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Failure to advance: resource logic for early venture failure

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New ventures play an important role in economic growth. The resource logic underlying how these firms develop in the early stages, however, has not received adequate attention in the literature. This paper examines the launch trajectories of embryonic ventures. We propose a configurational model of these trajectories based on the resources and stages required to establish a viable commercial entity. Potential launching paths are identified, from the inception of a new product/service idea through to success outcomes, including rapid, independent sales growth, stabilized profit, acquisition or Initial Public Offering. We argue that embryonic firms must balance the development of product, financial and human resources through waves of resource accumulation as they move through different stages of development. We summarize our arguments in a model of venture evolution.

Introduction

The importance of new ventures has been widely recognized because of their role in economic growth (Acs and Audretsch, 2003). Much work has been done to build models of new venture growth (see, for example, Roper, 1999; Wiklund *et al.*, 2009). However, these studies overwhelmingly focus on firms that are successful in attaining their growth objectives, and overlook understanding new firm failure. This paper examines the launch trajectories of embryonic ventures. We propose a configurational model of these trajectories based on the resources and processes required to establish a viable commercial entity that highlights a stage-gate type evolution (Cooper, 1983, 1990). Potential launching paths are identified, from the inception of a new product/service idea through to success outcomes, including rapid, independent sales growth, stabilized profit, acquisition or IPO (Initial Public Offering).

Previous research (e.g. Cooper *et al.*, 1988; see also Baum *et al.*, 2001) has enhanced our understanding of the factors associated with new venture performance. This research has focused on outcomes, such as survival and growth of firms younger than seven years (e.g. Lyles *et al.*, 2004). Few attempts have been made, however, to recognize discrete episodes of development between idea formation and the seven-year time horizon, and to relate success factors to the specific stage of development that a new venture is going through while highlighting the issues that result in failure. We argue that different resources and processes may affect a firm's ability to complete one stage of development successfully and move on to the next, with important implica-

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tions for the venture's long-term growth trajectory as well. Indeed, the definition of performance itself may vary in each of these stages of growth. Further, we explore how bundles of resources are incorporated into the emergent venture in waves that allow for further development, but limit flexibility and contribute to path dependence (Gersick, 1991).

Our paper thus focuses on a process model of firm growth *from inception of the idea through the establishment of the viable enterprise and early growth*. This period of venture evolution is sometimes referred to as the emergent phase and is underdeveloped in the entrepreneurship literature (Gartner and Carter, 2003). We suggest that launching trajectories can be divided into stages as new ventures bring together the critical components of ideas, people and funding. This results in a model that is configurational in nature and that simultaneously highlights the importance of multiple drivers of success (or failure) as well as temporality and sequencing of events. It is important to note, though, that this progression is neither inevitable nor experienced equally by all firms in terms of timing or sequence.

Part of our thesis is that firms progress through these development stages through co-evolution of the human, financial and product components. Furthermore, different skills and combinations of tangible and intangible resources affect this progression. The individual founder may have a good idea and a credit card or second mortgage to fund early iterations of the venture; a founding team with a more fully-developed plan and seed funding may require a different combination of assets. Our model of launching trajectories highlights when and how these critical components progress into a new stage for the venture, as shown in Figure 1 below. We develop our model from the extant theory and empirical literature on organizational development, as well as interaction with and observation of dozens of entrepreneurs and ventures in this period of their evolution. This effort was not intended to yield inductive theory based on

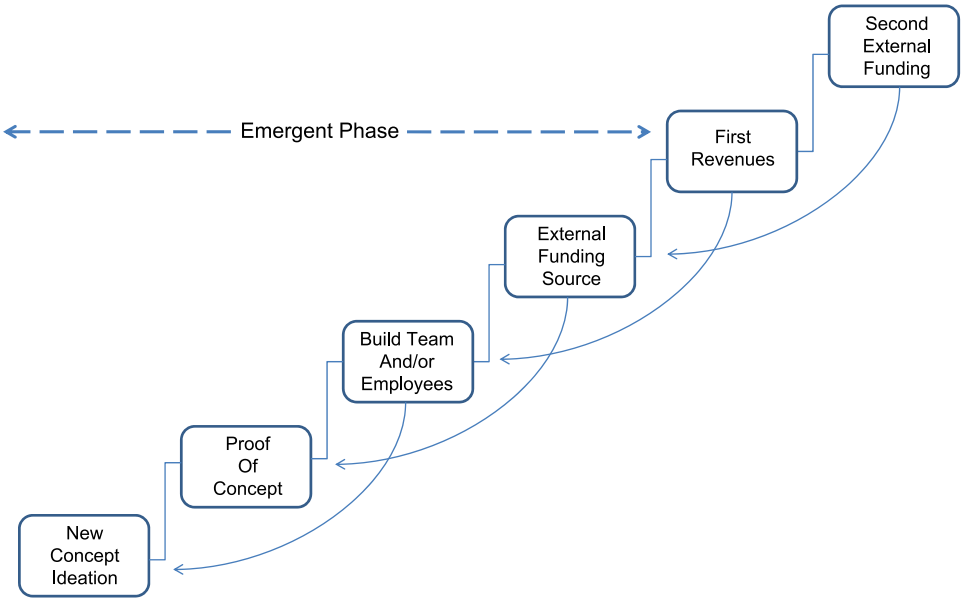

Figure 1. A configurational stage-gate model of embryonic firm development

systematic investigation, but to serve as a basis for illustrations and examples for deductive reasoning.

We should also note in advance that several research initiatives (e.g. PSED, GEM and the Kaufman Family Survey) have examined factors that lead nascent entrepreneurs to take their ideas and actually start new businesses. These studies tend to focus on individual factors (such as ethnicity, education and income), regional location and access to capital as enhancers of firm birth (Reynolds *et al.*, 2002; Robb *et al*., 2009). However, these studies shed little light on the process by which new firm founders configure resources to evolve their embryonic ventures into a more mature state. Thus, our focus is at the firm level following idea generation and the intent to form a venture, and complements such research.

In a review of the firm growth literature, Wiklund (1998) categorizes studies according to their underlying theoretical assumptions and units of analysis (Davidsson and Wiklund, 2000). One of these groupings is identified as the *resource-based perspective* where the unit of analysis is the business activity or related set of business activities rather than the entrepreneur. The second of these groupings is labelled the *strategic adaptation perspective* that focuses on governance and ownership as the main unit of analysis and is based upon theories of agency and transaction costs. This perspective downplays the importance of individuals. However, the *motivation perspective*, with its grounding in psychological studies, uses the individual as the unit of analysis to discover what business activities expand or do not as a result of the entrepreneur's orientation and motivation. These motivations may also affect the choice of governance structures. Davidsson and Wiklund (2000) classify these three perspectives as seeking factors that can explain the growth of firms. In other words, they search for antecedents of growth which is analysed as a dependent variable. Our model attempts to incorporate variables from each of these perspectives.

In contrast to these factor studies, the *configuration perspective* deals with the process of growth itself and the organizational changes that occur as a consequence. Managerial problems will appear and structures must be put in place to address these problems. We believe that the value of our configurational model is not so much in describing how new ventures mature in general. Rather, we have developed this model from recognizing what leads to the failure of embryonic firms. New firm survival rates are acknowledged as being fairly low, with as few as 22% of new firms surviving for 10 years (Audretsch and Mahmood, 1994, 1995). Given these low survival rates, researchers have examined a variety of variables that are related to new-firm survival [see Dencker *et al.* (2009) for a more recent review of this literature], including individual factors such as prior knowledge, regional economics and demographics (education of the local workforce and so on). What is missing is how these factors are configured to allow embryonic firms to evolve or cease.

Likewise, research initiatives such as the PSED and GEM have examined what personal factors lead nascent entrepreneurs to move their potential ventures from gestation to birth. The transition from birth to maturity is still relatively unexplored. We believe that the value of our model is in breaking down birth to growth into stages that better explain why failure occurs. Finally, we do not suggest that all embryonic ventures must move through all of these stages in a linear fashion. Instead, we suggest that embryonic growth tends to be revolutionary whereby firms jump forwards and backward through these stages based on their ability to configure three different sets of internal resources.

Scope: embryonic ventures

Before discussing the theoretical background for the model, a prefatory note is in order regarding embryonic ventures as the focus of our paper. We are addressing here the *de novo* independent venture; corporate ventures such as spin-offs may have some similar resource and evolutionary challenges, but face a different set of circumstances we do not address. Similarly, our model primarily applies to and is developed from research on and discussions with founders that aspire to grow their ventures rapidly; thus, 'lifestyle' ventures are not the focus of our development.

An important element of our model is that these embryonic ventures develop through an evolutionary process via the co-evolution of the human, financial and product dimensions. Furthermore, different skills and combinations of tangible and intangible resources affect this progression. The individual founder may have a good idea and a credit card or second mortgage to fund early iterations of the venture: a founding team with a more fully developed plan and seed funding may require a different combination of assets to secure their first customer. For most of these emerging ventures, the evolutionary process has three components that need to grow simultaneously: the people involved, the product/service idea itself and the money required to launch. The initial idea of one individual with limited associated funds typically progresses to a founding team and more developed product or service concept and early stage or seed funding to move to launch. Finally, a business model or even fully articulated business plan and venture funding typically are required to launch the product as a company with employees and legal status. These concentric rings of growth are captured in Figure 2.

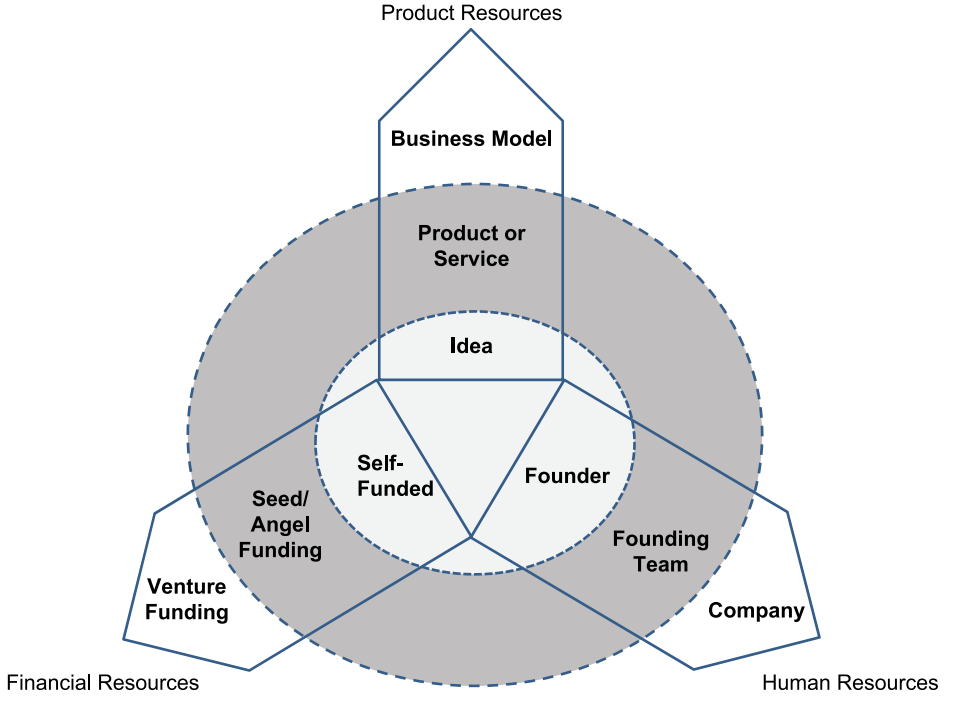

Figure 2. Evolving resources through embryonic firm development

Stylized exemplars

Before delving into the theoretical background, we set up three exemplars that represent different aspects of the evolution of the embryonic venture. The three prototypes are based on real ventures. The names and specifics of the situation have been slightly changed to protect the identity of the ventures and founders.

Exemplar 1: Aptus

The core idea for Aptus was developed by a consultant in the outplacement service industry. He identified an opportunity created by the convergence of broadband Internet access and digital video capture, combined with high recruitment costs and inefficiencies in the typical face-to-face interview process. He collaborated with an IT (information technology) professional with entrepreneurial experience to develop the idea further. They brought an accountant and business consultant with experience in business development and strategic alliance formation to the founding team. Over two years the team invested $50,000 of their own money, undertook significant market research, developed a business plan and built a prototype kiosk as the key node in capturing digital video of job candidates. The embryonic company would deploy a network of kiosks for video capture and incorporation of personal video into an electronic portfolio – think of Monster.com with more features. The kiosks would initially be deployed regionally on a test market basis in partnership with a national copying and business service company.

Before deployment, the chain involved in the partnership was acquired and all business development activities put on hold. Without a launch site and partner, Aptus needed either a new partner or money to develop the concept. While several potential angel investors liked the prototype and concept, none was willing to invest until 'proof of concept' had been established by a sale to an actual customer (a company that would incorporate the electronic portfolio into its recruiting process). The IT member and the original founder were unwilling to deploy a small number of kiosks on a test basis without further software development and a more robust system, which would require about $100,000 and three–six months of work. In the absence of a customer, sales experience from any team member and through lack of funds, Aptus was put permanently on the back burner about four years after idea conception.

Exemplar 2: Buzzsaw

Buzzsaw was the brainchild of an IT guru with significant Internet experience. He joined up with a consumer electronics product development engineer to develop a programme to monitor Web chatter, including blogs and other Internet resources to provide a sort of electronic clipping service for clients. From a modest original service of such electronic clippings, the team envisioned developing significant intellectual property around Internet data collection, interpretation and display to help clients interpret how 'buzz' and Internet chatter could be interpreted to predict changes in market position, reactions to advertising campaigns, product defects and other reputation enhancing or damaging events. The two co-founders sought significant outside guidance and feedback in the development of their plan. An information-based consulting service was discontinued based on advisor feedback that it distracted the founders and their clients from understanding the long-term focus of the embryonic venture.

Over two years and after multiple iterations, the prototype service was launched with eight test clients (non-paying). Based on their feedback and positive reaction, the venture landed US$300,000 in angel funding and an additional US$200,000 in state SBIR-type grants. The influx of money is allowing the venture to expand its services considerably, develop new IP and hire additional resources for product development and sales. While the company has certainly not reached high growth or gazelle status, it is well on its way to having paying customers, enhanced product offerings and full-time employees. At the time of writing, the venture has received an additional US$500,000 in grant funding for development and commercialization.

Exemplar 3: Cadence

Cadence was founded by a health care service provider with software experience in response to a specific hospital customer request. Specifically, the hospital wanted a better system for managing and monitoring the doctors' appointments and calendars. While outside his typical job responsibilities, the founder decided to engineer a PDA (personal digital assistant) solution, coupling the device with new software to have a custom solution to the hospital's request. He teamed up with a software developer as co-founder and Cadence was launched.

After six months of debugging and development, Cadence was able to provide the hospital with a functional solution. The founder quickly became intrigued with the idea of marketing the system to more hospitals and in more health care settings. While he had a product and a paying client, he had never investigated the competition, researched the market, consulted with outside advisors, or developed a business plan. He is currently in the process of determining if he can adapt the developed system to a wider audience, continue to develop custom solutions for each client, or start from scratch with a different device/software configuration that will better serve a broader market.

These three vignettes emphasize the movement through the circles of venture development illustrated in Figure 2. They identify several key themes that we will explore in the rest of the paper, namely: new ventures move through different stages of idea development, funding and business development; these stages take place in different combinations of these factors for different firms; and some ventures pass successfully through these stages while others fail, or fall off the path to launch and growth. The emphasis of our analysis is which resources are critical at the different stages of the concentric rings of growth. The following literature review provides a backdrop for a theoretical model which attempts to explain this.

Theoretical background

Our model of firm growth builds on several established theoretical streams of literature, as well as empirical findings regarding new venture growth and performance. To start, we recognize a staged approach to new venture growth whereby there are revolutionary episodes of resource accumulation followed by longer periods of evolutionary 'digestion'. We recognize that the periods of relative stability do not necessarily translate to 'equilibrium' for the evolving venture, but the underlying theory of a step-function to evolution is consistent with the punctuated equilibrium model. We also explore how the resource-based view relates to embryonic ventures. Finally, we introduce actor–network theory to understand better the means founders employ to collect and configure

resources, yet how those configurations can then constrain venture flexibility. Each of these streams is briefly summarized below.

The revolutionary/evolutionary view of growth

As opposed to a Darwinian model of evolution whereby organisms evolve through a slow gradual process, models of punctuated equilibrium propose that change occurs in revolutionary and often violent ways (Gersick, 1991). These changes cause significant upheaval, but are then followed by periods of relative stability. Gersick notes that punctuated equilibrium or its equivalent is becoming a more common perspective for understanding change in individuals, groups, organizations and institutions, as well as physical sciences and biological evolution.

Of course, the embryonic firms we are describing here have yet to (and may never) move into a state of equilibrium. Rather, we are suggesting that resources are typically accumulated in waves – e.g. gaining customers attracts funding and funding attracts new employees. But then, these resources have to be utilized in order to continue the venture's evolution. These waves of resource accumulation lead new ventures to describe their plight as 'feast or famine'.

Our stage-gate configurational model of growth should enhance our ability to understand what trigger points lead to revolutionary change, how these embryonic firms manage through this change, and what factors affect length of time in relative upheaval versus stability. As the Buzzsaw example above suggests, evolving ventures progress through periods of idea development with relatively limited financial resources and a small founding team, to sudden influxes of capital which trigger changes in staffing and rapid progression of the business model. While some models of organizational change and development do acknowledge these issues (Greiner, 1972; Tushman and Romanelli, 1985; Gerisck, 1994), punctuated equilibrium is relatively undeveloped in the literature. We therefore believe that this theoretical framework has much to offer our exploration of new venture evolution.

Resource-based view of the firm

The resource-based view of the firm has a rich history and associated stream of research (Penrose, 1960; Barney, 1986). Fundamentally, this field of theory suggests that the main reasons for growth and competitive advantage can be attributed to the set of factors or resources that exist within the firm (Penrose, 1960; Foss, 1997; Barney *et al.*, 2001). The resource-based view's relationship with the literatures of both strategic management and entrepreneurship is well known (Alvarez and Busenitz, 2001; Barney *et al.*, 2001). However, few authors consider how new resources are created and combined with other resources to form the capabilities that will create economic value for the new venture (Foss, 1997; Bromiley and Flemming, 2002).

One key point of difference in our approach to this process model of new firm growth is that we start with the premise that resources must be created by entrepreneurs. Garnsey *et al.* (2006) argue that even pre-venture activities (such as opportunity identification) require activity and therefore some kind of resource base. We argue that a resource-based view that does not account for the reconfiguring and creation of new resources is ultimately incompatible with a process theory that endeavours to explain the longitudinal patterns of success and failure in new ventures. As Garnsey

et al. state (2006), continuous learning means that the resource base is altered over time – underutilized resources are deleted, but it is also likely that learning and knowledge acquisition will increase the importance of intangible resources. To overcome these problems, we return to some of Penrose's original ideas on the dynamics of resources, and the formation of organizational components, that have largely been lost in the development of resource-based theory (Garnsey, 1995, 2002; Ahuja and Katila, 2004; Baker and Nelson, 2005; Steen and Liesch, 2007).

Actor–network theory

One set of literature that can be used to conceptualize the strengthening of connections needed to create resources, and the relationship between resources and agents, is the part of science and technology studies (STS) known as actor–network theory (Law, 1992; Latour, 2005). While this is a complex area of theory, we take two ideas that are compatible with our evolutionary approach to new ventures. The first of these is that entrepreneurs as agents are simultaneously networks (Steen *et al.*, 2006). For example, if an entrepreneur is able to present a compelling business case to an investment bank, it is because they are able to mobilize other documents (such as IP rights), devices (e.g. new technology) and people (e.g. supporting business experts) into a stabilized network. This is important for understanding how the network behind the changing resource base will also affect the opportunity set of the new venture.

The other key idea is that connections between components that make resources can be strengthened to be made more durable, but also less reversible. An example of this is how an entrepreneur's idea to apply technology to an industry problem gets solidified into a network of business plans, partners and financial contracts, which may then get further solidified into 'hardwired' resources of plant, product design and legal obligations to shareholders. Resource creation is therefore about the strengthening and lengthening of associations so that they can be held in place and counted as economically valuable resources (Law, 1992; Steen *et al.*, 2006). However, this process also enables and limits further opportunities.

New venture performance

The extant research on new venture performance incorporates a variety of models and a wealth of empirical evidence. A key research issue in entrepreneurship is to explain the performance differences between firms as well as what new ventures do in an attempt to improve performance (Kuratko *et al.*, 2001). The word 'performance' is used widely across management disciplines, yet the meaning is seldom defined and varies widely. Performance has been understood to mean effectiveness and efficiency, lean production competitiveness, cost reduction, value creation, growth, survival and job creation (Lebas and Euske, 2002). Lebas and Euske discuss various definitions of performance and then define it as 'the sum of all processes that will lead managers to taking appropriate actions in the present that will create a performing [firm] in the future'; in other words, 'doing today what will lead to measured value outcome tomorrow' (2002, p. 68).

As we suggested earlier, the definition of new venture performance may differ during the different stages of growth. Whereas entrepreneurial success in existing firms is generally measured against profit, market share, employee numbers or growth in these measures, embryonic firms often do not have sales income and use other

measures of success. These can vary from proving a concept, getting positive results on market research, attracting angel or venture capital, finding alliance partners, entering into sales agreements and making a first sale.

Theoretical model

Baker and Nelson (2005), in a rare longitudinal study comparing the growth of numerous new ventures, draw upon theories of problem solving and taking advantage of transient opportunity to discuss new venture growth. They use the term '*bricolage*' (French for 'tinkering') to capture the way that entrepreneurs creatively use the resources at hand to achieve growth. While this *bricolage* process accounts well for the non-linear processes that create resource systems, we also take this a step further by recognizing the instability of these new venture resource systems. In other words, stability is the exception rather than the rule, and entrepreneurs must endeavour to hold the system in place, as well as expand into more advanced stages of venture creation. The strategies that entrepreneurs use to 'lock down' these systems, while allowing enough flexibility for growth and adaptation, is vital to understanding why some ventures succeed, and others fail. Conceptualizing growth as a process of *bricolage* and resource stabilization could also account for failure of regression models to explain new venture success as details in process may have enormous implications for the future of the venture as the feedback loop between learning, resource creation and opportunity recognition proceeds. Entrepreneurship is intrinsically related to the capacity for purposive agency and 'the key to grasping the dynamic possibilities of human agency is to view it as composed of variable and changing orientations within the flow of time' (Emirbayer and Mische, 1998, p. 964).

As previously mentioned, following from Penrose (1960) we see new venture creation as a process of assembly and 'engineering' of resources that is underpinned by learning about these resources and external opportunities. Creating economically valuable resources involves arranging people, technologies, documents and capital into a stabilized 'system' (Steen *et al.*, 2006). We agree with the suggestion from McKelvey (2004, p. 337) that 'entrepreneurship is about order creation, rather than equilibrium'. Creating and recombining resources also changes the firm's opportunity set, and this will further drive entrepreneurs to change the resource-base of the new venture (Steen and Liesch, 2007). Furthermore, because resources are available in uneven multiples, there will always be a mismatch between resources and opportunities, creating '… resource shortages and surpluses resulting from earlier activity' (Garnsey, 2002, p. 108). In reality, ventures accumulate resources in waves; each round of funding, for example, allows for accelerated product development and employment growth. Founders may celebrate the signing of a term sheet with angel investors bringing a relative wealth of money; this munificence, however, is quickly drained as prototypes are developed and first employees hired.

Discussion and implications for future research

As the high failure rate would indicate, fledgling ventures have a number of opportunities to fall off the path to launch. If the product idea and strategy are not well formulated prior to seeking funding, the venture will not launch for lack of financial resources. If the management team and funding are not in place prior to pitching

customers, the emergent firm may not be able to deliver on promises. This may create market problems that are insurmountable in subsequent growth efforts. All of this creates a simultaneity problem: what resources are critical in these concentric rings of growth, and how should they most effectively be assembled and employed? Subsequent empirical research must not only provide support for the elements of this model, but also explore alternative paths and variables that help the embryonic venture to get to launch and beyond.

While counterintuitive, we can speculate that an influx of capital, people or customers can, in fact, unbalance a firm and make it more likely to topple. If a founding team is not able to configure sets of resources appropriately and balance human, financial and product elements, the firm may fail to advance beyond the embryonic state. Structurationist arguments can apply here as well; the founder is in essence creating and articulating his/her own reality of what a venture is and will become – if the resources fall into place and align to this vision, the venture may proceed to the next stage.

This configuration perspective brings into light some important methodological issues for studying new venture development. If venture growth is indeed characterized by problem solving, improvisation and *bricolage*, then the details of events in the process matter because small changes can affect the future development of the business through the recursive interaction between opportunity recognition and business development (McKelvey, 2004; Chiasson and Saunders, 2005). In other words, as suggested by Van de Ven (1992), the temporal sequence of events matters immensely, and this is not necessarily well captured in regression studies that ignore processes. This is reflected in the observation that the 'error term' in these regression studies, which endeavour to explain new venture performance, is in the vicinity of 70–80% (Woo *et al.*, 1994; Garnsey *et al.*, 2006). Such a phenomenon may warrant methodologies more aligned with chaos and complexity theories.

While models of venture evolution must incorporate factors or variables that explain performance, they must also be structured to capture processes and small differences that have large consequences. Any study of firm development necessitates the longitudinal examination of processes. This is true for the classic studies of growth within large firms that have been the platform for current understandings of business strategy (e.g. Penrose, 1960; Chandler, 1962, 1992), but it is particularly true for the complex and idiosyncratic process of new venture creation and growth (Woo *et al.*, 1994; Chiasson and Saunders, 2005; Garnsey *et al.*, 2006).

Despite this axiom, truly longitudinal studies of new ventures are rare (Van de Ven and Engleman, 2004), even though several prominent authors have called for more entrepreneurship studies that focus on processes and events (Van de Ven, 1992; Shane and Venkataraman, 2000; Davidsson and Wiklund, 2001). In a review of the entrepreneurship literature, Chandler and Lyon (2001) examine 291 empirical research studies and find that only 19 of these are genuinely longitudinal in the sense that they involve the collection of data over time, including the retrospective use of archival sources. Furthermore, only eight of these longitudinal studies involve real-time observation of event-driven processes.

Our paper makes important contributions to both research and practice. For research, we take a more evolutionary, process-based view of the development of the new venture and shed light on the void between idea and successful launch, often referred to as the Valley of Death (Barr *et al.*, 2009). In terms of practice, founders face overwhelming odds in attempting to launch a venture. By recognizing the

appropriate focus of activity for stage-specific resource development, our work will help founders use limited time and money in the best way to move through stages of development and realize long-term objectives.

References

Acs, Z. and Audretsch, D. (2003) *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction,* Springer, New York.

Ahuja, G. and Katila, R. (2004) 'Where do resources come from?', *Strategic Management Journal,* 25, pp.887–907.

Alvarez, S. and Busenitz, L. (2001) 'The entrepreneurship of resource-based theory', *Journal of Management,* 27, pp.755–75.

Audretsch, D. and Mahmood, T. (1994) 'Firm selection and industry evolution: the post-entry performance of new firms', *Journal of Evolutionary Economics,* 4, 3, pp.243–60.

Audretsch, D. and Mahmood, T. (1995) 'New firm survival: new results using a hazard function', *Review of Economics and Statistics,* 77, 1, pp.97–103.

Baker, T. and Nelson, R. (2005) 'Creating something from nothing: resource construction through entrepreneurial *bricolage*', *Administrative Science Quarterly,* 50, pp.329–66.

Barney, J. (1986) 'Strategic factor markets: expectations, luck and business strategy', *Management Science,* 42, pp.1231–41.

Barney, J., Wright, M. and Ketchen, D. (2001) 'The resource-based view of the firm: ten years after 1991', *Journal of Management,* 27, 6, pp.625–41.

Barr, S., Baker, T., Markham, S. and Kingon, A. (2009) 'Bridging the valley of death: lessons learned from 14 years of commercialization of technology education', *Academy of Management Learning and Education,* 8, 3, pp.370–88.

Baum, J., Locke, E. and Smith, K. (2001) 'A multidimensional model of venture growth', *Academy of Management Journal,* 44, 2, pp.292–303.

Bromiley, P. and Flemming, L. (2002) 'The resource-based view of strategy: a behaviourist critique' in Augier, M. and March, J.G. (eds) *The Economics of Choice, Change and Organization: Essays in Honour of Richard M. Cyert,* Edward Elgar, Cheltenham pp.319–336.

Chandler, A. (1962) *Strategy and Structure,* MIT Press, Boston, MA.

Chandler, A. (1992) 'What is a firm?: a historical perspective', *European Economic Review,* 36, 2, pp.483–92.

Chandler, G. and Lyon, D. (2001) 'Issues of research design and construct measurement in entrepreneurship research', *Entrepreneurship Theory and Practice,* 25, 4, pp.101–13.

Chiasson, M. and Saunders, C. (2005) 'Reconciling diverse approaches to opportunity research using the structuration theory', *Journal of Business Venturing,* 20, pp.747–67.

Cooper, A., Dunkelberg, W. and Woo, C. (1988) 'Survival and failure: a longitudinal study' in Kirchoff, B. *et al.* (eds) *Frontiers of Entrepreneurship Research,* Babson College, Wellesley, MA, pp.225–37.

Cooper, R. (1983) 'The new product process: an empirically-based classification scheme', *R&D Management,* 13, pp.1–14.

Cooper, R. (1990) 'Stage-gate systems: a new tool for managing new products', *Business Horizons,* 33, pp.44–53.

Davidsson, P. and Wiklund, J. (2000) 'Conceptual and empirical challenges in the study of the firm' in Sexton, D. and Landstrom, H. (eds) *The Blackwell Handbook of Entrepreneurship,* Blackwell, Oxford, pp.26–44.

Davidsson, P. and Wiklund, J. (2001) 'Levels of analysis in entrepreneurship research: current research practice and suggestions for the future', *Entrepreneurship Theory and Practice,* 25, 4, pp.81–99.

Dencker, J., Gruber, J. and Shah, S. (2009) 'Pre-entry knowledge, learning, and the survival of new firms', *Organization Science,* 20, 3, pp.516–37.

Emirbayer, M. and Mische, A. (1998) 'What is agency?', *American Journal of Sociology,* 103, 4, pp.962–1023.

Foss, N. (1997) 'Resources and strategy: problems, open issues and the way ahead' in Foss, N. (ed.) *Resources Firms and Strategies: A Reader in the Resource-Based Perspective,* Oxford University Press, Oxford, pp.345–65.

Garnsey, E. (1995) 'The resource-based theory of the growth of the firm' in Ellis, K., Gregory, A., Mears-Young, B. and Ragsdell, G. (eds) *Critical Issues in Systems Theory and Practice,* Plenum Press, New York, pp.239–44.
Garnsey, E. (2002) 'The growth of new ventures: analysis after Penrose' in Pitelis, C. (ed.) *The Growth of the Firm,* Oxford University Press, Oxford, pp.101–25.
Garnsey, E., Stam, E. and Heffernan, P. (2006) 'New firm growth: exploring processes and paths', *Industry and Innovation,* 13, 1, pp.1–20.
Gartner, W. and Carter, N. (2003) 'Entrepreneurial behavior and firm organizing processes' in Acs, Z. and Audretsch, D. (eds) *Handbook of Entrepreneurship Research: An Interdisciplinary Survey and Introduction,* Springer, New York, pp.195–212.
Gersick, C. (1991) 'Revolutionary change theories: a multilevel exploration of the punctuated equilibrium paradigm', *Academy of Management Review,* 16, 1, pp.10–36.
Gersick, C. (1994) 'Pacing strategic change; the case of a new venture', *Academy of Management Journal,* 37, 1, pp.9–45.
Greiner, L. (1972) 'Evolution and revolution as organizations grow', *Harvard Business Review,* 50, 4, pp. 37–46.
Kuratko, D., Ireland, R. and Hornsby, J. (2001) 'Improving firm performance through entrepreneurial actions: Acordia's corporate entrepreneurship strategy', *Academy of Management Executive,* 15, 4, pp.60–71.
Latour, B. (2005) *Reassembling the Social: An Introduction to Actor–Network Theory,* Oxford University Press, Oxford.
Law, J. (1992) 'Notes on the theory of the actor–network: ordering, strategy and heterogeneity', *Systems Practice,* 5, 4, pp.379–93.
Lebas, M. and Euske, K. (2002) 'A conceptual and operational delineation of performance' in Neely, A. (ed.) *Business Performance Measurement: Theory and Practice,* Cambridge University Press, Cambridge, pp.65–79.
Lyles, M., Saxton, T. and Watson, K. (2004) 'Venture survival in a transitional economy', *Journal of Management,* 30, 3, pp.351–75.
McKelvey, B. (2004) 'Toward a complexity science of entrepreneurship', *Journal of Business Venturing,* 19, pp.313–41.
Penrose, E. (1960) 'The growth of the firm. A case study: the Hercules Powder Company', *Business History Review,* 34, 1, pp.1–23.
Reynolds, P., Carter, N., Gartner, W., Greene, P. and Cox, L. (2002) *The Entrepreneur Next Door: Characteristics of Individuals Starting Companies in America,* available from http://sites.kauffman.org/pdf/psed_brochure.pdf [accessed January 2010].
Robb, A., Ballou, J., DesRoches, D., Potter, F., Zhao, Z. and Reedy, E. (2009) *An Overview of the Kauffman Firm Survey, Results from Data Collected 2004–2007,* available from http://www.kauffman.org/uploadedFiles/kfs_fourth_040709.pdf [accessed January 2010].
Roper, S. (1999) 'Modelling small business growth and profitability', *Small Business Economics,* 13, 3, pp.235–52.
Shane, S. and Venkataraman, S. (2000) 'The promise of entrepreneurship as a field of research', *Academy of Management Review,* 25, 1, pp.217–26.
Steen, J., Coopmans, C. and Whyte, J. (2006) 'Structure and agency? Actor–network theory and strategic organization', *Strategic Organization,* 4, 3, pp.303–12.
Steen, J. and Liesch, P. (2007) 'A note on Penrosean growth, resource bundles and the Uppsala model of internationalisation', *Management International Review,* 47, 2, pp.193–206.
Tushman, M. and Romanelli, E. (1985) 'Organizational evolution; a metamorphosis model of convergence and reorientation' in Cummings, L. and Staw, B. (eds) *Research in Organizational Behavior,* JAI Press, Greenwich, CT, pp.171–222.
Van de Ven, A. (1992) 'Longitudinal methods for studying the process of entrepreneurship' in Sexton, D. and Kasarda, J. (eds) *The State of the Art of Entrepreneurship,* PWS-Kent, Boston, MA, pp.214–242.
Van de Ven, A. and Engleman, R. (2004) 'Event and outcome-driven explanations of entrepreneurship', *Journal of Business Venturing,* 19, pp.343–58.
Wiklund, J. (1998) *Small Firm Growth and Performance: Entrepreneurship and Beyond,* University of Jonkoping, Jonkoping.

Wiklund, J., Patzelt, H. and Shepherd, D. (2009) 'Building an integrative model of small business growth', *Small Business Economics,* 32, pp.351–74.
Woo, C., Daellenbach, U. and Nicholls-Nixon, C. (1994) 'Theory building in the presence of randomness: the case of venture creation and performance', *Journal of Management Studies,* 31, 4, pp.507–24.