CESIS

Electronic Working Paper Series

Paper no 13

RELATING ENTREPRENEURSHIP TO ECONOMIC GROWTH [1]

CHARLIE KARLSSON, CHRISTIAN FRIIS AND THOMAS PAULSSON

(CESIS/JIBS)

September 2004

The Royal Institute of technology
Centre of Excellence for studies in Science and Innovation
http://www.infra.kth.se/cesis/research/publications/working papers
Corresponding author: charlie.karlsson@jibs.hj.se

[1] Status of the paper: The paper is forthcoming (2005) in The Emerging Digital Economy: Entrepreneurship, Clusters and Policy, Springer-Verlag, Berlin (2005). Editors: B. Johansson, C. Karlsson & R.R. Stough)

Relating entrepreneurship to economic growth

Charlie Karlsson,[*] Christian Friis [φ]and Thomas Paulsson[⊥]

September, 2004

Abstract

The entrepreneur is an elusive character in economic theory due to the difficulty of providing an accurate description. It appears impossible to produce a single definition of entrepreneurship and most theoretical approaches yield operational difficulties. By the same token, most operational definitions are incomplete and cover only single parts of the concept. Numerous empirical studies have examined the effects of entrepreneurship, but few studies have been undertaken in order to summarise the empirical evidence and synthesize the theoretical framework and the empirical results. The objective of this paper is to provide a critical overview of recent empirical research on the relationship between entrepreneurship and economic growth.

Keywords: Economic Growth, Innovation, Competition, Start-ups, Entrepreneurship
JEL Codes: M13, O31, O40, L10.

[*] charlie.karlsson@jibs.hj.se
[φ] Christian@ltc.se
[⊥] Christian@ltc.se

1. Introduction

Not all economists grant the entrepreneur a central role to explain economic growth. However, some include the entrepreneur as one of the main characters. For example, Holcombe (1998, p. 60) claims that, "*the engine of economic growth is entrepreneurship*." Others, not least neoclassic economists, place the entrepreneur in the wings.
The entrepreneur is an elusive character in economic theory due to the difficulty of providing an accurate description. It appears impossible to produce a single definition of entrepreneurship and most theoretical approaches yield operational difficulties. By the same token, most operational definitions are incomplete and cover only single parts of the concept[2].
Previous overviews on the topic of entrepreneurship include Goel (1997) who has made a comprehensive study of the entrepreneur in mainstream economic theory. Glancey and McQuaid (2000) offer a summary of how entrepreneurship is incorporated into economic and social theory. Yu (1997) presents some approaches to encompass entrepreneurship into the theoretical framework of economics. Two volumes of commonly cited articles are edited by Casson (1990) and Livesay (1995). Furthermore, Wennekers and Thurik (1999) attempt to identify the links between entrepreneurship and economic growth. The paper by Wennekers and Thurik is of particular relevance to this paper as it provides an overview of studies of entrepreneurship in economic theory and a methodological reference. Henrekson (2002) dedicates a chapter to summarise effects of entrepreneurship on economic growth. Numerous empirical studies have examined the effects of entrepreneurship, but few studies have been undertaken in order to summarise the empirical evidence and synthesize the theoretical framework and the empirical results.
The objective of this paper is to provide a critical overview of recent empirical research on the relationship between entrepreneurship and economic growth.
Outline of the Paper. In Section 2, there is a discussion of the role and definition of entrepreneurship. Section 3 gives an overview of theoretical schools and their explanations of economic growth with reference to entrepreneurship. The theories are outlined briefly and categorized. Following this, in Section 4, there is a summary of empirical studies of entrepreneurship and economic growth. This serves partly as a survey of recent research and partly as a method of identifying neglected aspects of research in entrepreneurship with respect to growth. The findings are analyzed and discussed in Section 5 and summarized in Section 6 alongside suggestions for further research.

2. The Role and Definition of Entrepreneurship

One aspect that might initially blur the concept of entrepreneurship is that it can be defined in a number of different ways. In this section the hypothesis, that the role of entrepreneurship has changed, is presented. Following this, there is a selection of definitions of entrepreneurship along with a discussion of the importance of various aspects of the concept.

2.1 The Changing Role of Entrepreneurship

Looking into historical perspectives of entrepreneurship, Baumol (1993) makes two propositions. First, the rules of the game determining the payoff from entrepreneurial activity

[2] In a similar way, economic growth is not an axiomatic concept. It could include an increase in per capita income, an outward shift of the production possibility frontier, greater purchasing power, an increase in average living standards, a sustained rate of innovation or capital accumulation as well as a higher share of employment.

change and has been changing over time and from place to place. Secondly, entrepreneurial behavior has been changing according to the rules of the game.
A number of studies indicate that there has been a structural shift in the OECD economies from large companies competing through mass production, product differentiation, and economies of scale, towards smaller companies relying on knowledge, initiative, and flexibility. This transition from a "managed economy" towards an "entrepreneurial economy" appears to have taken place between the mid-1970s and the early 1990s (Acs, 1996 and 1999; Acs and Audretsch, 2001; Audretsch and Thurik, 1997, 2001a and 2001b; Audretsch *et al*, 2002; Carree and Thurik, 1998; Carree *et al*, 1999 and 2002; Thurik, 1996; Verheul *et al*, 2003).
The economy, later to be labeled managed, was characterized by "[the] three-pronged investment in production, distribution and management that brought the modern industrial enterprise into being" (Chandler, 1990, p. 8). The competitive advantage was in economies of scale or scope and a distributional network allowing the product to reach a large market. Thus, large firms were the engines powering the economy ahead. The entrepreneurial economy is described by a decentralized industry structure with knowledge and flexibility as key factors of production. Knowledge is, as a factor of production, characterized by uncertainty as well as being highly asymmetric between individuals and costly to transact (Audretsch and Thurik, 2001a).
A number of variables are assumed to have caused this transition, among them increased global competition, changes in demand and demographics, intensified uncertainty and new technologies. Various aspects and explanations are discussed in Acs (1996), Acs and Audretsch (2001), Acs, Carlsson and Karlsson (1999), Acs, Morck and Yeung (1999), Audretsch and Thurik (2001a), Brock and Evans (1989), Carlsson (1992, 1996 and 1999), Carree and Thurik (1998), Carree *et al* (2002), Eliasson (1994), Glancey and McQuaid (2000), Loveman and Sengenberger (1991) and Piore and Sable (1984).

2.2 Definitions of Entrepreneurship

In this paper, there is a distinction between theoretical and operational definitions of entrepreneurship. In general, the theoretical definitions are wide, covering a number of entrepreneurial activities, whereas the operationalized definitions cover a singular aspect. Glancey and McQuaid (2000) mention five definitions of entrepreneurship, while Wennekers and Thurik (1999) mention thirteen. For example, entrepreneurship could imply an economic function, as a bearer of uncertainty, a resource allocator, or an innovator. It could also refer to particular behavior, intrinsic characteristics, the creation of new organizations, or the role of an owner-manager of a company. Baumol (1993), and subsequently Dejardin (2000), stress that entrepreneurial activities can also range from being productive to society at large to searching for surplus profits with negative consequences, all depending on the structure of incentives and possibilities.
In this paper, there is a focus on the economic aspects of entrepreneurship, the entrepreneur in economic theory as well as on recent empirical evidence of the economic impact of entrepreneurship on economic growth. This does not imply that other aspects, such as e.g. sociological or psychological manifestations of entrepreneurship, are irrelevant. They are merely beyond the scope of this paper. For more insights and references, consult e.g. Hébert and Link (1989).
The economic definition of entrepreneurship can be viewed from a theoretical and an operational context. Among the early theoretical definitions, Cantillon (1755) claims that "*Undertakers*" are a class of economic agents, making decisions on market transactions in the face of uncertainty. Knight (1921) defines entrepreneurship as dealing with uncertainty,

making a distinction between risk, which can be calculated, and uncertainty, which cannot. Schumpeter (1934) describes the entrepreneur as the bearer of the mechanism for change and economic development, and entrepreneurship as the undertaking of new ideas and new combinations, i.e. innovations. He makes the distinction between five different manifestations of entrepreneurship (Schumpeter, 1934, p. 66), a new good, a new method of production, a new market, a new source of supply of intermediate goods, and a new organization. The role of the entrepreneur in a competitive market process is stressed by Kirzner (1973, p. 16-17):

> "The 'pure' entrepreneur observes the opportunity to sell something at a higher price than that at which he can buy it. It follows that anyone is a potential entrepreneur, since the purely entrepreneurial role presupposes no special good fortune in the form of valuable assets. […] The entrepreneur's activity is essentially competitive. And thus competition is inherent in the nature of the entrepreneurial market process. Or, to put it the other way around, entrepreneurship is inherent in the competitive market process."

This definition is very wide and would imply that every agent on the market, every firm, making a profitable business is an entrepreneur.
Yu (1997) argues that Schumpeter's entrepreneur, the creative destructor, prevents the economy from reaching a stationary equilibrium, while Kirzner's entrepreneur is the one bringing the economy into equilibrium by spotting and profiting from disequilibria[3].
Landström (1999) illustrates the difference between the Schumpeterian and the Kirzner entrepreneur on a production possibility curve, as shown in Figure 2.1.
Holcombe (1998) claims that the actions of the Kirznerian and Schumpeterian entrepreneurs are no different. Both take advantage of unexploited profit opportunities and the actions undertaken by any of them will alter the future market environment. One way of identifying unexploited profit opportunities is suggested by Runge (2000, p. 38):

> "Entrepreneurship involves inter alia exploitation of differences between market-determined values and private value. Successful entrepreneurship involves demonstrating to someone else (the 'market') that the value attached to some private capital exceeds the value that has hitherto been appreciated."

A further implication of the Kirzner entrepreneur is that, without the presence of a Schumpeter creative destroyer, the role of the entrepreneur as an engine of economic growth would cease as the economy reaches equilibrium.
Vosloo (1994, p. 147) suggests that the entrepreneur might be an opportunity maximizer when defining an entrepreneur "as a person who has the ability to explore the environment, identify opportunities for improvement, mobilize resources and implement action to maximize those opportunities [sic.]".

[3] See also Kirzner, 1973, pp. 72-73.

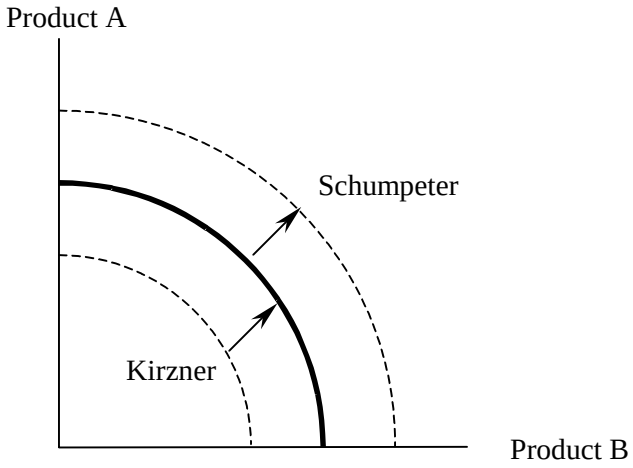


Fig. 2.1. A production possibility curve illustrating the difference between Schumpeter and Kirzner's view on the function of the entrepreneur. (Source: Landström, 1999, p. 49)

In what appears as a synthesis of the previous suggested definitions, Wennekers and Thurik (1999, pp. 46-47) suggest the definition:

"Entrepreneurship is the manifest ability and willingness of individuals, on their own, in teams, within and outside existing organizations, to:

- perceive and create new economic opportunities (new products, new production methods, new organizational schemes and new product-market combinations) and to
- introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions."

In a previous study (Wennekers *et al*, 1997, p. 5) a third aspect was included as well:

- "[…] -compete with others for a share of that market."

This definition might include many of the aspects of entrepreneurship but it is not operationally applicable. Most of the aspects are hard to identify and isolate, leading to various functional definitions describing individual aspects of the concept. Quantitative studies of entrepreneurship often focus on business start-ups or innovation in small enterprises. Both these measures have several limitations.
According to Audretsch (1995), some of the shortcomings in using the measure of start-ups are methodological, i.e. only net entry of start-ups has been used, and entry has generally only been measured over a single time period. Net entry gives little information on volatility and could conceal a process of creative destruction. The last few years this problem has been addressed, which could result in some interesting publications. The measure of start-ups excludes "intrapreneurship," i.e. entrepreneurship within existing organizations.
Defining entrepreneurship as small-firm innovation might also be misleading. Large firms might exhibit entrepreneurial and innovative behavior. There might also be non-innovative start-ups, which are entrepreneurial in the sense that they respond to disequilibria or profit opportunities. An additional obstacle regarding the process of innovation is to define meaningful measures of innovative inputs and outputs, e.g. a measure using R&D expenditures cannot account for innovation in small firms (Acs and Audretsch, 1990 and 2001). From this, an alternative classification emerges, distinguishing three breeds of entrepreneurs (Wennekers and Thurik, 1999 and Dejardin, 2000). In Table 1, the distinctions between the different types of entrepreneurs are presented.
The Schumpeterian entrepreneurs mainly operate in small, independent firms. Intrapreneurs are the innovators and creative leaders within existing organizations. Both are creative destructors and bearers of change. In contrast to this, there are the managerial business

owners, who focus on coordination of production and distribution. Possibly, this might be more of a Kirzner entrepreneur.

Table 2.1. Three types of entrepreneurs

	Self-employed	**Employee**
Entrepreneurial	**Schumpeterian entrepreneurs**	**Intrapreneurs**
Managerial	**Managerial business owners**	**Executive managers**

Source: Wennekers and Thurik 1999, p. 47

There are numerous, at times even contradictory, definitions of entrepreneurship. Broadly, these definitions can be divided into two subcategories; those that are generally more encompassing theoretically and the more narrow operational ones. Thus, one conclusion is that it might be more fruitful to talk about entrepreneurial activities, at least from an operational point of view. The operational definitions, such as start-ups or innovative activities, each cover a limited range of entrepreneurial activities but might yield a more profound coverage in combination.

3 Theories of Entrepreneurship and Economic Growth

This section provides an outline of some of the basic approaches used to define the relationship between entrepreneurship and economic growth. A brief sketch of the theories is offered in the following sections. For economy and comparison, this sketch is for the most part parallel to the classification offered by Wennekers and Thurik (1999). However, some words of caution are warranted here. First, we do not fully and completely endorse the classification offered by Wennekers and Thurik (1999). However, it serves as a useful tool to identify connections between entrepreneurship and theories of economic growth. Second, the list and description of growth theories are by necessity neither complete nor extensive and detailed. The brief theoretical outlines are merely offered as an orientation of theories with a significant academic impact. These short descriptions subsequently lack the details and intricacies of the full models. Therefore, the interested reader probing deeper into this subject matter is advised to consult original references and/or advanced textbooks on economic growth.

3.1 Classifying the Theories

The study of entrepreneurship was central to a number of leading economic theorists in the early 20th century, then relatively neglected for some decades until it was rediscovered in the 1970s. Donald Sexton offers an account of the shifts in academic focus and advances in the study of entrepreneurship since 1980 (in Chapter 18 in Sexton and Smilor, 1997).
In a recent study, Steele (2000) raises criticism against traditional theoretical approaches to economic growth. Dividing the contemporary account into two broad categories, mathematical macroeconomic models and institutional or historical accounts, Steele questions the underlying neoclassical assumptions of a social equilibrium and individual optimization. Instead, economic growth is attributed to market disequilibria with entrepreneurship functioning as an equilibrating process. This view is an extension of Kirzner (1973 and 1994). Besides Kirzner's adaptive entrepreneurship, Audretsch *et al* (2001) mention Lebenstein's routine entrepreneurship, Baumol's imitative entrepreneurship, and Schumpeter's creative entrepreneurship. A more in-depth presentation and analysis of this classification can be found in Yu (1997).

An alternative systematization of the field is offered by Wennekers and Thurik (1999). They attribute economic growth through entrepreneurship to three main processes or entrepreneurial activities, enhanced competition, innovations, and employment growth through firm start-ups. It should be noted that these processes or activities might be overlapping and not mutually exclusive. From this perspective, the foci of explanation of the different schools of thought are mapped. This is presented in Table 2. While the assessment offered by Wennekers and Thurik can be questioned (or at least discussed) on some accounts, this systematization is used throughout the paper, as it appears to be a useful tool in identifying links between entrepreneurship and economic growth.
In addition to the various schools of growth theory presented in the table, the model and theory of recombinant growth could be included. This model was initially proposed by Weitzman (1998) and further developed by Olsson and Frey (2002). The focus of the model concerns innovation. Management literature perspectives on entrepreneurship are, however, omitted in this study.

Table 3.1. Assessment of the role of entrepreneurship, drawn from several fields of research

Field of literature	Specific domain	Competition	Innovation	Firm start-ups	Importance of entrepreneurship for economic growth
Historical views	**Schumpeter / Baumol**	++	+++	+	++
	Neo-classicals	++	+	**0**	+
	Austrians	++	+	**0**	++
Endogenous growth theory		+	+++	**0**	+
Economic history		++	+++	+	+++
Management literature		+	+++	++	++
Industrial economics	**Porter**	+++	+++	++	+++
Evolutionary economics	**Eliasson**	+++	+++	+++	+++

0 Not present in the writings.
\+ Implicitly present in the writings.
++ Explicitly present in the writings.
+++ Pivotal element in the writings.

Source: Wennekers and Thurik 1999, p. 50

3.2 Schumpeter / Baumol – The Creative Destructor

The German tradition with Schumpeter (1934)[4] and Baumol (1968) focuses on the entrepreneur as an innovator and inspirer, the implementer of creative destruction, creating

[4] The importance of the entrepreneur is primarily stressed in Schumpeter's earlier work on competitive capitalism. In the later works on capitalism, large firms are seen as the vehicle of economic progress (Brouwer, 2000).

instability, disequilibria, and economic development. Yu (1997) concludes that Schumpeter's objections to the orthodox system relate to the use of equilibrium models and static analysis as well as the assumptions of rational behavior and profit maximization. Furthermore, Schumpeter (1934) argues that the risk of trying new combinations, i.e. being entrepreneurial, intrinsically falls on the capitalist and not on the entrepreneur.

3.3 Neoclassical Growth Theory

Wennekers *et al* (1997) and Glancey and McQuaid (2000) mention that under traditional neoclassical assumptions, also labeled the Chicago tradition, there are limitations imposed on entrepreneurship by perfect competition, perfect information, and rational behavior. An alternative to the latter limitation could also be the absence of time lags between decision and outcome, as suggested by Lydall (1998). The primary analytical tool of neoclassical theory is a model in which equilibrium is attainable and with an invisible hand leading the market towards equilibrium. There have been a few attempts made to incorporate entrepreneurship into the neoclassical framework. Knight (1921) defines willingness to accept uncertainty as entrepreneurship. Some intuitive ability or non-universal knowledge gives the successful entrepreneur a superior ability to handle uncertainty. Introducing Knight's uncertainty into a Schumpeterian framework has spawned several models, e.g. Kihlstrom and Laffont (1979), Brouwer (2000) and Rigotti *et al* (2001).

While there are several growth models that can be labeled (more or less) neoclassical, no single growth model have received as much attention and have had such an impact as the Solow (1956) growth model.[5,6] A fundamental conclusion of the Solow model is that accumulation of capital cannot account for neither historic growth of per capita income nor substantial international differences in per capita output. The model is built around a standard CRS production function, where output is a function of capital and "effective labor." Effective labor includes the knowledge or effectiveness of the labor force. Hence, output increases if either capital or effective labor increases. With given levels of capital and labor, growth can only occur through the expansion of knowledge, i.e. we have technological progress. Independent of its starting point, the economy eventually reaches its equilibrium of the balanced growth path where output, capital, and effective labor are growing at a constant rate. Here the growth rate is completely determined by advances in knowledge or technological progress.

The entrepreneur does not exist in the Solow model. The benevolent reader could possibly discern the existence of an implicit entrepreneur encompassed by the notion of *knowledge.* However, knowledge or effectiveness of labor is incompletely defined in the model and can, therefore, be attached to various and several factors (other than capital and labor) that possibly could influence output. Furthermore and as pointed out by Romer (1990), since the growth rate of knowledge is exogenously given, growth is modeled by assuming its existence.

3.4 Austrians – The Arbitrageur

The peculiar characteristic of the Austrian entrepreneur is the ability to perceive profit opportunities. Kirzner (1973) suggests that the connection between entrepreneurship and economic growth is founded on the entrepreneur spotting and profiting from a situation of disequilibrium by improving on market inefficiencies or deficiencies. In an extension of

[5] The model is sometimes referred to as the Solow-Swan growth model, due to Swan (1956).

[6] When from here on referring to the neoclassical tradition in relation to growth, we will refer to the Solow model.

Kirzner's model, Holcombe (1998) argues that these opportunities must come from somewhere, namely the insights of other entrepreneurs. Entrepreneurship creates changes, and changes lead to more opportunities for entrepreneurship. Thus, entrepreneurship generates more entrepreneurship. In a comment on Holcombe, Hülsman (1999) is critical to the notion of entrepreneurship as a perpetuum mobile of economic growth. Minniti (1999) reaches the same conclusion as Holcombe, but does also include a "network externality of entrepreneurship", i.e. a self-reinforcing culture of entrepreneurial spirit. Referring to Knight, Minniti also endows the entrepreneur with bearing some degree of uncertainty.

3.5 Endogenous Growth Theory

The basic neoclassical theory of growth, such as e.g. the Solow model, explains growth as exogenously determined changes or levels of technological progress. As such the neoclassical model is limited because it tells us very little about the factors that shape and mould technological progress, and in the extension growth. This has spawned the development of a family of highly influential models, generally labeled endogenous growth or "new growth" models. Some of the more pioneering and important contributions in this field include Romer (1986, 1990), Lucas (1988), Grossman and Helpman (1991), and Aghion and Howitt (1992). For an overview of these models and others, see Aghion and Howitt (1998) and Valdés (1999).

A unifying character of these models, which also distinguishes them fundamentally from the Solow model, is that knowledge is modeled as being endogenous.[7] Growth is generated by investments in knowledge and the models outline the determinants of investment decisions in knowledge. Furthermore, some of these models, such as e.g. Lucas (1988) differentiate between physical and human capital. This implies that the relative importance of capital could be substantially more important than acknowledged by the Solow model, especially if there exists positive externalities in accumulation of (foremost human) capital.

While technologies or knowledge may be of diverse types and have different sources, such as e.g. basic scientific research, private R&D and innovation, or learning by doing, the entrepreneur does not generally hold a central position (if any) in the endogenous growth models. There is e.g. no explicit entrepreneur in Romer (1986, 1990) and Lucas (1988). A notable exception, extending upon Segerstrom *et al* (1990) and Aghion and Howitt (1992), is offered by Grossman and Helpman (1991) where all R&D and investment decisions are made by forward-looking profit maximizing entrepreneurs. Successive quality improvements are made of available goods and services, so called quality ladders. The model generates an equilibrium with a deterministic aggregate level of innovation, which is constant in the steady state. While the model claims to capture several realistic aspects of the innovation process such as e.g. product life cycles, non-uniform development across sectors etc., the role and behavior of the entrepreneur is relative simplistic and mimics the behavior of the standard profit maximising firm.

3.6 Economic History – The Importance of Institutional Frameworks

According to Gould (1972), there has been a synthesis of economics and economic history in order to extend the static equilibrium models of economic growth and development.

[7] Within the theoretical framework of endogenous growth, efforts have been made in order to formalise Schumpeter's model of creative destruction and innovation as a mean of capturing monopoly profits (e.g. Aghion and Howitt, 1992). From this perspective, endogenous growth theory can be regarded as a synthesis and extension of the German and Chicago schools.

In economic history, institutions are often perceived as a major determinant of economic growth. According to North and Thomas (1973, p. 2) economic growth can be explained in the following way:

> "The factors we have listed (innovation, economies of scale, education, capital accumulation, etc.) are not causes of growth; they are growth. […] Growth will simply not occur unless the existing economic organization is efficient. Individuals must be lured by incentives to undertake the socially desirable activities."

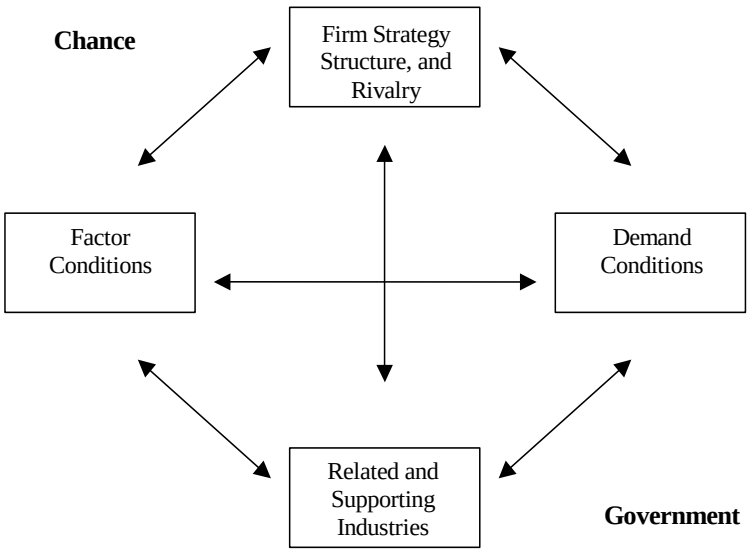
In a subsequent study by North (1990, p. 83) there is an even more explicit link between economic growth and the entrepreneur; "*The agent of change is the individual entrepreneur responding to the incentives embodied in the institutional framework*." This is in contrast to Gould (1972) who de-emphasizes the importance of the individual when analyzing the history of growths and inventions.
Baumol (1993) advocates the importance of institutions for productive entrepreneurship, i.e. economic growth. He offers an account of the conditions for entrepreneurship and its manifestations throughout history, from ancient Rome and Greece to the present time.
Another approach to describing the history of entrepreneurship, also focusing on institutional settings, is offered by Cole (1949).
In a study aimed at identifying links between entrepreneurship and economic growth Wennekers *et al* (1997) include a section on the role of entrepreneurship in European history. In accordance with North and Baumol, the institutional framework is here the major determinant of the manifestations of entrepreneurship.

3.7 Industrial Economics - Competitiveness

Michael Porter grants entrepreneurship a crucial role when considering economic growth from a national perspective (1990, p. 125-26):

> "Invention and entrepreneurship are at the heart of national advantage. […] Our research shows that neither entrepreneurship nor invention is random; assigning a role to chance does not mean that industry success is wholly unpredictable."

Porter finds a great deal of explanatory power in a number of determinants, such as factor conditions; demand conditions, the firm's strategy, structure and rivalry, related and supporting industries as well as a government function. This "diamond," originally presented in Porter (1990, p. 127) is replicated in Figure 2.
In order to gain a competitive advantage there must be an interaction between the determinants. An advantage in one single factor might not be sufficient. Wennekers *et al* (1997) suggest using the model for analyzing the relationship between entrepreneurship and economic growth to find out where entrepreneurship and innovation is most likely to occur.



3.8 Evolutionary Economics - Competitive Selection

Abstracting from optimization and market equilibrium Nelson and Winter (1982) were influential in developing the school of evolutionary economics, drawing inspiration from disciplines such as Darwinism. A core concept of the theory is the notion of bounded rationality; all individuals are different and are facing both uncertainty about the possible courses of action, as well as imperfect information about the consequences of their decisions. Each individual is endowed with a set of routines, which can only evolve gradually. In the market situation, different routines are tested and through a process of natural selection the most suitable for the given market environment survive and achieve. Grebel *et al* (2001) make an attempt to encompass the entrepreneur into an evolutionary framework. In the model, each individual is endowed with entrepreneurial spirit, human capital, and venture capital.
Eliasson (1994) claims that competence is the crucial factor for firm survival, competence being the ability to profit locally on internationally available technology. There are a large number of ways to solve any particular problem, and more ways the more complex the problem. Some ways are better than others, but a priori, the different strategies cannot be ranked. This implies trial-and-error experimentation where the learning process, i.e. the accumulation of competence, is the determinant of success. A subsequent study by Eliasson and Braunerhjelm (1998) support this by claiming that economic growth stems from human-embodied tacit competencies.

3.9 Recombinant Growth – The Innovator

The concept of recombinant growth is based on Schumpeter's notion on innovations as a result of new combinations. The model was introduced by Weitzman (1998) and extended to specifically explain entrepreneurship by Olsson and Frey (2002). The model by Olsson and Frey includes a combinatory process of existing ideas that take place in a multidimensional technology space where ideas are separated by technological distance. Any convexities in the technology frontier imply potential expansion possibilities of the technology set. In this

model, the entrepreneur is given the role of combining new ideas, and thus expanding the technology set.

3.10 Summary

It should be emphasized that the classification used in this paper is only one of several comprehensive options. The advantage of this classification is its coverage of influential theories and the wide variety of entrepreneurial functions described.
Entrepreneurial activities range from being a creative destructor and an innovator to dealing with uncertainty and spot profit opportunities. The innovating Schumpeter entrepreneur brings the economy out of equilibrium and is the catalyst for a reallocation of resources to better uses. Knight's successful entrepreneur has a special advantage when dealing with uncertainty, while Kirzner's entrepreneur is skilled at spotting and making profit from disequilibria in the economy. These different aspects might have opposite effects on the market but they are not mutually exclusive per se. Due to the diametrically diverse natures of the entrepreneurial activities, no attempt has been made to formulate a master theory incorporating all the various aspects.
The institutional framework is the form in which the manifestations of entrepreneurship are molded. Imperfections in the institutions might lead to socially undesirable entrepreneurial activities.

4 Entrepreneurship and Economic Growth: Empirical Results

This section summarizes a number of recent empirical studies covering aspects of the changing importance of entrepreneurship and its links to economic growth. The section follows the division made by Wennekers and Thurik (1999), linking entrepreneurial activities to economic growth through competition, innovation, and firm start-ups. Following this, there is a discussion of the methodological problems recognized in the studies.

4.1 Competition and Economic Growth

Acs (1996) suggests that one explanation for employment growth in the U.S. is increased competition. Manifestations of increased competition include rising import competition, anti-trust, deregulation, new structures of vertical integration and reductions in economies of scale. An econometric study by Geroski (1994, p. 88) leads to the conclusion that "[c]ompetition plays a significant role in stimulating productivity, with both new firms and new ideas provoking movements to, and outwards movements of, the production frontier which, the data suggest, would not have occurred in their absence." Furthermore, Geroski (p. 149) finds that innovative activities tend to deconcentrate markets and concludes that "it is almost certainly the case that small-firm and entrant activity drives the negative association between changes in concentration and innovative activity which appears in the data."
An econometric study of the US telephone industry by Gort and Sung (1999) yields the conclusion that increased competition has led to greater efficiency within the industry. Gort and Sung assume that competition can affect efficiency in four ways; greater incentive to stimulate demand, higher quality of capital inputs, lower monitoring costs, and greater efficiency of firm-specific organizational capital as well as rivalry stimulating innovation. Regarding the fourth effect, the authors mention that it is possible that the incentive to innovate might be greater under monopolistic conditions due to better opportunities for capturing the returns from innovation. Furthermore, monopolistic enterprises might have more resources to invest in innovation.

Nickell (1996) finds, in a study of firms based in the UK, that there is only weak empirical evidence in favor of the hypothesis that competition improves corporate performance. On the other hand, when measuring competition, as either increased numbers of competitors or lower levels of surplus profits, it appears that there is a positive correlation between the level of competition and total factor productivity growth.

4.2 Innovation and Economic Growth

Novus ordo seclorum, characterized by greater uncertainty, asymmetry, and reliance on knowledge as a factor of production, has increased the importance of small entrepreneurial firms[8]. Acs and Audretsch (2001) conclude that there are significant differences in the importance of small firms regarding innovative activity across sectors. Specifically, they mention computers and process control instruments as industries where new entrepreneurial firms are an important part of the innovation process. This adds to a list of Baldwin and Johnson (1999), who mention the importance of small firms regarding electronics, instruments, medical equipment, steel, and biotechnology. Acs (1996) presents an innovation measure, defined as the total number of innovations per 1000 employees in different industry sectors. Applying this measure on data on the U.S. market 1982 indicates that small firms (<500 employees) produce more innovations in the fields of electronic computing equipment, process control instruments, electronic components, engineering and scientific instruments and plastics products. Suggested explanations for the relative importance of small firms might be diseconomies of scale in the production of innovations and knowledge spillovers.
Knowledge spillovers are considered explicitly by Acs *et al* (1994) in a study of the pattern of innovations in the U.S. in 1982. In an econometric analysis they conclude that the innovative output of small firms increase in the vicinity of universities. A similar study by Audretsch and Vivarelli (1996), covering 15 Italian regions over nine years, comes to the same conclusion.
In specific studies of the semiconductor industry through patent data between 1977-89, Almeida and Kogut (1997) and Almeida (1999) argue that small firms tend to innovate in relatively unexplored fields of technology. In this way, they differ from large companies, which seem to concentrate their research, measured as patents, in more established fields.
Rothwell and Zegveld (1982) made a study of 380 innovations made in U.S., UK, B.R.D., Japan, and France between 1953 and 1973. They found that small firms contributed 31 % and large firms 54 % of all innovations. In estimating how radical the innovations were they also concluded that the entire output of small firms in UK consisted of radical breakthroughs. The U.S. small firms produced 27 % of the “radical breakthroughs” made in the country as well as 30 % of the “major technological shifts” and 37 % of the “improvement-type innovations.”
Geroski (1994) finds a strong and negative relationship between market concentration and innovation. This conclusion receives support in a study of industry innovations in 1982 by Acs and Audretsch (1990). Furthermore, the latter support the notion of two technological regimes, an entrepreneurial one, and a routinized one. They note that the entrepreneurial regime, in which small firm innovation is of importance, is characterized by a relative reliance on skilled labor and that large firms control a significant share of the market. By contrast, the routinized regime is recognized as being capital-intensive, concentrated, unionized and producing differentiated products.
A study of growing small and medium sized enterprises (GSMEs) in Canada 1984-88 by Baldwin (1995) indicates that the more successful firms are on average focusing to a greater extent on innovative strategies and activities than the less successful firms. In conclusion, innovation is found to be the most important determinant of small firm success.

[8] See Section 2.1.

4.3 Industrial Structure, Start-ups and Job Creation

Carree and Thurik (1998) identify a number of market conditions favoring either large or small firms. Effects stimulating size include economies of scale and scope as well as declining average costs with increasing experience. In favor of small firms, Carree and Thurik mention that customers have a preference for minimizing traveling distance when searching for supplies thereby justifying geographically dispersed small firms. Furthermore, the demand for variety creates small markets, which can only sustain small firms. Another proposed argument is that small firms might have lower adjustment costs and, finally, the effect of control by an energetic, motivating entrepreneur. A similar list of advantages of small-scale enterprises is made by Vosloo (1994). It includes advantages for small firms in developing economies, such as less capital per worker on average and "grassroot" development overcoming the lack of formal training and education. Other, more general, advantages include greater flexibility, a higher propensity of innovations per employee, higher growth and job creation rates as well as being better suited to serving limited or specialized market niches. Finally, according to Vosloo, small firms enhance political stability by strengthening middle-class influence and distributing prosperity.

Audretsch *et al* (2002) present an econometric study of 18 European countries indicating that there has been a reward in terms of economic growth for countries that have experienced a quicker decentralization of their industry structure, i.e. have gained a greater share of smaller firms. This supports a study undertaken by Carree and Thurik (1998) of 14 manufacturing industries in 13 European countries. There were indications that on average, the employment share of large firms had a negative effect on growth of output 1990-1994. In a descriptive study of small business activity in Germany, Wengenroth (1999, p. 131) concludes that;

"*Small business was the catalyst of industrial growth in providing the background of skills and services which alone made possible the mass consumption of industrial product.*"

The relationship between entrepreneurship and unemployment is analyzed by Audretsch *et al* (2001) in an econometric model covering 23 OECD countries between 1974-1998. They find a complex relationship between the two variables. Defining entrepreneurship as firm start-ups there is both a positive effect of unemployment on entrepreneurship (the "shopkeeper" or "refugee effect") as well as a negative relation (the "Schumpeter effect").

The Global Entrepreneurship Monitor 2000 concludes that there is a strong relationship between entrepreneurial activities, defined as start-up activities, and economic growth. In the study, this definition of entrepreneurship is claimed to constitute the singularly most important factor for economic growth. In an econometric analysis of Sweden 1976-95, Fölster (2000) finds significant support for the hypothesis that an increase in self-employment has a positive effect on overall employment.

Another study of Sweden by Davidsson *et al* (1994) finds that 70 % of the new net jobs are generated in the small business sector in the period 1985-89. A further emphasis is that most of the new firms are not growth oriented, but are founded on a hobby or subsistence motive. Thus, small firms are important to the economy because of their large number but a vast majority of the upstarts will remain micro firms. Blanchflower (2000) does not support the hypothesis that increases in the level of self-employment increase the real growth rate. Furthermore, making a comparison of the level of self-employment in 23 OECD countries 1966, 1976, 1986 and 1996, Blanchflower finds that the level of non-agricultural self-employment has decreased in most of the countries.

The relative importance of small firms is not undisputed as Davis *et al* (1996) and Bednarzik (2000) remark in their studies. Although important, entrepreneurship through start-ups is claimed to make a smaller contribution to job growth than expansion within existing firms in the U.S., Davis *et al* draw their conclusion from a study of data from the U.S. Census Bureau during 1972-1988, whereas Bednarzik has studied the mid-1990s. Although smaller firms

have a higher gross job creation rate, large firms supply more in terms of net job creation. In a comment on Davis *et al*, Carree and Klomp (1996) contest its conclusion, arguing that small firms created more net jobs in the 1972-1988 period relative to their employment share. Davidsson *et al* (1998) empirically test the "regression fallacy," one reason for overestimating the importance of small firms according to Davis *et al*. The test by Davidsson *et al* covers Sweden 1989-96 and concludes that the bias does not imply a qualitative change on the overall result. Baldwin and Picot (1995) have studied the Canadian manufacturing sector 1970-90 and in order to avoid a regression-to-the-mean bias three different methods of estimation are used. A consistent finding is that small firms have a higher gross volatility in job growth and destruction but also a higher net employment growth than large firms. While an international comparison of the relative importance of small firms with respect to net job creation is interesting, the results are likely to differ between countries due to institutional reasons. For example, Davis and Henrekson (1999) show that the Swedish institutional environment prior to the economic crisis in the beginning of the 1990s significantly disfavored Swedish intensive-intensive, small, and/or managed-owned family businesses as well as entry of new firms compared to similar types of firms in the United States and other European countries.

In a test of the growth of micro and small firms, Heshmati (2001) calculates five different asset growth model parameter estimates on a large sample of firms in the county of Gävleborg in Sweden during the period of 1993-1998. The conclusion of the study is that the relationship between growth, size, and age of firms is highly specific to the method of estimation as well as the functional form and definition of size and growth. This conclusion lends supports to a study of the job flow dynamics in the U.S. economy by Acs, Armington, and Robb (1999). In a regression using longitudinal data the authors find great differences in the results depending on whether mean or initial firm size was used. It is suggested that this might account for the conflicting findings regarding the relationship between net growth and size.

Kwoka and White (2001) find that there are significant variations in the share of small businesses across industrial sectors. Referring to Sutton (1998), the authors suggest that sunk costs might explain the differences but suggest further studies in the topic. The variations might also correlate with varying degrees of small firm innovation, which is described in Section 3.4 above. Furthermore, there are also claimed to be considerable differences in the share of small firms across nations (e.g. Acs 1996).

A study of job creation by Andersson and Delmar (2000), covering firms with more than 20 employees in Sweden 1987-96, produces the conclusion that the high-growth firms are under-represented in the smaller size class and over-represented in the medium (50-249 employees) size class. High-growth firms are defined as the top ten percent of job creators in absolute numbers[9]. Furthermore, the high-growth firms are primarily found in young and growing industries, such as the knowledge-intensive service-, education- and health care industries. It is, however, yet again hard to make a general case for these findings in an international comparison. This may, due to institutional reasons, be a special feature of the Swedish case, which is indicated by e.g. Storey (1994), who finds high growth firms in all types of industries in the cases of the UK and the US.

Using data from the U.S. manufacturing sector 1972-93 Haltiwanger and Krizan (1999) find that young firms exhibit high average net employment growth rate but also high volatility compared to mature establishments. Furthermore, among newly started firms there is no evidence of any systematic pattern by employer size of net employment growth. The conclusion is that in the context of employment growth, the age of firms appears to be more

[9] It should be noted that this measurement creates a powerful bias against small firms. On the other hand, a straightforward percentage growth measurement would provide a bias in favour of smaller firms. A definition of high growth firms independent of firm size would have been ideal.

important than size, with the caveat that attributing a principal role to a single factor might be misleading.

4.4 Summary

A number of studies indicate that there has been a structural shift in the industrial sector towards a higher dependence on flexibility and knowledge-intense production. In general, this is considered to have made entrepreneurial activities a more important feature of the economy. However, this is not uncontroversial.

Empirical studies show that increased competition has been found to increase employment as well as enhance growth in total factor productivity. Small firms produce a large share of the total number of innovations, given sectoral differences, and are found to innovate in relatively unexplored fields. Examples include computers, electronics, and biotechnology. Innovation is also claimed to be a fundamental feature of successful small firms.

There is more controversy regarding the impact of small firms on net employment creation and as a generator of economic growth. The small firm sector is characterized by a high rate of gross job creation but also high volatility and destruction of firms. One explanation for the different outcomes in the empirical studies might be found in the different estimation techniques used. A cautious conclusion is that both small and large firms might be of importance for economic growth.

5 Entrepreneurship and Economic Growth: Discussion

In the first part, there is a discussion of some of the implications of the selected categorization. The division of entrepreneurship into economically gainful entrepreneurial activities creates three interdependent variables. The second part analyses the focus of the theories, finding a bias towards stressing innovative activities as the engine of economic growth. In the third part, the empirical evidence is categorized. The empirical studies are biased towards start-ups.

5.1 Implications of the Categorization

Although the categorization of the effects of entrepreneurship on economic growth is functional and intuitively appealing from a theoretical standpoint, it does imply practical difficulties. Most of the processes identified as generators of economic growth are combinations of entrepreneurial activities. Figure 3 is an attempt to illustrate this complication.
The complex nature of the entrepreneurial processes might result in a simplification, in which the processes are attributed to a single entrepreneurial activity. This might understate the total impact of the activities as well as ignore the aspects that are notoriously hard to define, such as competitive activities. It is less than straightforward to identify an operational measure of competitive behavior and competitiveness as well as find comparable markets with different degrees of competition. Geroski (1994, p. 88) makes the following suggestion for a measure: "*As entry and the innovation process are undoubtedly intertwined, the effect of competition might best be measured as the joint effect of the two, in which case it is clearly substantial.*"

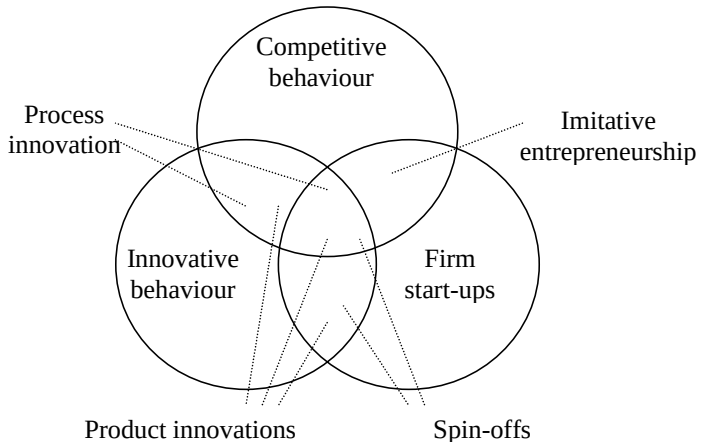


Fig. 5.1. A schematic presentation of some of the complications of the categorization of entrepreneurial activities, including some examples of cross-category entrepreneurial processes. (Source: Authors' construction.)

However, if acknowledging the impact of business stealing effects in the spirit of Aghion and Howitt (1992) – where innovation (and entry) destroys monopoly rents and eventually leads to sub-optimal levels of innovations – the position of Geroski may seem overly optimistic with respect to net growth effects following innovation and entry.

5.2 Positioning the Theories concerning Entrepreneurial Activities and Economic Growth

Even without a generally acceptable definition of entrepreneurship, it might be possible to discern a number of manifestations of entrepreneurial activity. Three of those that are assumed to affect economic growth are competition, innovation, and job creation through firm start-ups. An unbalanced amount of attention has been devoted to theoretical vis-à-vis empirical treatments of these activities.

Table 2 demonstrates the foci of the different theories that have been used when trying to formalize entrepreneurial activity into models. This is summarized and illustrated in Figure 4 above together with the theory of recombinant growth. It should be emphasized that the authors have some objections to the ranking of the different theories as suggested by Wennekers and Thurik (1999, p. 50). For instance, competition and innovation is in our view considerably more central to the Austrian school than compared to the neoclassical Solow model, why we have chosen make a sharper distinction between the two different traditions in the figure below than the one offered by Wennekers and Thurik.[10]

As demonstrated the main theoretical focus is on innovation. Innovation carries more weight in theory formulations than firm start-ups or competition, which in most cases is assumed to be monopolistic competition in the context of entrepreneurship.

According to the ranking by Wennekers and Thurik (1999) six of the eight schools of thought have provided innovation as a "pivotal" element (Schumpeter/Baumol, endogenous growth theory, economic history, management literature, industrial economics and evolutionary economics), two include competition in this category (industrial economics and evolutionary economics) and one comprises firm start-up (evolutionary economics). Three of the theories do not consider firm start-up at all and two include it implicitly. Considering the amount of attention dedicated to firm start-up in empirical studies this discrepancy between theory and practice might be unfortunate.

[10] Any classification of schools of thoughts as the one offered by Wennekers and Thurik (1999), represented by Table 2 and Figure 4, is of course subject to some arbitrariness. It should, therefore, be understood for what it is; an indication of emphasis and direction.

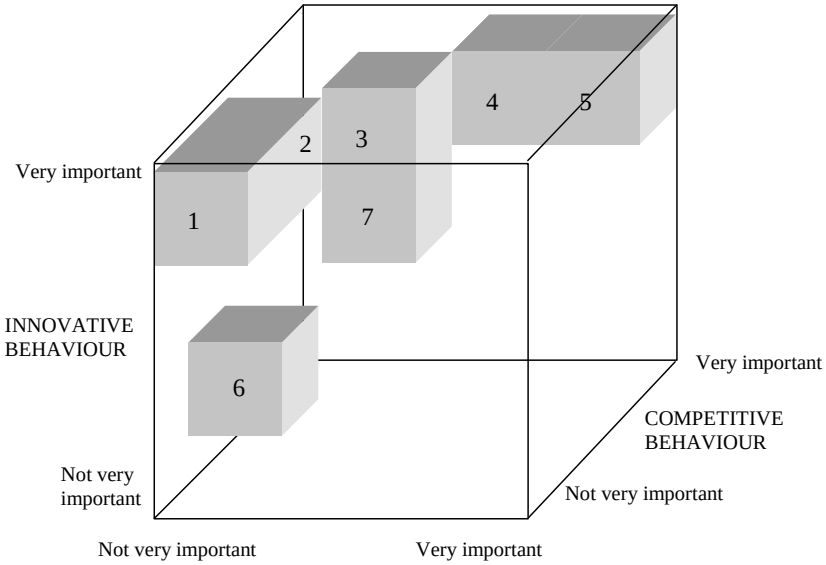


Fig. 5.2 The relative explanatory power of a number of different theories regarding innovation, competition and firm start-up. (Source: Authors' construction.)
(1) recombinant growth, (2) endogenous growth theory, (3) Schumpeter / Baumol and economic history, (4) industrial economics, (5) evolutionary economics, (6) neoclassical (Solow), and (7) Austrians.

5.3 The Relevance of the Empirical Studies and Methodological Problems

Regarding an operational measure of entrepreneurship, it is generally more straightforward to find statistics describing the number of firms entering and leaving the market than finding reliable data on innovation or competition. Figure 5 illustrates the distribution of the empirical studies scrutinized for this paper as well as the theoretical focus.[11] The outcome should not be generalized but might offer an indication of the allocation of research efforts.

[11] The theoretical emphasis-line is subjectively derived from Table 2 and Figure 4. That is, it is our conjecture that innovative behaviour carries the heaviest weight in the theoretical growth literature. Competition is moreover treated as relatively important whereas the explicit emphasis and importance placed on new firm creation is virtually ignored. The theoretical empasis can be compared with the focus adopted by the empirical studies considered for and referred to in this paper. Here, the overall emphasis lies on new firm creation and considerably less is on innovation and competition. This mismatch implies that hypotheses and predictions of theoretical models are not (sufficiently) tested.

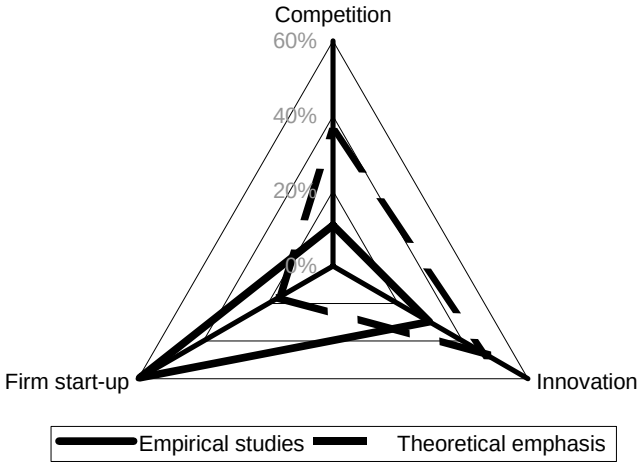


Fig. 5.3. The relative frequency of empirical studies and theoretical contributions covering different entrepreneurial activities. (Source: Authors' construction)

A methodological problem with most of the empirical studies undertaken in the field is the aggregate level of the data. It conceals regional differences, which are supposedly sometimes larger than the differences between countries. Concerning firm start-ups it also leads to difficulties in discriminating between the potential "gazelles", such as a biotech spin-off, and the no-growth firms, for instance a hairdresser or a pizza baker. One noticeable exception to this is provided by Fölster (2002), who compares two data sets – one aggregate international country comparison and one national disaggregate regionalized national comparison – in which the relationship between tax rates and levels of self-employment is analyzed. While both data sets generate similar results, i.e. that lower tax rates seem to favor levels of self-employment, only the latter set seem to be statistical reliable and robust to statistical testing; hence, highlighting some of the problems with aggregation.

The firm and the creation of firms have long played an ambiguous role in economic theory but have nevertheless been used as an important measure in empirical studies. Coase (1937) suggests that the function of the firm is to minimize transaction costs. In a functioning market, more firms will ensure more employment opportunities and fiercer competition.

Innovative activity is, furthermore, an ambiguous unit of measurement, especially concerning small firms. Neither R&D expenses nor patents might do small firms full justice. Reasons for this might include the existence of knowledge spillovers from universities and large corporations as well as diminishing returns to R&D, as suggested by Acs (1996). To counter this, Acs suggests using an innovation measure defined as the number of innovations produced per 1000 employees. Unfortunately, the author omits to include a definition of what constitutes an innovation[12].

In a similar way, the degrees of competition as well as its effects are difficult to measure. Nickell (1996) suggests using an increased number of firms in an industry and the level of surplus profits generated as measures of competition. Regarding an increased number of firms in an industry the picture might not be complete without some additional information about the distribution of firm size. Low or decreasing levels of surplus profits could indeed be a sign of increasing competition, but it could also be the characteristics of a dying industry, the final

[12] Most likely, the definition used is the one described in Acs *et al* (1994), where the measure represents the number of innovations recorded in 1982 by the U.S. Small Business Administration. The sources used are technology, engineering, and trade journals in each manufacturing industry. Even so, this measure does not appear unambiguous.

phase in the cycle of creative destruction. A different approach is offered by Baumol (2002). Here innovation is the method to avoid price competition and to maintain monopoly rents. Innovation is the tool to deter entry, in which case rents would be eroded and the rate of innovation would thereby decline.
The conclusion appears to be that there is a lack of theoretical treatments explicitly dealing with the relationships between entrepreneurship and economic growth through entrepreneurial activities such as e.g. innovation, competitive behavior, and firm start-ups. Furthermore, there appears to be a need for research on firm start-ups and job creation on a regional basis. The innovative activity of small firms could also be further studied and additional operational terms could be developed. Finally, there is a void regarding empirical tests of the links between competition and economic growth, especially in the context of entrepreneurship. To use Kirzner's (1973, p. 8) words: "*And I will argue further that the role of entrepreneurship in relation to competition has been virtually ignored.*" Kirzner aired this opinion in 1973; the statement still carries validity today.
A final emphasis should be put on the importance of studying regions rather than nations. Aggregate studies reveal little of the enigmatic nature of Silicon Valley, Third Italy or the Gnosjö area in Sweden.
This paper was initiated by a quotation by Holcombe and thus it appears appropriate to conclude the overview by completing the circle (Holcombe, 1998, p. 58):

> "The engine for economic growth is not better inputs, but rather an environment in which entrepreneurial opportunities can be capitalized upon."

6 Conclusion

6.1 Concluding the Findings

This paper has provided an overview of the research on the relationship between entrepreneurship and growth. The emphasis on entrepreneurial activities in the context of growth-oriented theories has been outlined and brief overviews and main findings of relevant and recent empirical studies have been presented.
There exist an abundant number of definitions of entrepreneurship describing a wide array of economic activities and functions. In this paper, a distinction has been made between theoretical definitions, which tend to cover a number of different aspects without being operationally applicable, and empirical definitions covering individual elements of entrepreneurial activities. Entrepreneurial activities range from creative destruction and innovation to dealing with uncertainty and spotting profit opportunities. Three links are emphasized through which those activities affect economic growth, firm start-ups, and innovative and competitive behavior. These entrepreneurial activities form the methodological foundation of this paper. In spite of the weaknesses of the classification, we have not found a better systematization to identify the links between entrepreneurship and economic growth.
Theories of growth generally have an emphasis on innovation as the main explanatory engine for growth. Empirical contributions, on the other hand, most often have a focus on the relationship between new-firm creation and net employment growth. If entrepreneurship can be defined as the activities outlined above, there seem to be an obvious discrepancy between the theoretical and empirical literature with respect to the relationship between entrepreneurship and growth.
When it comes to the empirical studies, there is some controversy regarding the impact of small firms and start-up activities on net employment growth (e.g. Audretsch *et al* 2001,

Fölster 2000, Davidsson *et al* 1994, Davis *et al* 1996, and Bednarzik 2000). Competition appears to correlate positively with both employment levels and growth in total factor productivity (e.g. Acs 1996, Geroski 1994, and Nickell 1996). Small firms are found to produce a large share of the total number of innovations but there are significant sectoral differences (e.g. Acs and Audretsch, 2001, and Baldwin and Johnson, 1999). They are also found to innovate in less explored fields of technology (e.g. Almeida and Kogut, 1997, and Almeida, 1999). This generally involves greater uncertainty but higher potential for growth.

6.2 Suggestions for Further Research and Policy Implications

As illustrated in Figure 4 the theoretical literature linking entrepreneurial activities to economic growth is skewed towards innovation. This calls for a discussion about the relationship between entrepreneurship and competition, as well as between competition and economic growth. Under favorable circumstances, firm start-ups appear to affect economic development through both job creation and increased competition. However, given that innovations are inducing growth and that innovation is the means to avoid price competition, increased competition may, via a business stealing effect, erode economic rents and lower innovation rates (Aghion and Howitt, 1992, Baumol, 2002). Net effects on growth following increased competition might, therefore, be ambiguous. This is an interesting and highly relevant area of research, but currently a relatively unexplored one.

A great variety of the instruments and methods has been used in the empirical studies undertaken so far. It would probably be beneficial to make an evaluation of the different approaches and compare their relative performance. Such an evaluation might assist in constructing operational tools for future studies. Corporate entrepreneurship and intrapreneurship are other promising themes for further research efforts, both with a theoretical as well as with an empirical foundation. Figure 5 suggests, furthermore, that there is a need for additional empirical tests to support the theories linking entrepreneurship and innovative activity. The correspondence between entrepreneurial activities and competition is another topic for future explorations.

One specific topic of interest would be to identify whether there is a correlation between the numbers of firms created as a function of the existing number of firms in a regional framework. Regional studies and cluster studies could also be undertaken to study the dynamics of the creation and destruction of firms, simultaneously studying net changes and gross volatilities. The regional or cluster perspective seems essential since there are substantial differences between regions in their ability to stimulate entrepreneurial activities under seemingly (but not identical) similar institutional settings (Fölster, 2002). A better understanding of how different regional economic milieus influence entrepreneurial behavior seems to be necessary in order to better understand the links between entrepreneurship and economic growth.

The main focus of this paper has been the empirical and theoretical relationship between entrepreneurship, or entrepreneurial activities, and economic growth. Some attention has been given to the importance of the institutional framework in supporting and enhancing entrepreneurship and growth. It is questionable whether a majority of the empirical results presented in this paper carries any generality unless the institutional framework in which the study was undertaken is taken into account. The contributions of e.g. Baumol (1993, 2002), Bergström (2000), Davis and Henrekson (1999), Henrekson (2002), and Fölster (2002), suggest that levels of entrepreneurial activities and rates of growth should be understood in relation to the incentives provided by the institutional setting in each nation or region.

If the implications of the research efforts on entrepreneurship were to be translated into policy formulation, it would be injudicious to make entrepreneurship policy equivalent to policy for

small firms and firm start-ups. This would imply that several aspects of entrepreneurial behavior would be lost, aspects that are likely to affect economic growth positively. Furthermore, and given the contributions discussed in the paragraph above, it seems clear that one of the main objectives for policy in relationship to entrepreneurship, and in the extension to growth, is to organize the institutional rules of the game in such a way as to provide and support the incentives for innovation and facilitate entry and growth of new and small firms. It follows from Baumol (1993) that adoption of new technology and levels of innovations could e.g. be facilitated by supporting 1) immigration of individuals with key knowledge, 2) education and training of national in foreign countries where new critical technology and knowledge is being used, and iii) loan guarantees for a rapid adoption of critical foreign technology. From e.g. Davis and Henrekson (1999), Henrekson (2002), and Fölster (2002), it follows that entry and growth of new and small firms could significantly be improved via policy measures. Predominantly taking a Swedish perspective, they among other things suggest that: 1) the wage formation and labor market in general should be deregulated. This would support growth of firms by making it easier to hire (and fire) staff. 2) The tax system should be reformed not to disfavor small and new firms. Income taxes need, furthermore, to be cut in order to make it possible to accumulate wealth, which is fundamental for the birth of new firms. 3) Entry of firms should be free in the entire economy, i.e. regulated public sector monopolies should be abolished. While potentially wide-ranging, this is only an example of potential policy measures suggested to support entrepreneurship and growth in general. Anyone with an interest in growth will generally not disagree.

References

Acs ZJ (1996) Small Firms and Economic Growth. In: Acs ZJ, Carlsson B, Thurik R (eds) Small Business in the Modern Economy. Blackwell Publishers, Oxford, pp 1–62

Acs ZJ (1999) The New American Evolution. In: Acs ZJ (ed) Are Small Firms Important? Their Role and Impact. Kluwer Academic Publishers, Dordrecht, pp 1–20

Acs ZJ, Armington C, Robb A (1999) Measures of Job Flow Dynamics in the U.S. Economy. CRIEFF Discussion Paper No. 9907, Centre for Research into Industry, Enterprise, Finance and the Firm, Fife

Acs ZJ, Audretsch DB (1990) Innovation and Small Firms. MIT Press, Cambridge, MA

Acs ZJ, Audretsch DB (2001) The Emergence of the Entrepreneurial Society. Swedish Foundation for Small Business Research, Stockholm

Acs ZJ, Audretsch DB, Feldman MP (1994) R&D Spillovers and Innovative Activity. Managerial and Decision Economics 14: 131–38

Acs ZJ, Carlsson B, Karlsson C (1999) The Linkages among entrepreneurship, SMEs and the macroeconomy. In: Acs ZJ, Carlsson B, Karlsson C (eds) Entrepreneurship, Small and Medium Sized Enterprises and the Macroeconomy. Cambridge University Press, Cambridge, pp 3–42

Acs ZJ, Morck R, Yeung B (1999) Evolution, Community, and the Global Economy. In Acs ZJ (ed) Are Small Firms Important? Kluwer Academic Publishers, Dordrecht

Aghion P, Howitt P (1992) A Model of Growth Through Creative Destruction. Econometrica 60: 323–51

Aghion P, Howitt P (1998) Endogenous Growth Theory. MIT Press, Cambridge, MA

Almeida P (1999) Semiconductor Startups and the Exploration of New Technological Territory. In: Acs ZJ (ed) Are Small Firms Important? Their Role and Impact. Kluwer Academic Publishers, Dordrecht, pp 39–50

Almeida P, Kogut B (1997) The Exploration of Technological Diversity and the Geographic Localization of Innovation. Small Business Economics 9: 21–31

Andersson P, Delmar F (2000) The Characteristics of High-Growth Firms and their Job Contribution. In: Delmar F (ed) Innovation, Growth and Entrepreneurship. ESBRI 2000/5, Entrepreneurship and Small Business Research Institute, pp 204–13

Audretsch DB (1995) Innovation and Industry Evolution. MIT Press, Cambridge, MA

Audretsch DB, Carree MA, Thurik AR (2001) Does Entrepreneurship reduce Unemployment? Tinbergen Institute Discussion Paper 2001–074/3, Tinbergen Institute

Audretsch DB, Carree MA, van Stel AJ, Thurik AR (2002) Impeded industrial restructuring: the growth penalty. Kyklos 55: 81–97

Audretsch DB, Thurik AR (1997) Sources of Growth: The Entrepreneurial versus the Managed Economy. Tinbergen Institute Discussion Paper TI 97–109/3, Tinbergen Institute

Audretsch DB, Thurik AR (2001a) What is new about the new economy: sources of growth in the managed and entrepreneurial economies? Industrial and Corporate Change 10: 267–315

Audretsch DB, Thurik AR (2001b) Capitalism and Democracy in the 21st Century: from the Managed to the Entrepreneurial Economy. In: Mueller DC, Cantner U (eds) Capitalism and Democracy in the 21st Century. Physica-Verlag, Heidelberg. pp 23–40

Audretsch DB, Vivarelli M (1996) Firms Size and R&D Spillovers: Evidence from Italy. Small Business Economics 8:249–58

Baldwin J, Picot G (1995) Employment Generation by Small Producers in the Canadian Manufacturing Sector. Small Business Economics 7: 317–31

Baldwin JR (1995) Innovation: The Key to Success in Small Firms. Research Paper Series No. 76, Analytical Studies Branch, Statistics Canada, Ottawa

Baldwin JR, Johnson J (1999) Entry, Innovation and Firm Growth. In: Acs ZJ (ed) Are Small Firms Important? Their Role and Impact. Kluwer Academic Publishers, Dordrecht, pp 51–77

Baumol WJ (1968) Entrepreneurship in Economic Theory. American Economic Review 52: 64–71

Baumol WJ (1993) Entrepreneurship, Management and the Structure of Payoffs. MIT Press, Cambridge, MA

Baumol WJ (2002) The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism. Princeton University Press, Princeton

Bednarzik RW (2000) The Role of Entrepreneurship in U.S. and European Job Growth. Monthly Labor Review 123: 3–16

Bergström F (2000) Capital Subsidies and the Performance of Firms. Small Business Economics 14: 183–93

Blanchflower DG (2000) Self-Employment in OECD Countries, Labor Economics 7: 471–505

Brock WA, Evans DS (1989) Small Business Economics, Small Business Economics 1: 7–20

Brouwer M (2000) Entrepreneurship and Uncertainty: Innovation and Competition among the Many. Small Business Economics 15: 149–60

Cantillon R (1755) The Circulation and Exchange of Good and Merchandise. In:Casson M (ed) (1990) Entrepreneurship. Edward Elgar, Hants, pp 5–10

Carlsson B (1992) The Rise of Small Business; Causes and Consequences. In:Adams WJ (ed) Singular Europe: Economy and Polity of the European Community after 1992. Universtiy of Michigan Press, Ann Arbor, pp 145–69

Carlsson B (1996) Small Business, Flexible, Technology and Industrial Dynamics. In: Acs ZJ, Carlsson B, Thurik R (eds) Small Business in the Modern Economy. Blackwell Publishers, Oxford, pp 63–125

Carlsson B (1999) Small Business, Entrepreneurship, and Industrial Dynamics. In: Acs ZJ (ed) Are Small Firms Important? Their Role and Impact. Kluwer Academic Publishers, Dordrecht, pp 99–110

Carree M, Klomp L (1996) Small Business and Job Creation: A Comment. Small Business Economics 8: 317–322

Carree M, Thurik AR (1998) Small Firms and Economic Growth in Europe. Atlantic Economic Journal 26: 137–46

Carree M, van Stel A, Thurik R, Wennekers S (1999) Business Ownership and Economic Growth: An Empirical Investigation. EIM Research Report 9809/E, Zoetermeer

Carree M, van Stel A, Thurik R, Wennekers S (2002) Business Ownership and Economic Growth in 23 OECD Countries in the Period 1976–1996. Small Business Economics 19: 271–90

Casson M (ed.) (1990) Entrepreneurship. Edward Elgar, Hants

Chandler A (1990) Scale and Scope: The Dynamics of Industrial Capitalism. Harvard University Press, Cambridge

Coase RH (1937) The Nature of the Firm. Economics New Series 4: 386–405

Cole AH (1949) Entrepreneurship and Entrepreneurial History. In: Livesay HC (ed) (1995) Entrepreneurship and the Growth of Firms, Vol. I. Edward Elgar, Hants, pp 100–22

Davidsson P, Lindmark L, Olofsson C (1994) New Firm Formation and Regional Development in Sweden. Regional Studies 28: 395–410

Davidsson P, Lindmark L, Olofsson C (1998) The Extent of Overestimation of Small Firm Job Creation – An Empirical Examination of the Regression Bias. Small Business Economics 11: 87–100

Davis SJ, Haltiwanger J, Schuh S, (1996) Small Business and Job Creation: Dissecting the Myth and Reassessing the Facts. Small Business Economics 8: 297–315

Davis S, Henrekson M (1999) Explaining Natonal Differences in the Size and Industry Distribution of Employment. Small Business Economics 12: 59–83

Dejardin M (2000) Entrepreneurship and Economic Growth: An Obvious Conjuction? DP 2000–08, Indiana University, Bloomington

Eliasson G (1994) The Theory of the Firm and the Theory of Economic Growth. In: Magnusson L (ed) Evolutionary and Neo-Schumpeterian Approaches to Economics. Kluwer, Boston, pp 173–201

Eliasson G, Braunerhjelm P (1998) Intangible, Human-Embodied Capital and Firm Performance. In: Eliasson G, Green C, McCann CR Jr (eds) Microfoundations of Economic Growth: A Schumpeterian Perspective. The University of Michigan Press, Ann Arbor

Fölster S (2000) Do Entrepreneurs Create Jobs? Small Business Economics 14: 137–48

Fölster S (2002) Do Lower Taxes Stimulate Self-Employment? Small Business Economics 19: 135–45

Geroski P (1994) Market Structure, Corporate Performance, and Innovative Activity. Oxford University Press, Oxford

Glancey KS, McQuaid RW (2000) Entrepreneurial Economics. MacMillan, London

Goel U (1997) Economists, Entrepreneurs and the Pursuit of Economics. European University Studies. Peter Lang, Frankfurt aM

Gort M, Sung N (1999) Competition and Productivity Growth: The Case of the U.S. Telephone Industry. Economic Inquiry 37: 678–691

Gould JD (1972) Economic Growth in History. Methuen & Co, London

Grebel T, Pyka A, Hanusch H (2001) An Evolutionary Approach to the Theory of Entrepreneurship. Discussion Paper Series 206, Institute for Economics, Universitaet Augsburg

Grossman GM, Helpman E (1991) Quality Ladders in the Theory of Growth. Review of Economic Studies 58: 43–61

Haltiwanger J, Krizan CJ (1999) Small Business and Job Creation in the United States: The Role of New and Young Businesses. In: Acs ZJ (ed) Are Small Firms Important? Their Role and Impact. Kluwer, Dordrecht, pp 79–97

Hébert RF, Link AN (1989) In Search of the Meaning of Entrepreneurship. Small Business Economics 1: 39–49

Henrekson M (2002) Entrepreneurship - A Weak Link in the Mature Welfare State. SSE/EFI Working paper No 518, Stockholm School of Economics, Stockholm

Heshmati A (2001) On the Growth of Micro and Small Firms: Evidence from Sweden. Small Business Economics 17: 213–28

Holcombe RG (1998) Entrepreneurship and Economic Growth. The Quarterly Journal of Austrian Economics 1: 45–62

Hülsman JG (1999) Entrepreneurship and Economic Growth: Comment on Holcombe. The Quarterly Journal of Austrian Economics 2: 63–65

Kihlstrom RE, Laffont JJ (1979) A General Equilibrium Entrepreneurial Theory of Firm Formation Based on Risk Aversion. In: Casson M (ed) Entrepreneurship. Edward Elgar, Hants, pp 19–48

Kirzner IM (1973) Competition & Entrepreneurship. The University of Chicago Press, Chicago

Kirzner IM (1994) The Entrepreneur in Economic Theory. In: Dahmén E, Hannah L, Kirzner IM (eds) The Dynamics of Entrepreneurship. Crafoord Lectures 5, Lund University Press, pp 45–59

Knight FH (1921) Risk, Uncertainty and Profit. In:Casson M (ed) (1990) Entrepreneurship. Edward Elgar, Hants, pp 11–18

Kwoka JE, White LJ (2001) The New Industrial Organization and Small Business. Small Business Economics 16: 21–30
Landström H (1999) Entreprenörskapets rötter. Studentlitteratur, Lund
Livesay HC (ed) (1995) Entrepreneurship and the Growth of Firms. Edward Elgar, Hants
Loveman G, Sengenberger W (1991) The Re-Emergence of Small-Scale Production: An International Comparison. Small Business Economics 3: 1–37
Lucas RE Jr (1988) On the Mechanics of Economic Development, Journal of Monetary Economics 22: 3–42
Lydall H (1998) A Critique of Orthodox Economics: An Alternative Model. MacMillan, London
Minniti M (1999) Entrepreneurial Activity and Economic Growth. Global Business & Economic Review 1: 31–42
Nelson RR, Winter SG (1982) An Evolutionary Theory of Economic Change. Harvard University Press, Cambridge, MA
Nickell SJ (1996) Competition and Corporate Performance. Journal of Political Economy 104: 724–46
North DC (1990) Institutions, Institutional Change and Economic Performance. Harvard University Press, Cambridge, MA
North DC, Thomas RP (1973) The Rise of the Western World: A New Economic History. Harvard University Press, Cambridge, MA
Olsson O, Frey B (2002) Entrepreneurship as Recombinant Growth. Small Business Economics 19: 69–80
Piore MJ, Sabel CF (1984) The Second Industrial Divide; Possibilities for Prosperity. Basic Books, New York
Porter ME (1990) The Competitive Advantage of Nations. MacMillan, London
Romer P (1986) Increasing Returns and Long Run Growth. Journal of Political Economy 94: 1002–1037
Romer P (1990) Endogenous Technological Change. Journal of Political Economy 98: S71–S102
Rigotti L, Ryan M, Vaithianathan R (2001) Entrepreneurial Innovation. Working Paper No. E01–296, University of California, Berkeley
Rothwell R, Zegveld W (1982) Innovation and the Small and Medium Sized Firm. Pinter Publishers, London
Runge I (2000) Capital and Uncertainty. Edward Elgar, Cheltenham
Schumpeter JA (1934) The Theory of Economic Development. In: Casson M (ed) (1990) Entrepreneurship. Edward Elgar, Hants, pp 105–34
Segerstrom PS, Anant TCA, Dinopoulos E (1990) A Schumpeterian Model of the Product Life Cycle. American Economic Review 80: 1077–91
Sexton DL, Smilor RW (eds) (1997) Entrepreneurship 2000. The Erwing Marion Kauffman Foundation, Upstart Publishing Company, Chicago
Steele CN (2000) Entrepreneurship, Institutions, and Economic Growth. UMI Dissertation Services, Ann Arbor, MI
Solow RM (1956) A Contribution to the Theory of Economic Growth. Quarterly Journal of Economics 70: 65–94
Storey DJ (1994) Understanding the Small Business Sector. Routledge, London
Sutton J (1998) Technology and Market Structure. MIT Press, Cambridge, MA
Swan TW (1956) Economic Growth and Capital Accumulation. Economic Record 32: 334–61
Thurik AR (1996) Small Firms, Entrepreneurship and Economic Growth. In: Acs ZJ, Carlsson B, Thurik AR (eds) Small Business in the Modern Economy. Basil Blackwell, Oxford, pp 126–52
Valdés B (1999) Economic Growth: Theory, Empirics and Policy. Edward Elgar, Cheltenham
Verheul I, Wennekers S, Audretsch D, Thurik R (2003). An Eclectic Theory of Entrepreneurship. In: Audretsch DB (ed) The Globalization of the World Economy. Edward Elgar, Cheltenham
Vosloo WB (ed) (1994) Entrepreneurship and Economic Growth. HSRC Publishers, Pretoria
Weitzman ML (1998) Recombinant Growth, Quarterly Journal of Economics 113: 331–360
Wengenroth U (1999) Small-Scale Business in Germany: The Flexible Element of Economic Growth. In: Odaka K, Sawai M (eds) Small Firms, Large Concerns. Oxford University Press, New York, pp 117–39
Wennekers S, Thurik R (1999) Linking Entrepreneurship and Economic Growth. Small Business Economics 13: 27–55
Wennekers S, Thurik R, Buis F (1997) Entrepreneurship, Economic Growth and What Links Them Together. EIM Strategic Study, Zoetermeer
Yu TFL (1997) Entrepreneurship and Economic Development in Hong Kong. Routledge, London