



WORKING PAPER

Evolutionary Views on Entrepreneurial Processes: Managerial and Policy Implications

Karl Wennberg

Stockholm School of Economics & The Ratio Institute

Frédéric Delmar

EMLYON Business School & Research Institute of Industrial Economics

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Evolutionary Views on Entrepreneurial Processes: Managerial and Policy Implications *

Karl Wennberg

Center for Entrepreneurship and Business Creation
Stockholm School of Economics
P.O. Box 6501
SE-111 83 Stockholm SWEDEN
Karl.wennberg@hhs.se

&

The Ratio Institute
P.O. Box 3203
103 64 Stockholm
Sweden

Frédéric Delmar

Center for Research in New Venture Creation and Growth
EMLYON Business School
23 avenue Guy de Collongue
BP 174
69132 ECULLY Cedex FRANCE
delmar@em-lyon.com

&

Research Institute of Industrial Economics
P.O. Box 55665
SE-102 15 Stockholm SWEDEN

Abstract: In this paper we outline an evolutionary framework of entrepreneurial processes where by firms are started, grow, and exit from the market. We explain the important of such a framework in explaining both what contextual factor affects entrepreneurial processes and in explaining the distinction and interaction between self-employment and high-potential entrepreneurship. We highlight the implications from prior empirical work using this evolutionary framework for management and policy making: Three broad implications relevant for managers and entrepreneurs interested in understanding how they can leverage their chances to position their firms as ripe for growth, and six detailed implications relevant for policy makers interested in understanding and affecting the structural conditions where by entrepreneurship can lead to enhanced growth and job creation.

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Why an Evolutionary theory of Entrepreneurship?

A good social science theory needs to be simple, parsimonious and realistic. A reason to prefer simpler, more parsimonious theories is that such theories are more constraining and thus more falsifiable. In empirical applications of theoretical models, a model that is not overly complicated increases its credibility (Pearl, 2000; Popper, 1959). Moreover, it is easier to understand and to apply. A theory also needs to be realistic in order for us to apply it in practice. This is a trade off that all social science research struggle with. This trade off becomes even more evident for theoretical models based on observational data as is the case in the majority of entrepreneurship studies. Theory is important for the following three reasons. First, the formal establishment of causality is a property of a theoretical model, not merely of data or statistical analyses. Hence, we cannot understand and explain our data and analyses without theory. Second, many different theoretical models can explain the same data. We therefore need to choose a clear perspective and follow it through as to be able to exclude alternative explanations to the best extent possibly. Third, assumptions must be made in any model of a causal-deductive type. Therefore, a good theory should allow us to derive a model which represents a logically consistent system (Heckman, 2000).

In our work we posit an evolutionary framework based on the areas of industrial organization (I/O) economics and organizational ecology to examine two important research questions: (1) The extent to which entrepreneurship, defined as the birth, growth, and exit of new firms, represent an important link between new knowledge and economic growth. (2) What contextual factor affects the birth, growth, and exit of new firms? An evolutionary view of social and economic processes implies that entrepreneurs represent an important source of variation in the economic system by introducing new types of goods and services and/or new ways of organizing the production of such (Schumpeter, 1934). Demand conditions strongly affects whether the business opportunities exploited by entrepreneurs lead to radically new solutions or – as is most often then case – slightly variations on already extant goods and service offerings (Samuelsson & Davidsson, 2009). Because of the environmental complexity and the inherent uncertainty of yet unknown demand conditions, entrepreneurs cannot know *ex ante* whether the opportunities they exploit will lead to successful variations. Hence, entrepreneurial endeavours are to a certain degree ‘blind’ variations. This means that at any given moment, both adaptive and maladaptive firms inhabit the economic system. We cannot tell which is adaptive until the maladaptive firms are selected out from by environment pressures (Aldrich & Kenworthy, 1999).

While most existing theoretical models of entrepreneurship focus on the behaviours, motives, and strategic actions of individual entrepreneurs, we are more interested in the ‘demand conditions for entrepreneurship’ that facilitate such action. An evolutionary theory allows us to explain the important patterns in contemporary entrepreneurship research moving from a view that ‘all forms of entrepreneurship is good’ towards a more nuanced view where ‘high-potential entrepreneurship’ is what matters for economic development (Autio & Acz, 2007; Henrekson & Johansson, 2008).

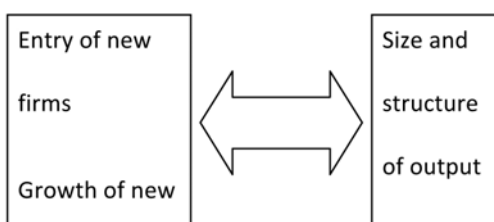
Models of firm evolution in I/O economics and organizational ecology in many regards overlap, but that they are derived from different assumptions. Perhaps the chief difference between ecological and economic theories attend to how they view firms’ evolutionary process as related to potential output markets. In the economic tradition, firms compete for exogenously given output markets. New firms are created by entrepreneurs who enter the market if they believe they can serve those markets in a new or potentially

better way than existing firms (cf. Eckhardt & Shane, 2003). According to organizational ecology, firms' entry process is endogenous to the size and constitution of the currently existing firm population. Few firms in a population – or firm populations with a 'vague' or 'less resonant identity' (McKendrick et al., 2003) means that the sociocognitive legitimacy (i.e. how potential customers, suppliers, employees or financiers accept this type of organization as natural and legitimate) for additional firm in that population will be low – hence suppressing the number of new firms. It is important to note here that the potential size of the output market is only one of many variables denoting legitimacy in the ecological tradition, whereas in the economic view output markets are a fundamental determinant of the number and size of firms serving that market. In a strict economic sense, efficient market exchanges means that the number and size of firms producing goods or services should always balance the output market. Hence, the economic view on firm entries and output market can be thought of as a scale that should be in balance – an increasing market will spur the entry of new firms and/or expansion of existing firms, whereas a decreasing market will reduce the number of firms.¹

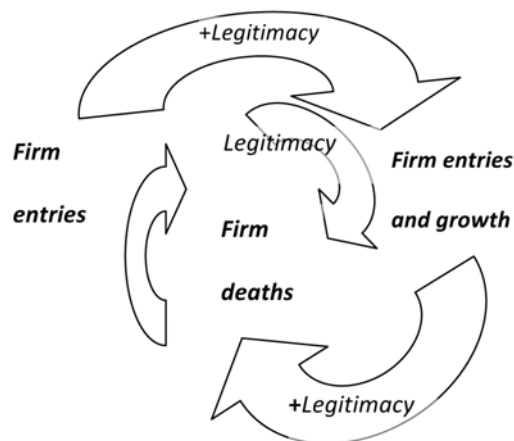
We sketch this view of the market entry process below in Figure 1.1a. The organizational ecological view of the market entry process could rather be viewed as an 'endogenous cycle' where the entry of additional firms confers more legitimacy to this type of firms, lowering the social threshold for additional firms to be founded, which again raises the legitimacy, up to a point where the competition between many similar firms become so strong that it overtakes the positive aspect of legitimacy and each additional firm suppress the probability of both entry, growth, and survival of additional firms (Carroll & Hannan, 1989; Barron, 1991). This process is sketched below in Figure 1.1b.

Figure 1.1. Economic and ecological views on the market evolution process

1.1a. Economic view of market evolution



1.1b. Ecological view on market evolution



¹ This concerns specifically equilibrium theories in modern economics approach. However, a key feature of evolutionary economics and entrepreneurship concerns the focus specifically on the disequilibrium aspects of entrepreneurship and market changes.

We believe with others (i.e. Geroski, 2001) that these assumptions are less different than a cursory overview might tell and that there exists an important overlap to be examined. In new and untested output market such as the market for web commerce during the 1990s, it is often not extant profit opportunities *per se*, but rather entrepreneurs' expectation to earn large profits in the future that leads to create a firm and engage in a new and fledging market (Wennberg, et al., 2010). This indicate strong validity for the ecological view of firm entry as an endogenous socio-economic process driven only in part by the existence of an output market, at least for new and 'untested' markets where it is difficult to conceive of an economic equilibrium. In terms of space-bounded competition, ecological and economic models bear much more resemblance. Both the density dependence model of firm evolution in organizational ecology and the concept of firm agglomeration in I/O economics involve an evolutionary process of positive feedback between size of a firm population and the entry and growth of new firms, indicating a number of clear similarities with industrial organization and ecological theories (Boone & van Witteloostuijn, 1995). Further, the density dependence model also bears similarities to the notion of the industry life cycle in industrial organization (van Wissen, 2004). We are far from the first to explicitly integrate sociological notions into models of market competition (c.f. Podolny & Scott Morton, 1999), but we feel strongly that is now time to take this evolutionary framework inspired by sociology and I/O economics to the entrepreneurship field.

Management Implications of evolutionary research on entrepreneurship

Our research efforts has generated a number of management implications both arising from the theoretical framework of evolutionary entrepreneurship and from our empirical investigations on this topic (see, among other publications, Delmar et al., 2006; Eckhardt et al., 2006; Pathak et al., 2010; Wennberg, 2009a; 2009b; Delmar & Wennberg, 2010). Central to these implications is the role of *context* in explaining why equally capable individuals engage in entrepreneurship in some contexts but not in others, and furthermore to understand why some of them choose to grow their firms while other does not. There are three reasons for why managers and entrepreneurs should care about the characteristics of the context in which their firms are started. First, new firms are in a situation of high uncertainty and complexity. The ability to adapt to a changing environment is an important advantage for such firms. Second, small and new firms are more strongly affected by competitive forces than large firms. Small and new firms are therefore more exposed to evolutionary selection forces such as competition for output markets or resources. Third, the characteristics of new firms change as they age and grow, and consequently so do their relationship to the context as well. This means that the demands on the entrepreneur also changes, as well as his or her possibilities to further develop the firm. For these three reasons it is important to understand specifically what contextual factors affect new firm evolution. Regardless of the ambition and skills of entrepreneurs in the modern economy, their fate is still ultimately subject to external selection forces such as demand, trends in technological regimes, and the action by outsiders with legitimacy and tangible resources (Aldrich & Kenworthy, 1999). In the below we outline three implications for managers and entrepreneurs derived from our evolutionary framework and the accumulated empirical evidence. These implications are: *(1) how corporate institutions shape the exploitation of new business opportunities, (2) how social institutions shape the growth behaviour of entrepreneurs, (3) how conditions for growth change during different stages of firm evolution.*

(1) How corporate institutions shape the exploitation of new business opportunities. In our empirical work we have shown how individual level initiatives have effect on the firm level and then on the market level and vice versa (Wennberg, 2009a). We explain how the uneven distribution of new knowledge across firms and individual facilitate the emergence of new business opportunities. We have also discussed the problems that arise for both incumbent firms and their employees when it comes to decide what the best way to exploit new opportunities (Delmar & Wennberg, 2010). For individuals currently employed but considering a new business opportunity, the creative process within the individual and between the individual and her employer is necessary to go from potential to realized entrepreneurship. Potential entrepreneurship is defined as the acquisition and assimilation of new ideas. Realized entrepreneurship is the transformation and assimilation of the assimilated new knowledge into an entrepreneurial opportunity. The choice to pursue the new opportunity within the existing firm or to leave and start an independent business might be based on as much on the individual's inability to convince their employer to pursue an opportunity as it is associated to personal incentives related to the potential returns with the pursuit of the opportunity (Adner & Levinthal, 2008). Recent research show that there exist a strong country variation related to industry structure and a negative correlation between intrapreneurship (defined as employees developing new business opportunities for their employers) and independent start-up activities; where intrapreneurship is a substitute to independent start-ups (Bosma, Stam & Wennekers, 2010). Intrapreneurs are more likely to be found in countries with larger firms and they frequently have strong intentions to start independent business but in the end, most of them still prefer to stay on as employees in larger firms (c.f. Folta et al., 2010). Moreover, intrapreneurs display similar individual characteristics to entrepreneurs (defined as choosing to start independent firms). The seminal paper by Baumol (1990) noted that that all societies and histories exhibit a constant influx of entrepreneurial action, this entrepreneurial action is institutionally contingent. This leads some societies to take a 'large enterprise' form rather than a 'small enterprise' form. Hence, the incentives structure or demand conditions are of central importance for moulding how entrepreneurial opportunities are exploited in different institutional environment. In Bosma and colleagues (2010) study, countries similar to Sweden as Norway and the Netherlands ranked very high on the intrapreneurship prevalence rate, indicating that entrepreneurship in these countries may still take a 'large enterprise' form rather than a 'small enterprise' form (Granstrand & Alänge, 1995).¹

New knowledge leads to an increased variation in ideas and subsequent potential for innovations for the existing firms. Many firms invest substantially in allowing their employees to find new ways of improving performance. A problem for many firms is to manage this innovation process and to create efficient and effective selection mechanisms to choose the correct initiatives. Empirical investigations indicate that the most uncertain or high-potential opportunities that theory posit as most apt for commercializing in new independent firms (Hellman, 2007) do not seem to be enacted that way in the Swedish context (Delmar & Wennberg, 2010). This means that such opportunities are dependent on the ability of corporate entrepreneurs to gather the support from managerial bureaucracies (Czernich & Zander, 2007), potentially

¹ It should be noted that while either form is not necessarily ill suited to coordinate economic activities in general, the transformation from an institutional environment fostering large-firm capitalism to one fostering small-firm capitalism is complicated and often very painful (Hancke, 2009). Such an analysis is however outside the scope of this article.

leading many of them remaining unexploited since large firms are known to favour more incremental types of innovative projects rather than the more radical and risky project (Baumol, 2005; Koberg, DeTienne & Heppard, 2003). Further, employees in large firms might seek to develop their own ideas as part-time efforts on a potentially suboptimal scale to reduce the uncertainty of striking out on their own (Folta et al., 2010).

(2) How social institutions shape the growth behaviour of entrepreneurs. We know that most entrepreneurial endeavours are probably engaged to increase utility, with utility being something different than pure monetary returns (Aldrich, 1999). Most firms are not created with growth as an imperative goal (Wiklund, Davidsson & Delmar, 2003). It seems that growth should be approached as a strategic option rather than as a behavioural assumption.

In our research we have shown that both the choice to persist in entrepreneurship and the choice to grow a small firm are not strictly rational decisions but rather that these decisions are contingent on entrepreneurs perception of profitability relative to a relevant peer group (Delmar & Wennberg, 2007; Wennberg, 2009a). Such peer groups represent an important

social institution, shaping the growth behaviour of entrepreneurs due to social influences of appropriate behaviour. In particular, our investigation how social comparison of profitability among the full population of Swedish Business Services Firms between 1995 and 2002 revealed that small firms growth behavior change over the stages of firm evolution: very small firms grow through risk-minimizing strategies. However, when they have reached either a size of 6-12 employees and/or have reached 5-6 years of age their growth behavior becomes more risk tolerant. We believe that this change from “small” to “not so small” firm is an imperative threshold for entrepreneurs in that it represents a conscious strategic decision to expand the firm, perhaps by bidding for that “super project” that necessitates expansion and puts the firm on a higher growth trajectory. Further, growing from “small” to “not so small” necessitates the new firm to become more professionalized, with the founding-entrepreneur assuming the role of leader and manager (Antonakis & Autio, 2005). This means that the conditions for growth, and also the resources and skills necessary to ensure profitability and growth, change during different stages of firm evolution. The changing role of various resources and skills during different stages of firm evolution is our final managerial implication, which will be elucidated in the below:

(3) How conditions for growth change during different stages of firm evolution. Our research has also documented that without a clear understanding of how a particular industry function and entrepreneurial skills necessary to build this into a business model that can generate profits, survival and growth of the new firm cannot be expected. Potential entrepreneurs therefore needs to seriously understand the value of previous experience in the founding team (Wennberg, 2009b) and should strive to leverage this in the suitable industrial context (Delmar, Wennberg & Hellerstedt, 2010) when starting a new business. Understanding previous experience entails both utilizing one’s human capital such as education and previous work experience when taking the necessary activities to registering a firm, recruiting personnel, and gaining financial resources (Eckhardt, Shane & Delmar, 2006). Leveraging this in an industrial context entails using one’s experiences to legitimize a proposed business model to stakeholders in the relevant industry, and reach the first sales efforts (Delmar & Shane, 2004a; 2004b). Growing from “small” to “not so small” necessitates the new firm to become more professionalized, yet many founding-entrepreneurs are reluctant to assume the role of leader and manager (Davidsson, 1995). For such firms, drawing upon a wider set of

stakeholders such as investors and a professional board of directors to infuse leadership skills in the firm is imperative in order to grow and professionalize (Gabrielsson & Huse, 2003).

Finally, our research has shown that experience from the industry has a clear value for founding, survival and growth (Delmar & Wennberg, 2010), but entrepreneurs should also understand that various environments are more or less munificent for new firms (Delmar, Hellerstedt & Wennberg, 2010). The choice to engage in growth, rapid growth or no growth and the probability of succeeding is strongly dependent on industry characteristics. In our research we have seen that some features such as an industry's instability, the minimum efficient scale or size of operations in the industry, and the level of crowding have strong and long reaching impact on firm evolution (Wennberg, 2009a; Delmar & Wennberg, 2010). For entrepreneurs that envision growing their firms, it is therefore wise to consider where to launch their envisioned venture. This is likely to be especially important and relevant if new knowledge is the basis of the opportunity exploited. New technologies have the advantage that they can be applied in many different markets. Entrepreneurs need to consider which context that could be the most favourable for their opportunities. Geographic location and choice of industry subsector plays a crucial role for firm survival and growth, which should be considered both by growth-oriented entrepreneurs and by investors interested in facilitating firm growth (Wennberg & Lindqvist, 2010).

Implications for Public Policy of evolutionary research on entrepreneurship

Policy makers should care about the context and environment in which entrepreneurs evolve in because they often can control many of the factors affecting the incentives behind entrepreneurial behaviour. Much effort and resources are spent by policy makers trying to increase entrepreneurship either from society's supply side or from its demand side. For example, policy makers have attempted to increase the attractiveness of entrepreneurship as a career choice by lowering the tax rate for new firms (Lundström & Stevenson, 2002). There is comparatively little policy attention directed at the joint implications of public policy for various stages of new firm evolution such entry, growth, and exit. It is here that an evolutionary perspective on entrepreneurship policy is of imperative importance. From an evolutionary point of view, there is an important heterogeneity among young and new firms that is largely based on where they are active (industry and geography), their performance (growth or high growth or no growth) and their evolution (age and size). Therefore these firms are likely to react differently to policy measures and consequently policy measures need to be more closely targeted in this area. Since new entrepreneurial firms are so weak as separate entities, but so important taken together, policy makers have special responsibility towards those firms as they cannot lobby as effectively as larger more established firms tend to do. It needs to be accentuated that most new business start-ups or micro firms created has little to no economic value. It is therefore important for policy makers to target high potential entrepreneurship. Policy makers have a special duty to establish more knowledge about favourable contexts for entrepreneurship in general and high-potential entrepreneurship in particular (Shane, 2009). Only a tiny share of firms accounts for the vast majority of the contribution of job creation and economic growth that comes from entrepreneurial activity.

The question is how is it possible to construct a policy environment promoting high potential entrepreneurship? Entrepreneurs represent an important source of variation but due to the environmental complexity and uncertainty, entrepreneurs (and policy makers) cannot know if they are exploiting successful variations. Hence, their start-up attempts are to a certain degree blind. This means that at any given moment, both adaptive and maladaptive firms inhabit the economic system. We cannot tell which is adaptive until the environment selects out maladaptive firm, and it is highly unlikely that policy makers may *ex ante* be able to funnel support to specific industries or sectors believed as particularly important. Such industrial policies have shown to be generally unproductive, or even destructive, in other nations such as France or Japan. However, the results from our research efforts provides some clues to how we can achieve a situation where we have an increasing number of potential high-growth firms and a decreasing number of typical start-ups with limited economic viability.

In the below we discuss six implications for public policy following our evolutionary perspective and our accumulated empirical work on this topic. These implications are:

- (1) Discussing the regulatory regime**
- (2) Encourage exit and wealth creation**
- (3) Leveraging entrepreneurial experience**
- (4) Encourage employee mobility**
- (5) Unemployment is not a good motivation for entrepreneurship**
- (6) Designing institutions encouraging both slow growth and gazelle growth**

Discussing the regulatory regime. In our own research we concur with the established literature in I/O economics that a high turnover in firm entries and exit is important for a healthy economy both at the national and the local level (Audretsch, 1995; Nyström, 2009). Our research cannot yet pinpoint the causality of local factors leading to favourable entrepreneurial outcomes, but is clear that local initiatives play a very important role in shaping both what firms are created and their chances for growth and survival. In Delmar and Wennberg (2010) we noted that municipalities predominated by a liberal/right wing majority had increased numbers of firm births, but that firms located in municipalities predominated by a liberal/right wing majority have higher likelihood of exit. These are interesting findings that should be taken as tentative and worthy of further investigation. One potential explanation for these findings is that political majority also covary with some unmeasured factor, suggesting that our findings suffer from some type of omitted variable bias. For example, one could expect poorer municipalities or municipalities with a larger public sector to gather left-wing constituents rather than liberal/right-wing constituents. But since the regional economic size (GRP) as well as public sector size was controlled for in our regressions, such an explanation does not seem to hold true. Another potential explanation is that high correlation between births and exits across municipalities, potentially indicating that liberal/right-wing municipalities experience higher rates of both entries and exits, perhaps by encouraging competition within their region. Gianetti and Simonov (2004) suggested that political mentality in a region is a good proxy of the psychosocial support for engaging in

entrepreneurship. Yet, we think that the mechanism by which individuals draw upon social support for their entrepreneurial endeavours are much more intricate in nature than what suggested in these regional-level analysis. Cross-national evidence indicates that social support operates at the level of social groups that are more or less similar in demographics (Wennberg & Autio, 2009), and that individual entrepreneur growth aspirations are moulded at the intersection of such social factors and the institutional contingencies offered by political regulators (Autio & Acs, 2010). These institutional contingencies, such as the intellectual property regimes, legal climate for new and small firms, labour market regulations, are perhaps the most important variables that regulatory regimes may impact in the short- and long-term (Henrekson & Douhan, 2009).

Encourage exit and wealth creation. An important conclusion from our work is the potential distinction between successful and unsuccessful firm exits (Wennberg, 2009a; Wennberg et al, 2010). Most prior studies have investigated unsuccessful exits (Amaral et al., 2007). This is relevant for public policy especially from the perspective of entrepreneurial experience below, in that the overly negative impact of unsuccessful exits – such as the stigma of failure – should be addressed. If public policy seeks to stimulate more high-potential entrepreneurship, focus should be on tools that encourage entry as well as the rapid exit of unprofitable firms. Important tools suggested in prior research are a lowering of the cost of incorporating a firm into limited liability (Delmar, et al., 2005) and balanced bankruptcy laws that do not exclusively favour the creditors of small firms (Gratzer & Sjögren, 1999). Conversely, public policy should balance the encouragement of rapid exit of unprofitable firms with encouraging the growth of profitable businesses. Yet, from a policy perspective, successful exits are at least equally relevant because they might provide an informal source of capital and advice to the novice entrepreneur (Mason & Harrison, 2006) and act as role models for future generations by increasing their propensity towards and attachment to entrepreneurial activities (Samuelsson, 2004).

Leverage entrepreneurial experience. Related to the question of distinct exit routes, our consistent findings in relation to the role of prior entrepreneurial experiences indicates policy makers should strive to promote serial entrepreneurship as a way to leverage entrepreneurial experience (Wennberg et al., 2010; Delmar & Wennberg, 2010). Specifically, legal obstacles such as personal credit and bankruptcy laws, and policy tools such as public financing of small business, should explicitly consider the importance of not focusing solely on ‘de novo’ or first-time entrepreneurs. This might also help to remedy the ‘stigma of failure’, as indicated in our related work that revealed that entrepreneurial experience moderates the negative impact of social stigma (Pathak, Autio & Wennberg, 2010). In other words, individuals with previous entrepreneurial experience seem to care less about the potential negative concerns that other in society may hold about entrepreneurship. Experienced entrepreneurs may thus be the die-hard fools that are needed to infuse more variation – and thus also raise the probability of creating gazelle firms – in the economy. Among the policy variables relevant to encourage such serial entrepreneurship are bankruptcy laws that take the societal costs of entrepreneurial failure into account and do not exclusively favour the creditors of small firms (Gratzer & Sjögren, 1999), and housing exceptions commonplace in many U.S. states that allow entrepreneurs to keep some of their basic property, should they go into personal bankruptcy (Falkenhall & Wennberg, 2010).

Encourage employee mobility. In our work related to how corporate institutions shape the exploitation of new business opportunities we have highlighted the importance of idiosyncratic pools of knowledge and the presence of educated individuals able to exploit this knowledge for commercial means (Delmar,

Wennberg & Hellerstedt, 2010). New types of knowledge increases variation in entrepreneurial ideas and the potential for successful entrepreneurship. Still, a fundamental paradox remains in that those that have the best access to new knowledge, new technologies and new opportunities are often the ones that are the least likely to enter into entrepreneurship because they have high opportunity costs (Amit, Muller & Cockburn, 1993; Delmar et al., 2005). Hence, it is not necessarily the most apt individuals that respond to the possibilities of entrepreneurship (Folta, Delmar & Wennberg, 2010). However, our work on the employment background of entrepreneurs suggest that spin-out firms started by entrepreneurs leaving employment to set up a new firm in the same industry are often more capable and grow more rapidly than the general start-up (Delmar, Wennberg & McKelvie, 2010). Similar evidence has been presented elsewhere (Dahl & Jensen, 2010). The importance of entrepreneurs' employment background suggests that policy measures should target people with proven competencies to start business. This has two broad implications: First, the opportunity costs for individuals with extensive competencies to engage in entrepreneurship need to be lowered. This can be achieved by encourage employee mobility. It is not directly linked to entrepreneurship but it is likely to enhance the quality of entrepreneurial efforts (Agarwal et al., 2004). The abolition of non-compete covenants, job security based on tenure at a specific workplace, and the potential to "carry" health care and other social benefits across workplaces are suggestions of policy measures that could be important in encourage high-potential entrepreneurship. Second, policy measures needs to be differentiated between those with extensive and those with rudimentary competencies given the large differences in their financial, social, and human capital (Davidsson & Honig, 2003). For example, some current policy attempts to "match" novice entrepreneurs to firms where the owner is approaching retirement and the family is not willing to take over management of the firm. The accumulated evidence suggests that matching such firms with novice entrepreneurs is, at best, a very risky approach.

Unemployment is not a good motivation for entrepreneurship. A macro oriented literature has investigated the potential of creating jobs by encouraging the unemployed to start businesses. This line of work has generated somewhat conflicting conclusions, at times indicating that start-up subsidies bring social good (Carling & Gustafson, 1999; Caliendo & Kritikos, 2010) while at other times showing negative effects. In our own micro oriented research on entrepreneurial exit we have investigated the long-term effect on firm evolution depending on whether any of the founder(s) entered from unemployment (Delmar & Wennberg, 2010, Wennberg, 2009a). The analyses clearly shows that firms whose founder(s)' were unemployed prior to engaging in entrepreneurship had higher likelihood of exiting from the market. This evidence highlights the importance of initial commitment and resources for entrepreneurial endeavours, and limits the long-term potential of "from unemployment to entrepreneurship" programs that are often highlighted in times of economic distress. This is in line with our basic argument that public policy should focus more on high potential entrepreneurship promoting quality instead of quantity.

Building conditions for both slow-growth and gazelle growth. A conclusion from our work on firm growth is the imperative need for a potential distinction between growth and high-growth in both research and public policy (Davidsson, Delmar & Wiklund, 2007; Delmar & Wennberg, 2007; 2010; Stam & Wennberg, 2009). There is a stark distinction between "slow growth" and "gazelle growth" in that (a) the variables predicting mediocre growth are different from the variables predicting gazelle growth, and (b) the aggregate societal impact on job creation is actually higher for the trickle of gazelle firms than for the large majority of slow-growth firms. As we could see in our study of the total population of knowledge-intensive consulting firms

between 1994 and 2002 (Delmar & Wennberg, 2010), the 4 largest firms started in 1994 accounted for 2percent of all jobs created in that year and 13percent of total sales, but in 2001 the same 4 firms accounted for a whopping 35percent of all jobs created and 30percent of total sales. These findings mirror those of earlier studies, and also suggest that there are two distinct types of policy variables applicable for slow grower and gazelles. Further, Stam and Wennberg (2009) showed in a longitudinal random sample of Dutch firms that entrepreneurs' growth motivation is important for slow growers, but for the small number of gazelles, building innovative capabilities is more important. It is also likely that the policy variables affecting growth conditions differ across firms evolutionary stages. McKelvie, Wiklund and Davidsson (2006) investigated growth among Swedish firms at different stages in the evolution, finding that old and large firms overwhelmingly pursued growth by acquiring other firms, whereas young and small firms tended to grow organically. They also found that growth motivation of the founding entrepreneur was important during the first stages of organic growth but for more mature firms, access to financial resources and the ability to employ capable individuals were more important.

These findings suggest that policy makers should adopt differential policy frameworks to encourage new firm growth and gazelle-growth / growth of more established firms. What encourage the small 2-person firm to hire its first employee is different from what encourage the 20-employee firm to expand operations further. One should remember that gazelles and slow-grower are not two static types of firms. Rather, gazelles originate in the overall population of slow-growers, and despite the evolutionary theory framework developed and tested in this book; it is unlikely that policy makers will be able to identify *ex ante* what possibly characterizes a gazelle firm or not. The general picture for gazelle entrepreneurs nevertheless seem to be: committed entrepreneurs with a high quality education, suitable industrial background, some personal savings that are targeting a new growing market with a new technology where size is important to survive and achieve financial performance. Since starting and growing a firm is an extensive process such firms needs various forms of intellectual and financial support during the various stages in their firms' evolution. Policy makers should therefore try to develop programs that encourage for such high-potential individuals to both start and grow their businesses.

The policy interest in what determines the nature of high growth firms versus non growth or marginal growth cannot be sufficiently be underlined. Our descriptive results clearly show the firms most likely to affect the economy are to be found in the upper margins among growth firms. Using tools such as quantile regression to investigate the effect of different policy measures is an interesting avenue to explore as it allows policy makers to see how different policies (changes in legal frameworks and taxes, direct and indirect industry subsidies, and innovation policies) affect firms differentially depending on their growth trajectory. A recurring problem with new policies is that they are often tailored either to a statistical mean firm or to firms that have strong lobbies. A method that is more suited to separate out effects in a highly heterogeneous population is likely to be an interesting effect to better evaluate effects of policy changes.

In the specific context of knowledge intensive entrepreneurship, incubators are likely to play a central role in fostering firm survival, growth and high growth. We probably need incubators that work in several stages to better address the needs of new firms. There is clearly a need for traditional incubators that help the new firm developing a new technology into a new commercial advantage based around a tentative business model. However, many new firms need help to get to the next stage if they chose to do so. Hence, there is a

clear need for a second stage or high growth incubator where new firms can access this specific pool of resources and capacities. The type of competences needed for establishment and rapid growth are different. The first stage of the incubator focuses on establishment and proof of concepts whereas as the second stage incubator focuses on organizational development and scalability to support profitable growth.

Future research efforts from an evolutionary perspective on entrepreneurship

Entrepreneurial aspirations and realised growth. A limitation of our previous investigation of secondary data is that we cannot assess entrepreneurial motivation to engage in firm growth, something which has been shown important for the general population of entrepreneurs (c.f. Stam & Wennberg, 2009; Wiklund et al., 2003). Future studies of firm growth should therefore focus on disentangling the attitude and disposition of individuals to start growth-oriented firms, versus starting a small business in general (Pathak, Autio & Wennberg, 2010). Further, institutional effects are assumed to shape the economic behaviour of firms and individuals, but we know little about the meso-level linkages by which perceptions are constructed from the macro to the group to the individual level. Many of these explanations focus on differences in the institutional features of local labour and supply of capital (Autio & Acz 2007; Stuart & Sorenson, 2003) but little research to date has attempted to show how these features flow from the societal or regional level to individual entrepreneurs. An important future goal for multi-level investigations of entrepreneurial behaviour henceforth concerns how perceptions as socially constructed phenomenon might effects entrepreneurs' willingness to start, growth, or exit their firms.

Individual's motivation for entrepreneurship in the modern knowledge economy. While we have seen many types of entrepreneurship becoming more prevalent in the last two decades, the majority of such efforts are still miniscule and on a part-time basis (Folta et al., 2010). This development highlights a recent debate in the academic literature whether there is something fundamentally "new" in regards to the "new knowledge economy" or not. Some argues that the rise of the knowledge economy represents one of the most important structural changes in working life since the shift from an agrarian to an industrial society (Piore & Sable, 1984). Others argue that this shift in work-life conditions mean that while some of the self-employed are highly skilled entrepreneurs who can choose between various types of occupational arrangements, other have a with weaker labour market positions and are more or less 'pushed' into self-employment (cf. Hughes, 2003; Steinmetz & Wright, 1989). While some recent research in entrepreneurship, labour market sociology and labour economics have investigate what types of new types of jobs and novel forms of work organization have emerged in recent years, much of this research is still very theoretical or empirically cross-sectional in nature. Comparative studies has shown that this heterogeneity affects work-life conditions *between countries*, but less evidence has been given to how work-life conditions change *within countries over time*. For example, McManus (2000) showed in a comparative study between Germany and the United States that self-employed in the United States benefit from exploiting the increased demand for knowledge-intensive services, but at the same time, more loosely structured labour markets and weaker worker protections means that the proportion of low-paying, unstable jobs was more prevalent in the United States. This indicates a strong need for further research on how changing labour markets, occupational mobility, and new forms of work organization affect the conditions for entrepreneurship.

The accumulated evidence in both our own work and other international studies indicate that entrepreneurship as a phenomenon is becoming much more heterogeneous than just a few decades ago (Arum & Muller, 2004; Parker, 1997). This change concerns the shift to service-based economy and the loosening of boundaries between occupational arrangements and types of work (Kalleberg, 2000). This highlights the need for further research on individual's motivation for entrepreneurship in the knowledge economy. The degree to which new types of jobs and entrepreneurship are in fact causally related to the emergence knowledge intensive economy still not clear. Furthermore, how new types of work arrangements differ from older ones is still the subject of academic debate (Kochan & Barley, 1999). In future studies we therefore hope to dwell more into the minds and hearts of individual entrepreneurs, enquiring how the evolution of new enterprises originate from the dreams, ambitions, fears and aspirations of these individuals.

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