Linking Entrepreneurship and Economic Growth

Sander Wennekers
Roy Thurik

ABSTRACT. In the 1980s stagflation and high unemployment caused a renewed interest in supply side economics and in factors determining economic growth. Simultaneously, the 1980s and 1990s have seen a reevaluation of the role of small firms and a renewed attention for entrepreneurship. The goal of this survey is to synthesize disparate strands of literature to link entrepreneurship to economic growth. This will be done by investigating the relationship between entrepreneurship and economic growth using elements of various fields: historical views on entrepreneurship, macro-economic growth theory, industrial economics (Porter's competitive advantage of nations), evolutionary economics, history of economic growth (rise and fall of nations) and the management literature on large corporate organizations. Understanding the role of entrepreneurship in the process of economic growth requires the decomposition of the concept of entrepreneurship. A first part of our synthesis is to contribute to the understanding of the dimensions involved, while paying attention to the level of analysis (individual, firm and aggregate level). A second part is to gain insight in the causal links between these entrepreneurial dimensions and economic growth. A third part is to make suggestions for future empirical research into the relationship between (dimensions of) entrepreneurship and economic growth.

1. Introduction

Economic growth is a key issue both in economic policy making and in economic research. In Europe in particular, the interest in economic growth is growing fast in view of the persistently high rates of unemployment. In most OECD countries the first decades after World War II showed historically high rates of economic growth. Following the first oil crisis in 1973 a period of stagflation set in, characterized by a combination of inflation and slow growth. Since the mid-1980s economic growth in some countries – such as the Netherlands – has picked up again.

In the 1960s and 1970s academic and political interest in many Western countries gradually turned to matters of demand management and income equality, whereas the interest in the causes of economic growth waned. Neo-classical theory explained economic growth by accumulation of production factors and by exogenous technological change. Mainstream economics however did not show any substantial interest in the ultimate causes underlying long-term factor accumulation and technological development.

In the 1980s stagflation and high unemployment caused a renewed interest in supply side economics and its underlying factors. As clearly exposed by North and Thomas (1973), Olson (1982) and more recently by Van de Klundert (1997) the institutional foundations of an economy are among the most prominent of these factors. These authors focus attention on factors such as incentives, regulation of markets and social rigidities. Somewhat understated in their analysis is the primal role of the economic agents who link the institutions at the micro level to the economic outcome at the macro level. It remains veiled how exactly institutions and cultural factors frame the decisions of the millions of entrepreneurs in small firms and of entrepreneurial managers working within large companies. And little is known about how these individuals materialize their decisions into the kind of actions that aggregate into economic growth. This directs our attention to two related phenomena of the 1980s and 1990s: the resurgence of small business and the revival of entrepreneurship.

There is ample evidence that economic activity moved away from large firms to small firms in the

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EIM Small Business Research and Consultancy, The Netherlands and Centre for Advanced Small Business Economics (CASBEC), Erasmus University Rotterdam, The Netherlands
E-mail: awe@eim.nl

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1970s and 1980s. The most impressive and also the most cited is the share of the 500 largest American firms, the so-called Fortune 500. Their employment share dropped from 20 per cent in 1970 to 8.5 per cent in 1996 (Carlsson, 1992 and 1999). European data dealing with the size distribution of firms were not available in a systematic manner until recently. However, Eurostat has begun publishing yearly summaries of the firm size distribution of (potential) EU-members at the two-digit level for the entire business sector. See Eurostat (1994), for instance. The efforts of Eurostat are supplemented by the European Network for SME Research (ENSR), a cooperation of 19 European institutes. This organization publishes a yearly report on the structure and the developments of the small business sectors in the countries of the EU including Iceland, Norway, Liechtenstein and Switzerland. See EIM (1993/4/5/6/7). In its 1997 issue (EIM, 1997, p. 15) it is shown that small business employment growth in Europe is in excess of that of their large counterparts in the period 1988–1998.

Acs and Audretsch (1993) and Carlsson (1992) provide evidence concerning manufacturing industries in countries in varying stages of economic development. Carlsson advances two explanations for the shift toward smallness. The first deals with fundamental changes in the world economy from the 1970s onwards. These changes relate to the intensification of global competition, the increase in the degree of uncertainty and the growth in market fragmentation. The second deals with changes in the character of technological progress. He shows that flexible automation has various effects resulting in a shift from large to smaller firms. The pervasiveness of changes in the world economy, and in the direction of technological progress result in a structural shift affecting the economies of all industrialized countries. Also Piore and Sable (1984) argue that the instability of markets in the 1970s resulted in the demise of mass production and promoted flexible specialization. This fundamental change in the path of technological development led to the occurrence of vast diseconomies of scale.

This shift away from large firms is not confined to manufacturing industries. Brock and Evans (1989) show that this trend has been economy-wide at least for the United States. They provide four more reasons why this shift has occurred: the increase of labor supply leading to lower real wages and coinciding with an increasing level of education; changes in consumer tastes; relaxation of (entry) regulations and the fact that we are in a period of creative destruction. Loveman and Sengenberger (1991) stress the influence of two trends of industrial restructuring: that of decentralization and vertical disintegration and that of the formation of new business communities. These intermediate forms of market coordination flourish owing to declining costs of transaction. Furthermore, they emphasize the role of public and private policies promoting the small business sector.[1] Audretsch and Thurik (1998) point at the necessary shift towards the knowledge based economy being the driving force behind the move from large to smaller businesses. In their view globalization and technological advancements are the major determinants of this challenge of the Western countries. See Loveman and Sengenberger (1991), Acs et al. (1999) and Carree et al. (1999) for a further documentation of industrial changes and their causes.

The causes of this shift are one thing. Its consequences cover a different area of research. Acs (1992) has discussed them. He distinguishes four consequences of the increased importance of small firms: entrepreneurship, routes of innovation, industry dynamics and job generation. His claims are that small firms play an important role in the economy serving as agents of change by their entrepreneurial activity, being the source of considerable innovative activity, stimulating industry evolution and creating an important share of the newly generated jobs. Baumol (1993a) amply deals with the role of entrepreneurial activities and the different effects it may have. The role of smallness in the process of innovative activities is investigated extensively in Acs and Audretsch (1990) and Audretsch (1995). The discussion of the relation between the role of small firms and industry dynamics is spread out: examples can be found in Audretsch (1993, 1995). Cohen and Klepper (1992) zoom in on the role of number of firms and diversity for obtaining progress. The role of small firms in the job creation process is controversial.[2]

Clearly, there are many more consequences of the increased share of small firms than the four

mentioned by Acs (1992). For instance, an increase in the share of small firms may lead, ceteris paribus, to a lower orientation towards exports, a lower propensity to export employment, a qualitative change in the demand for capital and consultancy inputs, more variety in the supply of products and services or in the manner and aims of conducting research and development. The literature of the consequences of smallness is complemented by some empirical exercises by Thurik (1996) and Carree and Thurik (1998 and 1999) for some European countries. They show that a rise in the share of smallness in a certain economy, respectively a high share of smallness in a certain industry generates additional output in the entire economy, respectively industry. Schmitz (1989) provides a theoretical model with a similar result. Audretsch and Thurik (1999) show that an increase of the rate of entrepreneurship (number of business owners per labor force) leads to lower levels of unemployment in 23 OECD countries in the period 1984 through 1994.

The reevaluation of the role of small firms is related to a renewed attention to the role of entrepreneurship. If the size class distribution has an influence on growth, it must be differences in organization that matter. The major difference between the organization of a large firm and a small one is the role of ownership and management. In a small firm usually there is one person or a very small group of persons which is in control and which shapes the firm and its future. The role of such a person is often described with the term "entrepreneurship".

In recent years renewed attention has been given to the role of entrepreneurship in economic development. This is related to the aforementioned shift to supply side economics. Many economists and politicians now have an intuition that there is a positive impact of entrepreneurship on the growth of GDP and employment. Furthermore, many stress the role of the entrepreneur in implementing innovations. This renewed interest of politicians and professional economists coincides with a revival of entrepreneurship rates in most, though not in all, Western economies.[3]

A related question is whether small firms and entrepreneurship are synonymous. We will argue that this is not the case.[4] Small firms certainly are a vehicle in which entrepreneurship thrives. There are more such vehicles, for instance business units within large companies. Clearly, this broader interpretation of entrepreneurship implies measurement difficulties.

"Small business has to save us" is a slogan often heard from European politicians and representatives of social and institutional groups. They fear for a further rise of the already unacceptably high level of unemployment caused by the sheer endless series of efficiency and cost-cutting operations of the public and large business sectors. They seek salvation with the residual sector, being the small business sector. They hope that stimulating smallness can fight unemployment. There is probably some truth in their hopes and slogans. The literature cited above points decisively it this direction. However, there are more ways for entrepreneurship to contribute to growth than through small firms. Recent studies on the role of competition (Nickell, 1996), of deregulation (Koedijk and Kremers, 1996) and of the nature of innovation (Cohen and Klepper, 1996) support this view.

The objective of this article is to synthesize disparate strands of literature in order to link entrepreneurship to economic growth. This will be done by investigating the relationship between entrepreneurship and economic growth in the following fields: historical views on entrepreneurship, macro-economic growth theory, industrial economics (Porter's competitive advantage of nations), evolutionary economics, history of economic growth (rise and fall of nations) and the management literature on large organizations. This last body of literature is taken into account because management techniques within large organizations have tried to learn from their smaller counterparts. This led to a wave of downsizing, the creation of business units, forms of intrapreneurship, etc. Furthermore, as we have argued above, our approach to entrepreneurship will not be confined to its role in the arena of small firms.

Entrepreneurship is an ill-defined, at best multidimensional, concept. Understanding its role in the process of growth requires the decomposition of the concept of entrepreneurship. A *first* goal of this paper is to contribute to the understanding of the dimensions involved, while paying attention to the level of analysis (individual, firm and aggregate level). A *second* goal is to provide insight in the causal links between these entre-

preneurial dimensions and economic growth. These insights, however valuable, are not a goal in itself but should be viewed in a broader framework. Empirical research of the role of entrepreneurship as a driving force of economic development still is not well developed. Therefore, a *third* goal of our paper is to suggest ways in which to measure entrepreneurship and to suggest ways in which the relationship between dimensions of entrepreneurship and growth might be empirically investigated. This might shed light on the way the capitalist market engine works.

The preliminary framework of this article is given in Figure 1. This framework is adopted because there is not usually a direct link between entrepreneurship and economic growth. And secondly, entrepreneurship is an ill-defined concept. That is why we need *intermediate variables* or *linkages* to explain how entrepreneurship influences economic growth. Examples of these intermediate variables are innovation, and entry and exit of firms (competition). We will also attempt to provide some *conditions* for entrepreneurship. This is done for several reasons. First personal traits lie at the origin of entrepreneurship. Furthermore, both entrepreneurship and the intermediate linkages may depend upon underlying cultural and institutional conditions. The relevance of these conditions will be looked into in some detail. Finally, the possibility of feedbacks will be considered.

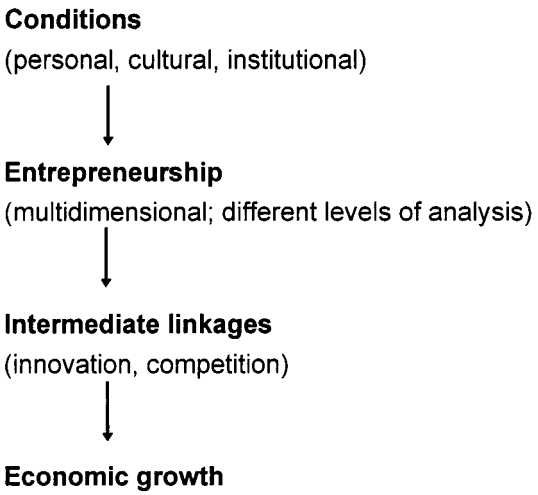

Figure 1. Preliminary framework.

This article is structured as follows. In section 2 introductory remarks will be made on current and historical views on entrepreneurship. This section also contains a part on the explanation of the disappearance of entrepreneurship from economic theory during the post war period, and closes with the explanation of the revival of interest in entrepreneurship since the 1980s. Section 3 is concerned with understanding economic growth. First, the significance of the rejuvenation of macro-economic growth theory for entrepreneurship research will be examined. This theory focuses on the importance of (human) capital formation and innovation. Next, some seminal literature in the field of economic history, in particular concerning the rise and decline of nations, is discussed in order to search for the underlying causes of economic growth such as the cultural setting, legal framework and entrepreneurial activity. In a final section some modern views regarding economic growth, as formulated in industrial economics and in evolutionary economics are considered. Section 4 focuses on the role of entrepreneurship, downsizing and intrapreneurship within large organizations. Section 5 attempts to bring it all together. Some conclusions will be drawn from the literature research reported in sections 2 through 4, viewed through the framework as it has developed in the course of our investigations. This section also presents proposals for further research.

2. Economic literature on entrepreneurship

In section 2.1 we will give an introduction to the historical views of economists on entrepreneurship, particularly by summarizing Hébert and Link (1989) which again is a summary of Hébert and Link (1982). In section 2.2 we will describe the disappearance and the revival of the interest in entrepreneurship. In section 2.3 we will expand on two main aspects of entrepreneurship: start-ups and innovation.

2.1. *Historical views on entrepreneurship*

Throughout intellectual history, the entrepreneur has worn many faces and fulfilled many roles. At least thirteen distinct roles for the entrepreneur can be identified in the economic literature (Hébert

and Link, 1989, but also Van Dijk and Thurik, 1995 and Van Praag, 1996):

1. The person who assumes the risk associated with uncertainty.
2. The supplier of financial capital.
3. An innovator.
4. A decision-maker.
5. An industrial leader.
6. A manager or a superintendent.
7. An organizer and coordinator of economic resources.
8. The owner of an enterprise.
9. An employer of factors of production.
10. A contractor.
11. An arbitrageur.
12. An allocator of resources among alternative uses.
13. The person who realizes a start-up of a new business.

Once we focus on the dynamic role of the entrepreneur – a role most directly linked with change and growth, implied in statements 1, 3, 4, 5, 7, 10, 11, 12, and 13 – the taxonomy of entrepreneurial theories can be condensed into three major intellectual traditions, each tracing its origin to Richard Cantillon (Hébert and Link, 1989). The first is the German tradition of von Thünen, Schumpeter and Baumol, the second the (neo-)classical tradition of Marshall, Knight and Schultz and the third the Austrian tradition of Menger, von Mises, and Kirzner. These traditions share a heritage and common language but they point at different aspects of the function of the entrepreneur. Representing differences in style and emphasis, they can be summarized as follows. The (neo-)classicals stress the role of the entrepreneur in leading markets to equilibrium through their entrepreneurial activities. The Austrians concentrate on the abilities of the entrepreneur to perceive profit opportunities, usually after some exogenous shock. The "Austrian" entrepreneur combines resources to fulfill currently unsatisfied needs or to improve market inefficiencies or deficiencies. In the German or Schumpeterian tradition economists concentrate on the entrepreneur as a creator of instability and creative destruction. The difference between the German (Schumpeterian) and Austrian tradition can be summarized as follows: "The creation of potential may be seen as Schumpeterian and its realization as Austrian" (Nooteboom 1993, p. 1).

The entrepreneur first appeared in the writings of Cantillon (1680–1734). Cantillon recognized three classes of economic agents: landowners, entrepreneurs and employees. Cantillon's entrepreneur is someone who exercises business engagements in the face of uncertainty. He argued that the origin of entrepreneurship lies in the lack of perfect foresight. Von Thünen also sharply discriminates between the entrepreneur and the supplier of financial capital, who is similar to Cantillon's landowner. Menger, being one of the founders of the Austrian school, also makes this distinction. See Hébert and Link (1989). He saw the entrepreneur primarily as a person combining production factors. This draws attention to the personality of the entrepreneur. See also Lumpkin and Dess (1996).

Marshall describes the function of "superintendence". This superintendent organizes the production in a firm. Marshall attached a more important role to entrepreneurs, "the pioneers of new paths" (Marshall, 1961), than any other neoclassical theorist. The mainstream modern neoclassical economists apparently have not cared to include the entrepreneur in their formalized model. Knight and Schumpeter distinguished this managerial or superintendent role from the role of the "entrepreneur". Since the writings of Knight, it is customary to distinguish between risk and uncertainty. The latter is unique and uninsurable. We will discuss the disappearance of the entrepreneur from economic theory in section 2.2. We will also see that Knight's distinction between risk and uncertainty parallels information problems within firms, increasing the need for entrepreneurial coordination.

Based on their study of the history of economic thought about entrepreneurship, Hébert and Link (1989, p. 47) propose the following "synthetic" definition of who an entrepreneur is and what he does: "*the entrepreneur is someone who specializes in taking responsibility for and making judgmental decisions that affect the location, form, and the use of goods, resources, or institutions*". When searching for links between entrepreneurship and growth, this definition does not fully suffice. The dynamics of perceiving and creating new economic opportunities and the competitive dimensions of entre-

preneurship need more attention. We will return to the definition of entrepreneurship in section 5.

2.2. *Disappearance and revival*

In the traditional interpretation of the neo-classical model, all individual agents have perfect information. Their economic objectives are clearly and rationally stated. In equilibrium, consumers and producers reach one set of prices at which demand for each good equals its supply. All markets that are implicitly assumed to exist and to work perfectly well are cleared at this set of equilibrium prices. Given this definition of a firm's task, there is no need for innovative alertness and risk bearing initiative.

The neo-classical model, with its production function, the internal logic of rational choice and perfect information, leaves no room for an active entrepreneur.[5] As neo-classical economics became more formalized and as the mathematics of equilibrium theory became more important, references to the entrepreneur receded from the micro textbooks. The model left no room for aspects like initiative, charisma, stubbornness and the struggle with new ideas and uncertainty. "The model is essentially an instrument of optimality analysis of well defined problems which need no entrepreneur for their solution" (Van Praag, 1996, p. 17, referring to Baumol, 1968 and 1993a). Also see Barreto, 1989 and Kirchhoff (1984, p. 30).

Reality, however, does not consist of well-defined problems alone. The neo-classical model constrained the decision making of the entrepreneur, in terms of product quality and price, technology, within limits wholly alien to the context in which real world entrepreneurs characteristically operate (Kirzner, 1985). It is now some twenty years since economic theorists have come to feel uncomfortable about the absence of entrepreneurship from their models. A number of circumstances have contributed to this discomfort.

Firstly, the importance of the entrepreneur in the real world became more and more difficult to ignore. Some economists had predicted that large firms would prevail in economic life, due to their higher efficiency and superior technology (Galbraith, 1967). In the 1980s it became clear that firms of different size continued to coexist in each industry. The importance of mass-producing, "Fordist" firms declined (Piore and Sabel, 1984). Flexibility of (groups of) small firms was shown to result in competitive advantages. In some circumstances, like in a very turbulent environment, small firms can act more resolutely. Also, large firms have created more room for entrepreneurial employees to act within the firm. We will expand on this "corporate entrepreneurship" in section 4.

The share of small firms expanded in the 1980s in many industries in many industrialized countries. This generated an increased interest in the concept of entrepreneurship. Another reason why the interest in entrepreneurship has grown, is the employment problem in Western Europe. Many politicians and economists have the intuition that new possibilities for growth, innovation and creating jobs will come from small and new firms.

Two theoretical developments outside the realm of established neo-classical theory brought entrepreneurship within the focus of attention (Casson, 1991). Leibenstein in formulating his X-efficiency theory distinguished himself from the neo-classicals. Basically, X-efficiency is the degree of inefficiency in the use of resources within the firm: it measures the extent to which the firm fails to realize its productive potential. Four differences can be identified between the X-efficiency theory and neo-classical theory. One is that contracts are incomplete. This leads to the second main difference, which can be compared to the principal-agent problem. According to Leibenstein, there is a tension between the employee and the employer over how hard the former should work. Thirdly, effort and alertness are required to change old routines and production techniques. Finally, Leibenstein differs from neo-classical theory in regarding the firm as an organization of different individuals that have no consensus on their objectives. Leibenstein sees entrepreneurship as a creative response to X-efficiency (Leibenstein, 1968 and 1979).

A second addition to neo-classical theory was offered by institutionalism. Coase (1937) saw the entrepreneur as a coordinator of production within the firm. This coordination is needed because the price mechanism is mostly not used to allocate resources within the firm itself. Outside the firm, price movements direct production. Williamson (1975) elaborated on this approach with his thesis that firms concentrate on economizing on trans-

action costs. Institutionalism also focused attention on information problems and hierarchical tensions within an organization. An important question is how entrepreneurial individuals can "appropriate" the gains of their specific abilities. Is it within a firm as an "intrapreneur" or by starting a new firm as an entrepreneur? We will expand on this in the section on corporate entrepreneurship.

In sum, we see that the importance of entrepreneurship increased by developments in the economic process itself and was recognized by theories serving as a supplement or an alternative to the established neo-classical paradigm.

2.3. *Entrepreneurship: new entry and newness*

Hébert and Link (1989) show that many different roles[6] of the entrepreneur can be distinguished. However, from a viewpoint of linking entrepreneurship to economic growth, two major roles of entrepreneurship can be singled out. The first has to do with "new entry" and the second with "newness" in general. First, the entrepreneur as the founder of a new business: ". . . someone who creates and then, perhaps, organizes and operates a new business firm, whether or not there is anything innovative in those acts". Secondly, entrepreneurship plays a more general innovative role in economic life: ". . . the entrepreneur as the innovator – as the one who transforms inventions and ideas into economically viable entities, whether or not, in the course of doing so they create or operate a firm" (Baumol, 1993b, p. 198). The latter approach can be embodied in the former, i.e. an innovation implemented by a firm start-up (see Kirchhoff, 1994 p. 37, who regards entrepreneurship as "innovation by newly formed independent firms").

The management literature has a broader view upon entry. In surveying this literature, Lumpkin and Dess (1996) integrate the renewing aspects of entrepreneurship. "New entry can be accomplished by entering new or established markets with new or existing goods or services. New entry is the act of launching a new venture, either by a start-up firm, through an existing firm or via internal corporate venturing" (Lumpkin and Dess, 1996, p. 136). In their view, the essential act of entrepreneurship is more than new entry as we see it. In section 4 we will see that entrepreneurial activities in existing, large firms often take place by mimicking smallness. Usually, new-firm start-ups and innovative entrepreneurship are treated separately. In the next two sections we will pay attention to both appearances of entrepreneurship.

2.3.1. *New entry: start-ups*

To some the creation of new organizations is what entrepreneurship is all about. This view is clearly expressed by Gartner (1989, p. 62). A firm start-up is a major form of (new) entry into an industry. Both macro and micro-economic factors influence start-ups. Since measuring the number of new-firm start-ups has not been done systematically at the industry level, but mostly at the macro-level (Audretsch, 1995, p. 56), separating macro-economic influences from microeconomic causes of new-firm start-ups is difficult. Three major points can be emphasized (Audretsch, 1995). Firstly, the number of new-firm start-ups and its importance relative to the total number of firms differs considerably across industries. Secondly, the number of start-ups differs significantly from year to year. Thirdly, the impact of macro-economic developments varies from industry to industry.

The traditional view on why firms enter says that firms are attracted by excess profitability in an industry because of lack of competitors. Start-ups play a more important role than reestablishing market equilibrium. Antitrust regulation determines the legal structure for the role entrepreneurship can play in stimulating competitiveness. We will return to this in section 3. New-firm start-ups do not take place at the same rate in every industry. Audretsch (1995, p. 63) finds that, due to differences in the underlying knowledge structure, new-firm start-ups tend to be more important in industries that can be characterized as having an entrepreneurial technological regime. New firms tend to be less important in industries with a routinized technological regime. This difference is caused by higher expected profits when starting up in an industry with an entrepreneurial technological regime.

To start as an entrepreneur both "willingness" and "opportunity" are essential (Van Praag, 1996, p. 39). She defines opportunity as "the possibility to become an entrepreneur if one wants to".

Opportunity depends on starting capital, entrepreneurial ability and the (economic) environment. Van Praag regards willingness to start as an entrepreneur as "dependent on both individual preferences for the special features of entrepreneurship as well as on the alternative available options and their perceived attractiveness".

Although reliable data are scant, there are indications that since the mid-1980s start-ups have increased in several Western countries. This rise was particularly strong in The Netherlands.[7]

2.3.2. *Newness: innovating entrepreneurship*

Schumpeter[8] was the economist who has most prominently drawn attention to the "innovating entrepreneur". He or she carries out "new combinations we call enterprise; the individuals whose function it is to carry them out we call entrepreneurs" (Schumpeter, 1934, p. 74). Dess and Lumpkin write that: "Innovativeness reflects a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes. Although innovations can vary in their degree of radicalness, innovativeness represents a basic willingness to depart from existing technologies or practices and venture beyond the current state of the art" (Lumpkin and Dess, 1996, p. 142). Innovativeness can be distinguished between product-market innovation and technological innovation. The latter which until recently enjoyed the main focus of research into this field, "consists primarily of product and process development, engineering, research, and an emphasis on technical expertise and industry knowledge. Product-market innovativeness suggests an emphasis on product design, market research and advertising and promotion" (Lumpkin and Dess, 1996, p. 143). Using a broad definition of new entry, Dess and Lumpkin point out that entrepreneurship can be innovative without new products or production processes being introduced.

Enlarging the amount of innovative entrepreneurship has long been the aim of government policy. Schumpeter does not formulate any concepts for the role of government in stimulating "innovative entrepreneurship". Baumol states that this is the main shortcoming of Schumpeter's theory: ". . . the paucity of insights on policy that emerge from it". Baumol finds that institutional arrangements or other social phenomena affect the quantity of entrepreneurial effort. These structural and cultural factors can also determine the allocation of entrepreneurship. Essential for economic development is ". . . that the exercise of entrepreneurship can sometimes be unproductive or even destructive, and that whether it takes one of these directions or one that is more benign depends heavily on the structure of payoffs in the economy – the rules of the game" (Baumol, 1990, p. 899). Some examples can clarify this: Baumol describes various types of rent seeking, like the wars in the early Middle Ages in Western Europe over land and castles. "Such violent economic activity inspired frequent and profound innovation . . . its net effect may be a . . . net reduction in social income and wealth" (Baumol, 1990, p. 904). A more recent example is that in Japan, when compared to the United States, ". . . the rules of the game have been designed to discourage the allocation of entrepreneurial talent into rent-seeking litigation" (Baumol, 1993a, p. 240). In section 3 we will return to the role of entrepreneurship in the economic history of various countries.

2.4. *Conclusions from the literature on entrepreneurship*

The different historical views of economists offer a broad perspective on the concept of entrepreneurship as well as on the intermediate variables that form the connection between entrepreneurship and economic growth. The neo-classicals stress the role of the entrepreneur in leading markets to equilibrium. In the Austrian tradition, the alertness for profit opportunities and the importance of competition are emphasized. Schumpeter sees the entrepreneur as the innovator in economic life. Table I provides our conclusions in terms of the preliminary framework proposed in section 1.

Entrepreneurship has to do with individuals, both with their traits and their actions (roles). Newness through start-ups and innovations as well as competition are the most relevant factors linking entrepreneurship to economic growth.

Many questions remain, like what is the influence of basic conditions on entrepreneurship and on the intermediate linkages? Which is the

TABLE I
Conclusions based upon the historical views of economists

Items from the framework	Relevant variables found in the literature	Relevant disciplines	Focal unit of observation
Conditions	– (only indirect links were found in the literature; to be discussed in section 3)		
Entrepreneurship	– traits (alertness, perception)	– psychology	– individuals
	– roles of the entrepreneur	– economics	– individuals
Intermediate linkages	– newness through start-ups and innovation	– industrial economics	– firms
	– markets and competition	– industrial economics	– firms and industries
	– equilibrium versus disequilibrium	– economics	– aggregate levels
Economic growth	– (only indirect links were found in the literature; to be discussed in section 3)		

role of smallness and what are the opportunities for entrepreneurship within large organizations? Which intermediate linkages are still missing from the analysis? These questions will be touched upon in the following sections.

3. Economic growth and entrepreneurship

Where entrepreneurship was the focus in the preceding section, we will now focus upon economic growth. In section 3.1 we briefly deal with growth theories. Some aspects of the history of economic growth are surveyed in section 3.2. Finally, in section 3.3, some modern views as formulated in industrial economics and in evolutionary economics are discussed.

3.1. *Growth theory*

In this section, the distinction will be made between the "old" neo-classical growth theory and the "new", endogenous growth theory. For a long period neo-classical growth theory concentrated solely on the contribution of labor and capital to the process of economic expansion. In its different forms, either as growth accounting (Denison, 1985) or as a theory of long-run tendencies (Solow, 1970), there remained much to explain. Both forms generate a substantial residual, which was ascribed to the effects of technological change. This change is unaccounted for and is viewed as exogenous "manna from heaven" (Van de Klundert and Smulders, 1992, p. 177).

The basic idea of the new growth theory is to endogenize the long-run rate of economic expansion. Baumol (1993a, pp. 259–260) suggests ". . . that so far as capital investment, education, and the like are concerned, one can best proceed by treating them as *endogenous* variables in a sequential process – in other words, these variables affect productivity growth, but productivity growth, in turn, itself influences the value of these variables, after some lag. These endogenous influences are, then, critical components of a feedback process". Baumol (p. 260) continues: "To some degree, the same story can be told about the exercise of entrepreneurship, investment in innovation, and the magnitude of activity directed to the transfer of technology. These too, clearly, are influenced by past productivity growth achievements and they also, in their turn, influence future growth. Yet it would seem plausible that there is a strong streak of exogeneity in these variables, which can help to account for the outbreak and spread of industrial revolutions and for the relative decline and even for the collapse of economies that formerly were models of success". These statements describe both the contribution of endogenous growth theory and the dilemma this theory is confronted with.

Few attempts have been made to incorporate entrepreneurship in growth models. Entrepreneurship did not fit in the traditional, theoretical neo-classical models for two reasons. Firstly, the neo-classical axiom of perfect competition implies that there are no profit opportunities for entrepreneurs left. Secondly, models of general equilibrium do not take into account the dynamics of

"innovating entrepreneurship", as described in section 2. The axioms of the endogenous growth theory have created new possibilities for fitting entrepreneurship and/or innovation into growth models. A first example is Romer's version (1990) in which the engine of growth is the research sector which produces blueprints for new varieties of capital goods that are in turn produced and used in the goods-producing sector. The model assumes increasing returns to scale. By assuming monopolistic competition (Chamberlin, 1933), rents can be assigned to the research activities that generate knowledge. Secondly, the model pertains to some features of Schumpeter's later work:[9] growth is driven by monopoly rents obtained by the introduction of new products, economic change is the result of purposeful activities of profit-seeking entrepreneurs.

Van de Klundert and Smulders (1992, p. 191) state that Schumpeter's "creative destruction" gives a much richer description of entrepreneurship and economic dynamics. A recent attempt to capture "creative destruction" in a formal model can be found in Aghion and Howitt (1992). The R&D sector invents new production techniques making existing techniques obsolete. Producers shift to this new technique and the innovator is rewarded until a new technique is found which replaces his invention. The intermediate variable of innovativeness, enlarging the long-term growth, can be seen as valuable in the endogenous growth theory.

A connection between historical views on entrepreneurship (Schultz, 1980) and the endogenous growth theory (Lucas, 1988) can be made using the concept of "enlarging entrepreneurial ability", as a form of human capital. Schultz stated that the quantity and quality of entrepreneurial efforts can be enhanced by investment in entrepreneurial ability: ". . . the abilities of entrepreneurs to deal with the disequilibria that are pervasive in a dynamic economy are a part of the stock of human capital. . . . Many of the disequilibria that are associated with economic growth are endogenous. An innovation by a business enterprise (Schumpeter's innovator) is an endogenous event" (Schultz, 1980, p. 437 and p. 444). Schultz is a scholar of the Anglo-American tradition, since he concentrates on the abilities of entrepreneurship to restore equilibrium. Eliasson (1995) contests this view. He stresses the importance of entry and exit and selection mechanisms. Lucas (1988) concludes from his models that structurally divergent rates of growth can occur, due to the external effects of human capital (spillovers). In our view the external effects of entrepreneurship, a special form of human capital, can be seen as an additional intermediate variable derived from the "new" growth theory.

The new growth theory puts emphasis on the endogenous role of innovation and human capital formation in explaining economic growth. On the other hand, in spite of the strong technological dynamism of today it is well to remember that in world history technological creativity has been an exception rather than a rule (Mokyr, 1990). Underlying political, social and economic conditions have time and again been seen to play a vital role.

Summing up, the endogenous growth theory focuses explicit attention on the intermediate variables (human) capital formation and innovation. However, entrepreneurship remains largely implicit and this theory does not shed light on the underlying conditions of the entrepreneurial activity needed for (human) capital formation and innovation. This will be the subject of the next section.

3.2. *Economic history and the causes of long term growth*

Growth accounting in a neo-classical framework can disentangle economic growth into contributing factors such as labor inputs (correcting for hours of work and education), capital formation, economies of scale and advances in the state of knowledge. But it leaves a residual, and more importantly it misses the fundamental causes governing capital formation and innovation. Lewis (1955) already distinguishes between the proximate causes of economic growth (the effort to economize, increase of knowledge and increase of the amount of capital per head) and the underlying "causes of these causes", which are to be found in beliefs and institutions. North and Thomas (1973) put it even more bluntly: "The factors we have listed (innovation, economies of scale, education, capital accumulation, etc.) are not causes of growth; they *are* growth". According to them

the causes of economic growth are to be found in the factors which determine the efficiency of the economic organization: incentives, property rights etc.

An interesting approach focusing on these factors is chosen by economists studying historical processes of economic growth. An introduction to this approach which aims at ". . . comprehending the economy as a dynamic, historical process' is provided by Lazonick (1991, pp. 115–117 and pp. 303–321). The time span covered in these historical investigations is usually quite long (a century or more). This time span encompasses large differences in average growth rates between periods (usually referred to in terms of the "rise and decline of nations"). It keeps track of slowly changing factors in the culture, the legal framework and the external organization of markets, and it covers the full length of time it may take for new technologies to disseminate through the economic system.

Paraphrasing Cipolla (1981) who regards growth accounting as highly artificial, because in reality "everything flows together" can summarize their approach. Referring to Schumpeter he states that economic growth cannot be understood without taking the role of entrepreneurship into account. Cipolla (p. 120) however continues: "Entrepreneurial activity is a necessary ingredient, but not a sufficient one. It is the human vitality of a whole society which, given the opportunity, comes into play and sets loose the 'creative responses of history' ".

This field of "the rise and fall of nations" is extremely wide and diverse.[10] Below we will certainly do no full justice to the analysis of each of the authors whom we cite. However, all is well if we will have succeeded in painting a picture of the role of entrepreneurship in the historical analysis of economic growth. We follow two approaches: historical case studies and generalizations (Lewis, 1955). First some major periods in European history will be summarized one by one, while another short case study will discuss the so-called East Asian miracle. Secondly, some general views on the role of culture and institutions will be discussed and the main findings will be integrated in our final framework.

3.2.1. *Role of entrepreneurship in European history*

Between 1000 and 1500 the European economy seemed locked in the feudal system. Property rights were not secure, the rendering of many services in the so-called manorial system (Cipolla, 1981, p. 114) was not monetarized, local tolls hindered a free flow of goods. These conditions improved slowly. Gradually, a system evolved in which entrepreneurship was primarily embodied by a class of merchants advancing raw materials to the craftsmen and marketing the finished goods. Also, the rise of the cities created a frontier for experimentation and innovation.[11]

The Italian city states took the lead in this development, and their commercial success went hand in hand with a Renaissance of arts and sciences. Gradually the center of gravity moved to the Low Countries. In the seventeenth century conditions in the Northern Netherlands were highly conducive for an upsurge of entrepreneurship. The legal framework was advanced, property rights were secure and the economy had been monetarized to a great extent. Markets for final goods and production factors were reasonably accessible. Social mobility was relatively high. The rate of urbanization was far ahead of the rest of Europe, and in these cities demand conditions were favorable for economic expansion. According to De Vries and Van der Woude (1985) the resulting Golden Age can be regarded as the first round of modern economic growth.

As is well known, in this period also the arts and sciences bloomed. Again we quote Cipolla (1981, p. 120): "In the seventeenth century, when the Low Countries became the prime movers in international trade while producing great entrepreneurs such as De Geer or the Tripps, they also produced jurists like Grotius, experimentalists such as Huyghens and Leeuwenhoek, and painters such as Rembrandt." Regarding periods of economic rise in general he continues: "In order to understand what happened in certain societies, it is necessary to understand an atmosphere of collective enthusiasm, of exaltation and of cooperation".

Jane Jacobs (1984) has a great deal to offer when dealing with entrepreneurship. While it is fair to say that "cities" and not "entrepreneurship" form the central theme of her writing, it is clear

from her analysis that the all-important growth of import-replacing cities must be viewed as a highly entrepreneurial process. Historically, she finds two major patterns or motifs: reliance of backward cities upon one another and economic improvisation. Her views on the rise of Venice and subsequently many other hitherto backward European cities may serve to bear this out. Essentially the Veneti used their initial trade with the rich city of Constantinople as a springboard to start re-exporting and selling their imitations to other backward cities in Europe. They were able to replace more imports by home production and to shift to more sophisticated imports as their wealth increased. Meanwhile, other cities used Venice as a springboard. Finally, a volatile network of inter-city trade developed, constantly changing in content and stimulating new markets for city-made innovations. According to Jacobs there were no "ready-made schemes of producing predetermined choices of products" underlying these developments. On the contrary, the entrepreneurs in the backward cities of Europe had to experiment and to improvise in order to develop and sell cheaper substitutes for more sophisticated import-goods.

According to Cipolla (1981, p. 276), at the end of the fifteenth century England was still an "underdeveloped country" in comparison to countries such as Italy, the Low Countries, France and Southern Germany. Between 1500 and 1700 considerable changes occurred. At first British exports were dominated by wool and woolen cloth only. After 1550, gradually the many immigrants from France and the southern Low Countries brought many other "industrious manufactures" with them. English society at the time showed a striking cultural receptiveness and open-mindedness for new ideas and techniques. Increasingly young men were sent abroad to study at foreign universities. English society showed an ability to give positive and innovative responses to challenges and difficulties such as increasing competition and scarcity of raw materials. Entrepreneurs adopted other methods of production, diversified into other manufactures and penetrated new markets. Gradually the English developed a worldwide commercial network. The notable development of international trade, according to Cipolla (p. 295) "proved to be a great school of entrepreneurship".

By 1700 the legal and institutional conditions had also considerably changed and were favorable for factor mobility and innovation in economic activity (North and Thomas, 1973). The elimination of feudalism, the declining power of the guilds, the burgeoning of the joint stock company and the development of a banking system are some important examples they cite. North and Thomas (p. 156) conclude: "England . . . had developed an efficient set of property rights embedded in common law . . . and had begun to protect private property in knowledge with its patent law. The stage was now set for the industrial revolution". The Industrial Revolution was both a revolution in production techniques (mechanization) and in organization (the factory system). A great variety of innovations, mutually reinforcing each other, yielded an unprecedented increase in productivity (Landes, 1969, p. 41). There is apparently no full consensus why this revolution came about first in Britain, but some factors seem beyond doubt. Among these is the technological leadership (Mokyr, 1990, p. 239) which Britain showed between 1750 and 1850.

In explaining this leadership British superiority in implementation (innovation) was more decisive than their strength in inventions. It was not based on scientific leadership although British inventors and manufacturers were in constant contact with scientists. Another factor was its endowment of technically skilled labor, which had more to do with on-the-job training than with schooling. Mokyr (p. 254) sums it all up in one sentence: "It is arguable that though Britain may have had an absolute advantage in both inventors and entrepreneurs, it had a comparative advantage in entrepreneurs and skilled workers, and thus imported inventions and inventors and exported entrepreneurs and technicians to the industrializing enclaves of the Continent".

In Britain a free flow of entrepreneurship between lines of business was also manifest, and the allocation of resources was more responsive to new opportunities than in Continental economies which were characterized by occupational exclusiveness (Landes, 1969, p. 71). Also in these countries social and psychological attitudes, viewing the family business as a way of life and not as a means to an end, were unfavorable to effective entrepreneurship and competition

(Landes, pp. 131–132). The inevitable conclusion is that during the Industrial Revolution Britain excelled in entrepreneurship.

During the 19th century decline set in. Some figures from Maddison (1995, pp. 23–24) may serve to illustrate this. During the period 1870 through 1973 real growth of GDP per capita in Britain was only 1.3% annually and lagged behind that in the U.S.A. (1.9%) and Germany (1.9%), and certainly behind that in Japan (2.7%). Consequently, in 1973 per capita income in Britain, once the richest nation in the world, had fallen substantially behind that in countries such as Switzerland, Denmark, Germany and the U.S.A.

It is beyond the scope of this paper to consider all the possible causes of this decline. We will only view this retardation through the perspective of entrepreneurship and some underlying factors. Wiener (1981) paints a vivid picture of how the Industrial Revolution seems to have caused a strong cultural reorientation. Part of this was a romantic reaction to industrial society ("our England is a garden"). Another part has to do with what Wiener calls "the gentrification of the entrepreneurial class", in which values such as zeal for work, invention and money making gave way to a preference for comfort, enjoyment and public service. This was reinforced by the school system which, modeling itself on the public schools, separated the middle class from technology and business. Quite contrary to the U.S.A. where Henry Ford was a folk hero, in Britain a successful entrepreneur like William Morris "has received largely uninformed and unenthusiastic acceptance" (Wiener, 1981, p. 131). Wiener also gives two examples illustrating how this cultural reorientation permeated deeply into the 1960s and the 1970s. First, several surveys among students and graduates then showed a "combination of ignorance and distaste" towards industry. Secondly, a poll revealed that a large majority of directors of leading British companies felt that television and universities were "biased against business and private enterprise". At the same time the legal and institutional framework – with high marginal tax rates, public monopolies, shop stewards, and collusive tendering among its prominent features – had become less conducive to entrepreneurship and competition.

Another authoritative source in this area is Landes who also argues that the major reasons why Britain declined when compared to Germany were ". . . not material, but rather social and institutional" (Landes, 1969, p. 334). As examples he mentions the control of well-organized craft workers and the limited organizational capabilities of the entrepreneurs as major obstacles to innovation.

Porter (1990, p. 502) sums it all up for the postwar period: "British firms have, too often, a management culture that works against innovation and change . . . Combined with such managerial attitudes has been a debilitating relationship between labor and management. . . . Unions have had great power to negotiate restrictive practices, which have inhibited innovation and retarded productivity." According to Porter also the motivation of managers and workers to work hard and to earn a great deal of money was traditionally low in Britain, and absenteeism into the early 1980s was high. High personal tax rates contributed to dulled incentives. Finally domestic rivalry according to Porter has long been lacking. Instead of competing fiercely British firms would rather attempt to protect a monopoly or to merge with another firm. Up to the early 1980s rivalry was also limited by a slow rate of new business formation.

Summarizing one can say that entrepreneurship has played a vital role both in the take off stages of the European economy and during the Industrial Revolution. Moreover, it is likely that economic decline, such as experienced in late 19th and most of 20th century Britain, was aggravated by the cultural and institutional framework becoming less conducive to entrepreneurship.[12]

3.2.2. *The East Asian miracle*[13]

One of the most interesting recent growth experiences is the superior achievement of the East Asian economies in the last decades. In a World Bank policy research report, titled "The East Asian Miracle; economic growth and public policy", the rapid and sustained growth of the Republic of Korea, Taiwan, Singapore, Hong Kong, Japan, Indonesia, Malaysia and Thailand in the period 1965–1990 is analyzed. See World Bank (1993). These eight so-called High-performing Asian economies (HPAEs) experienced an average annual growth rate of real GNP per capita of 5.5%, more than twice that of the OECD countries. At

the same time the HPAEs diminished the inequality of their income distributions.

In fact, the analysis of the World Bank fits well into our framework. The remarkable growth achievements manifest themselves in both exports and domestic demand, and can directly be linked to superior accumulation of physical and human capital, allocation of resources to productive investment, and the acquisition and mastering of technology. These investment activities were supported by public policies promoting macroeconomic stability, diminishing inequality and universal primary and secondary education, as well as by a reliable legal framework conducive to competition and international trade. In spite of this attention for fundamentals it is fair to say that the analysis is primarily macroeconomic and somehow does not convey that innovation, private investment and marketing all are manifestations of entrepreneurial activity. Apart from a factual section on the profusion of small and medium-size enterprises there is no analysis of the rise of entrepreneurship. Nor is there an extensive analysis of the role of cultural factors such as attitudes towards risk and uncertainty, and openness to foreign technology.

Support for an alternative view on the East Asian miracle can be found with Phelps in his comments on a paper by Mankiw (1995, pp. 312–313) concerning "The Growth of Nations". We quote Phelps: "The alternative view also has implications for the demand for human capital. Why is it that several countries have, in only a few short decades, experienced a rapid accumulation of human capital – the Asian miracle economies – while other countries at about the same place in the poverty ranking have not? Surely the answer is the emergence of entrepreneurship, encouraged and sanctioned by the government". Porter (1990) endorses this alternative view in his section on Emerging Korea. Two of the key factors he mentions are the willingness to take risk and the intensity of competition. Primary focus of the central government has been to promote international competitiveness. Finally, Hofstede (1995, pp. 208–209) points at the comparatively strong long-term orientation prevalent in these countries, which may have determined their remarkable growth performance.

3.2.3. *Culture and the legal framework*

Values are often seen as the hard core of a culture. The outer layers of a culture are then made up by rituals, heroes and symbols. See Hofstede[14] (1995, pp. 18–20). Other authors, such as Lynn (1991), speak of attitudes rather than of values. The attitudes and values toward work, production, wealth and saving, toward new information, invention and strangers, and finally toward risk and failure seem particularly relevant for economic growth. Probably, these values are active through all players be they consumers, workers, business men or government officials. As we have seen from the historical case studies, they may also influence growth through the degree and quality of entrepreneurship in a society.

Jane Jacobs has made some additional observations about culture and economic growth. In her view: "In its very nature, successful economic development has to be open-ended rather than goal-oriented, and has to make itself up expediently and empirically as it goes along" (Jacobs, 1984, p. 221). Entrepreneurs have to find improvised solutions for unforeseeable problems. And this has little to do with "long-range planning" and meeting "targets". Jacobs also cites Cyril Stanley Smith from MIT, who points out that the roots of invention are to be found in curiosity, and especially "esthetic curiosity". Smith also gives examples how many industrial products and technologies first started out with frivolities and luxuries.

A classic study of the relationship between culture and economic development is Max Weber's famous essay (1958)[15] on "The Protestant ethic and the spirit of capitalism". Weber studies how psychological conditions may have facilitated the development of capitalism. In his view the ascetic Calvinist ethic with its emphasis on piety, industry and zeal, was greatly conducive to the spirit of modern capitalism that emphasizes rationality and discipline. Already contemporary authors (Sir William Petty as quoted by Weber, p. 179) attributed the economic success of seventeenth century Holland to that the numerous protestants in that country "are for the most part thinking, sober men, and such as believe that Labour and Industry is their duty towards God". In retrospect however, De Vries and Van der Woude (1995, pp. 198–213) contend that much of

the capitalist spirit was already present in (late) medieval Holland and was mainly reinforced by Calvinism.

Several authors have also considered the relationship between culture and economic growth during the 20th century. Hofstede (1995, pp. 208–217) points out that a long term orientation as expressed by thrift, investment and perseverance may be particularly conducive to economic growth. Some support for this hypothesis was found in a sample of 23 countries for the years 1965–1987. Hofstede (1995, p. 211) also regards this long-term orientation as conducive to entrepreneurship. Lynn (1991) has conducted an empirical study linking economic growth to several work attitudes in 41 nations. Lynn reports a significant positive correlation between "competitiveness" in each country (measured as a positive attitude towards competition) and the growth performance of these countries over the years 1970 through 1985.

Recently, however, Wildeman et al. (1998) reported that relationships could also be counter-intuitive, where they found a positive relationship between uncertainty avoidance (at the national level) in 23 developed countries and the rate of self-employment in these countries. They explain this result as further proof that dissatisfaction may be a source of entrepreneurship.

In summarizing the literature we conclude that the impact of cultural dimensions on entrepreneurship and economic growth, while probably significant, is not straightforward. The role of the following traits deserves further investigation while distinguishing between the individual level, the firm level and the country level:

- open-mindedness towards other cultures;
- curiosity, creativity and experimentation;
- perseverance;
- valuation of wealth and savings;
- acceptance of risk and failure;
- competitiveness.

From the historical case studies we have already seen the relevance of the legal framework and economic institutions for economic growth. Lewis (1955) offers a general framework to study the role of institutions. He distinguishes:

- the right to reward; this has to do with property rights and the structure of incentives;
- possibilities for trade and specialization; in history as well as today the extent of the market is determined by the presence or absence of prohibitions such as tolls, guilds, tariffs, quota and other barriers to the mobility of goods and productive factors;
- economic freedom, i.e. the freedom a society permits for seeking out and seizing economic opportunities; first of all this has to do with the possibilities to make a profit and to go bankrupt; also relevant is the legal framework determining the access to resources through the functioning of the labor market and the capital market; finally economic freedom has to do with the possibilities (both legal and cultural) for vertical mobility.

The seminal contribution by Olson (1982) adds a vital element to this perspective. His central thesis is that special interest groups slow down a society's capacity to adopt new technologies and to reallocate resources in response to changing conditions, and thereby reduce the rate of economic growth. Further evidence is found in Mokyr (1990). Some major examples of these coalitions are labor unions blocking labor saving innovations, professional groups regulating entry to their profession and price cartels. Olson contends that the harm for society is often much greater than is the gain for the interest group. As he demonstrates through an extensive historical tour d'horizon, stable societies accumulate more collusion over time, and see their growth rates falter. Whereas societies in which these narrow interest groups have been destroyed (by war or revolution) enjoy a period of great gains in economic growth. Far from advocating "war and revolution", Olson does recommend to repeal special interest legislation and regulation, and to apply anti-trust law to cartels and forms of collusion that fix wages or prices above competitive levels.

We conclude that the legal and institutional framework is another vital factor hidden behind entrepreneurship and indispensable for a good understanding of economic growth. Viewed from the angle of entrepreneurship and economic growth the most vital concepts seem to be the incentives and the competition rules. Legal incentives for entrepreneurship are mainly rooted in the

fiscal regime (replacement ratio, flat or steep tax rates) and in the laws concerning bankruptcies. Competition rules have to do with entry (de)regulation, anti-trust policy, removal of trade barriers and market intransparancies, and finally with union power in the labor market.

3.2.4. *Conclusions from economic history*

Economic history offers many insights with which to fill in and expand the framework as proposed in section 1. Our conclusions are summarized in Table II. A major addition to our conclusions in section 2.4 has to do with cultural and institutional conditions stimulating entrepreneurial traits and behavior within a population, as well as influencing the intermediate linkages (such as interaction between invention and innovation). A second addition is the evidence that, far from denying the vital role of capital formation and technological change for economic growth, for a real understanding of long-term growth it is necessary to explicitly take into account the role of entrepreneurial activity underlying these intermediary processes.

Remaining questions have to do with the role of smallness and selection and the possibilities for entrepreneurship within large organizations. They will be dealt with below. First we discuss the relevance of the historical view for modern economies.

3.3. *Relevance of historical views at the threshold of the new millennium*

Why are the historical views on the role of culture, the legal framework and entrepreneurial activity still relevant for understanding economic growth at the threshold of the new millennium? In this section we will first consider some views on economic growth as formulated in Porter's "The competitive advantage of nations" (1990). Next, we will discuss the views on economic growth as developed by evolutionary economics.

3.3.1. *Entrepreneurship and the competitive advantage of nations*

The conclusions from economic history, as exposed in Table II, can be related to the more recent analysis of Porter (1990). In his analysis four interrelated sets of factors or conditions determine the competitive strength of nations and thereby the possibilities for sustained productivity growth. These four sets of factors make up the so-called national "diamond". The four determinants are

- factor conditions. Porter distinguishes basic factors (e.g. natural resources and cheap, unskilled labor) from advanced factors (highly skilled personnel, modern networks infrastructure);
- demand conditions. These have three main elements: the nature of buyer needs (e.g. sophisticated instead of basic), the size and the pattern of growth and the existence of mecha-

TABLE II
Conclusions from economic history

Framework	Variables	Relevant disciplines	Focal unit of observation
Conditions	– culture (open-mindedness, acceptance of risk, long term orientation etc.)	– social psychology, anthropology and sociology	– groups and societies
	– institutions (incentives, competition rules)	– law and economics	– macro framework influencing micro behavior
Entrepreneurship	– traits and behavior	– psychology and managerial economics	– individual persons
Intermediate linkages	– conquest of new markets – invention and innovation – new business formation – competition	– industrial economics	– firms and industries
Economic growth	– rise and decline of nations	– economics	– national economies

nisms by which a nation's domestic preferences are transmitted to foreign markets;
- related and supporting industries. The presence of internationally competitive supplier and related industries stimulates rivalry and partial cooperation;
- the structure and culture of domestic rivalry. This encompasses a wide scope such as opportunities provided to possible new entrants, the nature of competition between incumbent firms, dominant business strategies and management practices.

The relevance of Porter's diamond for our analysis can be summed up in one sentence: "Invention and entrepreneurship are at the heart of national advantage" (Porter, 1990, p. 125). More specifically, Porter's "diamond" can help investigating the interface between entrepreneurship and economic growth. Demand conditions signal needs better in some nations than in others. National factor creation mechanisms affect the pool of knowledge and talent. Supplier industries provide crucial help or are the source of new entrants. Domestic rivalry creates a good "incubation environment" for entrepreneurs, but it can also be a mechanism by which entrepreneurship contributes to growth. Finally, feedback mechanisms are relevant because entrepreneurship can enhance the quality of the factor conditions through the learning process which starting a business provides.

In terms of our framework Porter's diamond offers several extensions. First, invention or rather innovation is best viewed as a direct manifestation of entrepreneurship, more than an intermediate process linking entrepreneurship to growth. Secondly, international competitiveness is a crucial intermediate linkage between entrepreneurship (innovation) and economic growth; however domestic rivalry is an essential precondition for international competitiveness; so competition comes in as an intermediate linkage at two levels. Thirdly, whereas in the short run there is a straight direct line of causation as in our preliminary framework in section 1, in the long run feedbacks are active. Finally, it is also clear from his analysis that entrepreneurship is not restricted to small firms.

3.3.2. *Evolutionary economics*

The economy is entering a world governed by a new technological paradigm. Like the steam machine during the first Industrial Revolution, Information and Communication Technology is a pervasive new technology (or in terms of Mokyr: a macro-invention) which will radically alter the economy. A wave of micro-inventions and innovations based on ICT is gaining momentum and will sweep the world in the decades to come. The implications of this radical transition for the growth of nations will not only depend on macroeconomic conditions, but primarily on cultural and organizational factors and on the adaptability of institutions and the legal framework. An analysis of the diffusion of the many applications of this new technology will also have to include microeconomic processes of new start-ups and of entry by firms from outside the industry.

This ICT revolution makes it increasingly necessary to distinguish between information and knowledge. On the one hand information will become more cheaply and readily available. In some cases this will weaken existing entrepreneurial edges. On the other hand information has to be selected, upgraded and combined with other information in order to become useful for economic application. Only then may it be called "knowledge". Whereas the raw material information will become abundant, knowledge will remain scarce. Undoubtedly, new entrepreneurial edges will be based on knowledge. In this way an economy may develop which is driven by ideas and in which entrepreneurship equates to competition between ideas.

A framework helpful when analyzing this transition at the level of sectors of industry is evolutionary economics[16] as developed by Nelson and Winter (1982), and the related theory of the experimentally organized economy developed by Eliasson (1995). These lines of thinking will be briefly discussed in the following section.[17] The seminal book by Nelson and Winter (1982), bearing the title of this section, argues that in order to understand how technical change functions as the key driving force of long-run economic development, it is necessary to incorporate the realities of firm decision making as well as the dynamics of the competitive process. In developing their theory they acknowledge their intellectual debts

with Schumpeter (economic development) and Simon (human and organizational behavior).

Nelson and Winter contend that the concepts of optimization and equilibrium which are the core of orthodox theory are unfruitful abstractions and simplifications from reality. Instead of maximizing behavior of firms they use the concept of decision rules, and instead of equilibrium they see tendencies. Next, in their evolutionary theory, they borrow some major ideas from biology such as from Darwin and Lamarck. Individual firms have a kind of genetic endowment in terms of technical routines, procedures etc. These routines usually can evolve only gradually. However searching for new routines (innovation) is itself also a routine. Besides, exogenous shocks can press incumbent firms or outsiders to search for new organizational and technical routines. In the end the competitive process at the sector level selects the most successful routines and weeds out the routines which are no longer suitable. So innovation ("mutations") and selection are the catchwords in this approach.

Although the approach chosen by Nelson and Winter is strongly based on the premise of variety of behavior and performance of individual firms, there is not much explicit attention for the role of the entrepreneur. More explicit scope for the entrepreneur is to be found in the work of Eliasson. He argues that market competition and economic growth cannot be understood without recourse to non-linear selection mechanisms and the discontinuities of technical change (Eliasson, 1995). In his view the major production factor is competence capital embodied in people. This capital accumulates through education and learning on the job. It is allocated and reallocated through the labor market and the market for mergers and acquisitions, through entry of new enterprises – often by entrepreneurial people leaving large firms – and through the exit of failing enterprises. These processes make up the mechanism of "competitive selection among business experiments". Eliasson has incorporated these ideas into his micro-to-macro model of the Swedish economy called MOSES. In his model the long-term growth rate is determined by the institutions regulating the mechanisms of selection and the allocation of competence. Eliasson also argues that 30 years of post war mistreatment of the market mechanism show up in a decline of the percentage share of new firms and are responsible for the slow growth of the Swedish economy since the 1970s.

Viewed from the perspective of "linking entrepreneurship and growth" we may now distinguish between two lines of thinking. The first is the neo-classical paradigm. The second we will call the entrepreneurial paradigm. See Figure 2.

The neo-classical paradigm seems most applicable in the more mature sectors of the economy, the entrepreneurial paradigm seems most relevant for understanding the rise of new, technology-driven industries. Audretsch and Thurik (1997) would call these sectors the "managed" and the "entrepreneurial" sectors, respectively. Our expanded framework as developed in Table II remains valid. An essential addition is the crucial role of diversity (variety) and of selection as an intermediate linkage between entrepreneurship and economic growth.

4. Entrepreneurship in large firms

Entrepreneurial activity not only takes place in small firms. It also happens in large organizations.[18] Entrepreneurship not only occurs in the form of new small firms but also in the form of corporate entrepreneurship, new ideas and responsibilities implemented in existing large organizations. According to Drucker (1985, p. 144) today's large businesses will not even survive "unless they acquire entrepreneurial competence".

Stopford and Baden-Fuller (1994, p. 521) sum-

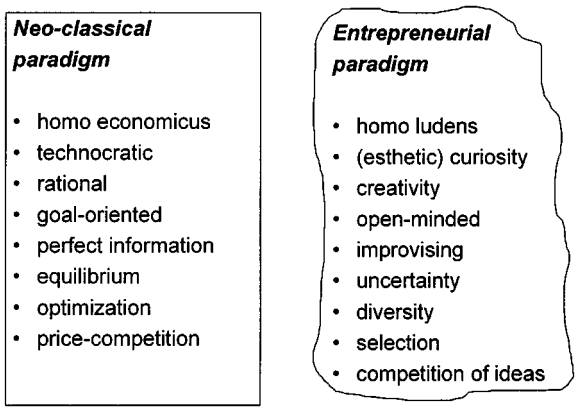

Figure 2. Two paradigms.

marize how the strategy literature identifies three types of corporate entrepreneurship. The first type is the creation of new businesses or business units within an existing organization – corporate venturing or intrapreneurship as it is sometimes called. Another is the more pervasive activity associated with the transformation or strategic renewal of existing organizations. The third type is where the enterprise changes the "rules of competition" for its industry, for example by carrying out an innovation that fundamentally alters the industry. Stopford and Baden-Fuller (1994, p. 523) distinguish five attributes that are common to all types of (corporate) entrepreneurship: proactiveness, aspirations beyond current ability, team-orientation, capability to resolve dilemmas and learning capacity. Despite the classification of Stopford and Baden-Fuller we will use the terms corporate entrepreneurship and intrapreneurship interchangeably.

Stevenson and Jarillo (1990, pp. 23–25) also regard corporate entrepreneurship as wider than corporate venturing and include the "ability of corporations to act entrepreneurially". In their view ". . . pursuing opportunity, whether through specific company structures or not, constitutes the core of entrepreneurship, both individual and corporate". In order to create corporate entrepreneurship top management is heavily dependent on other individuals within the firm. As relevant elements promoting corporate entrepreneurship Stevenson and Jarillo mention "a conscious effort to lessen negative consequences of failure when opportunity is pursued" and facilitating "the emergence of informal internal and external networks". This points again to the importance of (business) culture. Furthermore they state "The crux of corporate entrepreneurship is, then, that opportunity for the firm has to be pursued by individuals within it, who may have perceptions of personal opportunity more or less at variance with opportunity for the firm."

Bridge et al. (1998, p. 190) also point out that "Inventors are usually individuals, but intrapreneurship is frequently carried out by groups or teams". This underlines the need of what we have called a vehicle for entrepreneurship. Regarding the fostering of innovation they do not only mention the toleration of failure but add the reward of success. More generally speaking we would consider both business culture and incentives as potentially stimulating factors.

Of course there are also dilemmas in corporate entrepreneurship in so far that there may be an intrinsic tension between hierarchies and entrepreneurial behavior. Also there is the appropriability dilemma of individuals that possess "new knowledge". The question may be put forward whether entrepreneurial employees who can realize their ideas within the firm may be less likely to create a spin off or start working for another existing firm. On the other hand a firm may have to explicitly offer the option of spinning off when it wants to keep and attract entrepreneurial employees.

Regarding the possible effects of corporate entrepreneurship we conclude that it plays an essential role in the process of strategic renewal of large and incumbent firms. It can be associated with the typical growth enhancing features of entrepreneurial behavior: alertness, finding new product-market combinations and innovation. In the short run corporate entrepreneurship can occur simultaneously with corporate downsizing, which is associated with the process of job destruction. In the long run though, it is expected to stimulate competitiveness and sales growth of the firm. Furthermore, viewed in a macro-economic perspective downsizing creates opportunities for growth by enhancing the creation of new ventures. Wherever entrepreneurial employees reap the benefits of their abilities, within the firm or in a spin-off, their activities are likely to enhance growth at the macro-level.

There seems to be a strong case to hypothesize a positive impact of corporate entrepreneurship on economic growth. On the other hand corporate entrepreneurship remains an elusive concept. Innovative empirical research will therefore be needed to investigate this hypothesis. In that respect it will be necessary to develop a scale for measuring corporate entrepreneurship.

Conclusion

In this section we assert that entrepreneurship occurs irrespective of the size of organizations.[19] A crucial element in organizing corporate entrepreneurship is the necessity of an organizational "vehicle" such as teams, business units or other

TABLE III
Conclusions regarding individual and corporate entrepreneurship

Framework	Individual entrepreneurship	Corporate entrepreneurship
Conditions	– national culture: open-mindedness, acceptance of risk, etc. – institutions: property rights, incentives, competition rules, entry barriers	– business culture: open-mindedness, proactiveness, trust in employees etc. – internal rules and procedures, incentives
Entrepreneurship	– personal traits: alertness, creativity, ambition, perseverance – vehicle: smallness (autonomous role of owners of small firms) – manifestations or behavior: newness through innovation, entry of new markets, start-ups	– idem – vehicle: mimicking smallness (autonomous role of entrepreneurial individuals through teams and business units) – manifestation or behavior: newness through innovation, entry of new markets, spin-offs, joint ventures
Intermediate linkages between entrepreneurial actions and performance	– domestic and international competition – variety and selection of viable ideas and replacement of obsolete enterprises	– idem – variety and selection of viable ideas and re-engineering of corporations
Economic growth	– higher productivity; new niches and industries – international competitiveness	– higher productivity; improving best practice; new industries – idem

ways of decentralization. This is sometimes called "mimicking smallness". Corporate entrepreneurship may also stimulate spin-offs. Our conclusions are summarized in Table III.

5. Synthesis

We have investigated the relationship between entrepreneurship and economic growth from various perspectives: historical views on entrepreneurship, macro-economic growth theory, industrial economics (in particular, Porter's competitive advantage of nations), evolutionary economics, history of economic growth (in particular, rise and fall of nations) and the management literature on large corporate organizations. The challenge is to synthesize these insights to provide a broad picture of how economic growth is linked to entrepreneurship. We will do so defining entrepreneurship and considering its inherent heterogeneity. We will present a framework for linking economic growth to entrepreneurship while including conditions for entrepreneurship. This framework is meant to help setting an agenda for further research.

5.1. *Definition of entrepreneurship*

At least three levels of analysis can be distinguished when discussing the relationship between entrepreneurship and economic growth: the level of the individual entrepreneurs operating on their own or in teams and partnerships, the firm level and the aggregate levels of industries, regions and national economies. Basically, entrepreneurship has to do with activities of individual persons. The concept of economic growth is relevant at levels of firms, industries and nations. Linking entrepreneurship to economic growth means linking the individual level to the aggregate levels.

First we will define entrepreneurship. Inspired by Hébert and Link (1989), Bull and Willard (1993) and Lumpkin and Dess (1996), we propose the following definition of entrepreneurship:

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.

Essentially, entrepreneurship is a behavioral characteristic of persons. This behavior has an input and an output side: where on the one hand entrepreneurial behavior requires entrepreneurial skills and qualities, it also implies the participation in the competitive process on the other.

It should be noted that entrepreneurship is not an occupation and that entrepreneurs are not a well-defined occupational class of persons. Even obvious entrepreneurs may exhibit their entrepreneurship only during a certain phase of their career and/or concerning a certain part of their activities. In this respect we agree with Gartner (1988, p. 64) who asserts that "The entrepreneur is not a fixed state of existence, rather entrepreneurship is a role that individuals undertake to create organizations". See also Schumpeter (1934, p. 78) who states "Because being an entrepreneur is not a profession and as a rule not a lasting condition, entrepreneurs do not form a social class in the technical sense as, for example, landowners or capitalists or workmen do".

Entrepreneurship is not synonymous with small business. Certainly, small firms are an outstanding vehicle by which individuals can channel their entrepreneurial ambitions. The small firm is an extension of the individual who is in charge (Lumpkin and Dess, 1996, p. 138). However, as we have seen, entrepreneurship is not restricted to persons starting or operating an (innovative) small firm. Enterprising individuals in large firms, the so-called "intrapreneurs" or "corporate entrepreneurs", undertake entrepreneurial actions as well. In these environments there is a tendency of "mimicking smallness", for instance using business units, subsidiaries or joint ventures.

Strictly speaking, entrepreneurship is a behavioral characteristic of persons. By creating opportunities for entrepreneurial behavior of their employees, organizations can also become entrepreneurial. In the popular press Europe's current economic problems are often attributed to a lack of entrepreneurial firms. This term is sometimes used also in the academic literature. See Audretsch (1995), Audretsch and Thurik (1997 and 1998) and Carree et al. (1999).

Our survey suggests that entities at the macro level such as industries, cities, regions and nations can be entrepreneurial to a certain extent. Therefore, we need to define and operationalize concepts of entrepreneurship at the aggregate levels of firms, industries and nations. These concepts are usually intuitive and need further developing. Probably, entrepreneurship at these levels of analysis is a multidimensional concept. Where entrepreneurs tend to reside at the tails of the distribution of the dimensions of personal characteristics, entrepreneurship is an inherent complex phenomenon to capture. The development of these concepts should be the subject of future, probably multidisciplinary, research.

5.2. *Measuring entrepreneurship*

Clearly, it is difficult to measure entrepreneurship, both at the individual level and at the aggregate level. The concepts involved have to be operationalized. Meanwhile proxies are needed to help researchers and policy makers to take their bearings. At the aggregate level it seems pragmatic to count numbers. However, because in colloquial speech many terms like entrepreneurs, self-employed and businessmen are used indiscriminately, it is not immediately clear which numbers to count.

However, we can make some pragmatic distinctions. First, we distinguish between the concepts *entrepreneurial*, as defined in section 5.1, and *managerial* in the sense of organizing and coordinating. Secondly, we make a distinction between business-owners or *self-employed* (including owner-managers of incorporated firms)[20] and *employees*. Based on this double dichotomy of self-employed versus employee and entrepreneurial versus managerial, three types of entrepreneurs may be distinguished. These three types are the Schumpeterian entrepreneurs, the

TABLE IV
Three types of entrepreneurs

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

intrapreneurs and the managerial business owners who are entrepreneurs in a formal sense only. This is illustrated in Table IV.

Schumpeterian entrepreneurs are to be found mostly in small firms. They own and direct independent firms that are innovative and creatively destroy[21] existing market structures. After realizing their goals Schumpeterians often develop into managerial business owners, but some may again start new ventures or new firms. *Intrapreneurs or entrepreneurial managers* also belong to the core of real entrepreneurship. By taking commercial initiatives on behalf of their employer, and by risking their time, reputation and sometimes their job in doing so, they are the embodiment of leadership resulting in entrepreneurial ventures in larger firms. Sometimes these entrepreneurial employees, either in teams or on their own, spin off, start new enterprises and become Schumpeterian entrepreneurs. *Managerial business owners (entrepreneurs in a formal sense)* are to be found in the large majority of small firms. They include many franchisees, shopkeepers and people in professional occupations. They belong to what Kirchhoff (1994) calls "the economic core" and sometimes entrepreneurial ventures grow out of them.

While the managerial business owners fulfill many useful functions in the economy such as the organization and coordination of production and distribution, they cannot be viewed as the engine of innovation and creative destruction. This is the major function of Schumpeterian entrepreneurs and intrapreneurs. How all three groups can make a contribution to economic growth, we will briefly touch upon in section 5.3.

First however we want to consider the feedbacks from economic development to both the total number of self-employed and the number of real entrepreneurs (the sum of Schumpeterians and intrapreneurs). Figure 3 illustrates in a tentative way how these numbers may depend on the stage of economic development.

Figure 3 is based upon the assumption that the number of self-employed includes an unknown but probably relatively modest share of Schumpeterian entrepreneurs. Clearly, this share depends on various historical, institutional and structural factors. Up to the late 1970s, most industrialized economies experienced a long period of secular decline in the number of self-employed per population. Since the late 1970s the number of self-employed in several of these countries is increasing again (Wildeman et al., 1998). This mirrors both a resurgence of entrepreneurship in the intrinsic sense (Schumpeterian entrepreneurship) as well as an increase of franchisees and marginal start-ups.

Further evidence of this U-shaped trend of self-employment rates over time (1965–1990) is presented in Acs, Audretsch and Evans (1994).[22] In their analysis a U-shaped trend is a net effect of

Figure 3. The hypothesized number of self-employed and of real entrepreneurs.

(among others) the negative influence of rising per capita income and a positive one of the rising share of the service sector. Further research should dig more deeply into this relationship between economic development and this U-shaped trend (Carree et al., 1999). To what extent do stages of economic development matter? And to what extent is economic development over specific time intervals[23] involved?

In Figure 3 it is hypothesized that the number of real entrepreneurs will increase even more steeply. It is hypothesized that the revival of Schumpeterian start-ups the Western world is now experiencing is matched or even surpassed by an upsurge of intrapreneurship in its many forms.

The number of self-employed is the only yardstick of entrepreneurship because statistical information is available only along the ownership dimension. This can be misleading. For instance, it is unknown whether the relatively high number of self-employed in Italy as compared to the Netherlands expresses a high level of Schumpeterian entrepreneurship or merely a time-lag in economic development influencing the number of marginal establishments. In recent empirical studies other approximations are brought forward. Audretsch (1995) uses the employment share of surviving young firms as a proxy for entrepreneurial activity in manufacturing industries. This variable may well express the comparative entrepreneurial positions of these industries. Outside the manufacturing sector this variable may be biased due to the occurrence of franchising firms and marginal or part-time start-ups. Audretsch and Thurik (1997) and Carree and Thurik (1998) use the share of small firms as proxies. Also these proxies have obvious shortcomings. Moreover, the rate of intrapreneurship, both in new and incumbent firms, is still lacking in these approaches.

The number of real entrepreneurs would approach the level of entrepreneurial activity more closely. Measuring their number will necessitate further conceptual development taking into account personal capabilities and a wide array of behavioral aspects. This implies a need to define typologies of entrepreneurs, for instance based on entrepreneurial dimensions (Lumpkin and Dess, 1996) and on the vehicle they use for materializing their goals.

Of course counting numbers, in however sophisticated a manner, will always remain an approximation of the rate of entrepreneurship. Hopefully other ways can be found to measure the intensity of entrepreneurial activity.

5.3. *Linking entrepreneurship to economic growth*

5.3.1. *Views in the economic literature*

Entrepreneurship is "at the heart of national advantage" (Porter, 1990, p. 125). It is of eminent importance for carrying out innovations. Concerning the role of entrepreneurship in stimulating economic growth, many links have been discussed. Both the role of the entrepreneur in carrying out innovations and in enhancing rivalry are important for economic growth. Our assessment of the role of entrepreneurship as expressed in several fields of research which we have drawn from (such as historical views; management literature; growth theory; evolutionary economics), is shown in Table V. Competition is interpreted in the broad sense: contestability of markets, domestic rivalry and international competition.

In the historical views of the Schumpeterians and the Austrians entrepreneurship is explicitly relevant for explaining economic growth. On the other hand, the neo-classicals have no explicit room for the role of an active entrepreneur. The endogenous growth theory may offer new theoretical perspectives for entrepreneurship. As yet it does not offer many concrete starting-points. Economic history is the foremost field in which entrepreneurship is considered crucial for the economic growth of nations. On the micro-economic level the management literature of large organizations devotes explicit attention to the importance of entrepreneurship for performance. Porter's work offers distinctive starting points for the role of entrepreneurship in explaining economic development and growth of nations. Entrepreneurship can be attached to the determinants of his "diamond". In the work of Eliasson entrepreneurship is also considered crucial for economic growth.

5.3.2. *Final framework*

Figure 4 presents our final framework inspired by the many insights reaped from the fields of literature. In discussing this framework we concentrate

TABLE V
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.

on entrepreneurship, economic growth and what links them together. We also take into account some wider ranging relationships. As we have seen in section 5.1, it is crucial that three levels of analysis be distinguished. More precisely, *linking entrepreneurship to economic growth also means linking the individual level to the firm and the macro level*.

Strictly speaking, entrepreneurship as defined in section 5.1, is a concept operational at the individual level. While requiring skills and other qualities, essentially entrepreneurship has to with behavior.

Entrepreneurial action takes us to the firm level. Entrepreneurs need a vehicle transforming their personal qualities and ambitions into actions. Small firms where the entrepreneur has a controlling stake provide such a vehicle. Larger firms often mimic smallness (using organizational forms like business units, subsidiaries and joint ventures) to introduce corporate entrepreneurship. The outcome of these entrepreneurial manifestations at the firm level generally has to do with newness. This can be newness through product, process and organizational innovation, entry of new markets and innovative business start-ups.

At the aggregate level of industries, regions and national economies the many individual entrepreneurial actions compose a mosaic of new experiments. In evolutionary terms this can be called variety. A process of competition between these various new ideas and initiatives takes place continuously, leading to the selection of the most viable firms and industries. Variety, competition, selection and also imitation (for the latter see Baumol, 1993a, p. 260) expand and transform the productive potential of a regional or national economy (by replacement or displacement of obsolete firms, by higher productivity and by expansion of new niches and industries). They enhance its international competitiveness and thereby its market share. Viewed from within a closed economy or the world economy as a whole, one could say that the additional productive potential in a competitive environment would create its own demand.[24] We assume that the outcome of this chain of variables linking the individual level to the macro level, will be economic growth.[25]

In this process Schumpeterian entrepreneurs, intrapreneurs and managerial business owners all play their part. Assuming that the secular trends in Figure 3 may be regarded as equilibrium rates, this implies “optimal” proportions for both real entrepreneurs and self-employed.[26] Deviations from these rates can be expected to frustrate the growth rate of an economy. A shortage of real entrepreneurs will hamper innovation, whereas a glut of self-employed may result in an average scale of business below optimum levels. Besides both the number of real entrepreneurs and that of

self-employed may influence the intensity of competition.

Next to the linkages from the individual level to the aggregate level, it is likely that there are important feedback mechanisms. Competition and selection amidst variety undoubtedly enable individuals (and firms) to learn from both their own and other's successes and failures.[27] These learning processes enable individuals to increase their skills and adapt their attitudes. The outcome of these so-called spillovers will be new entrepreneurial actions, creating a recurrent chain of linkages.

Clearly, the outcome of these dynamic processes depends on a set of conditions referred to in Figure 4. Given the psychological endowments of the population, conditions refer to the environment in which an individual carries out his or her entrepreneurial activities. First, this refers to the national (or regional) cultural environment, and to the internal culture of corporations. The linkages between culture and entrepreneurship are by no means simple and straightforward, and much is still unknown about these processes. As we have seen in section 3, the history of the rise and fall of nations has shown that cultural vitality, thriving sciences and high tide in entrepreneurship often coincide. Second, the institutional framework, both on the national level and within firms, defines the incentives for individuals to turn their ambitions into actions, and determines to what extent unnecessary barriers will hamper them. The importance of institutions for the development of entrepreneurship is paramount and deserves further study.

5.4. *Research conclusions*

Entrepreneurship matters. In modern open economies it is more important for economic growth than it has ever been. The reason is that globalization and the ICT-revolution imply a need for structural change, requiring a substantial reallocation of resources. This induces an intense demand for entrepreneurship (Audretsch and Thurik, 1998 and Casson, 1995, p. 94). When it comes to how the mechanisms operate, little is known, either on how entrepreneurship can best be promoted or on how entrepreneurship influences economic performance. Our paper has to be viewed in exactly this broader framework of unanswered questions. It attempts to be a starting point for an agenda of research into the field of entrepreneurship and economic development. In formulating such an agenda, we propose to distinguish three main fields of research.

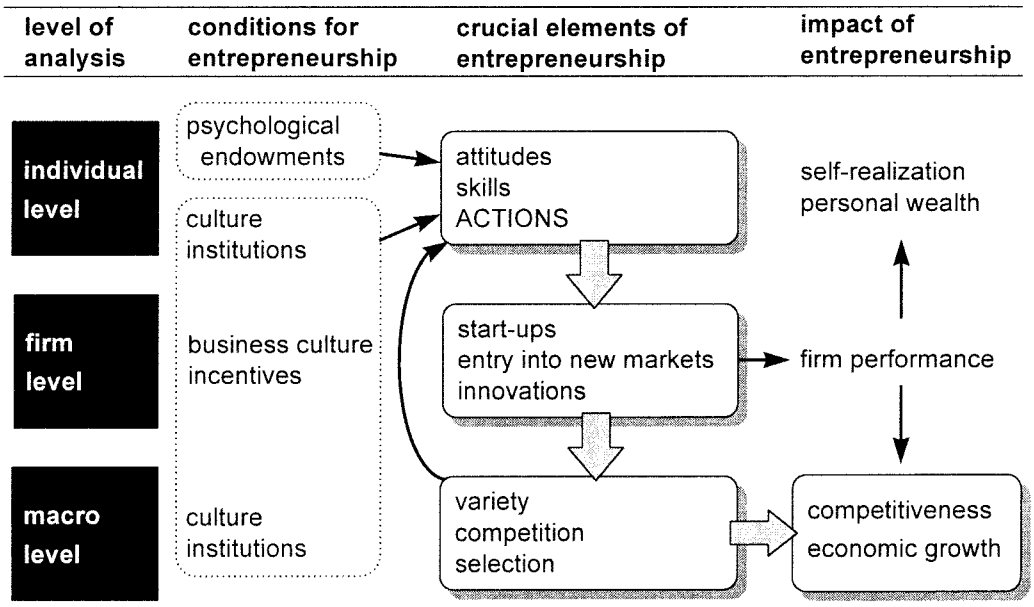

Figure 4. Final framework: linking entrepreneurship to economic growth.

The *first* field is that of measuring entrepreneurship. Much work has yet to be done in two directions. First, that of the development of typologies of entrepreneurship at the micro level. Second, that of operationalization of a multi-dimensional concept of entrepreneurship at higher levels of aggregation such as industries and national economies; possibly a scale can be devised tracking the amount of entrepreneurship over time or comparing it between national economies.

The *second* field is that of the determinants of entrepreneurship. Both culture and the institutional framework are important conditions codetermining the amount of entrepreneurship in an economy and the way in which entrepreneurs operate in practice. But also technological, demographic and economic forces are at play.[28] Several questions remain, such as

- how do cultural variables influence the decisions of individuals to start a business, and how do cultural variables interact with economic and technological developments or with policies designed to promote entrepreneurship; what is the role of the educational system in this respect?
- how do differences in incentive structures contribute to the explanation of differences in entrepreneurship?
- which role is played by business dynamics (entry and exit) originating from deviations between the actual and an equilibrium rate of self-employment (entrepreneurship)?

Future research should attempt to explain the statistical number of the self-employed, but will also have to deal with explaining more qualitative aspects such as the rise of Schumpeterian entrepreneurship and that of intrapreneurship.

The *third* field is that of the impact of entrepreneurship on economic development. This major field opens up many highly relevant questions for research, both at the level of firm performance and that of the development of industries and national economies:

- knowing that many new start-ups fail and that only few develop into gazelles, which then are the major determinants of failure, of mere survival and of real success?
- which specific contributions to the post war performance of national economies were made by Schumpeterian entrepreneurship, intrapreneurship and self-employment, respectively; which role have institutions and policies played?
- how can the results of these studies be incorporated in the econometric models[29] which are now being used in policy analysis?

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Notes

[1] De Koning en Snijders (1992) provide an overview of the various public policies in countries of the European Union which have been introduced during the 1980s. You (1995) attempts to use various lines of economic theory in explaining the shift. Finally, Carree (1997) brings it all together in his extensive survey of the determinants of the shift building upon the literature of the determinants of firm size and firm-size distribution and complemented with empirical material.

[2] See Davis, Haltiwanger and Schuh (1996), Carree and Klomp (1996) and Kleijweg and Nieuwenhuijsen (1996) for a recent discussion.

[3] Equating the growth of entrepreneurship by the number of new firm start-ups and taking the Netherlands, for which we have reliable figures, as an illustration, we observe that the number of new start-ups in the Netherlands almost doubled between 1986 and 1994. See Wennekers (1997).

[4] Here we differ from Kirchhoff (1994, p. 37 and p. 62).

[5] As Lazonick (1991, p. 309) points out, the neo-classicals in fact use the terms “entrepreneur” and “manager” interchangeably.

[6] These roles are also corroborated by colloquial speech in Germanic languages such as Dutch and German. The first meaning of the Dutch word “ondernemen” is “to undertake” but it also means “to dare”, “to attempt” and “to start”.

[7] See Wennekers (1997) for more information about this revival.

[8] Schumpeter’s “Theory of Economic Development” was published in German in 1911, and in English in 1934.

[9] See Schumpeter (1996), which was first published in 1943.

[10] Important publications concerning “the rise and fall of nations” include Cipolla (1981), Jacobs (1984), Landes (1969), Lewis (1955), Mokyr (1990), North and Thomas (1973), Olson (1982) and Wiener (1981). A useful survey is presented in De Jong and Van Paridon (1989).

[11] “Stadtluft machts frei” (Cipolla. p. 146).

[12] For a partly conflicting view on the quality of British entrepreneurship in the period 1870-1914, see Pollard who argues: "In short, some failures there undoubtedly were, but they were surely not characteristic of the period as a whole. The entrepreneurs who had got to the top in late Victorian and Edwardian Britain could hold their own with the very best abroad" (Pollard, 1994, p. 89).

[13] The economic problems that many countries in East Asia are presently facing do not nullify their remarkable growth performance in the past decades. It is yet too early to decide whether the present setback is temporary or is another example of "rise and fall".

[14] This publication builds upon Hofstede (1980) but also includes new material.

[15] Weber's essay was first published in German in 1904–1905.

[16] Also see Witt (1993).

[17] Also see Magnusson (1994).

[18] We will focus our discussion on entrepreneurship in large firms, but note that there is also a literature on "entrepreneurial government" (see Osborne and Gaebler, 1992).

[19] See also Stevenson and Gumpert (1991).

[20] We will use the terms self-employed and business owners interchangeably. For definitions see SBA, The state of small business: a report of the president 1986, Washington: U.S. Government Printing Office, chapter 4.

[21] The concept of creative destruction was introduced by Schumpeter (1996) which was first published in 1943.

[22] See also Acs et al. (1999).

[23] For instance, when Greece will have reached the 1990 per capita income of the U.S.A., its number of self-employed will also have been influenced by global technological and cultural trends. Besides, country-specific demographic, social and institutional conditions will be relevant for its number of self-employed.

[24] Cf. Say's law.

[25] As the figure indicates there will also be an outcome at the individual level (self-realization and personal wealth) and at the firm level (performance).

[26] There is an analogy with the work of Allen (1988, p. 116) who asserts that the success of the overall system is determined by the balanced existence between "stochasts" (representing the adaptive capacity) and "cartesians" (representing efficient performance).

[27] Also see Dosi (1988, p. 235).

[28] For an overview of possible determinants of the level of entrepreneurship, see Wennekers (1997).

[29] These models will have to incorporate the two-way relationship between entrepreneurship and economic development. See Carree et al. (1999).

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