–147. Wellesley, MA: Babson College.
- Geroski, P. 2001. Exploring the niche overlaps between organizational ecology and industrial economics. *Industrial and Corporate Change*, 10(2): 507–540.
- Gompers, P. 1999. Ownership and control in entrepreneurial firms: An examination of convertible securities in venture capital: Harvard University.
- Gompers, P., & Lerner, J. 1999. *The Venture Capital Cycle*. Cambridge, MA: MIT Press.
- Gordon, L. A. 2004. *Managerial Accounting: Concepts and Empirical Evidence*. New York, NY: McGraw-Hill, Inc.
- Granovetter, M. 1973. The strength of weak ties. *American Journal of Sociology*, 78: 1360–1380.
- Gulati, R. 1995. Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal*, 38(1): 85–112.
- Gulati, R., & Gargiulo, M. 1999. Where do interorganizational networks come from? *American Journal of Sociology*, 105(5): 1439–1494.
- Hannan, M., & Freeman, J. 1977. The population ecology of organizations. *American Journal of Sociology*, 82: 929–964.
- Hannan, M., & Freeman, J. 1984. Structural inertia and organizational change. *Strategic Management Journal*, 14: 59–73.
- Harper, D. 1996. *Entrepreneurship and the Market Process: An Enquiry Into the Growth of Knowledge*. London: Burns & Oates.
- Hayek, F. 1945. The use of knowledge in society. *American Economic Review*, 33(4): 519–530.
- Henderson, R. 1993. Underinvestment and incompetence as responses to radical innovation: evidence from the photolithographic alignment equipment industry. *Rand Journal of Economics*, 24(2): 248–268.
- Henderson, R., & Clark, K. B. 1990. Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 27: 548–570.
- Highfield, R., & Smiley, R. 1987. New business starts and economic activity. *International Journal of Industrial Organization*, 5: 51–66.
- Hoffman, H., & Blakely, J. 1987. You can negotiate with venture capitalists. *Harvard Business Review*, 65(2): 16–24.
- Holmstrom, B. 1989. Agency costs and innovation. *Journal of Economic Behavior & Organization*, 12(3): 305–327.

- Johannisson, B. 2000. Networking and entrepreneurial growth. In D. Sexton, & H. Landstrom (Eds.), *The Blackwell Handbook of Entrepreneurship*. Malden, MA: Blackwell Publishers.
- Jovanovic, B. 1982. Selection and the evolution of industry. *Econometrica*, 50(3): 649–670.
- Junkkunc, M., & Eckhardt, J. 2009. Specialized knowledge and owner liquidity in initial public offerings. *Management Science*, 55(10): 1670–1687.
- Kaplan, S., & Strömberg, P. 2003. Financial contracting theory meets the real world: An empirical analysis of venture capital contracts. *Review of Economic Studies*, 70(2): 281–315.
- Khilstrom, R., & Laffont, J. 1979. A general equilibrium entrepreneurial theory of firm formation based on risk aversion. *Journal of Political Economy*, 87(4): 719–748.
- Kirzner, I. 1973. *Competition and Entrepreneurship*. Chicago, IL: University of Chicago Press.
- Kirzner, I. 1985. *Discovery and the Capitalist Process*. Chicago, IL: University of Chicago Press.
- Kirzner, I. 1997. Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of Economic Literature*, 35: 60–85.
- Klevatorick, A., Levin, R., Nelson, R., & Winter, S. 1995. On the sources and significance of interindustry differences in technological opportunities. *Research Policy*, 25: 185–205.
- Knight, F. 1921. *Risk, Uncertainty, and Profit*. New York, NY: Augustus Kelly.
- Larson, A. 1992. Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administration Science Quarterly*, 37(1): 76–105.
- Levin, R. C., Klevatorick, A., Nelson, R., & Winter, S. 1987. Appropriating the returns from industrial research and development. *Brookings Papers on Economic Activity*, 3: 783–831.
- Martin, R. 1988. Franchising and risk management. *American Economic Review*, 78(5): 954–969.
- McClelland, D. 1961. *The Achieving Society*. New York, NY: Free Press.
- Michael, S. 1996. To franchise or not to franchise: An analysis of decision rights and organizational form shares. *Journal of Business Venturing*, 11: 57–71.
- Miller, D., & Drodge, C. 1986. Psychological and traditional determinants of structure. *Administration Science Quarterly*, 31: 539–560.
- Nelson, R. 1995. Recent evolutionary theorizing about economic change. *Journal of Economic Literature*, 33(1): 48–90.
- Pearce, D. W. (Ed.). 1992. *The MIT Dictionary of Modern Economics*. Cambridge, MA: MIT Press.
- Pellmar, T. C., & Eisenberg, L. 2000. *Bridging Disciplines in the Brain, Behavioral, and Clinical Sciences*. Washington, D. C.: National Academy Press.
- Romanelli, E. 1989. Environments and strategies of organization start-up: effects on early survival. *Administrative Science Quarterly*, 34: 369–387.
- Ronstadt, R. 1988. The corridor principle. *Journal of Business Venturing*, 3: 31–40.
- Rosenberg, N. 1976. On technological expectations. *The Economic Journal*: 523–535.
- Rotter, J. 1966. Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80: 609.
- Sahlman, W. 1990. The structure and governance of venture capital organizations. *Journal of Financial Economics*, 27: 473–521.
- Sarasvathy, S., Simon, H., & Lave, L. B. 1998. Perceiving and managing business risks: Differences between entrepreneurs and bankers. *Journal of Economic Behavior & Organization*, 33(2): 207–226.
- Schmookler, J. 1965. Technological change and economic theory. *American Economic Review*, 55(1/2): 333–341.
- Schumpeter, J. A. 1934. *The Theory of Economic Development*. New York, NY: Oxford Univ. Press.
- Sexton, D. L. & Bowman, 1986. Validation of a Personality Index: Comparative Psychological Characteristics Analysis of Female Entrepreneurs, Managers, Entrepreneurship Students, Business Students. In R. Ronstadt, et al. (Eds.), *Frontiers of Entrepreneurship Research*: 18–28. Wellesley, MA: Babson College.
- Shackle, G. 1982. *Imagination and the Nature of Choice*. Edinburgh, Scotland: Edinburgh University Press.

- Shane, S. 1996. Explaining variation in rates of entrepreneurship in the United States: 1899–1988. *Journal of Management*, 22(5): 747–781.
- Shane, S. 1998. Making new franchise systems work. *Strategic Management Journal*, 19(7): 697–707.
- Shane, S. 2000. Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, 11(4): 448.
- Shane, S. 2001a. Technological opportunities and new firm creation. *Management Science*, 47(2): 205.
- Shane, S. 2001b. Technology regimes and new firm formation. *Management Science*, 47(9): 1173–1190.
- Shane, S. 2008. *The Illusions of Entrepreneurship*. New Haven, CN: Yale University Press.
- Shane, S., & Cable, D. 2002. Network ties, reputation, and the financing of new ventures. *Management Science*, 48(3): 364–381.
- Shane, S., & Stuart, T. 2002. Organizational endowments and the performance of university start-ups. *Management Science*, 48(1): 154–170.
- Shane, S., & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 26(1): 13–17.
- Shankar, V., Carpenter, G., & Krishnamurthi, L. 1999. The advantages of entry in the growth stage of the product life cycle: An empirical analysis. *Journal of Marketing Research*, 36: 269–276.
- Singh, R., Hills, G., Hybels, R., & Lumpkin, G. 1999. Opportunity recognition through social network characteristics of entrepreneurs. In P. Reynolds, W. Bygrave, C. Manigart, C. Mason, G. Meyer, H. J. Sapienza, & K. Shaver (Eds.), *Frontiers of Entrepreneurship Research*: 228–241. Babson Park, Babson, MA: Babson College.
- Smith, A. 1776. *An Inquiry Into the Nature and Causes of the Wealth of Nations*. Edinburgh, Scotland: University of Edinburgh Press.
- Spector, P. 1992. Behavior in organizations as a function of locus of control. *Psychological Bulletin*, 91: 482–497.
- Stewart, W. H., & Roth, P. L. 2001. Risk propensity differences between entrepreneurs and managers: A meta-analytic review. *Journal of Applied Psychology*, 86(1): 145–153.
- Stigler, G. 1961. The economics of information. *The Journal of Political Economy*, 69(3): 213–225.
- Teece, D. J. 1981. The market for know-how and the efficient international transfer of technology. *The Annals of the American Academy*, 458: 81–96.
- Teece, D. J. 1987. Technology transfer by multinational firms: The resource cost of transferring technological know-how. *Economic Journal*, 87: 242–261.
- Tushman, M., & Anderson, P. 1986. Technological discontinuities and organizational environments. *Administration Science Quarterly*, 31: 439–465.
- Venkataraman, S. 1997. The distinctive domain of entrepreneurship research: An editor's perspective. In J. Katz, & R. Brockhaus (Eds.), *Advances in Entrepreneurship, Firm Emergence and Growth*, Vol. 3: 119–138. Greenwich, CT: JAI Press.
- Von Hippel, E. 1988. *The Sources of Innovation*. New York, NY: Oxford University Press.
- West, P., & Meyer, G. 1997. Temporal dimensions of opportunistic change in technology-based ventures. *Entrepreneurship Theory and Practice*, 22(2): 31–52.
- Zucker, L., Darby, M., & Armstrong, J. 2002. Commercializing knowledge: University science, knowledge capture, and firm performance in biotechnology. *Management Science*, 48(1): 138–153.
- Zucker, L., Darby, M., & Brewer, M. 1998. Intellectual human capital and the birth of U.S. biotechnology enterprises. *American Economic Review*, 88(1): 290–306.