Distinguishing Opportunity Types: Why It Matters and How To Do It

DISSERTATION

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Abstract

While opportunities have become a focus of entrepreneurship research, the understanding of different opportunity types has not yet become clear. Prior research has struggled to empirically separate discovery opportunities from creation opportunities. This dissertation addresses discovery and creation opportunities in three ways. The first chapter further develops the theory behind opportunity types in order to clarify the boundary conditions between discovery and creation opportunities. The second chapter addresses the empirical challenges of investigating opportunity types by conducting a mixed methods study of the impact of opportunity type on competitive advantage in the face of information disclosure. The study uses frequentist statistics, Bayesian statistics, and qualitative analysis to demonstrate the robustness of the findings. The third chapter clarifies the boundaries between creation opportunities and two other constructs in entrepreneurship research: effectuation and bricolage. This dissertation contributes to the field of entrepreneurship by advancing the understanding of opportunity types, investigating their relationship to firm performance, and distinguishing opportunity types from other concepts in the field.
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Boundaries on Opportunity Types

Introduction

Opportunities exist. Or maybe they don’t? They are discovered, but sometimes they are created. Entrepreneurs find opportunities. No, they make them. In the end it doesn’t matter... or does it? The entrepreneurship literature has heavily investigated entrepreneurial opportunities for more than a decade (Shane & Venkataraman, 2000). Good empirical work has provided insight into entrepreneurs as they pursue opportunities, doing well to answer Shane & Venkataraman’s (2000) question of who identifies opportunities. For example, greater knowledge and potential financial reward increase the number and innovativeness of opportunities identified (D. Shepherd & DeTienne, 2005) while gender does not affect the innovativeness of the opportunities identified (DeTienne & Chandler, 2007). Still, the large number of conceptual articles regarding opportunities (see Short, Ketchen, Shook, & Ireland, 2009 for a review) without sufficient empirical work suggests that opportunities have not yet become a paradigm of entrepreneurship research (Kuhn, 1996). The value of investigating different types of opportunities lies in whether those different types suggest different processes for exploitation.

At least two issues have slowed the progress of research on opportunities: the lack of well-defined boundary conditions between opportunity types and the difficulty in
empirically examining opportunities (Dimov, 2011). While some authors have addressed both discovery and creation opportunities simultaneously (Alvarez & Barney, 2007; 2010; Sarasvathy, 2001), the majority of research on different types of opportunities has focused exclusively on discovery or creation - often without explicitly stating that focus. Previously, some research has not specified the boundary conditions of opportunities possibly because that research only examined one type of opportunity. The difficulty in empirically examining opportunities is partially a result of vague boundary conditions. Still, opportunities, as unobservable phenomena, present challenges to empirical testing (Godfrey & Hill, 1995). To understand if different opportunity types typically have different entrepreneurial processes, the distinction between the opportunity types must be clearly delineated.

The purpose of this paper is to clearly describe the boundary conditions between opportunity types and use these boundary conditions to offer empirical guidance for testing the different types of opportunities. Without an appropriate understanding of the boundary conditions, opportunity research may lead to inappropriate conclusions from both future and existing empirical studies. Using Dubin’s (1978) guidance for theory building, we will focus on boundary conditions and system states to explain the differences between creation and discovery opportunities. Both boundary conditions and system states provide direction for empirical research. We propose measurable metrics for the aspects of opportunities that are unobservable (Godfrey & Hill, 1995).

The paper proceeds with a brief review of opportunity literature and makes the case for further clarification of boundary conditions between types of opportunities. The
next section describes three specific boundary conditions between discovery and creation opportunities. From there we describe how system states give further clarity to opportunity types. The following section describes the empirical directions for testing opportunity types by suggesting some possible metrics for testing before concluding the paper.

Opportunities

Opportunities have been defined in many different ways (see Short et al., 2009 for a review). Many of those definitions draw on the assumption that the typical economic state is one of disequilibrium (Dimov, 2011; Eckhardt & Shane, 2003; Shane & Venkataraman, 2000). With that in mind, we define opportunities from an economic perspective. For the purposes of this paper, opportunities exist when there are competitive imperfections in a factor or product market (Alvarez & Barney, 2010). Recent research on opportunities has described different types of opportunities as creation and discovery (Alvarez & Barney, 2007; McMullen & A. Shepherd, 2006; Sarasvathy, 2001).

There are three potential viewpoints on the reality and relevancy of different opportunity types. First, some research argues that at least two (if not more) types of opportunities have been described and these opportunities give way to different entrepreneurial processes (Alvarez & Barney, 2007; Wood & Mckinley, 2010). Second,

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1 There have been other descriptions of these opportunity types such as made and found or constructivist and objectivist. While there may be minor differences between these terms, we will use creation to include made and constructivist opportunities, while discovery will include both found and objectivist opportunities.

2 One could imagine a scenario where multiple entrepreneurial teams are enacting similar opportunities simultaneously, but this possibility is theoretically less probable.
some research contends that one view of opportunities supersedes other views and understanding opportunity types from that perspective more appropriately describes the phenomenon in question (Baker & Nelson, 2005; Eckhardt & Shane, 2003). Third, some research contends that while there may be different opportunity types - or differences in the ways opportunities come into existence - there is little to no relevant differences in entrepreneurial processes so the conversation is merely academic and philosophical (Baron, 2004). The question of which perspective is most appropriate is an empirical one. If there are demonstrable empirical differences in entrepreneurial processes between different opportunity types, then research must be devoted to further delineating these types of opportunities theoretically and empirically.

Extant empirical research has examined many of the entrepreneurial processes as they relate to opportunities: from planning (Brinckmann, Grichnik, & Kapsa, 2010; Wiltbank, Dew, Read, & Sarasvathy, 2006) to financing (Bhide, 1992; Gompers & Lerner, 2001) to business models (Fiet & Patel, 2008) to marketing (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009) to firm leadership (Dencker, Gruber, & Shah, 2009; Randøy & Goel, 2003) and other areas. In some areas, empirical results have been equivocal or highly contextualized (e.g. Brinckmann et al., 2010). Other research has developed from the second perspective above, assuming (often implicitly) one view of opportunities. These underlying assumptions can lead to an appropriate research design given the view of the authors, but give biased results if multiple opportunity types are considered. For example, Shepherd and DeTienne (2005) find a relationship between prior knowledge and the number of opportunities identified. However, as we will
describe later, this opportunity identification task requires preexisting opportunities - a boundary condition between creation and discovery opportunities.

While conceptual work has grown discussing each of the perspectives described above, little empirical work has examined entrepreneurial processes considering the possibility of multiple opportunity types (Edelman & Yli-Renko, 2010; Hmieleski & Baron, 2008; R. K. Mitchell, J. R. Mitchell, & J. B. Smith, 2008). There may be several reasons for the dearth of empirical investigation, but one issue is the lack of clearly defined and understood boundary conditions between these types of opportunities.

The boundary conditions of any theory describe under what conditions that theory applies (Dubin, 1978). Most often theoretical development entails specifying the boundary conditions of that theory in conjunction with its general description. Part of the issue with boundary conditions on opportunity types may be the timing of the theoretical development in work on opportunities. While research on opportunities often dates back to Austrian economics (Hayek, 1945; Schumpeter, 1934), the most recent emphasis on opportunities may be attributed to Shane and Venkataraman’s (2000) call to action in entrepreneurship research. Shane’s further work (Eckhardt & Shane, 2003; Shane, 2000a; 2001; 2003) described opportunities as a phenomenon bounded by other fields of research rather than by other types of opportunities. Sarasvathy’s work (Sarasvathy, 2001) described a distinction between two alternative decision-making processes in opportunity exploitation. Alvarez and Barney’s work (Alvarez & Barney, 2007) was the first description of the distinctions between discovery and creation opportunities as a whole.
While these timing issues in research have created some confusion concerning the boundaries between opportunity types, philosophical stances have further obfuscated the issue. Creation opportunities have been associated with social constructionism (Berger & Luckmann, 1967), while discovery opportunities have been associated with realist epistemologies (Alvarez & Barney, 2010; Wood & Mckinley, 2010). McMullen and Shepherd (2006) describe these as two philosophically intractable positions that bookend an empirically tractable center of entrepreneurship research. The underlying philosophical issues concern the origination of an opportunity, whereas the entrepreneurial processes can be objectively studied without a view toward the origin. Therefore, differences in opportunity types stemming from (or perhaps even loosely related to) philosophical differences may be overlooked to focus on the objective reality of entrepreneurial processes. This direction for research is perfectly valid if the origination of an opportunity does not inherently affect the objective entrepreneurial processes.

Sarasvathy’s work (2001; 2008) describes different entrepreneurial processes for effectuation and causation. Alvarez and Barney (2007) go on to describe a list of seven implications for entrepreneurial processes that differ between discovery and creation. If these processes differ systematically based on the type of opportunity pursued by an entrepreneur, then the origination of an opportunity must be taken into account when empirically investigating objective processes associated with opportunity exploitation. In other words, empirical research on opportunities must consider opportunity type in both
research design and generalizability. To enable this research, the boundary conditions between opportunity types must be more clearly articulated and understood.

**Boundary Conditions**

According to Dubin (1978), boundary conditions can be specified by describing the values that units within a theory can have. The unit is a “thing” or part of the model that is of particular interest to the theorist (Dubin, 1978). Limiting these values specifies the boundary conditions by excluding situations where the units take other values or other combinations of values. The units of opportunity types are the opportunity, the entrepreneur (specifically his or her prior knowledge), and the decision-making context (Alvarez & Barney, 2007; 2010; Sarasvathy, 2001). For each of these units we will describe the values that those units may take in the case of both discovery and creation opportunities.

**The opportunity**

Opportunities, in a discovery context, exist in the environment awaiting an alert entrepreneur to find them (Eckhardt & Shane, 2003). They arise from some exogenous shock to the environment and have some unchangeable properties (Eckhardt & Ciuchta, 2008). Shane and Venkataraman describe them as “objective phenomena that are not known to all parties at all times” (Shane & Venkataraman, 2000). Entrepreneurs may discover several opportunities (DeTienne & Chandler, 2007; D. Shepherd & DeTienne, 2005) and the selection process then becomes important (Eckhardt, Shane, & Delmar, 2006). The nexus of opportunities and entrepreneurs (Shane, 2003) suggests a type of fit
between opportunity and entrepreneur. The opportunity’s unchangeable properties
require certain resources be brought to bear for exploitation. However, any entrepreneur
with that fixed set of resources (or the ability to obtain those resources) may exploit the
given opportunity. In essence, several entrepreneurs may discover the same opportunity
and attempt to exploit it simultaneously.

Turning to creation, these opportunities are formed by the endogenous actions of
entrepreneur who interacts with his or her environment to create a market imperfection
(Alvarez & Barney, 2007; Sarasvathy, 2001). Construction of these opportunities follows
from idea to objectification to enactment (Dimov, 2007; Wood & Mckinley, 2010).
According to this pattern there are no fixed properties to the opportunity, but rather
entrepreneurial sensemaking (Weick, 1995) gives form to new information that is created
throughout the enactment process. This evolutionary process is more likely to represent
the actions of a single entrepreneurial team than any number of entrepreneurs pursuing
the same discovered opportunity\(^2\) and may result in the creation of entirely new markets
(Santos & Eisenhardt, 2009).

\(P1a\): Discovery opportunities are formed by exogenous shocks to the environment.

\(P1b\): Creation opportunities are formed by the endogenous actions of entrepreneurs.

\(^2\)One could imagine a scenario where multiple entrepreneurial teams are enacting similar
opportunities simultaneously, but this possibility is theoretically less probable.
Nonetheless, it is an empirical question that has not yet been addressed.
Difficulties may arise in segregating opportunities based on the boundary condition of the opportunity alone. A discovery opportunity will have some fixed properties, whereas a creation opportunity will not. However, an ex post examination may have difficulty in determining whether there were ex ante fixed properties or if those properties were objectified in the process of creation and only appear fixed retrospectively (Dimov, 2011). For this reason, the boundary conditions must be considered in combination.

*The entrepreneur and prior knowledge*

Since discovery opportunities are objective phenomena in the environment, a natural question is who discovers them (Shane & Venkataraman, 2000)? The ability to discover an opportunity is often referred to as alertness (Gaglio & Katz, 2001; Kirzner, 1997; Shane, 2003; Tang, Kacmar, & Busenitz, 2012). Shane (2003) describes alertness as a combination of prior knowledge, expertise, and absorptive capacity. Existing empirical work supports the role of prior knowledge in the identification of opportunities (Shane, 2000; D. Shepherd & DeTienne, 2005). This suggests that entrepreneurs in discovery opportunities will typically have a relationship between their existing knowledge base and the relevant knowledge required for opportunity discovery and exploitation. However, as mentioned before many entrepreneurs may have the requisite alertness necessary to discover the given opportunity providing the possibility of several firms being formed to exploit the same opportunity.
Creation opportunities, on the other hand, do not exist as objective phenomena so the entrepreneurs need not demonstrate any specific expertise ex ante (Alvarez & Barney, 2007). These opportunities are often initially described as imagined or as future perceptions (Dimov, 2007; Wood & Mckinley, 2010). The entrepreneurs in creation opportunities shape and are shaped by their environment following a process of path creation (Garud, Kumaraswamy, & Karnøe, 2010). Furthermore, specific knowledge about an opportunity in a creation context is not a requirement but rather a byproduct. New knowledge is created during exploitation, and that knowledge accrues disproportionately to the entrepreneur enacting the opportunity (Alvarez & Parker, 2009). There are no predictive differences in entrepreneurs ex ante. That is to say, unlike discovery opportunities, nothing can be pointed to as a necessary condition or characteristic of a creation entrepreneur. However, the process of creating a new venture may affect entrepreneurs in such a way as to result in consistent differences ex post (Alvarez & Barney, 2010).

Regarding the entrepreneur and his or her knowledge, the boundary condition between discovery and creation can be thought of as the presence or lack of alertness. Alertness acts as a necessary condition for opportunity discovery, whereas creation opportunities make no predictions about the entrepreneur ex ante. Following Shane’s description (2003), prior knowledge can be considered a key factor in alertness. Empirical research has demonstrated the relationship between prior knowledge and opportunity identification and recent research has created a measure of alertness (Tang et al., 2012).
**P2a:** Discovery opportunities are exploited by alert entrepreneurs with specific prior knowledge.

**P2b:** Creation opportunities are exploited by entrepreneurs without any ex ante differences from non-entrepreneurs.

**Decision-making Context**

The final boundary condition between discovery and creation opportunities is the decision-making context. Discovery opportunities are exploited in a risk-based decision making context where the probabilities and possible outcomes can be estimated ex ante (Alvarez & Barney, 2007; Knight, 1921). This context has also been described as causation where the entrepreneur plans with a specific end in mind attempting to predict a probabilistic future (Sarasvathy, 2008).

Alternatively, in creation opportunities the decision-making context can be considered uncertain where neither the outcomes nor the probabilities can be estimated ex ante (Alvarez & Barney, 2007; Knight, 1921). Effectuation has been used to describe this context where the focus is on the means rather than the ends (Sarasvathy, 2001). The focus is not on the prediction of the future through accurate estimation, but rather the exploitation of contingencies based on the emergent uncertain future.

The presence of risk or uncertainty defines the line between creation and discovery for this final boundary condition. While measuring risk versus uncertainty (especially ex post) may be difficult, this boundary condition is useful as it outlines the probable actions of entrepreneurs in the face of either risk or uncertainty (Knight, 1921;
Sarasvathy, 2001). Work on effectuation has described many objective actions as they relate to uncertain decision-contexts including planning (Wiltbank et al., 2006) and marketing (Read et al., 2009), which provide insight into specific actions that may be observed to suggest a context of risk or uncertainty.

P3a: Discovery opportunities are exploited in a risky context.
P3b: Creation opportunities are exploited in an uncertain context.

Each of the above boundary conditions may not individually segregate discovery opportunities from creation opportunities. When these conditions are analyzed together, however, they provide a clearer picture of the boundary between creation and discovery. Dubin’s concept of a system state aids in understanding these boundaries at a theoretical level (Dubin, 1978).

System states

Dubin (1978) describes a theoretical model as a system of units each of which can take a specific value at a given point in time. When all the units of in a theoretical model take on specific values for some period of time the model is referred to as being in a system state. System states are important because they are conditions when the system as a whole presents distinctive features. For example, while a lump of coal and a diamond have the same atomic makeup, the structure and arrangement of those molecules determine the state of that system. The system of carbon atoms may have two states:
diamond and coal. The main unit of this system would be the arrangement of the atoms. When the unit “arrangement” takes the value of amorphous then the system is in a state of coal. When the unit “arrangement” takes the value of cubic crystals then the system is in a state of diamond. The system states of coal and diamond present significantly distinct features with different properties. Clearly, the arrangement of carbon and how it changes from coal to diamonds is important; similarly, the system states of opportunities and how they change are an important aspect of entrepreneurial research (Fry & Smith, 1987).

The system states of creation and discovery are represented by the boundary conditions of the decision-making context, the entrepreneur and the nature of the opportunity. In other words, a discovery system state presents a risky environment where an alert entrepreneur finds an exogenous (or preexisting) opportunity. Similarly, a creation system state presents an uncertain environment where an entrepreneur (with no specific predictive characteristics ex ante) forms an endogenous (or previously nonexistent) opportunity.

Analyzing opportunities as system states can advance the discussion of opportunity types. Discovery and creation opportunities have been criticized as a false dichotomy (Murphy, 2011). Some of this criticism may stem from a lack of clarity in boundary conditions, but there is also confusion in the transition between discovery and creation. System states aid in addressing the transition between states. System states enable a more complete understanding of opportunity types as well as the ability to analyze the transition between opportunity types. Furthermore, the transition from one state to another can help resolve the apparent false dichotomy. Some opportunities may
appear “more creation-like” or “more discovery-like” during the transition between states. Understanding the transitions between system states provides a more thorough picture of opportunities.

Dubin (1978) proposes analytical questions that are important to system states - three of which are germane to this discussion. Under what conditions does a system state persist? When does a system state cease to exist? Is there a pattern in the succession of system states? The questions regarding either system state’s persistence and conditions for the end of the system state have two possible answers when studying opportunities. The first answer actually addresses the question of when an opportunity is no longer an opportunity. An opportunity no longer exists when there are no more competitive imperfections in product or factor markets (Alvarez & Barney, 2010). In other words, in a state of perfect competition there are no opportunities. The second possible answer lies in the transition between system states - when a creation state becomes a discovery state or vice versa.

System states may transition from one system state to another and the pattern of that succession is important for understanding the system (Dubin, 1978). Zahra (2008) suggests that creation and discovery operate in a virtuous cycle where an opportunity may transfer back and forth between the two states multiple times throughout the exploitation process. These transitions may be the cause of some confusion between discovery and creation states. During a transition from one state to the next, the opportunity may exhibit processes common to both discovery and creation. For this reason, it is all the more important to understand the transition process. There may be
some empirical support for the transition from creation to discovery (Alvarez, Young, & Wooley, forthcoming), but the transition from discovery to creation is less supported. The empirical work on the transitions between discovery and creation is not yet conclusive. So, it is worthwhile to examine the processes of discovery and creation system states and how those processes would logically progress during entrepreneurial exploitation.

Examining the process implications outlined in Alvarez and Barney (2007), the transition between system states is more likely to flow from creation processes to discovery processes. For example, creation opportunities are typically led by more charismatic leaders whereas discovery opportunities are likely led by expert leaders (Alvarez & Barney, 2007). There is evidence from venture capital literature that entrepreneurs are often replaced by expert managers as a contingency of venture capital involvement (Wasserman, 2003). In a creation state, uncertain decision-making contexts may require the use of biases, heuristics and effectuation (Busenitz & Barney, 1997; Sarasvathy, 2001), whereas in a discovery state those decision paradigms may no longer be appropriate. We recognize that an individual decision-maker may not act as a rational or boundedly rational decision-maker. Therefore, this (and the following examples) may not be a perfect representation of the processes within all entrepreneurial organizations. Nonetheless, the description here is based on the underlying logic of rational decision-makers.\(^3\)

\(^3\) We acknowledge that not all entrepreneurial decision-making is rational. Nepotism may be an example of irrational decision-making in entrepreneurship. However, we assume that irrational decision-making is more the exception than the norm.
As another example, human resource practices in creation are typically limited to the entrepreneur’s social network whereas in discovery the entrepreneur is more able to hire expertise more broadly (Alvarez & Barney, 2007). It is unlikely that an organization would initially recruit broadly for expertise in a discovery state and then transition to hiring from within the entrepreneur’s social network as in a creation state. As a final example, entrepreneurs in discovery states are typically able to obtain external sources of capital such as banks or outside investors whereas entrepreneurs in creation states are typically limited to friends and family or bootstrapping (Alvarez & Barney, 2007; Bhide, 1992). It would be unlikely for the discovery entrepreneur to initially obtain external financing and then transition to raising additional capital from friends and family or bootstrapping. In each of these examples, however, it would be likely for a creation state to transition from charismatic leadership to expert leadership, from hiring within the entrepreneur’s social network to hiring more broadly, and from bootstrap financing to external financing. Therefore, we expect that the creation state transitions to a discovery state, but that a discovery state will not transition to a creation state.

An important caveat to this point is found in the nature of the opportunity itself for both discovery and creation states. Entrepreneurs in creation states interact with the environment forming the market imperfection. This market imperfection may generate demand greater than the creation state is capable of fulfilling by itself. From this perspective, the creation state may transition to a discovery state, but it may also serve as the exogenous shock for other entrepreneurs to pursue further discovery states. Thus, the creation state may transition to either an ongoing business or a discovery state, but it may
also, in a manner of speaking, spin off further discovery opportunities that serve to fill the additional demand formed by the initial creation state.

The boundary conditions and system states of discovery and creation opportunities are useful in providing empirical directions for testing opportunity types. The last section outlines an empirical agenda for testing discovery and creation states of opportunities.

Empirically Testing Opportunity Types

Research on theories involving unobservable phenomena has been vital to strategic management research (Godfrey & Hill, 1995). Godfrey and Hill (1995) describe how transaction cost economics, agency theory and the resource-based view of the firm all theorize about unobservable phenomena. Unobservables are phenomena that may be relevant to theory building, but are unable to be measured because of inadequate measurement instruments or because the act of measuring the phenomenon alters the phenomenon itself. Strategic management research has advanced through empirical research that found solutions to these problems of unobservables. In transaction cost economics, transaction costs are unobservable, but creative empirical studies (e.g. Walker & Weber, 1987) have been able to estimate unobservable transaction costs. In agency theory, proxies have been used to infer the unobservable agency costs by looking at observable phenomena such as abnormal returns (e.g. Kaufman & Englander, 1993). In the resource-based view, again suitable proxies have been used to support the assertions regarding unobservables (e.g. Henderson & Cockburn, 1994). In each of these theories,
Godfrey and Hill (1995) take into account what is assumed and what is theorized about to describe a means of empirical testing. Similar steps can be taken to test opportunity types.

To test opportunity types the underlying assumptions, or the boundary conditions, must be considered. While sampling on a boundary condition may provide a sample that reflects only discovery states or only creation states, verifying the existence of multiple opportunity types requires testing both system states simultaneously. If a sample disproportionately focuses on one state, any generalizations from the study should be limited to that state. To overcome this issue, metrics must be developed for each of the boundary conditions to ensure the existence of one system state or the other. In some cases, the metrics will need to be proxies for the unobservable aspects of the theory.

The opportunity itself is an unobservable phenomenon (Godfrey & Hill, 1995). While creative empirical settings may aid in identifying an appropriate proxy for whether an opportunity is exogenous or endogenous, more general proxies may be derived from the processes that are expected to depend most directly on the nature of the opportunity. In discovery states, the nature of the opportunity is exogenously given. The opportunity exists within a given industry with established practices and technologies. As such the entrepreneur capitalizes on information asymmetry in exploiting the opportunity. During exploitation the information asymmetry is diffused to the market. Therefore, a firm pursuing a discovery opportunity typically relies on speed, secrecy, and the erection of entry barriers as means of defending a competitive advantage (Alvarez & Barney, 2007).

The nature of creation opportunities, on the other hand, is endogenous. They are formed by the iterative path-dependent actions of the entrepreneur. Speed, secrecy, and
entry barriers are not typically a means of defending competitive advantage, but rather in this view it is the creation of new information and new social constructions (Alvarez & Barney, 2010). This new information may create a new path\(^4\) in the creation system state. The ensuing path-dependency may serve as a barrier to imitation that could provide sustainable competitive advantage (Barney, 1991). Thus, a suitable proxy for the nature of the opportunity may be found in the means of defending a competitive advantage. Specifically, if a firm is focused on speed, secrecy or the erection of entry barriers then it is more likely exploiting a discovery state. This is but one example of what could be a suitable proxy for the nature of the opportunity in a given empirical setting.

Turning to the nature of the entrepreneur, this boundary condition is observable. Although there has been some debate on the usefulness of the alertness construct (Gaglio, 2004; Gaglio & Katz, 2001), recent work has described varying constructs that can be used to measure the presence of alertness in an entrepreneur. More simple measures may include quantifying the relevant experience or expertise an entrepreneur may possess (Shane, 2003), whereas more complex measures could include the tool developed by Tang and colleagues (Tang et al., 2012) who have created and validated a survey instrument that measures the level of alertness in an entrepreneur. As these are measurable attributes, they are more straightforward in empirical work.

\(^4\) See Garud and Kanoe’s (2010) work for a discussion about the differences between path-dependency and path creation. The understanding of path creation here is that in creation system states, the entrepreneur is not initially locked-in to a given path, but instead interacts with the environment. This interaction may create a new path. Subsequent entrepreneurs may need to follow a similar path to imitate the focal entrepreneur, and find themselves at a disadvantage.
The boundary condition relating to the decision-context is again unobservable. The question here is if demand was estimable ex ante. However, it is difficult to verify whether a decision-making context was risky or uncertain ex post as the tendency is to assume that sales indicate ex ante demand. The emergence of demand does not mean that demand for that product or service would have existed without the actions of the entrepreneur. Therefore, it is important to look for proxies of the decision context at the time of exploitation. While the decision-making context itself may be unobservable, both strategy and entrepreneurship literature have shown that firms and individuals often use alliances as a means of overcoming uncertainty (Dickson & Weaver, 1997; Sarasvathy, 2001). The greater use of alliances would suggest an uncertain decision-context and thus a creation state. Furthermore, research on effectuation has described a variety of processes that are present in decision-making under uncertainty (see Read, Song, & Smit, 2009 for an overview). These indicators could be used separately or in combination to create an observable measure for the presence of decision-making under uncertainty.

It is important to note that these measures collectively form the boundaries of creation and discovery states. Simply segregating opportunities based on one of the criteria above may seem expedient, but that would not reflect the entire nature of a discovery or creation state. There is no direct measurement of these boundaries, since they are based on some unobservable phenomena. Therefore, it is important to gather as much relevant information to indicate the type of opportunity being pursued. A combination of the measures suggested above should be used for empirical testing. Factors could be created and future research could draw on these factors of discovery or
creation to test the reality of the opportunity states, their implications for entrepreneurial processes, and the progression from one state of the opportunity to another. While prior research has used singular measures for the difference between discovery and creation (Hmieleski & Baron, 2008), future research should work to examine discovery and creation as system states with specific implications for the entrepreneurial process as a whole.

Furthermore, the transition between system states should be addressed. The transition from creation to discovery seems logically straightforward but the means and markers of this transition are not well defined. Research can address whether creation states typically transition into discovery states or if they more often transition into organizations pursuing efficiency rents. Some existing research has examined the formation and initial evolution of industries without a specific view of opportunities (Santos & Eisenhardt, 2009). Additional research at the industry level should address if and how creation states become the exogenous shocks for future discovery states. Discovery opportunities may represent entrepreneurship that moves economic processes closer to equilibrium while creation opportunities may represent entrepreneurship that moves economic processes further from equilibrium. Opportunity types may then give indications for policy regarding economic growth and entrepreneurship.

Understanding these opportunity types, their boundaries, and their transitions offers promise for understanding highly contextualized aspects of entrepreneurship. Planning, for example, has been widely studied in entrepreneurship (see Brinckmann et al., 2010 for a meta-analysis) resulting in many different contextual factors that explain
when planning is effective (Shane & Delmar, 2004; Wiltbank et al., 2006) and how often planning is used (Honig, 2004) among other questions. These contextual factors may align with discovery and creation states such that the context of these areas really lies in the state of the opportunity and the related entrepreneurial processes. Thus, the boundary conditions on opportunity states may further serve to galvanize prior research in specific aspects of entrepreneurship by incorporating opportunity type as a possible explanation.

**Conclusion**

Recently, Shane (2011) has suggested that there are not yet any distinctive theories or assumptions in entrepreneurship research. To some extent, this paper has attempted to answer that critique by detailing the boundary conditions on opportunities and furthering the theoretical development of opportunity types. Drawing on Dubin’s (1978) guide to theory building we have clarified existing theory work in entrepreneurship to elucidate the boundary conditions and underlying assumptions of a theory of opportunity types. While strategic management research may explain some of the phenomena that entrepreneurship has claimed to be distinct, this theory aids in explaining issues that are assumptions of strategic management. For example, the system state of the opportunity helps to explain where the firm’s heterogenous resources may come from - an assumption of the resource-based view in strategy (Barney, 1986). Opportunity system states also explain how market research would be effective in a discovery system state, but can be misleading in a creation system state.
There is still controversy over the value of opportunity types in entrepreneurship research. However, this is common in theory development as can easily be seen in questions regarding the RBV in strategy. Conner (1991) questioned whether the RBV was significantly different from other existing theories in other fields. Ten years later Priem and Butler (2001) described the RBV as a potential theory and questioned it’s usefulness for strategic management. Nonetheless, a recent Journal of Management special issue described the resource-based theory as a mature theory in strategic management (Barney, Ketchen, & Wright, 2011). While opportunity types and their underlying theory may still be in their infancy, the concept of discovery and creation opportunities has the potential to be a distinctive theory of entrepreneurship.

The concept of opportunity types is simultaneously alluring and frustrating. Classifying different types of opportunities for more fine-grained analysis seems to be a logical step for entrepreneurship research. Yet it has proved difficult to test or even verify multiple opportunity types. Still, a theory of opportunity types holds promise for entrepreneurship research. Moving the conversation from purely theoretical to empirical requires a clear understanding of the boundary conditions between creation and discovery system states. By analyzing opportunity types as system states and creating metrics based on their boundary conditions, future research can demonstrate how different processes are more appropriate for one state of opportunity or another and how the origins of the opportunity are, in fact, both important and within reach.
Opportunity Types and Competitive Advantage

Introduction

Opportunities have been called the distinctive domain of entrepreneurship research (Shane & Venkataraman, 2000). More recently, two types of opportunities with differing process implications have been described: discovery and creation (Alvarez & Barney, 2007). These opportunity types suggest alternative means of exploitation when it comes to human resources, financing, and competitive advantage as well as other areas. Some empirical work has found support for differing implications of opportunity types (Hmieleski & Baron, 2008). Many of the differences in processes have been outlined conceptually and not tested empirically. While there have been debates about the nature of these opportunity types from philosophical and practical levels (Dimov, 2011; Edelman & Yli-Renko, 2010; Zahra, 2008), underlying their research is the implicit question of the relevance of opportunity types to both theory and practice. We contend that the importance of different opportunity types lies in the different processes at work in each type.

Prior work on the differences between opportunity types suggests that the type of opportunity may be linked to the subsequent firm’s path to competitive advantage (Alvarez & Barney, 2007). Specifically, if a firm exploiting a discovery opportunity obtains a competitive advantage, that advantage is likely the result of a process that
enables them to exploit with speed and secrecy or to construct entry barriers to prevent the erosion of that competitive advantage. Alternatively, if a firm enacting a creation opportunity obtains a competitive advantage, it is likely the result of tacit knowledge (Barney, 1991) and causal ambiguity (Dierickx & Cool, 1989; Lippman & Rumelt, 1982) arising from the enactment process.

The purpose of this paper is to examine how the processes associated with different opportunity types affect the performance of firms. Firms established to exploit opportunities depend on their ability to defend their competitive position vis-à-vis incumbents and other new entrants. The type of opportunity that a firm pursues may be related to how well a new firm could defend their competitive position. Therefore, this paper asks how does the type of opportunity impact competitive advantage and firm performance?

To answer this question, we will examine firms that exploited either a discovery or a creation opportunity that reached an initial public offering (IPO) during the dot com boom of the late 1990’s. Typically, creation firms would not receive venture capital funding and gathering data on those firms would be difficult. However, this time period acts as a quasi-natural experiment by increasing the variety of opportunities that received venture capital (VC) funding and subsequently filed an IPO, which enables greater data availability.

The paper proceeds in the following manner. First we review the existing work on opportunity types and the resource-based view. Next, we link these two literatures to further develop theory and create hypotheses. The third section describes the sample
selection and methods followed by results. Since investigating opportunity types represent a new empirical challenge, we use qualitative and Bayesian methods following what Creswell (2003) termed a concurrent triangulation strategy. Finally, the paper concludes with discussion and the limitations of the study.

Theory and Hypotheses

Opportunity Types

While opportunities have had many definitions (Short, Ketchen, Shook, & Ireland, 2009), for the purpose of this paper opportunities will be defined as market imperfections (Alvarez & Barney, forthcoming). Opportunities differ with respect to whether they are discovered or created. In discovery opportunities, the market imperfection exists prior to opportunity exploitation, whereas in creation opportunities exploitation and the creation of a market imperfection occur simultaneously. Each of these types of opportunities has differing assumptions and implications for their exploitation processes.

Discovery Opportunities

Discovery opportunities arise in the environment through exogenous shocks such as changes in government regulation, technological advances, or changes in consumer preferences (Shane, 2003). These opportunities are exploited by “alert” entrepreneurs (Kirzner, 1997; Shane & Stuart, 2002) who perceive the opportunity existing in the environment because of that entrepreneur’s specific background, training, or prior
knowledge (Eckhardt & Shane, 2003; Shane, 2003). Discovery opportunities exist independent of human cognition with some unchangeable properties (Eckhardt & Ciuchta, 2008). Opportunity exploitation follows the individual cognitive act of recognizing the opportunity, which begins the process of diffusing information regarding the opportunity (Shane, 2003). Since the opportunity exists, its possible outcomes from exploitation and their respective probabilities can be estimated. Thus, discovery opportunities are exploited in a context of Knightian risk (Knight, 1921; Miller, 2007). Since discovery opportunities exist in the environment, the important questions involve who discovers which opportunities (Shane & Venkataraman, 2000). Research has attempted to quantify and refine what precisely enables an entrepreneur to discovery an opportunity by drawing on counterfactual thinking (Gaglio, 2004), learning (Corbett, 2005; Corbett, 2007), and affect (Baron, 2008). While the concept of “alertness” was initially difficult to examine (Gaglio & Katz, 2001), recent work has developed a scale to measure the alertness in an individual (Tang, Kacmar, & Busenitz, 2010).

Empirical research on discovery opportunities has often focused on knowledge and the relationship between the entrepreneur and the pre-existing opportunity. Entrepreneurs are more likely to exploit a technological change in relation to their prior knowledge and experience (Shane, 2000) and more likely to discover and exploit opportunities where they have greater knowledge (Choi & Shepherd, 2004; Shepherd & DeTienne, 2005). In discovery opportunities, entrepreneurs are motivated by greater potential gains (Shepherd & DeTienne, 2005) and the entrepreneur’s perception of risk varies with the magnitude of those gains (Mullins & Forlani, 2005). Furthermore, the
relationship between the entrepreneur and the characteristics of the opportunity affect firm survival (Dencker, Gruber, & Shah, 2009a), job creation (Dencker, Gruber, & Shah, 2009b), and the innovativeness of the opportunities identified (Ucbasaran, Westhead, & Wright, 2009). As a whole, there have been equivocal findings for the relationship between planning and performance (see Brinckmann, Grichnik, & Kapsa (2010) for a meta-analysis). When examined in discovery contexts, however, planning has been shown to decrease the likelihood of firm termination (Shane & Delmar, 2004) and increase firm performance (Gruber, 2007).

Creation Opportunities

Creation opportunities diverge from discovery opportunities on underlying assumptions regarding the nature of opportunities, entrepreneurs, and the decision-making context (Alvarez & Barney, 2007; 2010). In the creation view, opportunities do not exist independent of the entrepreneur. Instead opportunities are created when the entrepreneur interacts with the environment to form a new market imperfection. The background of the entrepreneur is not a significant predictor of who will exploit what opportunity, but rather differences between entrepreneurs and non-entrepreneurs may emerge ex post. Finally, the decision-making context of creation opportunities is uncertain (Knight, 1921), meaning that creation opportunities lack both a set of potential outcomes and their respective probabilities (Miller, 2007).

Due to the uncertain nature of these opportunities, entrepreneurs typically rely on bootstrapping and bricolage in place of formal financing (Bhide, 1992; Baker & Nelson,
Effectuation describes the decision-making paradigm typically involved in the uncertain contexts associated with creation opportunities (Sarasvathy, 2001; 2008). The uncertainty facing entrepreneurs reduces the value of planning when compared with non-predictive strategies (Wiltbank, Dew, Read, & Sarasvathy, 2006). Since many creation opportunities begin social constructions (Aldrich and Reuf, 2006; Berger & Luckmann, 1967), the value of the resultant market imperfection cannot be ascertained until the formation process reaches completion.

Unlike discovery opportunities, properties in a creation opportunity are not only changeable, but not all properties of an opportunity are known at the beginning of the enactment process (Alvarez & Barney, 2010). As the iterative process of creation tests the entrepreneur’s assumptions against the market and refines or modifies those assumptions, the entrepreneur’s initial beliefs may be completely altered. The evolutionary process of variation, selection and retention (Nelson and Winter, 1974) may result in forming an opportunity that displays only a remnant of its original design. This evolutionary creation process is linked with the entrepreneur’s actions (Alvarez & Barney, 2007).

The underlying assumptions of these two opportunity types generate differing implications for the exploitation of those opportunities (Alvarez & Barney, 2007). Several implications have been identified conceptually and at least one other has been tested empirically (Hmieleski & Baron, 2008). These divergent implications include directions for human resource practices, financing, leadership, and competitive advantage of the firms formed to exploit either type of opportunity.
Resource-based Theory

The resource-based theory (RBT) of the firm is a model of business strategy that describes how internal firm resources can lead to competitive advantage (Barney, 1986a). Following Penrose (1959), research on the RBT has described how firms, as a bundle of resources (Wernerfelt, 1984), may pursue sustained competitive advantage. Sustaining a competitive advantage does describe a length of time for maintaining an advantage, but rather a firm’s ability to outperform its competitors despite attempts to imitate the focal firm (Barney, 1991). RBT describes how the firm pursues above normal returns by relying on their bundles of resources that differ from other firms (Wernerfelt, 1984).

The RBT rests on two assumptions: firms may differ in the resources they control and that resource heterogeneity may be long-lasting (Barney, 1991). Some resources may be difficult to imitate due to unique historical conditions, causal ambiguity, or social complexity surrounding those resources (Dierickx & Cool, 1989; Lippman & Rumelt, 1982). Research has shown how organizational culture (Barney, 1986b), managers (Castanias & Helfat, 1991), and many other resources could lead to competitive advantages. Thus, resources are a means of gaining competitive advantage, which leads to above normal firm performance. A recent meta-analysis found strong support for the relationship between resources and firm performance (Crook, Ketchen, Combs, & Todd, 2008).

A major question in the RBT is how do firms acquire these resources below their market value in a particular strategy (Barney, 1986a). While there may always be the
possibility of luck, more accurate expectations concerning the future value of a strategy can help a firm take advantage of opportunities. These uniquely accurate expectations go beyond knowledge and expertise in a given area to an ability to organize and coordinate that knowledge (Barney & Alvarez, 2002).

The combination of accurate expectations and coordination of knowledge bears similarity to the entrepreneurial concept of alertness in discovery opportunities (Kirzner, 1997; Shane, 2003). Furthermore, RBT and entrepreneurship share the idea of resource heterogeneity (Alvarez & Busenitz, 2001). In the next section we explain how these concepts link literature on opportunity types to firm competitive advantage and performance.

**Competitive Advantage and Opportunity Types**

While not all opportunities must be exploited by means of a firm (Alvarez, 2007), firms that are organized to exploit entrepreneurial opportunities differ in their means of obtaining a potential competitive advantage. The type of opportunity informs how a competitive advantage might be obtained. Firms exploiting discovery opportunities typically rely on speed, secrecy or erecting entry barriers, whereas creation opportunities rely more on the unique path of exploitation, which creates both the market imperfection and the entry barriers (Alvarez & Barney, 2007). Both of these potential means of competitive advantage are derived from RBT.

Discovery opportunities are existing market imperfections that could be exploited by an entrepreneur that recognizes those opportunities. The discovery opportunity itself is
a market level phenomenon, which could be exploited by any number of firms. In entrepreneurship literature, this ability to recognize opportunities has been termed alertness (Eckhardt & Shane, 2003; Kirzner, 1997), whereas RBT literature has described this ability as having more accurate expectations about future strategies (Barney, 1986a; Amit & Schoemaker, 1993). These more accurate expectations about future strategies allow a potential entrepreneur to acquire factors of production below their value in the prospective strategy. Assuming the entrepreneur is correct, this can be considered an information asymmetry, which is the basis for the discovery of opportunities by certain individuals and not others (Shane & Venkataraman, 2000).

The information asymmetry involved in discovery opportunities aids in explaining the nature of competitive advantage for these opportunities. In discovery opportunities, forces outside the entrepreneur form the market imperfection. Exploitation follows naturally from opportunity discovery. The act of exploiting a profitable discovery opportunity simultaneously discloses the information asymmetry and invites competition. Both of these forces would put upward pressure on the price of factor inputs competing away the initial entrepreneurial profit unless the resources meet the criteria for sustaining a competitive advantage.

Sustaining a competitive advantage depends on ex post limits to competition based on resources that are imperfectly imitable and imperfectly substitutable (Peteraf, 1993). These factor market imperfections act as entry barriers for potential competitors. In discovery opportunities, entrepreneurs have market knowledge and expertise that enables them to discover the opportunity. While some of this knowledge may be tacit, it
is likely that the entrepreneur’s knowledge is common to those with similar knowledge and expertise. Further, that market has established routines and practices, which current customers are familiar with making it unlikely that an entrepreneur would look to alter those routines. More often experienced individuals create firms with similar practices to the firms already in the industry (Cliff, Jennings, & Greenwood, 2006). It is unlikely that an entrepreneur would develop causally ambiguous or socially complex processes (Lippman & Rumelt, 1982; Peteraf, 1993). Therefore, potential advantage for the entrepreneur lies in his or her ability to erect entry barriers following the discovery. In discovery opportunities, entry barriers would more likely arise from preferential access to resources, such as land, or from intellectual property protection such as patents. Another means of sustaining a competitive advantage for discovery opportunities may be in creating a brand as a first mover in a new market segment. Still, this would be based on the speed with which the opportunity is exploited. Thus, sustaining competitive advantage in discovery opportunities depends on executing with speed in combination with erecting entry barriers, as the truly unique resource is the initial insight of the entrepreneur regarding the market imperfection.

Creation opportunities differ in nature from discovery opportunities as the formation and the exploitation of the opportunity occur simultaneously. In creation opportunities, market imperfections are created by the iterative actions of the entrepreneur interacting with his or her environment (Alvarez & Barney, 2007). These actions may be product development, sales or other organizing activities. The entrepreneur follows a path creation process whereby the actions of the agent, in this case
the entrepreneur, are central to the emergent process rather than dictated by the process (Garud, Kumaraswamy, & Karnøe, 2010). These opportunities emerge as the result of new social constructions (Berger & Luckmann, 1967) where potential customers would not have recognized a need prior to the enactment of the opportunity. The creation opportunity exists at the market level, but is simultaneously a firm level phenomenon since only one firm is creating that opportunity. As the enactment process continues, new knowledge is created. This knowledge accrues disproportionately to the entrepreneur, even more so than it would to an investor in that organization (Alvarez & Parker, 2009).

This suggests that at least some portion of the newly created knowledge is tacit and possibly causally ambiguous (Reed & DeFillippi, 1990). Knowledge in this context is not an information asymmetry because prior to the entrepreneur’s actions, the knowledge did not exist (Alvarez & Barney, 2010). This new knowledge, created by the entrepreneur’s actions, coupled with new social constructions form the market imperfection.

Once the market imperfection has been created, the firm has emerged from the creation process and other firms may imitate the focal firm. In creation opportunities, however, the endogenous nature of the opportunity leads to different means of defending a competitive position. Throughout the process, new information is created that may be tacit in nature (Alvarez & Parker, 2009) and more difficult to imitate or substitute. In creation opportunities, entrepreneurs often use effectuation, involving stakeholders in the enactment process (Sarasvathy, 2001; 2008). This involvement of outside actors increases the potential for social complexity as another barrier to competition. Moreover, as a path
creation process, creation opportunities are more likely to develop causally ambiguous processes increasing the likelihood of imperfect imitation (Lippman & Rumelt, 1982).

**Distinguishing Opportunity Types**

Empirically examining discovery and creation opportunities has been particularly difficult (Dimov, 2011) as evidenced by the great quantity of conceptual works compared with the relative scarcity of empirical research (Short et al., 2009). Part of this difficulty stems from the unobservable nature of opportunities (Godfrey & Hill, 1995), which makes straightforward measurement of opportunities difficult. To better capture the phenomena, Godfrey and Hill (1995) suggest measuring the effects of the unobservable opportunity. To that end, we have derived hypotheses relating the underlying assumptions of the different opportunity types to measurable criteria that would indicate the existence of those opportunity types. We support these hypotheses with a qualitative analysis from the dataset.

To perform qualitative analysis, we follow a modified version of Eisenhardt’s (1989) process of building theory from case study research. Once cases were selected we worked recursively between the theory and selected cases (Baker & Nelson, 2005; Eisenhardt, 1989). We performed both within case analysis and cross-case pattern search – first analyzing each of the cases by discovery or creation, then examining the cases comparatively with their matched counterpart. The cases themselves consist of the “Business” section of the IPO prospectus. This section, which is typically 10-30 pages long, summarizes most of the information in the prospectus with the exception of
financial data. Like much of the prospectus the language contained in this section is often boilerplate language. Therefore, any variation between the cases would more than likely be significant sources of difference.

Cases were selected from the sample beginning with expert raters. created a matched sample of the creation firms in the data with discovery firms based on the firm’s age, IPO year, and size – specifically looking at both number of employees and pre-IPO revenue.

The nature of the entrepreneur

Discovery opportunities assume that the entrepreneur has relevant prior knowledge and absorptive capacity that would lead them to being more alert to opportunities existing in the environment (Shane, 2003). Research has shown that entrepreneurs are more likely to discover opportunities where they have greater experience (Shane, 2000). Creation opportunities, on the other hand, make no prediction about the relevance of prior experience to the enactment of an opportunity. Therefore, we expect that relevant prior experience will be related to opportunity discovery more so than opportunity creation.

H1: Prior industry experience will be more strongly correlated with opportunity discovery than opportunity creation.

Creation opportunities do not assume any prior knowledge on the part of the entrepreneur, but rather the skills involved in creation opportunities require the
entrepreneur to acquire knowledge as it is created (Alvarez & Parker, 2009). As a path creation process, enacting a creation opportunity requires that an entrepreneur navigate through and out of existing processes to create new structures (Garud et al., 2010). In this case, specific industry experience would not be as helpful as prior startup experience. Previously navigating the process of firm formation could enable the entrepreneur to more effectively shape the processes and structures around them. Experienced entrepreneurs have more refined prototypes for new venture formation allowing them to more efficiently incorporate new information (Baron & Ensley, 2006). While industry experience affords entrepreneurs the relevant knowledge to discover an opportunity, prior startup experience enables an entrepreneur to utilize newly created knowledge in the process of opportunity creation.

H2: Prior startup experience will be more strongly correlated with opportunity creation than opportunity discovery.

The Nature of the Opportunity

The nature of the opportunity can enable resource acquisition. Discovery opportunities as pre-existing phenomenon with fixed properties give resource-holders the ability to evaluate the opportunity. They can understand where their resources may play a role. As such, discovery opportunities are more able to gain resources such as financing and human resources. In creation opportunities, the endogenous nature of the opportunity may inhibit resource investment in two ways. First, investors may be reticent to invest
their human or financial capital in an opportunity that they may not be able to understand. Furthermore, in a creation opportunity the resource-holders are committing to an evolving process. Rather than a defined endpoint, the opportunity enactment process emerges over time. Thus, financial investors may not be willing to provide resources with an undefined return and human capital investors may not be able to understand their potential contribution and subsequent gain from the opportunity. Therefore, discovery opportunities will be more able to gain the appropriate resources early on in a venture than creation opportunities.

Over the course of enactment, however, creation opportunities will need to acquire more resources. While discovery opportunities may be able to acquire resources early on with the appropriate planning, creation opportunities are more likely to acquire resources later in the enactment process. Nonetheless, creation opportunities may also need additional funding to acquire those resources. While an IPO may serve many purposes, in the case of creation opportunities, it would more likely enable resource acquisition that was previously unattainable. This resource acquisition phase could take the form of acquiring other firms utilizing the money raised from the IPO.

H3: Mergers and acquisitions of near competitors following an IPO will be more strongly correlated with opportunity creation than opportunity discovery.

Another way of examining the existence of an unobservable opportunity is to examine the processes utilized by the focal firm compared with existing firms in the
industry. Discovery opportunities arise from exogenous shocks to existing markets and are exploited by entrepreneurs with expertise in those markets. Individuals with greater expertise in a given area are more likely to use business models similar to existing business models (Cliff, Jennings, & Greenwood, 2006). These business models include, in particular, customer interactions and distribution. Since discovery opportunities arise in existing markets, customers already have existing routines and expectations for firms in that industry. As such, we would expect discovery firms to use similar routines especially with regard to distribution. Creation firms, however, gather stakeholders throughout the enactment process and build new means of interacting (Alvarez & Barney, 2007; Sarasvathy, 2001). Therefore, we would expect creation firms to be less likely to use existing means of distribution.

H4: Use of existing distribution channels will be more strongly correlated with opportunity discovery than opportunity creation.

The Nature of the Decision-making Context

In discovery opportunities the decision-making context is risk-based, whereas in creation it is uncertain (Alvarez & Barney, 2010; Knight, 1921). Measuring whether or not the probabilities and outcomes of an opportunity were known ex ante is very difficult ex post due to various recall biases on the part of any individual. Once again, it is important to look at the effects of risk and uncertainty. Both strategic management literature and entrepreneurship literature suggest that alliance formation is a means of
mitigating uncertainty (Dickson & Weaver, 1997; Sarasvathy, 2008). When faced with uncertain environments, entrepreneurs attempt to control the uncertain future rather than predicting the outcomes (Sarasvathy, 2001). In uncertain contexts, alliances allow flexibility while increasing the possible contingencies for a firm (Wiltbank et al., 2006). Therefore, we would expect that creation firms in uncertain contexts would use alliances to a greater extent than discovery firms, which operate in risk-based contexts.

H5: Greater alliance use will be correlated with opportunity creation rather than opportunity discovery.

*Opportunity Types and Performance*

While both discovery and creation opportunities have means of protecting their competitive advantage, creation opportunities offer a more defensible position. As information is diffused, more competitors are likely to enter the market of discovery opportunities. While speed and secrecy can offer temporary advantages, sustained advantages for discovery opportunities must rely on erecting entry barriers, which may be incredibly costly. Intellectual property protection in the form of patents can afford some protection, but the strength of that protection is contingent on the industry. Pharmaceutical patents are robust to imitation, whereas technological patents can often be innovated around. Creation opportunities, on the other hand, have ex post limits to competition that are, in essence, a byproduct of the enactment process. Causally ambiguous processes and socially complex resources may arise naturally from pursuing a
creation opportunity. Imitative firms may not be able to copy creation firms regardless of the information diffused.

Information about either type of opportunity may be shared on a limited basis with potential stakeholders to entice a commitment of resources. Initial sales will further spread the information about an opportunity. In discovery opportunities, these events are sharing pre-existing information that may simply be organized in a new way. Exploitation follows based on this new revelation of pre-existing information, and a competitor may outpace the entrepreneur in terms of exploitation, claiming whatever gains were available from the opportunity. In creation opportunities, these events would share a combination of pre-existing information and new knowledge. The enactment process may continue creating more new knowledge until the opportunity has been formed. Exploitation and formation occur simultaneously reducing the likelihood that a potential competitor could not simply outpace the focal firm in exploiting the opportunity.

Ultimately, the IPO process acts as a widespread sharing of the information asymmetry in an opportunity. While discovery firms may have already exploited their opportunity prior to going public, some discovery firms could attempt an IPO based on the potential gains from the eventual exploitation of the opportunity. Additional capital gained from an IPO could enable a discovery firm the ability to execute more quickly or to erect the appropriate entry barriers to protect their market imperfection from competitors. Creation firms, however, would likely file an IPO following the formation and exploitation of the opportunity since the future form of the company would still be
uncertain. Investors would be hesitant to invest in an uncertain opportunity compared with a risk-based opportunity (Knight, 1921; Alvarez & Barney, 2007). While VCs act as a bridge between firms and investors in terms of information asymmetry prior to an IPO (Gompers & Lerner, 2001), the IPO process widely diffuses the private information of a firm.

Therefore, we expect both types of firms to face increasing competitive pressure following an IPO. However, discovery firms will face a greater increase in pressure since their competitive position likely relies on less defensible resources that require the erection of potentially costly entry barriers. Creation firms will face less competitive pressure because their competitive advantage more likely relies on natural barriers to imitation arising as a byproduct of the creation process. Thus, if a discovery firm is able to sustain its competitive advantage, it would likely require additional expense which would decrease performance. A creation firm, however, may have a stronger defense without the additional costs.

H6: Creation opportunities will have a more positive change in performance following major information disclosures than discovery opportunities.

Data and Methods

Sample

To examine both discovery and creation opportunities the sampling frame for this study is internet-based businesses during the dot com boom. Specifically, this study
examines organizations that had received VC funding and filed for an IPO between 1995-2000. This sample was selected to provide sufficient number of creation firms with available data. Typically, creation firms do not receive VC funding (Alvarez & Barney, 2007), which makes data more available, but during this time more firms were receiving formal financing arrangements with VCs.

The dot com boom represented a time where there was a substantial increase in the amount of VC funding available. In many cases, firms that would not have received backing from VC firms were able to strike deals for funding. Since the IPO is typically the most profitable exit for a VC firm, more companies were filing for an IPO than ever before. The IPO process requires disclosure of firm data that would not usually be available. This acts as a quasi-natural experiment in providing us with greater information regarding creation firms – in some cases, from firm inception.

To select the firms for inclusion in the sample, all firms that filed an IPO prospectus with the SEC during 1995-2000 were initially considered. This group was then narrowed down to those firms whose business model was primarily Internet related. Firms that were launching websites to complement traditional brick-and-mortar stores were excluded as were agricultural firms whose business models did not use the internet as central to their operations. The sample was narrowed further by excluding any firm over 10 years of age to ensure the study of new ventures. This sample was then combined with data from VenturExpert to gain further information. Firms that lacked data in the VenturExpert database were excluded bringing the final sample to 124 firms.
Of these 124 firms, 11 were identified as creation opportunities. This small subset may give rise to questions regarding the validity of frequentist statistics. To that end, we additionally analyze the data using Bayesian statistics. Bayesian analysis has shown to be useful particularly in studying the RBV (Hansen, Perry, & Reese, 2004) and in analyzing smaller sample sizes (Hahn & Doh, 2006). Additionally, we perform a qualitative analysis of the data in line with Creswell’s (2003) description of triangulation to add further depth of understanding to the analysis.

Key Variables

Firm performance is measured by the change in annual revenue from pre- to post-IPO. This variable is the dependent variable for the hypothesis 6. Revenue figures were taken from SEC prospectuses and firm 10-Ks. This measure of revenue reflects the firm’s performance following a major disclosure of information asymmetry. In the IPO process, substantial amounts of a firm’s private information are revealed. The revelation of this information asymmetry gives insight into the nature of the competitive advantage of a firm. If a firm has above normal returns, then the IPO process will disclose those above normal returns encouraging entry into the industry. Conversely, an IPO of a creation firm may reveal information regarding the market imperfection that has been created, but the nature of the competitive advantage may protect creation firms from greater competitive pressure following the IPO.

There may be some concern regarding a selection bias in the sample that might alter the comparison between the performance of discovery and creation firms in the
sample. Specifically, VC investors first select firms to invest in before those firms could be considered for the sample. While this is true, we believe that this bias would make the test here more conservative. VC selection processes are organized to evaluate risk-based decisions as is common in discovery opportunities. While the time period increased the amount of VC investment, the decision-making processes and skills available to VC firms were still able to evaluate discovery firms in risk-based contexts more accurately. Creation firms, however, are typically outside the evaluative skills of the VC. Thus, we would expect VC firms to more accurately select higher performing discovery firms and select a more stochastic distribution of creation firms. This should lend more weight to any findings in support of hypothesis 6.

The opportunity type variable in this study is a binary variable representing the opportunity type of the firm: discovery or creation. The variable is used as a dependent variable in the test of hypotheses 1-5, as well as the independent variable for hypothesis 6. This variable was constructed by means of expert raters. The use of expert raters has been used in experiments in entrepreneurship research (Corbett, 2007), and has been used to evaluate opportunities identified by subjects (DeTienne & Chandler, 2007; Shepherd & DeTienne, 2005). As opportunities are unobservable phenomena (Godfrey & Hill, 1995), testing them requires an examination of the effects of those phenomena. Using expert raters enables the incorporation of as many effects as possible beyond simply analyzing proximate measures for discovery and creation opportunities.

The raters were given descriptions of the firms from the ‘Business’ section of each firm’s IPO prospectus, which ranges from 10-30 pages of text. They were instructed...
to use Alvarez & Barney (2007) as the primary understanding of the differences between discovery and creation opportunities and to evaluate the opportunities underlying the firm not simply the firm itself. Ten test cases that are not included in the sample were first evaluated and the raters discussed their evaluations along with the researcher to confirm common understanding of discovery and creation opportunities. Next both raters were given the sample firms’ descriptions and classified each firm as discovery or creation. The initial inter-rater reliability was 74%. From here the raters discussed the cases in conflict and came to consensus.

To test hypotheses 1-5, further independent variables were measured to indicate the existence of a discovery or creation opportunity. Prior startup experience is a binary variable based on the history of the founder(s) of the firm. If anyone of the founding team had previously formed a new venture the variable was coded as 1 and if not, 0. Prior industry experience is the average number of years of experience in a related field held by all the founding team members. The data for these variables were gathered from SEC prospectuses and founder biographies available online or in company documents.

Mergers and acquisitions (M&A) of near competitors is a count of the number of mergers and acquisitions of near competitors completed by the firm prior to 2001. M&A data was compiled from a number of sources including company documents, VenturExpert, and news outlets. Not all M&A activity was included in the count, but specifically M&A of competitors for the sake of market share. Cases were included if they mentioned acquisition of clients, customer base, or market share. Cases were excluded if they mentioned a purpose related to diversification or if the target was
completely outside the industry and value chain of the focal firm. Use of existing
distribution channels is a binary variable representing whether or not the firm utilized
distribution common to the industry at the time. The means of distribution were taken
from the SEC prospectus and company documents and coded into twelve different modes
of distribution. These modes were then compared with other firms in the industry to look
for similarities. Many firms used multiple forms of distribution and the primary form of
distribution was given the most weight. For example, if a firm distributes the vast
majority of their product through value-added resellers, but also operates a website for
direct sales that make up less than twenty percent of its distribution, then the value-added
resellers were considered the primary distribution. Firms using previously established
modes of distribution were coded as 1 whereas those using new modes of distribution
were coded as 0.

The variable *alliances* is a count of the alliances mentioned on the IPO prospectus
for the focal firm. Most IPO prospectuses use similar language and reveal limited
information from the firm descriptions. As such, any mention of an alliance would
suggest that the alliance is important to firm operations and is more than a loosely
structured agreement. Any mention of an alliance with a specific firm name, as opposed
to a general mention of a sales alliance or distribution alliance, was counted toward the
total number of alliances.

*Controls*
The study controls for both firm size and firm age. *Firm size* is measured by the number of employees at the time of IPO and *firm age* is measured as the age in years of the firm at the time of IPO. There is also a measure for *IPO year* to control for the various effects that could be accompanied by each year (Pollock & Gulati, 2007). Finally, there is a control for the *VC reputation* based on Lee, Pollock, & Jin (2011) to account for the impact of venture capital firms on the performance. The reputation score used was for the VC firm with the highest reputation score for all VC firms funding the particular firm (Lee, Pollock, & Jin, 2011).

*Statistical Analysis*

The frequentist statistics used to analyze this sample involves two parts. Hypotheses 1-5 are tested using logistic regression with opportunity type as the dependent variable and the covariates of prior industry experience, prior startup experience, number of mergers and acquisitions, existence of distribution channels, and number of alliances. The second part of the analysis uses OLS regression with the change in firm performance following IPO regressed on opportunity type and the control variables listed above.

The Bayesian statistics will use a Markov chain Monte Carlo (MCMC) technique to obtain predictive distributions in line with equations described in the frequentist analysis above. MCMC analysis utilizes the same equations as the logistic and OLS regression, but draws on Bayes law to generate the posterior distribution of each of the
variables (see Hansen, Perry, & Reece, 2004 for a description). This method is robust to small sample sizes and non-normal error terms.

An important consideration in Bayesian statistics is the use of prior information in generating the results. Prior distributions can be non-informative in that they are general enough to have little effect on the results (or posterior distributions). The idea in this case is to let the data speak for itself. Alternatively, informative priors allow the incorporation of prior information into the analysis. While the debate about the value of each of these methods is important to the statistical community (see Goldstein (2006) and Berger (2006) for a discussion), it is outside the scope of this paper. To ensure the validity of the analysis we have completed both an analysis using non-informative priors and one with informative priors. Both of these analyses resulted in consistent findings. Since non-informative priors typically result in findings similar to frequentist statistics, we report here the analysis using informative priors.

Typically, informative priors are based on the same or similar analysis performed on other data. Since empirical work analyzing both discovery and creation has been lacking, there is unfortunately limited prior data on which to rely. An acceptable alternative is to construct prior distributions based on a subset of the population that was excluded from the formal data analysis (Gelman, Carlin, Stern, & Rubin, 2004). Following this method, informative prior distributions were constructed using data points that were excluded from the initial sample due to a lack of complete data. While a complete data point was required to analyze the data in the sample, prior distributions could be constructed on partial data points so long as the partial data point included all
the information required for one equation or the other. In other words, a complete data record must be able to be fit across both equations described above. An incomplete data point, however, could be used to generate prior distributions so long as it is complete for one of the two equations. These data records were used to generate prior distributions for the variables.

Results

Table 1 presents the descriptive statistics and correlations for all the variables used in the analysis. Table 2 shows the logit regression of the raters’ measure of creation opportunities on the independent variables to test hypotheses 1-5. Table 3 shows the OLS regression model with the controls and then the full model including the raters’ measure of creation opportunities to test hypothesis 6.
<table>
<thead>
<tr>
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<th>2</th>
<th>3</th>
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<th>7</th>
<th>8</th>
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<td>.095</td>
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<td>.201*</td>
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<td>-.087</td>
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<td>-.081</td>
<td>-.111</td>
<td>.062</td>
<td>.057</td>
<td>.264**</td>
<td>.055</td>
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<td>11. Alliances</td>
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<td>.029</td>
<td>.036</td>
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<td>.040</td>
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</table>

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 1 - Descriptive statistics for frequentist regression
Hypothesis 1 predicted that greater industry experience would be related to discovery opportunities and thus a negative relationship in the statistics. The results show the opposite sign but a lack of significant results. Therefore, hypothesis 1 is not supported. Hypothesis 2 predicted that previous startup experience in the founding team would be more indicative of creation opportunities than discovery opportunities. Table 2 shows that the effect of prior startup experience is positive and significant (B = 2.54, p < .05). This result supports hypothesis 2 indicating that entrepreneurs with creation firms, more often than discovery firms, are founded by entrepreneurs with prior startup experience. Overall, there is partial support for the variables measuring the assumptions about the nature of the entrepreneur.

Hypotheses 3 and 4 examine the assumptions regarding the nature of the opportunity. The results in table 2 show that M&A activity for the purpose of market share is significant, but with the opposite sign of our prediction (B = 0.41, p < .01). This contradicts hypothesis 3 suggesting that increased M&A of competitors is more indicative of creation firms than discovery firms. Possible explanations of this finding will follow in the discussion section. Hypothesis 4 predicted that use of existing distribution channels would be indicative of discovery firms more than creation. Table 2 shows that the sign and significance of the existing distribution support hypothesis 4 (B = -2.89, p < .05). This suggests that creation firms are less likely to utilize existing distribution channels than discovery firms. These results suggest mixed support for the variables measuring the assumptions about the nature of the opportunity.
Lastly, hypothesis 5 predicted that increased alliance activity would be indicative of creation firms. Although the sign is in the correct direction, the results in table 2 indicate that the findings for alliances are not significant. Therefore, hypothesis 5 is not supported.

The results in the full model in Table 3 show support for hypothesis 6. The creation opportunity variable is positive and significant (B = 0.70, p < .06) indicating that change in performance following an IPO is greater for firms exploiting creation opportunities than for those exploiting discovery opportunities. It is worthwhile to note
that both discovery and creation firms, on average, saw performance gains following their IPOs, but the gain for creation firms was greater. There may be some alternative explanations for this difference, which we will address in the discussion.

<table>
<thead>
<tr>
<th>Dependent Variable: Firm Performance</th>
<th>Controls</th>
<th>Full Model</th>
</tr>
</thead>
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<tr>
<td>Opportunity type (H6)</td>
<td>0.80**</td>
<td>(0.36)</td>
</tr>
<tr>
<td>Firm Size</td>
<td>0.467***</td>
<td>0.482***</td>
</tr>
<tr>
<td></td>
<td>(0.132)</td>
<td>(0.130)</td>
</tr>
<tr>
<td>Firm Age</td>
<td>-0.067*</td>
<td>-0.056</td>
</tr>
<tr>
<td></td>
<td>(0.038)</td>
<td>(0.038)</td>
</tr>
<tr>
<td>VC Reputation</td>
<td>0.006</td>
<td>-0.024</td>
</tr>
<tr>
<td></td>
<td>(0.066)</td>
<td>(0.067)</td>
</tr>
<tr>
<td>IPO Year</td>
<td>-0.263</td>
<td>-0.204</td>
</tr>
<tr>
<td></td>
<td>(0.221)</td>
<td>(0.219)</td>
</tr>
<tr>
<td>Constant</td>
<td>15.489***</td>
<td>15.294***</td>
</tr>
<tr>
<td></td>
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<td>(.753)</td>
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<td>F</td>
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<td>R2</td>
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<td>0.180</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>0.118</td>
<td>0.146</td>
</tr>
</tbody>
</table>

* p < .1  
** p < .05  
*** p < .01  

Table 3 - OLS Regression for Firm Performance

Turning to the Bayesian analysis, we find similar results. Rather than examining p-values for each of the hypotheses, the Bayesian analysis generates the full distribution for the variables in question. This information is summarized in table 4 and graphically in figure 1. The posterior distribution of the coefficient on prior experience has greater than 97.5% of the distribution greater than 0. This suggests that the majority of the time
greater prior industry experience increases the likelihood of pursuing a creation opportunity contradicting hypothesis 1. Prior startup experience has an even more positive posterior distribution – over 99% of the distribution of the coefficient is positive. This supports hypothesis 2.

The posterior distribution of the coefficient on M&A activity is nearly completely positive. Over 99.99% of the distribution is greater than 0. This confirms hypothesis 3 that firms pursuing greater M&A activity following an IPO are more likely to be creation firms. The posterior distribution of existing distribution is nearly completely negative with over 99% of the distribution below 0. This supports hypothesis 4 that existing distribution is more likely associated with discovery opportunities than creation opportunities. The posterior distribution of the coefficient on alliances is mostly positive but more than 10% of distribution is below 0. Therefore, we cannot find support for hypothesis 5.
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>2.5%</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>97.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry XP (H1)</td>
<td>0.10</td>
<td>0.04</td>
<td>0.03</td>
<td>0.08</td>
<td>0.10</td>
<td>0.13</td>
<td>0.18</td>
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<tr>
<td>Startup XP (H2)</td>
<td>1.47</td>
<td>0.58</td>
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<td>1.08</td>
<td>1.46</td>
<td>1.85</td>
<td>2.71</td>
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<tr>
<td>M&amp;A (H3)</td>
<td>0.28</td>
<td>0.07</td>
<td>0.14</td>
<td>0.23</td>
<td>0.28</td>
<td>0.32</td>
<td>0.41</td>
</tr>
<tr>
<td>Existing Distribution (H4)</td>
<td>-1.51</td>
<td>0.62</td>
<td>-2.77</td>
<td>-1.94</td>
<td>-1.47</td>
<td>-1.06</td>
<td>-0.42</td>
</tr>
<tr>
<td>Alliances (H5)</td>
<td>0.05</td>
<td>0.04</td>
<td>-0.03</td>
<td>0.02</td>
<td>0.05</td>
<td>0.07</td>
<td>0.12</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.70</td>
<td>0.74</td>
<td>-5.29</td>
<td>-4.15</td>
<td>-3.65</td>
<td>-3.20</td>
<td>-2.37</td>
</tr>
</tbody>
</table>

Table 4 - Bayesian Logistic Regression for Opportunity Type
For hypothesis 6, the Bayesian results for the OLS regression can be found in table 5 and figure 2. The posterior distribution on the coefficient for opportunity type is nearly completely positive. Over 98% of the distribution is greater than 0. This supports the frequentist findings that creation opportunities are more strongly correlated with positive performance changes following an IPO supporting hypothesis 6. These results reflect the use of informative prior distributions as described above. To check the
robustness of the results the same analysis was completed with non-informative priors.

The results were similar to the informative prior analysis.

Figure 2 - Posterior Distributions for the Regression on Firm Performance
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>2.5%</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>97.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity Type (H6)</td>
<td>0.74</td>
<td>0.34</td>
<td>0.09</td>
<td>0.52</td>
<td>0.73</td>
<td>0.97</td>
<td>1.40</td>
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<td>Firm Size</td>
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<td>0.12</td>
<td>0.34</td>
<td>0.38</td>
<td>0.45</td>
<td>0.54</td>
<td>0.71</td>
</tr>
<tr>
<td>Firm Age</td>
<td>-0.06</td>
<td>0.04</td>
<td>-0.13</td>
<td>-0.08</td>
<td>-0.06</td>
<td>-0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>VC Reputation</td>
<td>-0.02</td>
<td>0.06</td>
<td>-0.15</td>
<td>-0.07</td>
<td>-0.02</td>
<td>0.02</td>
<td>0.11</td>
</tr>
<tr>
<td>IPO Year</td>
<td>-0.19</td>
<td>0.21</td>
<td>-0.62</td>
<td>-0.35</td>
<td>-0.19</td>
<td>-0.03</td>
<td>0.23</td>
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<tr>
<td>Constant</td>
<td>15.38</td>
<td>0.72</td>
<td>13.98</td>
<td>14.91</td>
<td>15.40</td>
<td>15.85</td>
<td>16.86</td>
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</table>

Table 5 - Bayesian Regression for Firm Performance
**Qualitative Analysis**

Small sample sizes are often best examined through qualitative analysis. Given the small number of creation opportunities in the sample, it is worthwhile to qualitatively analyze the firms. To perform a post hoc qualitative analysis, we created a matched sample of the creation firms in the data with discovery firms based on the firm’s age, IPO year, and size – specifically looking at both number of employees and pre-IPO revenue.

We follow a modified version of Eisenhardt’s (1989) process of building theory from case study research. Once cases were selected we worked recursively between the theory and selected cases (Baker & Nelson, 2005; Eisenhardt, 1989). We performed both within case analysis and cross-case pattern search – first analyzing each of the cases by discovery or creation, then examining the cases comparatively with their matched counterpart. The cases themselves consist of the “Business” section of the IPO prospectus. This section, which is typically 10-30 pages long, summarizes most of the information in the prospectus with the exception of financial data. Like much of the prospectus the language contained in this section is often boilerplate language. Therefore, any variation between the cases would more than likely be significant sources of difference. This process led to the results presented below, which serve to supplement and confirm the analysis presented already.

Initially, sixteen potential items were generated to analyze cases; nine discovery indicators and seven creation indicators. This list was expanded to twenty-seven potential indicators throughout the initial examination of the cases. After completing the analysis fifteen indicators were removed due to lack of evidence in more than a few cases or a
lack of any meaningful differences between the groups of cases. For example, a few indicators were removed because only three discovery cases and two creation cases mentioned anything related to the indicator. Lastly, two pairs of indicators were merged due to overlap. The end result was ten indicators, which are summarized in Table 6.

There are six indicators of discovery opportunities and four indicators of creation opportunities. Table 7 gives examples of quotes from the prospectuses that lead to the indicators used.

All but one of the discovery opportunities have a small number of large customers compared with none of the creation opportunities. These firms have two or more customers that each make up more than ten percent of their revenue up. One firm had 62% of its revenue from an individual customer. This characteristic aligns with discovery opportunities in that these large customers have a specific need to be filled. This need serves as an exogenous opportunity for the new firm to exploit. The ability to build a specific solution for these larger firms requires knowledge about existing industries and customers. Creation opportunities, on the other hand, typically have many customers making up smaller percentages of revenue. The uncertain context of creation opportunities leads to a greater breadth of stakeholders being involved as a means of mitigating uncertainty. These stakeholders may be investors or customers, but would more likely be larger in number with a lower level of investment.
<table>
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</table>

Table 6 - Qualitative Indicators of Opportunity Type
Comparison to existing products and services is further qualitative evidence of discovery opportunities. For example, D5 states that “more than 70 firms now offer online trading” demonstrating that a market clearly exists for its service. D11 states that “rapidly growing demand … has attracted many firms to this market.” These claims reflect the exploitation of a pre-existing opportunity. Furthermore, discovery firms often disclose their use of industry standard technology. D1 describes how their product “incorporates industry-leading technology as part of its architecture.” D4 explains how their selection of industry standard technology “can run on varying combinations of equipment on the same or different platforms.” These opportunities are fitting into existing markets and industries using existing technology. This aligns with discovery opportunities as the result of exogenous shocks in existing industries.

In a similar vein, several of the discovery opportunities describe a modular value chain. That is, the discovery opportunity seeks to supplant an existing firm process through outsourcing one or more firm activities. In these cases, discovery opportunities are created by the possibility of greater efficiency in one or more value chain processes. D3 observes that businesses at the time were “spending approximately 25% of their overall information technology budgets on outsourced services.” D9 goes further in describing their fit for this problem by stating “that businesses of all sizes have a significant need to outsource the hosting of Internet and other software applications to improve core business processes, reduce costs and enhance their global competitive position.” These quotes show how the opportunities were formed by exogenous shocks rather than created by the entrepreneur’s actions. Some of these discovery opportunities
even use the specific language of exploiting market opportunities. D5 states that they believe “that a significant opportunity exists.” D6 states that “a significant opportunity exists to provide small to mid-sized banks with a comprehensive, outsourced solution.” In these cases, the startup firms recognize the pre-existing opportunity and their ability to recognize that opportunity.

Lastly, the discovery firms often spoke of price competition. This further supports the notion of these opportunities arising exogenously since prices are well established. More so, the existence of price competition shows a risk-based decision context. Knowledge of existing price points and competition allows for estimation of future returns in line with causation decision-making (Sarasvathy, 2001).

<table>
<thead>
<tr>
<th>Competitive Comparison</th>
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<tbody>
<tr>
<td><strong>D3</strong></td>
</tr>
<tr>
<td>Our high-performance infrastructure together with our trained and experienced staff enable us to offer levels of service which are backed by guarantees which we believe are among the highest and most comprehensive in the industry</td>
</tr>
<tr>
<td><strong>D5</strong></td>
</tr>
<tr>
<td>More than 70 firms now offer online trading, up from approximately 30 at the end of 1997, including most of the major U.S. stockbrokers</td>
</tr>
<tr>
<td><strong>D11</strong></td>
</tr>
<tr>
<td>The rapidly growing demand for Internet professional services has attracted many firms to this market. [D5] believes that many of these firms suffer from one or more of the following limitations:</td>
</tr>
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<table>
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<tr>
<th>Small Number of Big Customers</th>
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<tbody>
<tr>
<td><strong>D5</strong></td>
</tr>
<tr>
<td>Four customers comprised 53% of our gross accounts receivable</td>
</tr>
<tr>
<td><strong>D6</strong></td>
</tr>
<tr>
<td>One client bank…accounted for 14% of our total revenues in the fiscal year ended June 30, 1998 and for 57% of our total revenues in the fiscal year ended June 30, 1997.</td>
</tr>
<tr>
<td><strong>D8</strong></td>
</tr>
<tr>
<td>[3 clients] accounted for 22.3%, 21.1%, and 19.7% of the Company’s revenues, respectively</td>
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</tbody>
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<thead>
<tr>
<th>Modular Value Chain</th>
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</thead>
<tbody>
<tr>
<td><strong>D3</strong></td>
</tr>
<tr>
<td>Businesses in the United States are now spending approximately 25% of their overall information technology budgets on outsourced services.</td>
</tr>
</tbody>
</table>

Table 7 - Example Quotes from Prospectuses

Continued
### Modular Value Chain

| D4 | Our patented software platform provides a comprehensive and highly portable solution for the development and delivery of digital interactive services to television viewers, without significant investment in hardware or digital infrastructure by network operators. |
| D6 | Many banks, particularly small to mid-sized banks, are seeking to outsource their Internet banking services as a more cost-effective, efficient means of providing these services to their customers. |

### Industry Standard Tech

| D1 | [The company’s product] incorporates industry-leading technology as part of its architecture |
| D7 | In response to the demand for high-speed and high-performance storage-to-server and server-to-server connectivity, the Fibre Channel interconnect protocol, an industry networking standard was developed in the early 1990s. |
| D10 | The use of the Internet as a means to conduct business necessitates uniform and standardized data exchange protocols to enable market participants to communicate. These exchange protocols are standard formats for content structure, as well as the methods and means for exchanging data. |

### Use Market Opportunities

| D2 | The Company seeks to capitalize on the market opportunities created by the worldwide popularity of sports, the emergence of the Web as a communications and commerce medium and the appealing demographics of sports fans on the Web. |
| D3 | Some businesses attempt to reduce cost and shorten time to deployment by utilizing multiple vendors, each of which provides only a partial solution. This has created [a] significant opportunity for an application service provider… |
| D5 | [The Company] believes that a significant opportunity exists for a company to provide easy access to real-time business news, financial programming, and analytic tools over the Internet. |

### Price Competition

| D5 | Increased competition could also result in price reductions, reduced margins or loss of market share… |
| D9 | Certain of these competitors may be able to … adopt more aggressive policies than we can. |
| D10 | We provide faster time to market and lower cost [than our competitors] |
Table 7 continued

<table>
<thead>
<tr>
<th>Primarily Direct Sales</th>
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<tbody>
<tr>
<td>C1</td>
<td>The Company markets and sells its products and services generally through its ten-person direct sales force, each of whom focuses on a specific region of the country.</td>
</tr>
<tr>
<td>C2</td>
<td>The Company believes that a strong sales and marketing organization is essential to effectively sell and market Internet advertising solutions… [The Company] plans to expand its … sales force and has established dedicated sales organizations.</td>
</tr>
<tr>
<td>C3</td>
<td>The Company believes it maintains one of the largest Internet advertising sales organizations.</td>
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<tr>
<th>Branding as Competitive Advantage</th>
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<tr>
<td>C4</td>
<td>[The Company] is a leading brand name in online commerce and believes that it is benefiting from first mover advantages and momentum. The Company’s strategy is to promote, advertise and increase its brand equity and visibility through excellent service and a variety of marketing and promotional techniques.</td>
</tr>
<tr>
<td>C8</td>
<td>We believe that our… brand name will be come synonymous with better, faster and more convenient mortgage loans, which will bring potential borrowers to our Web site and will help establish us as the premier technology enabler in the mortgage industry.</td>
</tr>
<tr>
<td>C10</td>
<td>We intend to continue using television advertising to increase brand awareness and loyalty and attract Internet users to our Web site… We believe that our television advertising has enabled us to increase the reach of our … brand and services.</td>
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<tr>
<th>New Future Revenues</th>
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<tbody>
<tr>
<td>C1</td>
<td>In addition, while the Company currently markets its products and services primarily to providers and suppliers, [the Company] intends to pursue opportunities in the healthcare payer market by leveraging existing methodologies and databases to develop products and services for healthcare payers.</td>
</tr>
<tr>
<td>C7</td>
<td>(Currently only an information destination on the Web) [The Company] has identified the opportunity to generate new commerce revenues by selling products or services…</td>
</tr>
<tr>
<td>C9</td>
<td>[The Company] intends to continue to leverage the … brand over the next two years by expanding its product offerings.</td>
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<tr>
<th>Description of the Problem</th>
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<tbody>
<tr>
<td>C5</td>
<td>As the number of contacts and the amount of information transmitted increase, information delivery bottlenecks are created, significantly decreasing network performance. This problem is exacerbated during peak periods of network usage and bursts in traffic volumes driven by news and other significant events.</td>
</tr>
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Continued
Table 7 continued

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<tr>
<th>Description of the Problem</th>
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<tr>
<td><strong>C7</strong> [The Company] focuses on the needs of women online and has created an environment that solves everyday problems quickly in those areas of life most important to women, including family, parent, work, money and health. The user’s experience on [The Company’s website] centers on solving these problems in one destination.</td>
</tr>
<tr>
<td><strong>C11</strong> We believe that our innovative business design addresses the challenge of e-commerce fulfillment by integrating a retail web site with an advanced distribution center and delivery system which enable us to efficiently fill a high volume of orders and deliver products to our customers on the same day.</td>
</tr>
</tbody>
</table>

Turning to creation opportunities, the majority of them sell primarily, if not exclusively through direct sales. In forming an opportunity, new knowledge is created and the opportunity may evolve over time. Direct sales enable firms enacting creation opportunities to both gain knowledge and educate potential customers. Whereas discovery opportunities may rely on channel partners or outside sales teams, creation opportunities have to deal with a changing marketing mix (Alvarez & Barney, 2007), which would complicate any interactions with channel partners or other outside sales teams.

Further evidence of an evolving strategy in creation opportunities lies in their plans for new future revenues. C5 describes how it “intends to continue to develop new technologies, as well as enhance and extend its core technology, in order to bring to market new scalable network applications.” C4 states that it “intends to leverage its brand, online commerce experience, operating infrastructure and customer base to
broaden its presence and develop additional revenue opportunities.” These quotes illustrate how even in an IPO prospectus the creation firms recognize the evolving nature of the opportunity, which speaks to the uncertain decision-making context associated with creation opportunities.

Another commonality among creation firms is a description of the problem the firm is attempting to solve. While discovery opportunities typically have an industry description coupled with a product description, the specific problem is not described. The endogenous nature of the opportunity makes a description of the problem more necessary. C7 claims that they have “created an environment that solves everyday problems quickly in those areas of life most important to women…solving these problems in one destination.” C4 describes the problem as limiting “customer selection and available retail shelf space.” They go on to describe their solution to this problem, which has gone unnoticed to consumers. An endogenously created opportunity may be described as actually creating the problem and the solution simultaneously. In this case, new firms enacting creation opportunities would be more likely to explicitly describe the problem associated with their opportunity.

Lastly, creation opportunities more often talked about branding as competitive advantage. Every prospectus discusses competitive position and the company’s rationale for why they have a competitive advantage including how they could sustain that advantage. The creation firms much more often discussed branding as that source. C2 “believes that brand awareness of the company and its solutions is critical to its success.” C8 argues that their “brand name will become synonymous with better, faster, and more
convenient” services that “will help establish us as the premier technology enabler” in their industry. This branding strategy falls in line with competitive advantage arguments for creation opportunities (Alvarez & Barney, 2007). While discovery opportunities typically rely on speed and secrecy, these creation firms drive exposure to increase brand awareness. The branding strategies here suggest that these creation firms may draw competitive advantage from their enactment processes that are likely to create more tacit resources. Rather than defending a competitive advantage on the basis of scale economies or technological superiority these firms turn to the socially complex resource of a brand. Their enactment process likely involved a wider base of stakeholders (Sarasvathy, 2001), which can strengthen this branding strategy.

While there may some overlap in the indicators between discovery and creation firms, the majority of the qualitative evidence supports the empirical findings above. The creation and discovery opportunities as identified by the expert raters and the empirical results align with the qualitative indicators outlined here.

**Discussion & Limitations**

Prior research has conceptually debated the existence of opportunity types and their relevance for the entrepreneurship research (Alvarez & Barney, 2007; 2010; Dimov, 2011; McMullen & Shepherd, 2006; Sarasvathy, 2001; Zahra, 2008). The results of this study suggest that there are distinctive opportunity types that have different processes as they relate to exploitation. These divergent processes affect firm performance and have
implications for both research and practice. Furthermore, this research offers a first step toward empirically classifying opportunities.

**Empirical indicators of opportunity type**

The first part of our analysis examined different indicators of opportunity types. These measurable criteria offer potential as a first list of indicators of opportunity types and greater practical understanding of the theoretical frameworks of discovery and creation. While there were mixed results, both the predicted and un-predicted findings warrant further discussion.

The relationship between prior startup experience and opportunity types has the potential to inform literature on serial and expert entrepreneurs (Sarasvathy, 2001). If the knowledge gained through undergoing a startup aids in creating future opportunities, then future research and education should focus on this knowledge. Is it specifically tacit knowledge or can it be codified and thus taught? What specifically about the entrepreneurial process, regardless of prior opportunity type, enables entrepreneurs to create future market imperfections? While prior research has contended that absorptive capacity on the part of the entrepreneur aids in opportunity discovery (Shane, 2003), these findings question the nature of that absorptive capacity. Is there knowledge about ‘entrepreneuring’ that enables individuals to create opportunities that differs from that knowledge that enables them to recognize opportunities? The findings here suggest these and other questions about the nature of the entrepreneur as it relates to opportunity type.
To further understand the findings related to M&A activity two issues should be considered. First, the timing of imitation may be an issue in this study. Specifically, a creation firm may have already created a market imperfection that may be exploited by other firms. In essence, the creation firm acts as an exogenous shock forming a discovery opportunity simultaneously with the creation opportunity. By the time a firm reaches the IPO stage, other firms may have already begun exploiting this discovery opportunity. Second, creation opportunities typically lack financial resources during enactment and rely instead on bootstrapping and bricolage (Baker & Nelson, 2005; Bhide, 1992). As such, these firms may not have the same specific needs for capital that discovery firms may be seeking in their IPO. A discovery firm, especially during this time frame, may reach IPO while still in development. The funds acquired by the IPO process may then be unavailable for M&A activity because they are being used for day-to-day operations. A creation firm, however, may have more funds at their disposal to finance M&A activity. While both of these explanations may be relevant, further research is needed to determine the nature of the relationship between M&A of near competitors and opportunity type.

The last significant indicator of opportunity type is the use of existing distribution channels. This finding provides further understanding as to the differences between opportunity types. Although creation firms need not use new distribution channels for exploitation, this measure could be part of a group of indicators that would allow more rigorous delineation of opportunity types for further investigation.

While expert raters can account for a greater number of variables in a variety of combinations, empirically investigating opportunity types without using expert raters
would add additional validity to findings. Future research should look for further indicators and combinations of indicators are related to different opportunity types. Understanding these indicators can make the study of opportunities more manageable and aid in refining the theory underlying opportunity types.

As mentioned above the time period for this study offered several advantages in terms of data collection, but there are drawbacks to using any natural experiment. These findings may not be generalizable beyond this time frame. Furthermore, alternative explanations for the findings call into question just how substantial the choice of time period may be on the results here. Beyond the time period, these findings studied VC-backed firms, which represent a small percentage of entrepreneurship as a whole (Aldrich and Reuf, 2006). The findings here may not be generalizable to smaller firms not backed by VC.

**Opportunity types and competitive advantage**

The model presented above supports the RBT argument that creation firms have a more defensible competitive advantage than discovery firms. This is because creation firm’s advantage does not rest on information asymmetry but arises as a byproduct of the enactment process. Measuring the change in performance before and after an IPO aids in isolating the effect of information diffusion, but other possible explanations still exist. Two possible alternative explanations arise from the possibility of VC selection effects or the added rigor brought by the IPO process to a creation firm.
The time frame of this study was selected to aid in the availability of data on creation firms. The dot com boom enabled creation firms to obtain VC funding where they would typically be unable to (Alvarez & Barney, 2007). The assumption of this study is that the creation firms in the sample represent a similar distribution to the discovery firms in which VCs invested. It is possible, however, that VCs, given greater financial resources than typically available, exhausted the possibilities of worthwhile discovery firm investments and then selected only the best creation firms. If this were the case, the sample for this study would be comparing a wider range of discovery firms with only the best creation firms. However, VCs typically invest in what they believe are the best discovery firms suggesting that the groups of discovery and creation are more comparable. Furthermore, VCs are structured to evaluate the risk involved in an opportunity (Gompers & Lerner, 2001) making it unlikely that they would have sufficient skills to appropriately select the best creation firms in an uncertain decision-making context. Therefore, it is likely that the discovery and creation firms in the sample are comparable groups.

Another alternative explanation may be that it was not competitive advantage that caused the difference in the change in performance, but rather it was the rigor of the IPO process that enhanced the performance of the creation firms. Creation opportunities are iterative emergent processes that benefit from the ability to evolve over time. That freedom of evolution may have costs in terms of focus and efficiency. The IPO process may force additional pressure toward consistency and stability that may enhance the performance of creation firms more so than discovery firms. In essence, the IPO process
may solidify the plans of the creation firm and eliminate wasteful variations within the firm. Discovery processes are more narrowly focused from the outset, since they follow risk-based decision paradigms (Sarasvathy, 2001). Nonetheless, each of these firms received VC backing prior to their IPO and the VCs would likely apply rigor to the creation firms’ processes prior to the IPO. By only examining the focal firm’s performance immediately preceding and immediately following the IPO, the focused process that may enhance performance have already been included in the performance measure of the creation firms. Therefore, the RBT competitive advantage explanation of these results seems the most plausible.

While using expert raters has precedence in entrepreneurial research (Corbett, 2007; DeTienne & Chandler, 2007; Shepherd & DeTienne, 2005), there may be some question as to the validity of the raters’ assessments. Furthermore, discovery and creation opportunities may not be the only types of opportunities (Alvarez & Barney, 2010). As a robustness check against these issues, we ran the analysis utilizing only the cases where the raters had initial agreement. The results of that analysis (not presented here) confirmed those presented in the study.

The findings presented here offer a first empirical step toward further study of opportunity types. Despite the conceptual debates, there has been little empirical work to support either the existence of different opportunity types or their irrelevance. In line with Hmieleski & Baron (2008), this research contends that opportunity types do in fact differ in their implications and processes. The context of an opportunity type is important
groundwork for further theory development in entrepreneurship research and future empirical studies examining other divergent processes.

Conclusion

This study demonstrates the reality of different opportunity types by examining the processes that lead to competitive advantage. While this study finds support for different types of opportunities and divergent implications of those opportunity types, it is just the tip of the iceberg. Further research must examine other processes that differ between opportunity types including financing and human resources – to name a few. Furthermore, this begins the work toward a list of indicators of discovery and creation opportunities, but it is a first step. Refining this group of indicators and developing others will advance research on opportunity types and inform entrepreneurship research, practice and education.
Bricolage, Creation and Effectuation

Introduction

Studies of the process of entrepreneurship have often focused on how entrepreneurs act to overcome two issues: (1) uncertain decision-making contexts (McMullen & Shepherd, 2006; Alvarez, 2007; Hmielski & Baron, 2008) and (2) the lack of resources available (Baker & Nelson, 2005; Katila & Shane, 2005; Bradley, Wiklund, & Shepherd, 2010). Entrepreneurs act in the face of uncertainty, which often requires different skills than managers (Busenitz & Barney, 1997). Furthermore, entrepreneurs often lack the resources necessary to pursue opportunities (Aldrich & Ruef, 2006). While these two ideas often co-exist in entrepreneurship, research on these two concepts has often been preformed independently.

In entrepreneurship, research on decision-making in the face of uncertainty is often termed effectuation (Sarasvathy, 2001; Wiltbank, Dew, Read, & Sarasvathy, 2006). Effectuation focuses on controlling an unpredictable future as opposed to causation, which focuses on estimating or predicting the future. Research on how entrepreneurs act when facing a dearth of resources is often termed bricolage – making-do with what’s on hand (Levi-Strauss, 1967; Baker & Nelson, 2005). Bricolage concepts have been applied to individual ventures (Baker & Nelson, 2005) as well as industries as a whole (Garud and Kanoe, 2003). These two concepts are both relevant to creation opportunities
(Alvarez and Barney, 2007). Nonetheless, the relationship between effectuation, bricolage and creation opportunities has not been explicitly examined. If these concepts are to become part of a paradigm in entrepreneurship research (Kuhn, 1962), it is important to understand how they come together and where they diverge.

The purpose of this paper is to detail the boundary conditions of effectuation and bricolage, and describe how they interrelate in creation opportunities. Some have suggested that all entrepreneurship occurs in a state of uncertainty (Sarasvathy, 2008), which would argue that effectuation would be the primary decision-making paradigm in entrepreneurship. Nonetheless, Sarasvathy (2001) also describes causation as an alternative to effectuation. Similarly, if bricolage simply describes any response to resource scarcity, then the concept loses its usefulness as a description of a specific entrepreneurial process. In detailing what is (and what is not) effectuation and bricolage, this paper will describe how these two concepts can occur simultaneously in a creation opportunity. Clarifying these relationships will provide prescriptions for future empirical work on each of these three concepts and hopefully provide a firmer foundation upon which to build a paradigm for entrepreneurship research.

In order to define the boundary conditions of these concepts, the paper proceeds with an overview of extant literature and derives the underlying assumptions of effectuation, bricolage and creation opportunities. From there, it proceeds to describe how these concepts interrelate with each other. Finally, the paper concludes with directions for further research in each area.
Effectuation

Effectuation is a decision-making paradigm that can be effective in the face of Knightian uncertainty (Wiltbank, Dew, Read, & Sarasvathy, 2006), where neither outcomes nor their respective probabilities are known (Knight, 1921). In predictable environments, planning and control are more appropriate decision models, but entrepreneurial decisions are often not made in predictable environments (Wiltbank et al, 2006). Furthermore, this uncertain future environment does not arise exogenously, but rather is affected by the actions of the entrepreneur (Read, Song, & Smit, 2009; Sarasvathy, 2008). This uncertain, endogenous future is the backdrop against which effectuation is set.

“Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means” (Sarasvathy, 2001: 245). Put simply, effectuation processes do not set an endpoint, but rather focus on what they can do as a first step moving toward a yet-to-be-determined future endpoint. Sarasvathy (2001) goes on to detail how effectuation processes begin by focusing on the means entrepreneurs have at their disposal. These means can be segregated into three categories: “who they are, what they know and whom they know” (Sarasvathy, 2003: 208). Beginning with these means, effectuation diverges from causation in focusing on affordable loss rather than expected returns, strategic alliances instead of competitive analysis, and exploiting contingencies rather than pre-existing knowledge (Sarasvathy, 2008).
Primary assumptions

The primary assumption of effectuation is that entrepreneurs operate in an uncertain world (Knight, 1921) where control outperforms prediction (Sarasvathy, 2001; Read, Song, & Smit, 2009). Control can be understood in two senses. First, an entrepreneur could in some manner control the future by exerting force over which unknown future state may come about. In this sense, an entrepreneur “controls” the future by increasing the likelihood of the occurrence of one future state over the likelihood of another. This assumes an endogenous environment where the entrepreneur and the environment interact with each other rather than an environment that acts as a set of exogenously given constraints. Sarasvathy (2001: 252), using the classical probability metaphor of drawing balls from an urn, suggests that effectuation involves changing the odds by throwing more correct balls in the urn (regardless of whatever unknown probability existed previously) or filling the urn with the wrong color balls and changing the rules of the game. However, effectuation has been called non-teleological (Sarasvathy, 2008). Without any goal in mind, it would seem unlikely that the entrepreneur would exert force over the environment to bring about a more favorable future state.

The second sense of control can be understood as the provision for control of an unknown future state. In essence, decisions are made to increase the number of possible future actions, thus increasing the likelihood of the availability of the correct future action. In this sense, the key element is not predicting the future, but rather having the correct response as an available option. This type of diversified decision-making may be
non-teleological as it does not represent any specific goal-seeking on the part of the entrepreneur. Control, in effectuation, must therefore represent a response mechanism. However, this does not seem to fit with the assumption of the endogenous environment. This inconsistency can be overcome by simply allowing effectuation to be a teleological construct.

Empirical analysis for effectuation has primarily consisted of field studies gathering and analyzing qualitative data (e.g. Sarasvathy & Dew, 2005) and think-aloud experiments involving entrepreneurs and students (e.g. Dew, Read, Sarasvathy, & Wiltbank, 2009). Read et al (2009) conducted a meta-analysis finding significant results for the use of effectual logic on firm performance looking at all articles in the last twenty-five years of *The Journal of Business Venturing*. Recently, Chandler et al (2011) developed survey constructs to test differences between effectuation and causation. Chandler et al (2011) found causation to be a uni-dimensional construct whereas effectuation is a multidimensional construct including dimensions for experimentation, affordable loss, and flexibility. These findings support the theoretical work of Sarasvathy and colleagues (Sarasvathy, 2001, 2008; Sarasvathy & Dew, 2005; Wiltbank et al, 2006; Dew, Sarasvathy, Read, & Wiltbank, 2009). Much of this research, however, does not directly address the question of what are the boundary conditions of effectuation.

*Boundary Conditions of Effectuation*

To theoretically derive the boundary conditions of effectuation, one must examine the underlying assumptions. The two primary assumptions mentioned above are the
assumption of uncertainty and the assumption of an endogenous environment. Boundary conditions can be understood by examining what other values could the units of these assumptions take (Dubin, 1978). Uncertainty is often contrasted with risk (Knight, 1921) so the logical boundary condition of effectuation based on uncertainty would be to stipulate that effectuation does not apply under conditions of risk. In other words, if the outcomes and probabilities associated with those outcomes can be estimated ex ante, then effectuation would not apply. The second theoretical boundary condition depends on the endogenous environment. If the entrepreneur cannot affect his or her environment, then effectuation would not be relevant, as the environment would be considered exogenous.

An exogenously given environment aligns with a critical realist philosophical stance (Alvarez & Barney, 2010). The environment exists “out there” and entrepreneurs must respond to the given reality. These theoretically derived boundary conditions may meet with some difficulty in empirical investigation so it may be helpful to derive boundary conditions empirically as well.

Sarasvathy (2001) described four principles that embody effectuation: (1) affordable loss rather than expected returns, (2) strategic alliances rather than competitive analysis, (3) exploitation of contingencies rather than pre-existing knowledge, and (4) controlling an unpredictable future rather than predicting an uncertain one (2001: 252). Recent research has drawn on meta-analysis to determine how these principles of effectuation affect firm performance (Read, Song, & Smit, 2009). The study does not incorporate boundary conditions, but analyzes all articles that have at least one principle of effectuation. There is a strong relationship between individual effectual principles and
firm performance suggesting that any of the effectual principles would have a positive effect on a firm performance. While this supports the relationship of the individual principles and firm performance, the question of the relationship of between effectuation and firm performance requires further examination.

Recently, Chandler et al. (2011) developed constructs to measure both effectuation and causation. They argue that effectuation represents a formative construct meaning, “the higher order constructs are ‘formed’ by the lower order ones… This implies that the sub-components should not be changed or deleted; doing so might substantially alter the upper level construct” (Chandler et al., 2011: 380). Put simply, each of the principles of effectuation play a role such that the whole differs from the sum of the parts. Thus, an appropriate boundary condition would require all principles of effectuation to be present. This finding questions the meta-analytic results as the presence of one aspect of effectuation, for example affordable loss, does not constitute effectuation as a whole. Certainly, one can imagine a situation where some of these principles are applied while excluding others. Based on Chandler et al. (2011) this setting would more appropriately be characterized as some other decision-making mode, not effectuation. Therefore, the empirically derived boundary conditions of effectuation are the presence of all four of the principles of effectuation and the presence of uncertainty.

Bricolage

In anthropology, Levi-Strauss (1967) initially described bricolage as “making do with what’s on hand.” He described two types of bricolage: ideational and material.
Ideational bricolage describes the process of recombining earlier myths to create new myths serving new functions whereas material bricolage represents the combination of resources at hand to find workable approaches to problems (Baker & Nelson, 2005). Although ideational bricolage has received some attention in the entrepreneurship literature (Mair & Marti, 2009), the majority of research regarding bricolage has focused on material bricolage (Baker, Miner, & Eesley, 2003; Garud & Kanoe, 2003; Baker & Nelson, 2005; Baker, 2007). This material bricolage describes a process of combining resources at hand in novel ways to overcome problems and exploit opportunities.

Bricolage, as applied to entrepreneurship literature, is typically defined in line with Baker and Nelson (2005) as “making do by applying combinations of the resources at hand to new problems and opportunities” (Baker & Nelson 2005: 333). They go on to describe how “making do” describes a state of action where bricoleurs – that is those who utilize bricolage – refuse to enact limitations, but instead act in the face of those constraints. These limitations represent a problem caused by a lack of appropriate resources. Rather than pursuing financing to obtain appropriate resources or simply quitting the process, entrepreneurs may use a resource on hand to solve the problem in a new way or combine existing resources to form a different solution than what is provided by the appropriate resources. The combinations of resources applied to new problems suggest that these resources may not be useful in their traditional application for the given problem, and thus may have been overlooked as by other potential entrepreneurs. Also, the resources at hand that bricoleurs use may be tangible or intangible. They could be physical possessions of the entrepreneur or they may be skills or training received for
another context. These resources may also include free (or nearly free) items or skills in the environment.

*Primary Assumptions*

The primary assumption of bricolage is that of resource scarcity (Baker & Nelson, 2005). This is not to be confused with resource-based arguments from strategy literature (Barney, 1991), but rather that entrepreneurs typically lack the necessary resources to accomplish their goals in the ideal manner. Thus, they must make do with what is available. Baker and Nelson describe two types of bricolage selective and parallel (Baker & Nelson, 2005). Parallel bricolage consists of repeated, often unrelated, instances of bricolage actions that create a self-perpetuating cycle. Here there is no specific goal or endpoint, but entrepreneurs simply do whatever they can with what they have. They continue to enact solutions from available resources focusing on new problems using similar resources rather than transitioning to more efficient solutions to a specific problem. Selective bricolage occurs when an entrepreneur fills in specific resource gaps with bricolage actions until the appropriate resource can be obtained. This type of bricolage moves toward a specific endpoint refining some bricolage solutions and replacing others with appropriate resources when they become available.

The combinations that result from bricolage may come from an individual actor (Baker, 2007) or a collective group of actors (Garud & Kanoe, 2003). Furthermore, perspective factors into bricolage (Baker, 2007). What may be the result of pre-planned resource-seeking for one individual, may also be the act of bricolage for another
individual (Baker, 2007). This distinction is important as it shifts the appropriate level of analysis from the action alone to the individual-action dyad. An action may involve two people with different perspectives; the first person may be acting as bricoleur whereas the second person may not. Therefore, the question is not whether an action is bricolage, but whether the person is acting as a bricoleur in the specific action.

Empirically the work to support bricolage has typically utilized the case study (Mair & Marti, 2009) or multiple case study (Baker & Nelson, 2005) approach. Even narrative (Baker, 2007) has been employed to further clarify the points of bricolage. While these case studies and industry studies (Garud & Kanoe, 2003) have served to describe the concept of bricolage and how it is employed in entrepreneurial settings, they have not yet provided a clear delineation between bricolage and other related entrepreneurial concepts such as effectuation. In particular, bricolage and effectuation may overlap in creation opportunities.

**Boundary Conditions of Bricolage**

Baker (2007) contrasts bricolage with resource-seeking behavior. The primary assumption of bricolage requires a level of resource scarcity. Nearly all organizations meet with resource scarcity at some level so scarcity is a necessary, but not sufficient condition for bricolage to exist. “Simply seeking out or paying discount prices does not—of course—constitute bricolage. But making use of a resource because it is available cheaply or for free—rather than because it is the ‘right’ resource—and then combining it with other resources to take advantage of some new opportunity exemplifies bricolage” (Baker,
2007: 705). The measure of bricolage, then, depends not on the cost of the item, but rather on its comparison to the ‘right’ resource and its use in comparison to its natural use.

Determining whether a resource is the ‘right’ resource is simultaneously subjective and difficult to verify. Consider a simple example. Suppose the desired action of an entrepreneur was to dig a hole. The right resource could be considered a shovel, but a backhoe may be more or less appropriate depending on the hole – a hole for a small potted plant would require a different resource than a hole for an Olympic size swimming pool. Nonetheless, simply using a shovel to dig a swimming pool does not constitute bricolage. Alternatively, taking old discarded shovels and using them as fence posts to construct a barrier around the pool could be considered bricolage. The resource must be combined or used in a novel way. This combination or use of resources in novel ways acts as the primary boundary condition for bricolage. If a resource is used in its intended use, then the action is not bricolage.

This distinction is important because it differentiates bricolage actions from a simple lack of resources. Resource constraint is important to many areas of management, but the examination of novel uses of resources in the face of constraint is an endeavor unique to bricolage studies in entrepreneurship. Bricolage is relevant to the context of entrepreneurship as it describes how new combinations of inputs can lead to new opportunities (Schumpeter, 1934). The novel combinations of resources formed by bricoleurs may give rise to an entrepreneurial opportunity where previous assumptions had proven that there was no opportunity present. Free and cheap resources utilized in
novel ways could turn useless resources into useful ones that possibly provide new social constructions and opportunities for profit (Baker and Nelson, 2005; Alvarez and Barney, 2007).

Creation Opportunities

Opportunities, for the purposes of this paper, are defined as competitive imperfections (Alvarez and Barney, 2010). Creation opportunities are a type of opportunities, which occur in uncertain, endogenous environments (Alvarez and Barney, 2007). These opportunities are the result of an evolutionary enactment process (Weick, 1979; Aldrich and Reuf, 2006) where the entrepreneurs’ interactions with the environment generate the competitive imperfection giving way to the new opportunity. These opportunities typically do not follow pre-specified strategic paths or planning, but rather form out of reactions to the environment. They may create new social constructions (Berger and Luckman, 1967), or arise from organizational failure (McGrath, 1999; Walsh and Bartunek, 2011).

While creation opportunities may be difficult to distinguish from other opportunities ex post, the process of creating an opportunity is important as the activities of creation opportunities differ. Creation opportunities typically do not involve planning or pre-specified strategy instead focusing on learning (Mintzberg, 1994). Leadership and human resources are based more on relationships than expertise (Alvarez and Barney, 2005; 2007) as the opportunity will evolve and relevant expertise may prove less valuable. Financing activity is typically restricted to bootstrapping (Bhide, 1992; 1994),
as more formal financing institutions are unable to evaluate the risk and return of the opportunity. Human resources in creation opportunities are more often found from within the entrepreneur’s social network than outside of it. Thus, while a creation opportunity may be difficult to distinguish from other opportunities, the processes of exploiting that opportunity can provide insight into the nature of the opportunity.

**Primary Assumptions**

There are three primary assumptions of creation opportunities: assumptions about the nature of the opportunity, the nature of the entrepreneur and the nature of the decision-making context (Alvarez and Barney, 2007; 2010). The nature of the opportunity in creation is assumed to be endogenous. That is to say, creation opportunities are formed from the interaction of the entrepreneur with his or her environment. Creation opportunities do not exist apart from the actions of the entrepreneur. As for the nature of the entrepreneur, it is assumed that differences between the entrepreneur and the non-entrepreneur ex ante are not capable of predicting who will exploit a creation opportunity, but differences may arise as a result of the enactment process. Finally, the decision-making context in creation opportunities is that of Knightian uncertainty (Knight, 1921) where both outcomes and probabilities cannot be estimated ex ante. These assumptions give way to divergent implications for the exploitation of creation opportunities as opposed to discovery opportunities (Alvarez & Barney, 2007).
Similar to bricolage and effectuation, empirical work on creation opportunities has been limited. The nature of creation opportunities makes ex post inquiry challenging as all opportunities can appear exogenous ex post (Alvarez & Barney, 2007). Hmielski and Baron (2008) use market turbulence as a proxy for uncertainty (and thus creation opportunities) and use regulatory focus theory to demonstrate a relationship between promotion focus and performance in creation opportunities. Edelman and Yli-Renko (2010) find support for the view that opportunities are the subjective perceptions of the entrepreneur. Beyond these papers, there has been little empirical investigation into creation opportunities. This is to be expected given that creation opportunities have been fully articulated more recently than the other concepts discussed in this paper.

It is clear that there is substantial overlap between bricolage, effectuation and creation. Nonetheless, these terms are not synonymous. The remainder of this paper will explain the areas that overlap between these concepts, use the boundary lines around them to delineate the differences, and explain why those differences may be important.

**Conceptual Overlaps**

The relationships between effectuation, bricolage, and creation are best understood by beginning with the underlying assumptions. Setting the assumptions of effectuation and bricolage against each other gives rise to four possible scenarios that can be set within each of the quadrants displayed in figure 3. The bottom axis shows uncertainty versus risk and thus, effectuation versus causation. The left axis shows a
gradient of resource scarcity and the resultant types of bricolage from parallel bricolage to selective bricolage to no bricolage.

The bottom right quadrant illustrates the case where effectuation, bricolage and creation opportunities all overlap. In this situation, uncertainty is met with scarce resources. Bricolage and effectuation are employed to enact creation opportunities. An entrepreneur may employ parallel bricolage or selective bricolage depending on how scarce the resources are. While creation opportunities often must rely on bootstrapping to overcome resource constraint, there is the possibility that a creation opportunity does not face this constraint. For example, consider a wealthy individual, who could finance her own venture, she would not face these resource constraints. As the amount of resources available to a venture increase, these creation opportunities become more endowed, reducing the need to rely on parallel bricolage. The upper right quadrant represents these endowed creation opportunities, which may employ selective bricolage or no bricolage whatsoever.

Moving from an uncertain context to a risky one while maintaining a relatively high amount of resources, the opportunities likely take the form of discovery opportunities. These opportunities may still require some form of selective or pre-planned bricolage (Baker, 2007), or they may not require any form of bricolage. Finally, if the amount of resources is reduced, few resources coupled with a more risky decision context leads to small discovery opportunities as seen in the lower left quadrant. These more than likely involve selective bricolage to fill resource gaps, but could employ parallel bricolage to exploit the opportunity.
Figure 3 illustrates where effectuation and bricolage overlap, but the boundaries between them may still be unclear. Part of this challenge lies in the difficulty of distinguishing between risk and uncertainty and assessing the level of available resources since both can be intangible. More specifically, uncertainty is unobservable, which presents further complications (Godfrey & Hill, 1995). Understanding these issues,
boundary conditions are best described based on the observable actions of the entrepreneur.

_Exemplars_

Prior work with each of these concepts has drawn on case studies, narratives, and thought experiments to illustrate the unique characteristics of each (Baker & Nelson, 2005; Baker, 2007; Sarasvathy, 2001). Drawing on the previous work, this paper (where it is possible) will use the same examples and narratives from these prior papers to illuminate the boundaries between the concepts. Figure 2 displays each of the following examples in relation to both bricolage and effectuation.

The first example represents the case where both bricolage and effectuation are present. Sarasvathy (2001) uses the case of U-Haul as an example of effectual logic citing that formal case analysis would suggest that the idea was untenable. Nonetheless, the Shoens (U-Haul’s founders) enacted this opportunity in the face of uncertainty by enlisting friends, family members, and customers to make down payments on trucks and lend them the use of those trucks, as they invested no more than $5000 personally. Furthermore, the Shoens gave incentives to early customers if they would establish an outlet for the trucks at their final location. In essence, the Shoens had set up a franchising business model prior to the idea of franchising being developed. This example describes how the Shoens represented each of the four principles of effectuation.

The effectual logic in this example led to bricolage actions. U-haul did not have a national sales force to locate appropriate sales outlets throughout the country. What they
had “on-hand” was customers moving to various parts of the country. They made use of these customers as a sales force. In a resource-constrained environment, the Shoens used the resource of re-locating customers to make do for the lack of a sales force to potential franchisees. The motivation of the Shoens was to apply an available resource (customers) that was not the ‘right’ resource (paid sales force) to accomplish a different task than that resource’s typically application (customers establishing franchise locations).

Figure 4 - Examples
The next example illustrates bricolage in the absence of effectuation. Baker (2007) uses the narrative of the Toy Store(y) (Allen, 2007) to illustrate how bricolage differs from resource-seeking behavior. In this narrative two would-be entrepreneurs decide to open a toy store near Christmas-time. These entrepreneurs undergo a number of pre-planned activities as well as activities that represent bricolage. The pair plans on filling the store with the latest toy – the Marvel Mustang (MM). They discover, however, that MMs do not fill the shelves and seek cheap inventory to stock the remainder of the shelves. Returning to their banker, the pair seeks additional funds and continue to leverage their existing business’s cash flow in hopes of reaping a substantial return. In so doing, they must also make use of an inexpensive solution that is “on hand” – namely a dealer who sells last year’s toys to them at substantial discount.

While this exemplifies bricolage, the Toy Store(y) clearly violates the principle of affordable loss. The entrepreneurs seek additional financial resources throughout the exploitation focusing on the possible return. Furthermore, the planning efforts of the entrepreneurs represent an attempt to predict the future rather than efforts to control an uncertain one. The formative nature of the effectuation construct requires all principles to be present to truly represent effectuation, and thus the absence of two of these principals suggest that the Toy Store(y) does not represent an example of effectuation.

The next example describes effectuation without the need for bricolage. Sarasvathy (2001) uses a thought experiment of “Curry in a Hurry” to demonstrate several scenarios of how effectual logic could be employed by a hypothetical entrepreneur. This entrepreneur may begin by cooking traditional Indian food for friends
and neighbors and delivering it to their places of business. From here, a number of scenarios are proposed based on the information created from these early actions. The entrepreneur may decide that customers are actually simply interested in her personality more than her food and decide to start a blog and write a book. Alternatively, the customers may instead show interest in Indian culture suggesting the business evolve into a cultural education – “School of Curry.” Enacting her “School of Curry” she may set a level of affordable loss, use her existing funds to purchase the appropriate resources, and form alliances with other cultural schools to enable her to exploit further contingencies should the need arise.

While this entrepreneur exhibits every principle of effectuation, her available capital allows her to purchase the appropriate resources for pursuing the opportunity. She has no need to make do with available resources, since she has sufficient funds. Thus, there is no need for bricolage.

The final example describes a situation where neither effectuation nor bricolage is present. This example comes from Shane (2000) as an example of discovery opportunities. Therics is a company designed to exploit a technology for 3D printing developed at MIT. This company, backed by venture capital investment, has been provided sufficient funds to purchase any resources needed for exploitation. Furthermore, the venture capital investment is predicated on the large expected rate of return as opposed to some measure of affordable loss. Clearly the capital invested removes any need for bricolage and at least one principle of effectuation is violated in that the investment is made based on expected returns rather than affordable loss.
These examples demonstrate the boundaries between bricolage and effectuation while incorporating creation (U-haul) and discovery (Therics) opportunities. The next section describes the directions for future research into these areas.

**Research Implications**

*Effectuation*

Chandler et al (2011) have begun making strides for the study of effectuation. They have developed a survey instrument to distinguish between effectuation and causation decision-making paradigms. To further this effort, measures need to be developed for understanding when these paradigms are appropriate. Specifically, measures of uncertainty need to be refined. Market turbulence has been used in the past as a proxy for uncertainty (Hmielski & Baron, 2008), but a more nuanced measure of uncertainty would inform the research on effectuation.

Given that effectuation is a formative construct (Chandler et al 2011), future research should focus on incorporating all four main principles of effectuation. Prior research can be reexamined to factor in any excluded components. Experiments may be an effective mechanism for testing the decision-making paradigms of entrepreneurs. Conjoint research designs similar to Shepherd and DeTienne (2005) and DeTienne and Chandler (2007) could be used to further examine the nature of effectuation. Is it a learned process of the expert entrepreneur (Sarasvathy, 2001)? Or is it a common decision-making schema that is actuated under uncertainty?
Lastly, given that the four principles of effectuation are formative to the concept, research could be directed to explore what happens in the absence of each of the four principles. For example, if decision-making is consistent with effectual principles in every area except that of affordable loss, what decision-making structure has occurred? A final question that requires further study is whether effectual paradigms are as effective in risky decision-making contexts. Read, Song and Smit (2009) suggest that individual principles of effectuation have positive effects on firm performance regardless of context. Are these findings suggestive of the effectiveness of the principles of effectuation, in and of themselves? In other words, do these findings prescribe that effectuation should be the decision-making paradigm of all entrepreneurs?

**Bricolage**

Turning to bricolage, the implications for research involve studying both entrepreneurial actions and intentions behind resources. Using a free or inexpensive resource does not make one a bricoleur, but employing that resource in a new manner does. Thus, research must distinguish between what the “right” resource for a particular problem may be, and compare the actual resource being used. For the most part, this understanding will come from further qualitative research. However, there are quantitative directions for bricolage research as well. Researchers could use surveys or experiments to compare entrepreneurial perceptions of the “right” resource compared with the resources they could gain access to or chose to gain access to.
Another possible area of research lies in examining areas where bricolage may be more effective than others. There are entrepreneurs nearly bereft of resources and there are those that lack only a few resources. Are there specific areas in which bricolage may be more effective as a tool for overcoming resource scarcity? Are there any areas in which bricolage will simply not work? Lastly, if bricolage is making-do with what’s available, how could it lead to competitive advantage and which environments likely provide the fertile ground for that advantage?

Perhaps the most interesting area for future research lies at the intersection of bricolage and effectuation where creation opportunities are formed. There are both theoretical and practical avenues for research. Theoretically, how do bricolage and effectuation interact? Does one enable the other or is the process inseparable? What, if any, entrepreneurial attributes enable someone to use effectuation and/or bricolage? How does creativity factor in to these two concepts separate and jointly? Since little research has explicitly put these concepts together, the first attempts at understanding this relationship may best be served by qualitative examination.

Creation

Research on creation opportunities requires two streams of inquiry – one temporary and another more prolonged. First, empirical investigation must confirm what has been developed conceptually regarding creation opportunities as they differ from discovery opportunities. Some research has described these opportunities types as cyclical (Zahra, 2008), while others have attempted to reconcile differences (Edelman
and Yli-Renko, 2010). Empirical investigation should clarify first, whether there are distinctive differences in opportunity types and if those differences matter.

To investigate those differences, research should develop measures of the underlying assumptions of creation opportunities to segregate them from discovery. While longitudinal studies of entrepreneurial actions would be the most fruitful, retrospective studies could develop proxies for the assumptions about the entrepreneur, the opportunity and the decision-making context. The entrepreneur in creation opportunities has no predictive differences from the non-entrepreneur, whereas discovery entrepreneurs typically exhibit alertness (Eckhardt and Shane, 2003). Tang, Kacmar, & Busenitz (2011) have developed a survey of entrepreneurial alertness in line with Shane’s (2003) conception of alertness as a combination of expertise and absorptive capacity. Examining whether the opportunity is exogenous or endogenous could incorporate measures for the number of firms pursuing a given opportunity. A creation opportunity would likely be enacted by one firm, while several firms could simultaneously pursue the same discovery opportunity. Timing would be important here as creation opportunities may give rise to future discovery opportunities (Alvarez, Young, and Wooley, working paper). Finally, the decision-making context can be understood in light of accommodations made for uncertainty. Research in strategic management has shown how alliance formation aids in overcoming uncertainty (Dickson and Weaver, 1997) and thus alliances may inform the type of decision-making context of an opportunity.

The second area of research regarding creation opportunities entails examining the implications for exploiting these types of opportunities as they differ from other
opportunity types. Alvarez and Barney (2007) describe seven implications that differ between discovery and creation including human resources, financing, competitive advantage and others. Hmielski and Baron (2008) investigate the effect of regulatory focus on opportunity type. Other implications could prove important as the processes that differ between opportunity types inform both theory and practice. Research could examine the variance in outcomes between the same process in different opportunity types or research could examine two alternative processes in the same opportunity type. For example, how does formal financing (eg. VCs) impact the performance of creation firms as opposed to discovery firms? How does the impact of informal financing (eg. friends, family and fools) differ from that of formal financing in creation firms? Similar questions regarding many entrepreneurial processes could be developed.

Conclusion

This paper has served to define the boundary conditions of bricolage and effectuation and describe their relationship with creation opportunities. The existence of uncertainty and the availability of resources both inform and bound the concepts of effectuation and bricolage. Separating these ideas conceptually is important for future research as they hold promise for a better understanding of entrepreneurial opportunity. If the boundaries of these concepts are not well defined, then eventually they will grow to the point of encompassing all entrepreneurship and cease to have meaning at all. Furthering the study of opportunities depends on an understanding of what is, and what is not, effectuation, bricolage and opportunity creation.
References


