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Innovative entrepreneurship policy: linking innovation and entrepreneurship in a European context

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Today it is a well-established fact that small- and medium-sized enterprises (SMEs) are important for economic growth and renewal. The ‘carrying out of new combinations’ may, however, have less to do with the size of a firm or organization, instead ‘newness’ in the form of innovation and entrepreneurship has again caught the attention of many academics and policymakers. Even so it is argued in this paper that the two areas of innovation policy and entrepreneurship policy (both relatively recent as distinct policy areas) are seldom integrated and the concept of ‘innovative entrepreneurship policy’ has not yet fully emerged. This paper attempts to make a bridge between and integrate innovation and entrepreneurship policy. The paper presents an overview of innovation and entrepreneurship policies as derivatives of other policy areas, hinting at why it might be problematic to integrate an innovative entrepreneurship policy into existing policy areas. It is argued that public policy promoting innovation and economic growth must also involve instruments promoting entrepreneurship. Since this task is not easily accomplished, the concept of an Innovative entrepreneurship policy is also introduced in the discussion. It is argued that policies in favor of ‘innovative’ entrepreneurship should be considered in the context of a ‘holistic’ entrepreneurship policy framework. For innovative entrepreneurship to be able to fully contribute to economic growth and development it is suggested that its importance will need to be further acknowledged in innovation as well as entrepreneurship policies.

Keywords: *small- and medium-sized enterprises; science and technology; innovative firms; entrepreneurial firms; start-ups; growth*

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Globalization and the shift toward knowledge as the source of competitiveness have rendered traditional policy instruments less effective (Gilbert, Audretsch, & McDougall, 2004). Traditional economic/industrial policies can no longer guarantee high growth and employment, certainly not for all regions and locations. Instead, both innovation and entrepreneurship policy have caught the attention of policymakers at different governmental levels, e.g. local, regional, national, and supranational. Both are considered vital for economic growth and industrial renewal and rank high on government policy agendas. Also their combination (i.e. innovative entrepreneurship) is a phenomenon that has become increasingly important, especially in the last decade.

There are many examples of highly successful innovations stemming from small enterprises, which have

revolutionized entire industries. Start-up companies, young entrepreneurs, university spin-offs, and small highly innovative firms more often than not produce the major technological breakthroughs and innovations, leaving behind the R&D efforts and innovation strategies of large global corporations (Ortega-Argilés & Voigt, 2009). It has been argued that entrepreneurship takes on new importance in a knowledge economy because it serves as a key mechanism by which knowledge created in one organization can become commercialized in another (new) enterprise (Audretsch, 2004; Lindholm, 1994; Lindholm Dahlstrand, 1997). New and small firms also serve as important vehicles for knowledge spill-overs when their ideas, competencies, products, strategies, innovations, and technologies are acquired, accessed, and commercialized by larger enterprises (Lindholm,

1994, Ortega-Argilés & Voigt, 2009).¹ Audretsch (2004) argues that small firms as the engine of innovative activity reflects changes in technology, globalization, and other factors that have fundamentally altered the importance and process of innovation and technological change. Small- and medium-sized enterprises (SMEs) and entrepreneurship continue to be a key source of dynamism, innovation, and flexibility in advanced industrialized countries, as well as in emerging and developing economies (Ortega-Argilés & Voigt, 2009).

Even so, the two areas of innovation policy and entrepreneurship policy, both relatively recent as distinct policy areas, are seldom integrated and the concept of 'innovative entrepreneurship policy' has not yet fully emerged. For innovative entrepreneurship to be able to fully contribute to economic growth and development, its importance will need to be further acknowledged in innovation as well as entrepreneurship policies (Audretsch, 2004). This paper attempts to make a bridge between and integrate innovation and entrepreneurship policy. Since this task is not easily accomplished, the concept of an innovative entrepreneurship policy will also be introduced in the discussion. We will start with an overview of innovation and entrepreneurship policies as derivatives of other policy areas, hinting at why it might be problematic to integrate an innovative entrepreneurship policy into existing policy areas. In the following section, we will discuss innovative entrepreneurship and innovative entrepreneurial firms, leading to some suggestions regarding the emergence of an innovative entrepreneurship policy. In the last sections, the paper will end with our conclusions and some implications.

Entrepreneurship and innovation policy as derivatives of other policy areas

Entrepreneurship and innovation policy are both derivatives of other policy areas. While entrepreneurship policy has emerged primarily from SME policy, innovation policy has largely evolved from science and technology (S&T) or research and development (R&D) policy.

Science, technology, and innovation policy

Technology is often attributed as one of the driving forces behind globalization (Bartlett & Goshal, 1996). With each wave of technological change the bar of knowledge required to obtain a level of sophistication changes. The result is generally a greater need for human capital, which has given rise to the increase in knowledge workers

(Gilbert et al., 2004). An economic landscape, characterized by the rise of international production, innovation networks, and the emergence of science-based technologies, has emerged. With the technology-driven boom of the 1990s, Germany and Japan have been replaced by the USA as the innovation policy exemplar. Here a vibrant capital market, an advanced system for intellectual property protection, and academic entrepreneurship seem to have become the role model for innovation policies (Larédo & Mustar, 2001).

Innovation policy, which has been growing in interest and emphasis since the mid-1990s, has largely evolved from S&T policy (OECD, 2006). The first generation of innovation policy, based on the 'science push' or 'linear model,' focused primarily on funding of science-based research in universities and government laboratories. The second generation of innovation policy adopted more of a 'demand-led' view based on interaction between users and producers of innovation in, what is referred to as, 'national innovation systems (NIS).' Since then, innovation policy has shifted toward an innovation systems perspective, including 'demand-pull' and interaction between users and producers of innovation. Innovation policy plays an important role in influencing innovation performance, but must be closely tailored to specific needs, capabilities, and institutional structures of each country (OECD, 2005a), i.e. the national innovation system.

The innovation system concept

There is no common definition of the innovation system concept. Typically the concept includes activities of private as well as public actors; linkages; the role of policy and institutions. The analysis is carried out at the national level: R&D activities and the role played by the universities, research institutes, government agencies, and government policies are viewed as components of a single national system, and the linkages among these are viewed at the aggregate level (Carlsson, Jacobsson, Holmén, & Rickne, 2002). Lundvall, Johnson, Andersen, and Dalum (2002, p. 220) 'find it useful to think about innovation systems in two dimensions. One refers to the structure of the system – what is produced in the system and what competences are most developed? The second refers to the institutional set-up – how does production, innovation, and learning take place?' The 'innovation system' concept can be understood in a narrow as well as a broad sense (Lundvall, 1992). The narrow sense concentrates on those institutions that deliberately promote the acquisition and dissemination of knowledge and are the main sources of innovation. The broad sense recognizes that these 'narrow' institutions are embedded in a much wider socio-economic system. The concept has become popular among several important policymaking organizations, for example, both the OECD and EU have absorbed

¹Both large and new/small firms fulfill important roles in the innovation process. A dynamic and well-functioning system of large and small interacting firms is important for innovativeness and economic growth (Lindholm, 1994; Rothwell, 1989). This system of large/small firm complementarity further emphasises the need to look not only at large firms or small firms, but in addition to look at the relationships between them.

Fig. 1. Summary Innovation Index based on European Innovation Scoreboard 2006 (European Commission, 2006b).

the concept as an integral part of their analytical perspective.²

Much of the literature on innovation systems insists on the central importance of national systems, but a number of authors have argued that globalization has greatly diminished or even eliminated the importance of the nation state (Freeman, 2002). As a result, there have been several new concepts emphasizing the systemic characteristics of innovation, but related to levels other than the nation state. Sometimes the focus is on a particular country or region which then determines the spatial boundaries of the system. The literature on 'regional systems of innovation' has grown rapidly since the mid 1990s (e.g. Cooke, 1996; Maskell & Malmberg, 1999). In other cases, the main dimension of interest is a sector or technology. Carlsson and Jacobsson (1997) developed the concept 'technological systems' while Breschi & Malerba (1997) use the notion of 'sectoral systems of innovation'. Usually these different concepts and dimensions reinforce each other and are not in conflict.

Despite this growing interest in systems of innovation there have been few attempts to include entrepreneurship as a central component (Golden, Higgins, & Lee, 2003). In Europe, all European Union (EU) Member States and candidate countries have committed to the Lisbon Agenda and increased their public R&D expenditure. Thus, in the 2000s, European innovation policy has become somewhat biased toward a science push or linear model, in which R&D is supposed to lead to increased innovation and entrepreneurship. For example, Arundel and Hollanders (2006) are critical of the fact that both the European policy community and academics interested in innovation continue to think of innovation primarily based on 'invention' (with R&D as the key

factor), and have failed to adopt modern innovation theory (with more emphasis on innovation as a process of diffusing new knowledge).

The third generation of innovation policy thinking calls for more horizontality, coordination and integration of innovation, and other policy domains (OECD, 2006) and stronger linkages with entrepreneurship as a component of the NIS (Golden et al., 2003) and through development of indicators to measure its importance as a driver of innovation (Arundel & Hollanders, 2006). Carlsson (2006) argues that in order to understand how successful innovation systems are in generating economic growth, one would have to include an assessment of the level of entrepreneurial activity and business formation outputs.

Both the OECD and the EU have produced considerable work on innovation policy in Member States and candidate countries. This includes discussions of the parameters of innovation policy (European Commission, 2002, 2003, 2006; OECD, 2002b), a description of NIS (OECD, 2002a), analysis of innovation policy measures in different countries (OECD, 2005a, 2005b, 2004), and publication of scoreboards to report on country performance against a set of benchmark indicators for innovation (European Commission, 2005a, 2005b, 2005c, 2005d, 2005e; Hollanders & Arundel, 2006). Primary among the scoreboards is the *European Innovation Scoreboard* (Fig. 1).

The European Innovation Scoreboard measures the innovation performance of a country's economy based on a wide range of indicators, from education to expenditure in Information and Communication Technologies, investment in R&D, and the number of patents. Countries with a more homogeneous behavior in all aspects of innovation tend to achieve higher overall scores. Practically all EU Member States excel in one or another dimension of innovation, but only a few of them (the innovation leaders, e.g. Sweden, Finland, Switzerland, Japan, and the USA) achieve an overall performance that grants

²It has been argued (e.g. Lundvall et al., 2002) that sometimes policymakers tend to favor the more narrow sense, ignoring important, and more complex aspects of the wider socio-economic system.

Fig. 2. Illustrative framework of innovation policy areas.

world innovation leadership. Also, according to the Euro-Creativity index, in Florida and Tinagli's (2004) study on 'Europe in the creative age,' the Nordic countries and some northern European countries (Ireland, the Netherlands, and Belgium) are performing well. This is confirmed in other studies, like the Global Innovation Scoreboard (2004) or the ranking in the Growth Competitiveness Index of the World Economic Forum (WEF), which shows Finland to be the most competitive country followed by the USA and Sweden, and which ranks the five Nordic countries among the top 10 ranked nations.

Innovation as a policy area

Innovation as a policy area is primarily concerned with a few key objectives: ensuring the generation of new knowledge and making government investment in innovation more effective; improving the interaction between the main actors in the innovation system (universities, research institutes, and firms) to enhance knowledge and technology diffusion; and establishing the right incentives for private sector innovation to transform knowledge into economic value and commercial success (Commission of the European Communities, 2005; OECD, 2002c). A review of innovation policy documents compiled by the OECD and the EU suggests that the framework for innovation policy could be illustrated as in Fig. 2. Here we find policy objectives for the increase of R&D intensity, the stimulation of climate and culture of innovation, as well as for the commercialization of technology. The last of these includes instruments and support which are important for many innovative start-ups, e.g. a support innovation infrastructure (such as technology transfer offices, science parks, and business/technology incubators), encourage the uptake of strategic technologies among SMEs; improve access to pre-commercialization funding and venture capital; and provide tax (e.g. R&D tax credits, favorable capital cost allowances) and other incentives and supports to accelerate the commercialization of new technologies and

products. As we shall demonstrate later in this paper, this framework is not dissimilar from that for entrepreneurship policy. The major difference may be the types of policy measures included within each of the framework boxes.

However, it is noted that policy measures to stimulate 'innovative' entrepreneurship are often of a different form than those to foster general entrepreneurial activity as are the target groups they seek to influence, and the composition of system members (Lundström & Stevenson, 2005; Stevenson, 2002). Of course, innovation policy is broader than policy to foster innovative entrepreneurship, especially regarding objectives such as those to increase R&D investments or encourage the uptake of strategic technologies.³ As Lundström and Stevenson (2005) observed, it is possible for governments to have policies for innovation that do not incorporate much consideration for policies to foster entrepreneurial capacity, not even for innovative entrepreneurship.

Small- and medium-sized enterprises (SMEs) and entrepreneurship

There is a long debate tracing back to the economist Josef Schumpeter about the role of small and large firms with respect to technological progress and innovation. While during the 1970s and early part of the 1980s the leading role of large enterprises was stressed amongst academics and policymakers, in the late 1980s and throughout the 1990s, the role and impact of SMEs was rediscovered. It is now well established that SMEs and entrepreneurship are important for economic growth and renewal (Acs, Audretsch, Braunerhjelm, & Carlsson, 2004; Birch, 1981; Davidsson, Lindmark, & Olofsson, 1994; Reynolds, Bygrave, Autio, Cox, & Hay, 2002; Wennekers & Thurik, 1999).

³For descriptions of innovation policy, see Arundel and Hollanders (2005) and OECD (2005a).

As mentioned, entrepreneurship policy has emerged primarily from SME policy, becoming particularly evident as a policy area in the late 1990s and early 2000s (European Commission, 1998, 2004a; Hart, 2003; OECD, 1998, 2001a; Stevenson & Lundström, 2002). Although it is the company's size that is the crucial criterion to distinguish SMEs from other enterprises, when considering SMEs, in particular, there is much more that matters, like the applied business model, occupied market segment, sector alignment, growth-orientation, etc. However, there is an aspect that is obviously more closely linked to the company's size than all the others: the 'age' of the company or – more precisely – the stage of the firm's life cycle (Ortega-Argilés & Voigt, 2009). In fact, it makes a difference whether an enterprise is classified as an SME because it is a very recently established firm (entrepreneurial start-up) or because the company's size is rather the result of a market adjustment process (e.g. a limited niche market). Since the majority of new firms are born small, it is natural that SMEs and entrepreneurial firms would, at least for a period of time, be seen as synonymous entities, and that SME policy and entrepreneurship policy would have overlapping domains, as illustrated in Lundström and Stevenson (2005). However, it is important to remember that there are also differences between SMEs and entrepreneurial firms; not all entrepreneurial firms stay small. Just as there are differences between SME policy and entrepreneurship policy.

Whereas the main objective of SME policy is to protect and strengthen existing SMEs (i.e. firms), entrepreneurship policy emphasizes the individual person or entrepreneur. Thus, entrepreneurship policy encompasses a broader range of policy issues geared to creating a favorable environment for the emergence of entrepreneurial individuals and the start-up and growth of new firms. A critical issue for entrepreneurship policy is how to encourage the emergence of more new entrepreneurs and growing firms.

New firm creation

Both the creation and the expansion of new firms affect employment and economic growth. Among the first to arrive at this conclusion was Birch (1981). He conducted an extensive analysis of all American firms in the period 1969 and 1976, and found that small firms were responsible for 81% of net new job creation. His finding has been confirmed by studies of entrepreneurial activity and firms in many other countries, demonstrating positive links between entrepreneurial activity and growth (e.g. the GEM studies, Davidsson et al., 1994; Reynolds et al., 2002; Wennekers & Thurik, 1999). This relationship has been further underlined in a number of regional studies (Reynolds, Hay, & Camp, 1999). It is often argued that the key to economic growth and

productivity improvements is entrepreneurial capacity. It is now generally accepted that entrepreneurship contributes to achieving higher levels of economic development. For instance, using data of 18 European countries, Audretsch, and Beckman (2007) and Audretsch, Thurik, Verheul, and Wennekers (2002) conclude that lagging behind in the process of economic restructuring from larger to smaller firms comes at an economic cost.

However, the majority of business start-ups are set up by 'lifestyle entrepreneurs' whose businesses will not grow beyond a very small size. It is often the case that a small number of rapidly growing new and young firms contribute disproportionately to the net employment effects (Hölzl, 2006; Schreyer, 2000; Storey, 1994). This suggests that it is not only the frequency of entrepreneurial firms that makes the difference for employment generation but also the quality and growth-potential of new firms. What produces this high quality is largely unclear.

With respect to company creation, the EU economy is – compared to the USA – characterized by a lack of entrepreneurial spirit; commonly referred to as the 'entrepreneurial gap.' The Flash Eurobarometer 2005 survey on entrepreneurship pointed out that only 4% of Europeans were involved in setting up a business in the past three years, yet almost half of Europeans say that they would prefer to be self-employed. The Global Entrepreneurship Monitor (GEM) 2004 report (Acs et al., 2004) concluded that changing the entrepreneurial mindset was one of the most important challenges in the EU. A less positive attitude toward entrepreneurship (i.e. compared to other OECD countries) was found to be linked to relatively high employment security and an aging population. The report also argued that complex regulations hinder the creation, growth, and expansion of new businesses in the EU; and that the pervading culture and reward system penalizes the commercialization of knowledge created in research institutions.

Entrepreneurship in Europe

Repeated measurements in the GEM (Acs et al., 2004; Bosma & Harding, 2007; Delmar & Aronsson, 2000; Minniti, Bygrave, & Autio, 2006; Reynolds et al., 2002) show that Sweden has one of the lowest levels of adult population entrepreneurial activity. Despite this low figure it has been concluded that the major share of net new jobs in Sweden (approx 70% in the 1980s) were in firms with less than 200 employees (Davidsson et al., 1994). Around a third of these were created by the establishment of new firms, and two thirds by the expansion of small firms. Moreover, it seems that the growth patterns of many new and/or small firms in Sweden differ from those in other countries. For example, Storey (1994) found that relatively few new British firms expand, but that these few are responsible for a

Fig. 3. Framework of entrepreneurship policy areas.

substantial part of overall employment growth. It has become common to refer to such firms as ‘gazelles.’ Sweden has few gazelles, but in Sweden it seems to be the large number of slowly growing new/small firms rather than the gazelles, that are responsible for the majority of net new job creation (Blixt, 1997; Davidsson, Lindmark, & Olofsson, 1996; Delmar et al., 2001). Obviously country context matters considerably.

Admittedly, the entrepreneurial spirit in Europe compared to that in the USA and Asian countries might be different. No doubt, with respect to the prosperity of the EU, it would be more than welcome to stimulate the entrepreneurial spirit of European citizens. However, enhancing entrepreneurship in Europe is very difficult, particularly from a policymaker’s perspective, because it can be achieved only step-by-step and may take a lot of time and efforts and, thus, remain among the major challenges for a long time (Ortega-Argilés & Voigt, 2009). A number of corresponding measures is already implemented or at least scheduled at various institutional levels, for example, founder seminars; management training sessions; implementing lectures in entrepreneurship at universities, business schools and colleges; providing contact points; etc. Nevertheless, a lot still remains to be improved, particularly the entrepreneurial and management skills of company founders. In the Digest of Industrial Research (Ortega-Argilés & Voigt, 2009) it is argued that since a great many potential entrepreneurs hesitate to actually launch their own businesses due to their perceived lack of skills, as well as the existence of different entry/exit barriers, any efforts to focus on enhancing the entrepreneurial spirit in Europe are to be more promising if they first tackle such concerns.

Entrepreneurship as a policy area

Entrepreneurship policy, then, is primarily concerned with creating an environment and support system that will foster the emergence of new entrepreneurs and the start-up and early-stage growth of new firms (Lundström

& Stevenson, 2005; Stevenson & Lundström, 2002). The framework of entrepreneurship policy measures (Fig. 3) includes policy actions in six areas: (1) promotion of entrepreneurship; (2) reduction of entry/exit barriers; (3) entrepreneurship education; (4) start-up support; (5) start-up financing; and (6) target group measures (Stevenson & Lundström, 2002). Major policy instruments and measures in this policy area include those to remove administrative and regulatory to new firm entry and growth,⁴ improve access to financing⁵ and to information, and other support infrastructure and services.⁶ To promote a culture of entrepreneurship, expose more students to entrepreneurship in the education system, and remove barriers to entrepreneurship among specific target groups within the population are further examples of major policy instruments (Gabr & Hoffman, 2006; Lundström & Stevenson, 2005).

When presenting their Entrepreneurship Policy typology, Stevenson and Lundström (2002) included four different categories of entrepreneurship policy. The first of these is the ‘SME Policy “Add-on”,’ in which case initiatives to respond to the needs of starting firms or the broader stimulation of entrepreneurship are ‘added-on’ to existing SME programs and services, but at a somewhat marginalized and weakly resourced level.

The second is the ‘New Firm Creation Policy,’ in which case the government focuses on measures to reduce administrative and regulatory (government) barriers to business entry and exit, and generally simplify the start-up process so more people are able to pursue that path.

In the “Niche” Entrepreneurship Policy’ the government formulates targeted measures to stimulate the level

⁴Policies affected include competition policy, the time and cost of starting a business, company law, bankruptcy law and regulations, labor market and social security policies, tax policy, procurement policy, etc.

⁵Including pre-seed, start-up, and growth financing.

⁶Which include, e.g. entrepreneurship training, counseling, advice and technical assistance, and enterprise and incubator centers.

of business ownership and entrepreneurial activity around specified groups of the population. There are two types of targets for niche policies, (a) segments of the population which are under-represented as business owners (e.g. women, youth, ethnic minorities, unemployed, etc.) where the objective is to address identified social, systemic, or other particular barriers to entry; and (b) 'techno-starters' where the objective is to encourage high-growth potential businesses based on R&D, technology or knowledge.

Finally, the "Holistic" Entrepreneurship Policy' is a comprehensive policy approach encompassing the full range of entrepreneurship policy objectives and measures.

Clearly, the 'Niche' Entrepreneurship Policy addressing 'techno-starters' is highly relevant when discussing Innovative entrepreneurship policy. However, which will be further discussed in the next section, the effectiveness of a niche policy as a stand-alone policy may be impeded if the entrepreneurial culture is under-developed. Bear in mind that, similar to what was earlier argued about the role of an Innovation policy (in the section on Science, Technology, and Innovation), Entrepreneurship policy plays an important role in influencing entrepreneurial performance, but the policy should be closely tailored to the specific needs, capabilities, and institutional structures of each country/region and innovation system.

Linking entrepreneurship and innovation

Entrepreneurship and innovation are closely linked. Much of entrepreneurial activity most assuredly involves innovation, and, likewise, entrepreneurs are critical to the innovation process. In addition, the turbulence (creative destruction) produced by a high rate of business entry and exit activity is in itself associated with higher levels of innovation in an economy. It is possible to observe convergence between innovation and entrepreneurship policy, particularly when the policy goal is to foster new high-growth innovative firms. In this section we will discuss the start-up of innovative and rapidly growing firms, as well as how public policy can be deployed to promote innovative entrepreneurship.

The innovative entrepreneurial firm

SMEs have not become obsolete as a result of globalization, but rather their role has changed as the comparative advantage has shifted toward knowledge-based economic activity (Audretsch & Thurik, 2001). Large manufacturing corporations in high-cost locations have lost much of their competitive advantage, and small entrepreneurial firms account for a disproportionate share of new product innovations (Audretsch, 1995). For example, European SMEs conduct a growing share of R&D, although they still lag behind large firms in most OECD countries. The European SMEs account for a

higher share of R&D than in the USA and Japan, performing 22% of business R&D in 2002 (European Commission, 2005a, p. 40). The higher concentration of R&D expenditure in European SMEs should not be a problem if this supports company growth. Empirical evidence, however, shows that, if some SMEs (particularly innovative or so called 'high-tech's') can grow rapidly and become crucial players in many industry sectors, the typical growth path of such a SME is likely to be more successful in the USA than in Europe (Ortega-Argilés & Voigt, 2009). According to data on the growth paths of large companies in both the EU and the USA, only 16% of the EU-15 current largest companies were established after 1980, compared to 30% in the USA. Out of these large European companies created after 1980, only 37% were entrepreneurial firms (the remainder being the result of mergers and acquisitions), compared to 82% in the USA (Cohen & Lorenzi, 2000, European Commission, 2005a). The data confirms that Europe lags behind when it comes to the creation of high-growth innovative entrepreneurial firms. It suggests once again that Europe lacks both an entrepreneurial spirit and the ability to grow innovative entrepreneurial start-ups into large firms.

Waasdorp (2002) makes the distinction between 'innovative' versus 'ordinary' entrepreneurship, suggesting that these two types of entrepreneurship may result in different economic outcomes. The main contribution of ordinary entrepreneurship, most often characterized by the 'lifestyle' entrepreneur mentioned earlier, is job creation. Innovative entrepreneurship is more likely to lead to higher value-added jobs and wealth creation and firms with higher growth rates, the founders perhaps more compelled toward growth by the opportunity of the venture and its innovativeness (Stevenson, 2002). On the other hand, ordinary entrepreneurship can be the seed-bed for growth businesses.

Kirchhoff (1994) locates lifestyle entrepreneurs in the 'economic core' in his 'Dynamic Capitalism Typology' of entrepreneurial firms (Fig. 4). The 'economic core' firms

Fig. 4. 'Dynamic Capitalism Typology' of entrepreneurial firms (Kirchhoff, 1994).

(quadrant I) represent the majority of SMEs and form the base of economic activity. In general, they grow to the size that satisfies the owner and then stop. The Ambitious firms (quadrant IV) look like the economic core-firms in the start-up phase, but the entrepreneur heading the firm has ambitions for growth. The Glamorous firms (quadrant III) continuously introduce innovations and are easily identified by their investments in R&D.

In the constrained growth firms (quadrant II), growth is not achieved and firms are unable to access the resources needed for growth. This is mainly because they are either resource-constrained (quadrant IIa) or internally constrained (quadrant IIb). In the resource-constrained firms, resources have not been available because of limited financial markets (e.g. seed and venture capital) or poor information. In the internally constrained firms, the owner is usually unwilling to accept the terms (e.g. price and/or ownership) on which resources are available. There are many unsuccessful examples when public funding has been offered to the internally constrained firms, especially university spin-off companies, but where this seed or venture capital has not resulted in helping these firms to grow. Better results are likely if the resource-constrained firms could be identified for venture capital investments.

To test his typology, Kirchoff (1994) analyzed a cohort of American firms and found that innovative new firms are more likely to encompass high quality and, thus, to become high-growth firms or 'gazelles.' Thus, a relatively large proportion of highly innovative new firms appear to have high-growth rates. In the same analysis, however, he also found a higher number of high-growth new firms among low innovation companies. One reason for this, of course, is that there are many more low innovation new firms than there are high innovation firms. Many governments want more entrepreneurial activity of the innovative, high-growth potential kind. This, in many instances, leads to the targeting of government support for higher-growth potential, technology-oriented sectors. It has been argued that encouraging the effective combination of entrepreneurship and technology capability needed to create high-technology SMEs, that is, fostering appropriate sources of finance and enabling the market access and business transformations needed for their subsequent development and rapid growth, would seem to present innovation policymakers with their biggest challenge (OECD, 2004).

Using the GEM data in an international comparison of 'High-Expectation Entrepreneurial Activity' (HEA), Autio (2005) found that only between 3 and 17% of all entrepreneurial activity consists of entrepreneurs (with nascent or baby businesses⁷) who expected to have more

than 20 employees within 5 years. This corresponds to only some 0.2–1.6% of the adult-age population actively participating in HEA. In general, countries with a high Total Entrepreneurial Activity (TEA) level also have a high level of HEA. But, interestingly, countries like Sweden and the highly developed parts of Asia (with a very low TEA), perform relatively well in measurements of HEA (12–13%). Nevertheless, the share of adults participating in entrepreneurial activity in these countries, in general, as well as in HEA, is low in international comparisons. The explanation seems to be that high-income countries with a very low TEA (such as Sweden and Japan) often have a relatively high share of high-growth expectation new firms. High-expectation entrepreneurship is relatively more prevalent in manufacturing and business services, and high-growth expectation businesses are often created by entrepreneurs who left gainful employment to start the business. In addition, Autio (2005) found that the employment expectations of HEA entrepreneurs accounted for up to 80% (Sweden and USA 77%, highly developed Asia 68%) of total expected jobs by all entrepreneurs with nascent and baby businesses. He argues that this pattern is consistent with empirical studies on actual job creation and that it underlines the importance of high-growth potential entrepreneurial activity for job creation.

Innovative entrepreneurship policy

It is possible to observe potential convergence between innovation and entrepreneurship policy, particularly when the policy goal is to foster the start-up of innovative, technology-based and rapidly growing knowledge-based enterprises. In fact, Lundström and Stevenson (2005) noted the emergence of 'innovative entrepreneurship' as a policy priority of several governments in their 13-economy examination of entrepreneurship policy. In principle, all the EU Member States now support the development of small research-intensive firms. The fall-out of this is that much of the policy and support measures are research-related rather than innovation-focused. As a matter of fact, Europe is not lacking in inventiveness; it is lacking in innovation (OMC-SME Expert Group, 2004) and entrepreneurial activities/spirit, and, in this sense, existing policies and support measures are still insufficient.

Evidence exists to support the idea that innovative entrepreneurship is likely to be more effective in environments conducive to high levels of general entrepreneurial activity, that is, in environments where entrepreneurship is highly valued and supported by society. Kirchoff (1994) makes the case that if there is a high density of firms with fewer than 20 employees, innovative, high-growth firms will emerge. Clarysse, Heirman, and DeGroof (2000) found in their study of spin-off firms in different regions, that the entrepreneurial climate in a

⁷In the GEM research, a baby business is defined as a young firm less than 42 months old.

region, to a large extent, determined the number of start-ups and early growth of research-based spin-off firms.

The extent of adoption of innovation policy and entrepreneurship policy varies considerably across countries (Lundström and Stevenson, 2005; OECD, 2005a). Innovation policy, like entrepreneurship policy has different meanings to different governments, thus, the policy instruments and measures encompassed in their policy implementation also vary widely from one government to another. Governments also vary widely in their selection of policy instruments and measures within each area, depending on a range of factors. Evidence of this diversity in the entrepreneurship policy area was clear in Stevenson and Lundström (2002) and Lundström and Stevenson (2005) who were able to more precisely define the entrepreneurship policy area. The review of innovation policy developments across Europe suggests that this diversity is also the case for innovation policy (European Commission, 2004b).

In various pieces of work, the interdependencies of entrepreneurship and innovation have been linked (Fig. 5). The 2001 OECD Growth Study identified entrepreneurship and innovation as two of the four microeconomic drivers of economic growth in the knowledge-based economy (the other two being human capital and ICT). Hoffman (2005) identifies entrepreneurship as one of the four drivers of innovation,⁸ together with human resources, knowledge building and sharing, and ICT. Gabr and Hoffman (2006) propose there are five drivers of entrepreneurship: opportunity, abilities, capital, incentives, and culture, each one influenced by a comprehensive list of policy instruments. From this, they have developed a general policy framework of the growth drivers of entrepreneurship, which they define more in terms of innovative (high growth) entrepreneurship rather than small business. In the view of Arundel and Hollanders (2005), entrepreneurship is possibly one of the most important drivers of innovation, yet one of the most difficult to measure because it involves attitudes to risk, opportunities that reduce risk, receptiveness to new ideas, and access to capital.

Governments will have to assess the risk of making a policy choice in favor of innovative entrepreneurship. Since innovative entrepreneurship is a niche policy area targeted primarily at the better-educated segments of the population, other 'niche' groups (e.g. under-represented groups) may become secondary policy targets and the economic opportunity from potentially successful entrepreneurial activity hampered (not that the two target groups are mutually exclusive). Lundström and Stevenson

(2005) conclude that policies in favor of 'innovative' entrepreneurship should be considered in the context of a 'holistic' entrepreneurship policy framework. Such a policy addresses a range of issues, such as societal support for an entrepreneurship culture; promotion of entrepreneurship; entrepreneurship education in the schools. Also general administrative, regulatory and legislative barriers to business entry, flexible labor markets, seed and start-up financing, as well as business support measures for the development of nascent entrepreneurs in their pursuit of any manner of business idea, need to be addressed. The effectiveness of 'innovative entrepreneurship' (or technostarter) policy as a stand-alone policy may be impeded if the culture for entrepreneurship is under-developed, the density of business owners too thin, the full range of education support missing, and so on. Also, a sole focus on opportunities in high technology sectors may well overlook growth opportunities in lower and non-technology areas (Balje & Waasdorp, 1999).

Earlier research suggests that a well-functioning policy should be either (a) encouraging entrepreneurship in general or (b) focusing comprehensively on the creation of high-growth firms (which can necessitate a costly system). For example, Clarysse, Wright, Lockett, Van de Vele, and Vohora (2005) found that policy initiatives to support incubators in an attempt to support innovative entrepreneurship via academic spin-offs, but without having the required resources, were the most unsuccessful and those with a less costly entrepreneurial enhancing policy were much more effective. Thus, an innovative entrepreneurship policy should be very clear on whether it is aiming to encourage the creation of a large number of entrepreneurial firms or if it is designed to facilitate the creation of a smaller number of rapidly growing firms. These policies, and the programs necessary to achieve them, are likely to be quite different. If policies focus solely on the gazelles, this risks losing sight of the importance of the phenomenon (Mustar, 2001). Policies and programs that are effective in creating both a large number of new firms and, at the same time a high number of high-growth firms, are not very likely, at least not without high costs. There is a need to know more about the role played by innovative entrepreneurship in society and about the direct and the indirect effects of these firms. The indirect effects of, for example, academic spin-offs acting as research boutiques, might be of high importance for economic renewal and growth.

Innovative entrepreneurship policy targets

In designing an Innovative entrepreneurship policy it may be important to differentiate between the needs of new entrepreneurial firms and other SMEs, since not all entrepreneurial firms stay small. In the 'Dynamic Capitalism Typology' presented above, it was argued that both high- and low-innovative new firms have the potential of

⁸In listing the framework conditions for entrepreneurship, Hoffman (2005) mentions incentives (income tax and bankruptcy regulation), secondary markets, entrepreneurship education, and entrepreneurship culture.

Fig. 5. Drivers of economic growth, innovation and entrepreneurship.

becoming high-growth firms; but it is relatively more common that a high-innovative new firm becomes a high-growth firm. Even so, since there are several times as many low-innovative new firms, there are in general a higher number of high-growth firms among the low-innovative ones (i.e. the Ambitious firms). A critical issue for these entrepreneurial firms (i.e. young but not

necessarily SMEs for a very long time) is to stay competitive (without a particular focus on innovation and R&D). This group of firms might be the most suited for policies trying to increase SME R&D and innovation. Thus, in order to increase economic growth through innovative entrepreneurship there are at least three important policy options (Fig. 6):

Fig. 6. Innovative entrepreneurship policy targets.

- increasing entrepreneurship in general (entrepreneurial climate, education, etc.) (*all quadrants, I to IV*)
- increasing the frequency of high-growth firms (resources, financing, networking, etc.) (*quadrants I, IIa and IIb*); and
- increasing innovation and R&D in SMEs (networking, universities, etc.) (*quadrants I and IV*).

Thus, in order to create an innovation friendly and entrepreneurial environment that will contribute to increased economic growth, it is important that not all SMEs are treated as a homogenous group. It would be beneficial to identify, for example:

- new firms and SMEs; small firms and entrepreneurial firms are often different;
- trends in entrepreneurship and SME activities;
- ambitious firms with high growth, but with a need to strengthen innovativeness and R&D, perhaps by public support programs, linking to universities, incubators, etc.;
- internally and resource-constrained firms that are high-innovation but low-growth. The internally constrained firms are not very likely to start growing in response to seed- and venture capital; and
- resource-constrained firms may benefit from venture capital, but also by networking with large firms (e.g. for internationalization).

As argued by Ortega-Argilés and Voigt (2009) it seems that the problem should not be seen in terms of the amount of assistance but rather in the way this assistance is actually provided, and how it affects the market and the behavior of market participants. Already the large number of unlinked measures and support causes problems. Many entrepreneurial firms and SMEs fail to grasp an overview of all available measures and/or cannot deal with the complicated and time consuming procedures to access them. This may lead to the absurd situation that a more innovative firm may fall behind a competitor in terms of internally available financial

resources simply because it might have been concentrating on performing research and building the business instead of applying for support to do it.

Concluding remarks

To sum up, it has been argued that both entrepreneurship and innovation are linked to economic growth and industrial renewal. But it is not entirely evident exactly how. Often the relationships between growth, entrepreneurship and innovation tend to be indirect rather than direct. Today it is a well-established fact that SMEs are important for economic growth and renewal. The ‘carrying out of new combinations’ may, however, have less to do with the size of a firm or organization; instead ‘newness’ in the form of innovation and entrepreneurship has again caught the attention of many academics and policymakers. Much of entrepreneurial activity most assuredly involves innovation. Likewise, entrepreneurs are critical to the innovation process and entrepreneurial capacity is a key element in the transfer of knowledge in the commercialization process (Acs et al., 2005; Audretsch & Thurik, 2001). The turbulence (creative destruction) produced by a high rate of business entry and exit activity is in itself associated with higher levels of innovation in an economy.

A main argument in this paper is, however, that the two areas of innovation policy and entrepreneurship policy (both relatively recent as distinct policy areas) are seldom integrated and the concept of ‘innovative entrepreneurship policy’ has not yet fully emerged. The examination of existing work on Entrepreneurship and Innovation policy, suggests that an important direction for the future is to link the two to each other. It is argued that public policy promoting innovation and economic growth must also involve instruments promoting entrepreneurship. For innovative entrepreneurship to be able to fully contribute to economic growth and development, it is recommended that its importance will need to be further acknowledged in innovation as well as entrepreneurship policies.

The combination of entrepreneurship and innovation results in innovative entrepreneurship: new firms based on new (inventive) ideas, and sometimes, but not always, research-based. Such firms often have relatively high-growth potential and may become future gazelles. Thus, the encouragement of innovative entrepreneurship has caught the attention of both policymakers and academics. In this paper it is, however, argued that policies in favor of ‘innovative’ entrepreneurship should be considered in the context of a ‘holistic’ entrepreneurship policy framework. The effectiveness of ‘innovative entrepreneurship’ policy as a stand-alone policy may be impeded if the culture for entrepreneurship is underdeveloped, the density of business owners too thin, the full range of education support missing, and so on. Thus,

in order to increase economic growth through innovative entrepreneurship it is suggested that at least three alternatives are considered. The first of these includes the encouragement of entrepreneurship in general. Not only does the establishment and expansion of new firms create additional new jobs, an increased general entrepreneurial activity is also likely to result in a higher number of innovative high-growth firms. The two other options discussed are niche policies focusing on either increasing the frequency of high-growth firms among the innovative ones or on increasing R&D and innovative activities among low growing firms. All three alternatives can increase innovative entrepreneurship, but the actual policy instruments are very different.

Policy implications

One of the challenges for governments is to determine what actions or combinations of actions will most appropriately address the salient direct and indirect barriers to achieving higher levels of entrepreneurship and/or innovation, given their idiosyncratic set of country contextual and structural circumstances. Because entrepreneurship is relatively new as a concrete policy domain, systematic approaches to an empirical examination of this are particularly rare.

In most countries the entrepreneurship policy and innovation policy areas are not integrated. Much of the research work related to entrepreneurship and innovation is pursued by different researchers and policies are, more often than not, designed and implemented by different ministries within national governments. One area of policy does not explicitly address the concept of the other, although higher levels of entrepreneurial and innovation activity have separately been identified as critical contributors to future economic growth, and both areas of policy may capture the general objective of 'boosting value creation.' However, these two areas of policy are certainly interrelated and in some cases overlapping. For how can innovation be effectively fostered without paying attention to building a country's entrepreneurial capacity? Likewise, how can a country's innovation performance be improved without a supply of entrepreneurs and managers with S&T backgrounds and business experience, and venture capitalists with the ability to effectively assess investments in technology-based companies and to provide well-founded advice and guidance?

What is called for from a policy perspective are 'platform policies' and 'holistic entrepreneurship policy' (Lundström & Stevenson, 2005) that include and integrate key components from several policy domains. Improving innovative entrepreneurship will – at the least – require a combination of entrepreneurship, SME, innovation, S&T, education/university, and regional policies (Fig. 7). For example, SME policies are often

developed to help existing small firms, while entrepreneurship policies focus on individuals and their entrepreneurial capacity (e.g. skills and motivation). An education/university policy is important since universities are responsible both for the education of a large part of future key personnel, and for a substantial part of the advancement of science, R&D, and innovation. Thus, the technological/knowledge profile and responsiveness of a (strong) university will influence the supply of innovative entrepreneurship and the profile of a dynamic region/country. In turn, innovation policy must, of course, include aspects linked to universities.

There are many prescriptions about what governments in general should do to foster entrepreneurship/innovation, such as promote role-models, integrate entrepreneurship in the education system, reduce the time and cost of starting a business, increase the percentage of science and engineering graduates, ease the intellectual property regime, foster more cooperation between research institutes and entrepreneurs, and so on, but there are few studies of governments' actual policy practices.

The lack of scientific work on how to evaluate policy on a national or regional level is becoming more and more evident. Many evaluations have been done on a measure-to-measure level, but very little has been done on a more comprehensive, systemic level. Therefore, we hope that the ongoing empirical work of the European innovation policy research for economic growth study (IPREG) will provide an important source of knowledge on how entrepreneurship and innovation policy – as a wide-ranging system – can enhance competitiveness and growth and how policies are adapted to different contexts. Ideas presented in this paper, together with the empirical work of the IPREG project, may build a basis for future public policy instruments promoting innovation, entrepreneurship, and economic growth. It is suggested that future research needs to explicitly identify what exactly those instruments are and how public policy can best be deployed to promote innovative entrepreneurship.

Fig. 7. Creating a 'holistic' innovative entrepreneurship policy?

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