

CHALLENGES TO THEORY DEVELOPMENT IN ENTREPRENEURSHIP RESEARCH*

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ABSTRACT

Why do some new ventures succeed while others fail? What is the essence of entrepreneurship? Who is most likely to become a successful entrepreneur and why? How do entrepreneurs make decisions? What market, regulatory, and organizational environments foster the most successful entrepreneurial activities? Entrepreneurship research is plagued by these and other fundamental unanswered questions, for which there does not exist a cohesive explanatory, predictive, or normative theory. In this article we identify major challenges for entrepreneurship theory development, and offer insights into promising directions for future research. Our conclusion suggests that it may be too ambitious to expect a complete and robust theory due to the interdisciplinary nature of entrepreneurship. However, we show that by integrating perspectives and by applying analytic, empirical and experimental tools from a range of fields, some of the fundamental questions can be answered.

1. INTRODUCTION

Academic research on entrepreneurship has grown dramatically over the past decade, with the recognition of new ventures as major contributors to job creation and economic growth. As the field has developed, research methodology has progressed from empirical surveys of entrepreneurs toward more contextual and process oriented research. This is an important advancement which has moved the field closer to the position of being able to explain behaviour, predict performance, and provide normative advice, rather than merely document the entrepreneurial phenomenon.

Although instructive in providing factual information about entrepreneurship, the received literature fails to offer answers, anchored in theory, to a

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range of core questions. What are the factors (*e.g.* environmental, economic, social, *etc.*) that induce entrepreneurial activity? Who is more likely to become a successful entrepreneur? How and why do entrepreneurs decide to invest their time, talent and treasure (the three Ts of entrepreneurship) in their venture ideas. What market, regulatory, and organizational environments foster more fruitful entrepreneurial activity? More fundamentally, we simply do not know, *ex ante*, why some new ventures succeed while others fail.

The rapidly growing role of merging businesses, coupled with the high failure rate of new ventures, as evidenced by the alarmingly low realized returns on seed financing (Bygrave *et al.*, 1988), calls for scholars to address these and other fundamental questions. In this article we seek to identify and review some of the challenges faced by those who wish to contribute to entrepreneurship theory development.

The study of entrepreneurship spans a wide range of fields including decision sciences, economics, management, sociology and psychology. In this review we focus on challenges to theory development only by drawing on all these fields, yet emphasizing the economic and financial theory perspectives. We also recognize that there are numerous important methodological issues that need to be addressed in the context of empirical and experimental research.

In section 2, we begin the discussion of challenges to theory development by highlighting the any unresolved issues that relate to the role of entrepreneurs and to the concept of entrepreneurship. We proceed, in section 3, by classifying the received theoretical literature into several categories, delineating the purpose and perspective of the theory and highlighting some major unresolved questions in each viewpoint. By integrating these perspectives, sections 4 to 7 address in greater depth selected issues that, in our view, present particular challenges for entrepreneurship theory development.

2. ENTREPRENEURSHIP AND THE ROLE OF ENTREPRENEURS

There is no consensus among researchers as to the exact meaning of entrepreneurship and the role of entrepreneurs. Clearly, there is a need for working definitions of both entrepreneurs and entrepreneurship which distinguish between entrepreneurial activity in different settings and allow measurement and comparison of performance results. Entrepreneurs can be categorized into those who are profit-seeking, either working individually or in a corporate setting, and those who are not profit seeking, working in charitable, government and other not-for-profit organizations (*e.g.* universities).

In a business setting it appears, however, that the process of endowing resources with new wealth-producing capacity (viewed as the act of innovation by Drucker, 1985) is central to any conceptualization of entrepreneurship. Entrepreneurship can therefore be defined as the process of extracting profits from new, unique, and valuable combinations of resources in an uncertain and ambiguous environment. More generally, Low and MacMillan (1988) defined entrepreneurship as 'the creation of new enterprise'.

Entrepreneurs are individuals who innovate, identify and create business opportunities, assemble and co-ordinate new combinations of resources (*i.e.* production functions) so as to extract the most profits from their innovations in an uncertain environment.^[1] Leibenstein (1968) offers a more detailed characterization of the entrepreneur as one who performs one or more of the following: (1) connects different markets (*e.g.* buyers and sellers across geographical regions); (2) answers market deficiencies (gap-filling) by supplying, for instance, private information for which there is no market; (3) creates and is responsible for time-binding implicit or explicit contractual arrangements and input-transforming organizational structures (*e.g.* building an organizational culture of trust); and (4) completes inputs (*i.e.* marshals all resources needed to produce and market a product). The entrepreneur may employ 'some inputs that are somewhat vague in nature (but nevertheless necessary for production) and whose output is indeterminate'. The provision of 'leadership, motivation, and the availability of the entrepreneur to solve potential crisis situations' (Leibenstein, 1968, p. 74) fall in this category of resources. As Schumpeter observed, entrepreneurs are leaders and major contributors to the 'process of creative destruction' (1942, chs VII and XII) which is an essential fact about capitalism. Entrepreneurs perceive profit opportunities (Kirzner, 1985) and initiate actions to fill currently unsatisfied needs or to do more efficiently what is already being done.

Knight (1921) described the entrepreneur as the one who undertakes uncertain investments – those investments for which the future returns and the associated probability distribution are unknown. The entrepreneur is characterized as having an unusually low level of uncertainty aversion. Since the risks associated with entrepreneurial investments cannot be evaluated, they cannot be insured, and therefore the entrepreneur is the one who bears these risks. If the risks associated with the creation of a new enterprise could be evaluated, then markets would be organized for contingent claims on those risks, and the entrepreneur would become the manager (or agent) of the claim holders. Thus, according to Knight, uncertainty aversion, rather than risk aversion, is the major inhibitor of entrepreneurship.

Bewley (1989) is one of the first researchers to formalize Knight's ideas about entrepreneurs. Several interesting insights, reviewed below, emerge from his analysis. While this approach offers an interesting alternative to the expected utility model (Schoemaker, 1982) in attempting to explain rational decision-making on the part of entrepreneurs, the theory needs further development. For example, in addition to entrepreneurs' low uncertainty aversion – the willingness and ability to handle ambiguity – there may be other characteristics of entrepreneurs that are essential to the creation of successful new ventures and these should be encompassed in a theory of entrepreneurship. These characteristics may include creativity, adaptiveness, technical know-how, vision and leadership ability, managerial and organizational skills, ability to make decisions quickly and to act in a rapidly changing and uncertain environment, personal integrity, a range of cognitive decision-making biases, and the entrepreneur's cultural background and education. We simply do not know whether there is an essential set of entrepreneurial characteristics and what that set is.

A further problem is that some of the critical characteristics of entrepreneurs may not be observable *ex ante*, raising a moral hazard issue since *ex post* it may be difficult to distinguish between the effects of bad luck and low entrepreneurial ability. In addition, perceptions about these characteristics of the entrepreneur may differ, raising an adverse selection problem. While the entrepreneur's familiarity with the industry, personal characteristics and track record can provide some insight, these criteria are, at best, partial predictors of the entrepreneur's ability to develop a successful new venture. For example, the entrepreneur^[2] may have (or may think he^[3] has) important private information that is difficult to communicate or assess by others (e.g. venture capitalists). As this private information will not be reflected in the price offered to the entrepreneur, Amit *et al.* (1990a) have shown that low ability entrepreneurs will accept the venture capitalists' price offer while high ability entrepreneurs will shy away from venture capitalist financing.

Another challenge for a theory of entrepreneurship is the power to predict the profiles of individuals who will choose to become entrepreneurs. Kihlstrom and Laffont (1979) attempt to address this issue. In a general equilibrium framework under uncertainty, they focus on risk aversion as the determinant that explains which individuals become entrepreneurs and which work as labourers. They assume that everyone has access to the same risky technology and uses the expected utility maximization criteria to determine whether to operate a risky firm or to work for a riskless wage. By implicitly assuming that all potential entrepreneurs are equally able, they have found that, at equilibrium, the less risk-averse individuals become entrepreneurs, while the more risk-averse choose to become labourers. Kihlstrom and Laffont's classification of an entrepreneur as one who bears risks and makes production decisions is obviously important, yet it is insufficiently exclusive since it would also include a corporate manager who bears risk and whose compensation is at least partially variable.

As not all potential entrepreneurs are equally able, or equally industrious, or face equal opportunity costs, it seems useful to consider other characteristics of entrepreneurs along with the risk – or Knightian uncertainty – bearing aspects of new venture formation in a formal analysis. For example, we do not have models that examine the influence of opportunity costs on the willingness of would-be entrepreneurs to embark on highly uncertain projects. *Ceteris paribus*, it can be conjectured that equally able individuals with low opportunity costs are more likely to accept entrepreneurial projects. (This may perhaps, explain why relatively few MBAs are attracted to starting their careers as entrepreneurs. It means giving up a high salary.)

There remain many unanswered questions about entrepreneurs and their behaviour. While the exploitation of innovation in an uncertain environment is at the core of the entrepreneurship phenomenon, the essential set of entrepreneurial characteristics, if any, needs to be determined by using an integrative perspective on entrepreneurship. For example, we should address such questions as, what do we mean by entrepreneurial ability?; what are the behavioural and personal characteristics of entrepreneurs that are germane to identifying and exploiting profit opportunities? In the section that follows we elaborate on these and related issues.

3. THE ROLE OF AN ENTREPRENEURSHIP THEORY

A theory of entrepreneurship is defined here as a verifiable and logically coherent formulation of relationships; or underlying principles that either explain entrepreneurship, predict entrepreneurial activity (*e.g.* characterize conditions that are likely to lead to new profit opportunities and to the formation of new enterprises), or provide normative guidance (*i.e.* prescribe the right action in particular circumstances).

There is as yet no entrepreneurship theory that meets even some of the criteria for completeness that emerge from recent studies by Bacharach (1989), Weick (1989), and Whetten (1989). These criteria, which can be particularized to matters of entrepreneurship, include answers to several questions. Which factors or issues should be considered in explaining entrepreneurship? Why? What are the underlying assumptions? Do the selected factors allow us to explain or predict the behaviour of entrepreneurs? How are the factors related to each other and to entrepreneurship? Why? Does the theory provide normative guidance for practice? Can the theory be validated or verified through experiments or empirical studies? How accurate is the theory in describing the observed phenomena? How robust is the theory across ranges of specific situations, environments or populations? How accurately will the theory predict the behaviour of entrepreneurs?

Rumelt (1987) lays some foundations for a theory of entrepreneurship. He argues that a good working theory would: (1) explain the conditions under which entrepreneurial talents should be employed; (2) address issues that relate to the supply and demand for entrepreneurs; (3) develop connections to observable and predictable phenomena; (4) deal with the type of resources that need to be associated with a new venture; and (5) be concerned with the structural and contractual arrangements that need to be associated with an entrepreneurial venture. Although Rumelt presents many intuitively appealing ideas about entrepreneurship theory, it seems that there is a lack of an integrative framework for investigating these insights and sorting out the various elements of Rumelt's observations.

Low and MacMillan (1988) provide a rather comprehensive review of recent advances that highlights the interdisciplinary nature of entrepreneurship. Following their general framework, the received body of entrepreneurship theory literature can be classified according to purpose and perspective as follows:

<i>Purpose</i>	<i>Perspectives</i>
1. Explain behaviour	(a) Social/cultural
	(b) Personality based
2. Predict behaviour	(c) Networks
3. Normative	(d) Population ecology
(give advice on what to do)	(e) Economic

Explanatory theory attempts to explain entrepreneurial behaviour and performance; *predictive theory* characterizes conditions that are likely to lead to

new profit opportunities, new venture initiation, and predict the outcome of venturing activity; *normative theory* provides guidance for practice, prescribing the right action in particular circumstances. Each of the theoretical perspectives contains both predictive and explanatory elements. *Social/cultural theory* attempts to link entrepreneurship to the larger social cultural context; *personality based theory* argues that specific psychological characteristics make people predisposed to entrepreneurship; *Network theory* focuses on the social links which facilitate and constrain entrepreneurs; *population ecology theory* identifies environmental factors as the most powerful determinants of entrepreneurial success; *finance theory* focuses on capital markets and examines a range of factors that relate to the supply of capital to new ventures; and *economic theory* centres on equilibrium analysis in the context of the stochastic nature of innovation and new production processes while, for the most part, assuming that the entrepreneur is a completely rational actor. While no single review can attempt to be completely comprehensive, the following discussion is intended to highlight some of the key challenges faced by entrepreneurship theorists.

The tendency of certain cultures to produce entrepreneurs has made it intuitively appealing to view culture as a determinant of entrepreneurship. Social/cultural theories conclude that there must be congruence between ideological constructs and economic behaviour if entrepreneurship is to flourish. Several models of venture initiation have been developed, ranging from models of entrepreneurship as a means by which disadvantaged minorities seek to alter the *status quo* (Greenfield and Strickon, 1981; Hagen, 1960) to models which view the entrepreneur as a decision-maker operating within a specific social and cultural setting (Glade, 1967).

A major study by Hofstede (1980) identified differences in cultural patterns across countries and sought to understand the institutional mechanisms that permit these patterns to remain stable over time. He found statistical evidence for the following four underlying dimensions of culture: (1) the management of inequality between people; (2) individualism; (3) uncertainty avoidance; and (4) the allocation of roles between the sexes. These findings have been reflected in entrepreneurship research. Entrepreneurs have a tolerance for inequality; they will favour individual rather than collective action; they are prepared to take risks; and they tend to have a highly 'masculine' orientation. More recently, Brenner (1987) argued that it is those groups who have lost or face the prospect of losing social status that are motivated to become entrepreneurs. These models have led to the conclusion that in some cases entrepreneurship is a response to lack of social mobility through other channels (Low and MacMillan, 1988). Shapero and Sokol (1982) argue that the entrepreneurial proliferation associated with Silicon Valley and Route 128 demonstrate that not all entrepreneurs come from disadvantaged backgrounds. Their model of social and cultural influences considers the interaction of many situational and cultural factors and provides a dynamic framework of entrepreneurship which helps to establish causal relationships. An experimental study by Shane *et al.* (1991) showed that, of 13 possible factors leading to new venture creation, all but the desire for job freedom are determined by an interaction of gender and nationality.

However, questions remain as to exactly which social factors are those that induce entrepreneurship; how applicable are social theories across ranges of specific situations and populations?; how strongly do cultural influences motivate entrepreneurship relative to other factors?; and how do life changes affect the entrepreneur?

Theories based on the psychological characteristics of entrepreneurs have been developing since 1967, when McClelland published his work on the high need for achievement present in successful entrepreneurs. These theories have been extensively tested through experimental studies. Literature reviews of this large body of work have identified the following four characteristics as key personality traits of entrepreneurs (Brockhaus and Horwitz, 1985):

(1) Need for achievement. An individual with a high need for achievement was characterized by McClelland (1967) as (i) taking responsibility for decisions, (ii) setting goals and accomplishing them through his/her effort, and, (iii) having a desire for feedback. Subsequent experimental studies verified that many successful entrepreneurs have a high need for achievement (Begley and Boyd, 1986; Johnson, 1990; McClelland, 1986). However, this is a characteristic common to many individuals and does not *predict* an entrepreneurial tendency (Sexton and Bowman, 1985).

(2) Internal locus of control. People who perceive that events are contingent upon their own behaviour and consequently believe that they can control events through their own actions have an internal locus of control. This characteristic, introduced by Rotter in 1966, has been attributed to entrepreneurs. However, it is not a trait exclusive to entrepreneurs as it has also been identified in successful managers (Sexton and Bowman, 1985).

(3) High risk-taking propensity. The characteristic of risk taking is often attributed to entrepreneurs but the overall evidence is that entrepreneurs are moderate risk-takers and do not significantly differ from managers in the amount of perceived risk they will bear (Sexton and Bowman, 1985). This contradiction may be explained by viewing entrepreneurs as capable risk managers whose abilities defuse what others might view as high risk situations. If they have a strong belief in their ability to achieve their goals, their perceived possibility of failure will be relatively low and therefore their perceived risk level will be low.

(4) Tolerance for ambiguity. Studies by Schere (1982) and Sexton and Bowman (1985) have indicated that entrepreneurs have a significantly greater capacity to tolerate ambiguity than managers. Other personality characteristics that have been argued to distinguish entrepreneurs from managers are a high need for autonomy, dominance, independence, and a capacity for endurance (Low and MacMillan, 1988; Sexton and Bowman 1985).

Definitional and methodological problems associated with these empirical studies, such as non-comparable samples, bias toward successful entrepreneurs, raise the possibility that observed traits are actually the product of entrepreneurial experience. This makes it difficult to interpret the results

which indicate that there are few psychological characteristics that distinguish the entrepreneur from the manager.

Researchers still do not know what specific characteristics differentiate entrepreneurs from small business owners or managers. Can a standard psychological profile be developed for the entrepreneur? Shaver and Scott (1991) argue that a comprehensive psychological portrait of new venture creation will need to consider general orienting dispositions, motivation and personal motives. Are these personality traits present in entrepreneurs before initiating their ventures or a product of the entrepreneurial experience? Is there as much difference among entrepreneurs as a group as there is among entrepreneurs and non-entrepreneurs? What are the key factors motivating entrepreneurs to start a business? In the domain of social cultural and personality-based theory, the challenge is develop integrative explanatory and predictive theories that will help in answering the above questions.

Theories involving networks view the entrepreneurial process as embedded in a shifting network of continuing social relations that facilitate and constrain links between entrepreneurs, resources and opportunities. Networks have three characteristics: the amount of resources within them, their diversity and their accessibility (Aldrich and Zimmer, 1986).

Theorists measure networks in terms of density, reachability and centrality. Density is defined as the extensiveness of ties between people, measured by comparing the total number of ties to the potential number that would occur if everyone in the network were connected to everyone else. Reachability measures the scope of the network by counting how many intermediaries are contacted to indirectly link the entrepreneur to someone else. Centrality is a measure of how centrally positioned the individual is within the network (Aldrich and Zimmer, 1986).

Networks are made of strong ties (close friends and family) and weak ties (acquaintances). A network of weak ties constitutes a low density network with greater reachability in which the entrepreneur has informal ties to a larger number of people. In contrast, a network of strong ties is small but dense. Successful entrepreneurs are found to have large networks of casual acquaintance who can provide timely and accurate information, provide access to potential customers, and introduce them to potential investors (Aldrich *et al.*, 1987).

Experimental research has examined the effects of density, reachability and centrality on business start-up and success. Findings support a relationship between accessibility of resources and business foundings but do not support network size or diversity of resources as elements which predict business formations (Aldrich and Zimmer, 1986).

Five major roles of networks in the start-up process have been identified. They are: facilitating the transformation of an idea into a realistic plan; increasing aspirations; stimulating ideas; providing practical help; and giving support (Dubini and Aldrich, 1991; Rush, *et al.*, 1987). Entrepreneurs have been found to use the help available within their local networks during the period prior to start-up and approach formal sources when the elements of the firm are set (Birley, 1985).

Ethnic networks supply mutual aid in the form of capital, information,

training, and business opportunities. A history of past dealings becomes the basis for trust and facilitates trade while collective actions provide support for potential entrepreneurs in the form of mutual benefit associations, joint buying arrangements and capital-raising activities (Aldrich and Zimmer, 1986). Network theory implies that the entrepreneurial process can be explained in the context of broad social processes which are more comprehensive and dynamic than simple personality-based theories.

To further develop entrepreneurship theory, it seems important to integrate the network perspective with related perspectives, as networks in and of themselves cannot explain entrepreneurial behaviour or predict performance. Therefore, questions of interest regarding networks include their relationship to profitability and venture initiation, how they affect the entrepreneur's accessibility to key resources and therefore impact business founding rates, whether they are formed deliberately or accidentally, and how they are maintained.

Population ecology is a relatively recent perspective which views the inability of organizations to adapt to change as a dominant organizational characteristic and suggests that organizations which are well adapted to their environments will survive, while those that are not will die (Aldrich, 1990; Hannan and Freeman, 1977). Through this selection mechanism, the environment determines the characteristics of populations of organizations and dictates the ultimate effect on the allocation of entrepreneurial resources (Baumol, 1990).

In applying this theory to entrepreneurship, Greenfield and Strickon (1986) argue that contemporary models in social science research are static and therefore incapable of explaining the dynamism of entrepreneurship. They propose a new paradigm which originates in Darwinian biology and recognizes a diversity of behaviour within which adaptive organizations are selected *for* and inadaptive ones are selected *against*. In this sense, individual environmental selection procedures are the most powerful determinants of success.

Population ecology theory has developed into a framework capable of integrating other theoretical perspectives. Prior to its development, most entrepreneurship research assumed strategic adaptation perspective, believing that success depends solely upon the decisions of individual entrepreneurs. The application of ecological thinking has challenged these assumptions and increased understanding of the entrepreneurial process.

A great challenge of the population ecology perspective is to predict the environmental circumstances that would lead to greater founding and growth of entrepreneurial firms. Further, to what extent is success determined by the environment rather than the skill and ingenuity and decisions of the entrepreneur? As in the case of network theory, these questions may best be addressed through the integration of various perspectives.

Economic theories of entrepreneurship focus on the stochastic nature of innovation and new production processes while, for the most part, assuming that the entrepreneur is a completely rational actor. Entrepreneurship has been largely excluded from modern microeconomic theory because the entrepreneur cannot exist within a framework which assumes perfect informa-

tion and efficient allocation of resources. Recognizing that markets are continually being pushed away from equilibrium by changes in the environment which generate new opportunities, economists identify entrepreneurs as those who bring the world back to equilibrium by reallocating resources to capture rents. The value of entrepreneurship lies in the fact that entrepreneurs correct the waste of resources by recognizing what other people have overlooked in a state of imperfect information and other market imperfections. Economics, specifically modern industrial organization economics, can contribute to entrepreneurship theory building by focusing the analysis on imperfections in markets and examining such broad issues as social welfare implications of entrepreneurship along with such issues as the factors that relate to the supply and demand for entrepreneurs,

Recent application of transaction cost theory to entrepreneurship indicates that transaction costs not only influence the viability of innovative ideas, but also give valuable advice for the organizational design of innovative new firms (Picot *et al.*, 1990).

Important theoretical questions remaining in the area of economic theory include: identification of the issues relating to supply and demand for entrepreneurs; the economic circumstances that would stimulate successful new venture creation and, consequently, economic growth; the social welfare implications of entrepreneurship.

There is no doubt that a theory of entrepreneurship should, indeed, reflect a range of decision theoretic, economic, psychological, sociological and other dimensions. It is unclear, however, what core aspects of entrepreneurship should be reflected in such a theory, and how the various perspectives can be effectively integrated. One of the main challenges we face is that of identifying *ex ante*, those aspects that can explain, *ex post*, most of the variations in the performance of entrepreneurs and their ventures.

In the sections below we address specific issues that cross disciplinary boundaries, that seem to be central to the development of entrepreneurship theory, and that present challenges for theorists and empirical researchers. These core issues include the distinction between risk and uncertainty (section 4); entrepreneurial profits (section 5); financial intermediaries (section 6); and organizational setting (section 7).

4. RISK AND UNCERTAINTY

An unresolved issue in theory development centres on the distinction made by Knight (1921) between risk and uncertainty. Most of the formal studies in financial economics and in behavioural decision sciences adopt alternative constructs of attitudes and behaviour towards risk. Typically, different permutations of the expected utility model (see Schoemaker, 1982 and Machina, 1987, for excellent reviews) are the principal constructs used in the analyses. Yet, as we discuss below, some of the underlying assumptions and results of such analyses may not be applicable to an entrepreneur's setting.

Knight's view is that a gamble is *risky* if the probabilities of outcomes are *known*. The gamble is *uncertain* if the probabilities of outcomes are *unknown*.

Uncertain gambles cannot be insured and the role of the entrepreneur is to initiate uncertain investments. Thus, entrepreneurs are characterized either by low levels of uncertainty aversion (rather than risk) or as having different perceptions about the uncertainty that is associated with a particular investment of their time, talent and treasure. Because neither the probabilities of future events, nor their value are known *ex ante*, the expected outcomes of entrepreneurial investments are difficult to evaluate and therefore difficult or impossible to insure.^[4] The entrepreneur is thus the one who assumes the uninsurable uncertainties.

Several interesting observations emerge from Bewley's (1989) formal analysis of Knight's ideas. First, innovation and the formation of new enterprises are shown to be the domain of individuals with most unusual preferences – very low aversion to uncertainty – who act alone or nearly alone. Further, the lack of co-ordination among entrepreneurs encourages innovation but gives rise to inefficiency. The inefficiency results from diversity of opinions and the failure of forward markets for the outcome of entrepreneurial initiatives. Bewley uses Knightian uncertainty about future spot process and events to explain the absence of forward markets. The collapse of insurance markets is shown even in instances when the difference in opinions is based on the same information. The explanation is based on the existence of transaction costs.

Knightian decision theory represents a major departure from the range of expected utility models used in financial economics (see Machina, 1987 for a recent review). Models which incorporate Knightian preferences (*e.g.* Bewley, 1989) yield results that are quite different from the ones obtained in models with risk-averse, utility-maximizing decision-makers with rational expectations. It seems that certain assumptions made in such models are intuitively appealing and applicable to the setting in which entrepreneurs act. These assumptions may include the elimination of the Bayesian axiom that preferences over lotteries are complete, adding the so-called inertia assumption which states that the *status quo* (*i.e.* the planned behaviour), is abandoned only when a preferred new alternative becomes available. There is, however, little in the way of experimental or empirical data that would allow us to validate the assumptions that underlie Knightian decision theory, and conclude that it is a model that is appropriate for the phenomena we wish to explain.

Why does the uncertainty construct (rather than risk) appear to apply so well to a theory of entrepreneurship? Because innovation lies at the core of an entrepreneurial activity, and whatever form it takes (*e.g.* product or cost-reducing process innovation), an undetermined amount of new tangible and intangible (or invisible) capital with uncertain return is created. This *ex ante* uncertainty, which may not be insurable and would, therefore, be borne by the entrepreneur, has three main sources. First, there is *technical uncertainty*, that is, the production and cost functions may be unknown. This raises such questions as, for example, what type and how many resources would be needed, and in what combinations? How long will it take to develop and introduce the innovation to the market? Will it work? What will it cost to produce it? Second, *demand uncertainty* relates to such questions as how many customers may demand the innovation? At what price? What will be the

diffusion rate? The third source of uncertainty is the *pace at which imitation and competing innovations* will erode the extraordinary profit that may be inherent in the innovation. If the imitation is instantaneous, then no surplus entrepreneurial profits will result.

To the extent that the behavioural assumptions (*i.e.* the preference structure) can be validated, modelling entrepreneurial decision-making by adopting Knightian decision theory is a promising, yet unexplained avenue for future research. Such models may help us to interpret ostensibly irrational entrepreneurial behaviour and predict the likely actions of entrepreneurs.

5. RENTS AND ENTREPRENEURIAL ACTIVITY

Another theoretical and empirical question relates to the existence of entrepreneurial profits. Are there abnormal returns to entrepreneurs? Are the rewards of the successful entrepreneur distinct from what we commonly refer to as 'monopoly rents'? Why and how are such rents created? While there are a range of prevailing economic rent concepts,^[5] there is no clear agreement about what constitutes entrepreneurial rents and how to measure them.

If the principals underlying Knight's view are adopted, then entrepreneurial rent is the return to the entrepreneur for bearing the *ex ante* uncertainty. This notion seems to resemble the concept of risk premium established by the Capital Asset Pricing Model (CAPM). Yet, these concepts are fundamentally different from each other because, in the case of an entrepreneurial venture, we are concerned with securities that are not publicly traded with no market-like benchmark return. Further, the payoff is unknown *ex ante*, as is its distribution.

Rumelt defined entrepreneurial rents as 'the difference between a venture's *ex post* value (or payment stream) and the *ex ante* cost (or value) of the resources combined to form the venture' (1987, p. 143). Economic theory suggests that in an expectational equilibrium, all rents will be competed away so that expected entrepreneurial rents are zero. If there are no extraordinary profits expected, what incentives do entrepreneurs have to assume the uncertainty associated with the creation of new ventures? It appears that either one must assume that markets are out of equilibrium, or – if it exists – a difference between *ex ante* costs and *ex post* value must be due to uncertainty or some form of market failure that restricts competition.

One explanation of how uncertainty can lead to abnormal rents in equilibria is offered by Lippman and Rumelt (1982). They showed that 'causal ambiguity', (namely, irreducible *ex ante* uncertainty with regard to the relationships between resources and *ex post* value) can lead to the creation of rents in a free-entry equilibrium. Another interesting explanation for the persistence of rents relates to imperfections in resource markets and the profits that emerge from being first. A major challenge to the entrepreneur, and a potentially ongoing source of entrepreneurial rents, is to create impediments to imitation (Rumelt, 1987). By preserving private information; by developing a bundle of firm-specific assets that are rare, durable, not easily transferred, and valued by customers; and, by selecting an appropriate entry

mode, extraordinarily high profits may be captured. Note that since this form of rent resembles monopoly profits, the successful entrepreneur may thus be rewarded by both entrepreneurial and monopoly rents.

Therefore, what are the components of entrepreneurial rents? How do they emerge from the *ex ante* uncertainty associated with the productivity of the newly created capital or from imperfections in either the resource or product markets? What actions can be taken by the entrepreneur to enhance the rents that may be inherent in the innovation? If the rents are indeed due to the underlying uncertainty, it may be wise not to reduce the uncertainty since it will make imitation easier for present competitors or new entrants and thereby reduce the entrepreneur's ability to appropriate rents.

6. FINANCIAL INTERMEDIARIES

We typically think of the entrepreneurial phase of a firm as that period between idea generation and the point at which the firm becomes a corporation with traded securities. After the latter point, the financial decisions of the firm fall under the purview of corporate finance. Prior to and including the initial public offering (IPO), outside investors would typically be involved in the enterprise, and hence the role of providers of equity capital for start-ups is relevant to the study of entrepreneurship.

A substantial literature which investigates IPOs has developed, and most of it concerns the asymmetry of information between the entrepreneur and the market that buys the newly issued equity. In fact, the first capital structure signalling paper (Leland and Pyle, 1977), might be considered an IPO paper. In that model, the percentage of equity retained by the entrepreneur serves as a signal of future earnings potential. The signal is effective because maintaining a sizeable interest in the firm is costly to a risk averse entrepreneur unless his information suggests that the future looks encouraging.

Subsequent investigations of IPOs have concerned themselves with the observed underpricing of new issues (see Chammanur, 1989 for a summary). A conclusion of the empirical investigations of IPOs is that going public involves non-trivial costs. In fact, the evidence suggests that the underpricing of new issues is in the order of 15 per cent (see Smith, 1989 for a summary of the evidence). In order for an entrepreneur to go public, then, there must be large benefits to justify this dilution of ownership. But, this suggests that the timing of going public requires a trade-off between various costs and benefits. The theoretical models suggest that, for the most part, the relevant costs are those due to an asymmetry of information between the entrepreneur and the market; the relevant benefits may be related to the need for capital and the risk aversion of the entrepreneur. A potentially fruitful area of research would be the determination of the appropriate timing for public offering. This would increase understanding of the process of evolution of the entrepreneurial firm and might provide suggestions for reducing the costs of going public.

Prior to the IPO, an entrepreneur may involve venture capitalists as

outside investors. Analysis of the relationship between the entrepreneur and the venture capitalist is in its infancy, but the venture capitalist is a financial intermediary. For the most part, the financial intermediary literature has focused on banks and insurance companies. Just as an insurance company must be concerned with the fact that the probability of default is in part under the control of the borrower, so too, must the venture capitalist be concerned with the fact that the success of an entrepreneurial endeavour is in part a function of the effort and decisions made (time and talent invested) by the entrepreneur. This is commonly referred to as the moral hazard problem. Similarly, an insurance company, a bank, and a venture capitalist may all be dealing with clients who have more information about the profitability of the deal than they do. This is commonly referred to as the adverse selection problem.

In the context of banking, these two issues have been looked at by Chan and Thakor (1987). In their study, collateral plays a key role in the contract between borrower and lender, and they derive predictions about who will borrow and how much collateral will be pledged. Interestingly, the nature of competition between banks plays an important role in determining the predicted equilibrium.

While the banking and insurance literature provides some insight into the nature of the entrepreneur-venture capitalist relationship, certain features of that relationship may demand more specific analyses. For example, it is hard to see a role for collateral in the relationship since the entrepreneurial value comes not from concrete assets but from the entrepreneurial vision. On the other hand, the contract between the venture capitalist and the entrepreneur can be more complicated than a loan contract. This is the point of view taken by Chan *et al.* (1990) and Hirao (1991) in considering environments characterized by moral hazard.

A crucial difference between a venture capitalist and a bank or insurance company is that it is common for a venture capitalist to supply capital, as well as substantial managerial expertise and reputation. This complicates the nature of the relationship since there does not appear to be a way for the venture capitalist to commit contractually to any particular level of consultation. Furthermore, venture capitalists may differ in their ability to provide help for any given entrepreneurial venture, and it may be difficult for the entrepreneur to assess *ex ante* the contributions of the venture capitalist. Investigation of the venture capitalist's role as both a consultant and financial intermediary may provide further insight into the nature and the mutual profitability of the entrepreneur-venture capitalist contract.

Recent studies by Amit *et al.* (1990a, b) provide new insights into the relationships between entrepreneurs and venture capitalists. They establish that the risk sharing that a venture capitalist provides is very valuable to an entrepreneur in the sense that if there is no asymmetry of information, an entrepreneur will always choose to involve a venture capitalist, despite the moral hazard created by the contract. On the other hand, if there is sufficient private information, then the entrepreneurs with the highest abilities will choose not to involve a venture capitalist. The venture capitalist's difficulty in assessing an entrepreneur's ability to develop a successful venture is the

driving force in the attempt by Amit *et al.* to explain what type of entrepreneur will chose to involve a venture capitalist in the seed stage. Their studies suggest that venture capital seed investments do not appear to foster the most promising entrepreneurial firms because the prices offered by venture capitalists will not be sufficiently attractive for the most able entrepreneurs. Thus, higher failure rates can be expected among venture capitalist backed firms than in the population of new firms in general. In a subsequent study Amit *et al.* (1992) develop a revelation game and establish that more able entrepreneurs will be backed and that there will be more entrepreneurial activity when (1) the venture capitalist rather than the entrepreneur initiates the venture activity, and (2) the costs associated with venture capital financing are reduced through the creation of more efficient mechanisms for matching entrepreneurs with venture capitalists. Further, the analysis of the model also reveals that the lower the opportunity cost of the entrepreneurs, the more likely they are to undertake entrepreneurial activity.

Chamley's (1983) analysis of limited liability as a signal of entrepreneurs' unobservable characteristics is another formalization of the relationships between venture capitalists and entrepreneurs with varying abilities in the presence of adverse selection due to private information. He shows that the choice of the form of liability can serve as a self-selection mechanism to distinguish between various types of entrepreneurs. He finds that when factor prices are exogenous, the institution of limited liability is a Pareto improvement over a regime where there is only unlimited liability.

In summary, this section examined the role of financial intermediaries as an important issue that is not well understood in entrepreneurship research. We face several challenging theory development questions. How to price venture capital investments in emerging enterprises? What are the bases for venture capital investments? How does the nature of competition among venture capitalists affect the nature of the contracts they sign? To what extent is the financial intermediary role of the venture capitalist important to the venture's success? That is, if there are no consulting services, will an entrepreneur approach a venture capitalist before going public? What role does the venture capitalist perform in the IPO? (Studies suggest they do not have a measurable effect on IPO underpricing.) How does the structure of the venture capital industry affect the outcome of entrepreneurial activity? What are the contracting, learning and signalling issues in venture capital financing?

7. THE ORGANIZATIONAL CONTEXT OF ENTREPRENEURIAL ACTIVITY

In studying entrepreneurship one must consider the organizational setting in which it occurs. While the organization behaviour literature about the difficulties of implementing organizational change and about the impediments of bureaucracy in organizations is vast, inadequate theoretical attention has been paid to issues associated with the development of entrepreneurial ventures in a corporate environment. For example, when the stockholders of a corporation have different risk preferences, then whose risk preference is

dominant essentially determines whether the risky venture should be pursued. Stockholder unanimity issues are addressed by Satterthwaite (1981), who observes that stockholder unanimity about the desirability of a new corporate venture is unlikely to exist for projects that expand the payoff space, but not the set of securities associated with that space. The implication of such a venture is that the new payoff space is not spanned by existing securities. New ventures, therefore, are more likely to achieve a unanimous stockholder approval when a new security is issued for the entrepreneurial activity as a means of ensuring coverage of the payoff space.

In addition, issues such as corporate fit (*e.g.* cannibalization of existing businesses, the extent to which resources may be shared and skills may be transferred to the venture, implications for corporate reputation in case of failure) and managerial challenge (*e.g.* organizational structure, culture, managing results) must be addressed in the context of a corporate new venture. Some of the obstacles that firms have experienced in developing corporate ventures are examined by MacMillan *et al.* (1984), while Sathe (1985) provides examples of corporations that managed to overcome some of the organizational barriers to corporate venturing activity. The generalizable principles that emerge from these empirical observations remain unclear.

Thus, a wide range of unanswered questions about the organizational setting that would foster entrepreneurial activity remain. Can entrepreneurship succeed in a corporate setting? Can organizational barriers be overcome? Is there a fundamental reason why 'entrepreneurship by committee' cannot succeed?

Further, a formal model may be necessary to analyse the range of trade-offs that are involved. Bewley's (1989) relatively simple analysis of Knightian decision theory points to the problems of attempting to foster entrepreneurship in a corporate setting. If we assume that uncertainty and aversion to uncertainty make innovation difficult, then a single entrepreneur in an independent setting with low aversion to uncertainty is more likely to initiate new enterprises than entrepreneurs in corporate settings. The latter would tend to hinder each other's initiative since they must overcome each other's aversions to uncertainty. Moreover, their opinions would have to be nearly consensual because diversity of opinions among corporate entrepreneurs might lead to a collective aversion to uncertainty. Another insight that emerges from Bewley's work is that more innovation is likely to occur if the decisions to innovate are dispersed among many individuals. This implies that corporations should not centralize the innovation function in the hands of a few decision-makers because they will be overly conservative and prevent initiatives that might lead to successful ventures. Unfortunately, there is little empirical or experimental support for this hypothesis.

8. SUMMARY

The above review of selected issues and problems in entrepreneurship research is by no means exhaustive. It does, however, highlight the enormous challenge of developing entrepreneurship theory. Although we have focused

primarily on economic issues (perhaps because of our own decision biases and orientations), we have attempted to reveal the broad interdisciplinary and complex nature of entrepreneurship. It may, in fact, be somewhat too ambitious to expect a complete theory of entrepreneurship. Yet, it seems within reach to address analytically, empirically, and experimentally, some of the specific questions that were raised in the preceding sections, emphasizing that the entrepreneurship process centres on the activities and behaviour of individuals with unique characteristics. It is our conjecture that the work that will overcome the complexities and make the major contributions to entrepreneurship research will be the studies that use new interdisciplinary approaches to modelling. These approaches will incorporate essential aspects drawn from multiple viewpoints and shed new light on the type of issues outlined in this article.

NOTES

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- [1] This definition is of limited scope, assuming the entrepreneur is profit driven. Many other factors may motivate entrepreneurial activity, as is discussed below.
- [2] Though expressed here in the singular, the term may also be interpreted as reference to a team of entrepreneurs.
- [3] To avoid awkward phrases throughout the paper, the masculine pronoun is used to represent either gender.
- [4] Clearly, adverse selection that may emerge from private information, and moral hazard will lead to failures in insurance market. Note that Knight's claim relates to uncertainty as a possible factor that can explain failures in insurance markets.
- [5] Economists commonly distinguish among three concepts of rent: Ricardian rents are extraordinary profits earned by the more efficient firm's superior productivity of resources under the condition of fixed and scarce production factors. Second, Pareto rents emerge from the difference between the payments to a resource in its best use and its next best use; the Pareto rent is thus the payment to a resource that is above and beyond the amount required to call it into use. The third rent concept is monopoly profits which are derived from the exploitation by colluding firms of their size and concentration and the consequent barriers to entry by others.

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