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for economic growth**

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# Understanding the role of entrepreneurship for economic growth

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## 1. Introduction

Throughout the first three-quarters of the last century, the economies of scale and scope present in production, distribution, management and R&D dictated increasing firm size (Chandler, 1990). Moreover, the growing but relatively low level of economic development went together with high price elasticities stimulating price competition that again favoured large scale production. Statistical evidence points towards an increasing presence and role of large enterprises in the economy during this period (Caves, 1982; Teece, 1993; Brock and Evans, 1989). This development towards large-scale activity was visible in most of the OECD countries (Audretsch, Thurik, Verheul and Wennekers, 2002). The importance of entrepreneurship and small business seemed to be fading. At the same time it was recognized that the small business sector was in need of protection for both social and political reasons, but not on the grounds of economic efficiency (Audretsch and Thurik, 2000).

Entrepreneurship and small business are related but far from synonymous concepts. On the one hand, entrepreneurial activity (defined for instance as behaviour concentrating on opportunities) may occur in both small and large businesses but also outside the business world (Stevenson and Gumpert, 1991; Low, 2001; Davidsson, 2004). On the other hand, small businesses can be a vehicle for both Schumpeterian entrepreneurs introducing new products and processes that change industry as well as for people who simply run and own a business for a living (Wennekers and Thurik, 1999). The latter group includes many franchisees, shopkeepers and people in professional occupations. The prominent example of entrepreneurship and small business overlapping is in the area of new, small and often fast growing businesses. During the first decades of the last century, small businesses were both a vehicle for entrepreneurship and a source of employment and income. This is the era in which Schumpeter (1934) wrote *The Theory of Economic Development*, emphasizing the role of the entrepreneur as prime cause of economic development. He describes how the innovating entrepreneur challenges incumbent firms by introducing new inventions that make current technologies and products obsolete. This process of

creative destruction is the main characteristic of what has been called the Schumpeter Mark I regime.

During the post-war years small business still mattered. It was obvious that this was less on the grounds of economic efficiency but more for social and political purposes. In a time when large firms had not yet gained the powerful position of the 1960s and 1970s, small businesses were the main supplier of employment and hence of social and political stability (Thurik and Wennekers, 2004). Scholars, such as Chandler (1977 and 1990), Galbraith (1956) and Schumpeter (1942), were convinced that the future was in the hands of large corporations and that small business would fade away as the victim of its own inefficiencies. Policy in the United States was divided between allowing for the demise of small business on economic grounds, on the one hand, and preserving at least some semblance of a small business sector for social and political reasons, on the other. It was argued that small business was essential to maintaining American democracy in the Jeffersonian tradition. The passage of the Robinson-Patman Act (providing some measure of protection to small independent retailers and their independent suppliers from possibly unfair competition from vertically integrated, multi-location chain stores) and creation of the United States Small Business Administration were policy responses to protect less-efficient small businesses and maintain their viability. These policy responses are typical for a Schumpeter Mark II regime. In *Capitalism, Socialism and Democracy*, Schumpeter (1942) focuses on innovative activities by large and established firms. He describes how large firms outperform their smaller counterparts in the innovation and appropriation process through a strong positive feedback loop from innovation to increased R&D activities. This process of creative accumulation is the main characteristic of the Schumpeter Mark II regime.

In Audretsch and Thurik (2004) the two Schumpeterian regimes are used in the framework of two broader concepts of economic organization: the *Managed* and the *Entrepreneurial Economies*. They introduce the concept of the *Managed Economy* that flourished for most of the last century. It was based on relative certainty in outputs, which consisted mainly of manufactured products, and in the traditional inputs of labour, capital and land. The joint effect of globalization and the ICT revolutions have drastically reduced the cost of shifting not just capital but also information out of the high-cost locations of Europe and into lower-cost locations around the globe. This means that economic activity in a high-cost location is no longer compatible with routinized tasks. Rather, globalization has shifted the comparative advantage of high-cost locations to knowledge-based activities, which cannot be transferred without cost around the globe. Knowledge as an input into economic activity is inherently different from land, capital and labour. It is characterized by high uncertainty, high asymmetries across people and is costly to transact. The response to a trend establishing knowledge as the main source of comparative advantage is the *Entrepreneurial Economy*. Audretsch and Thurik (2004) identify fifteen characteristics that differ between the *Entrepreneurial* and *Managed Economies* and provide a framework for understanding how the *Entrepreneurial Economy* fundamentally differs from the *Managed Economy*.

Entrepreneurship is an ill-defined, multidimensional, concept (Wennekers and Thurik, 1999, Table 4). This complicates the measurement of the extent of entrepreneurial activities and hence that of their impact on economic performance. Understanding their role in the process of growth requires a framework because there are various intermediate variables or linkages to explain how entrepreneurship influences economic growth (Carree and Thurik, 2003, Audretsch and Thurik, 2004 and Karlsson, Friis and Paulsson, 2005). The collection of articles in the present Handbook gives an image of the domain of the study of the consequences of entrepreneurship for economic growth. Before we present this collection in section 4 we first discuss the changes in the economy leading to the *Entrepreneurial Economy* in section 2 whereas in section 3 we distinguish between two frameworks of the impacts of entrepreneurial capital. One based upon

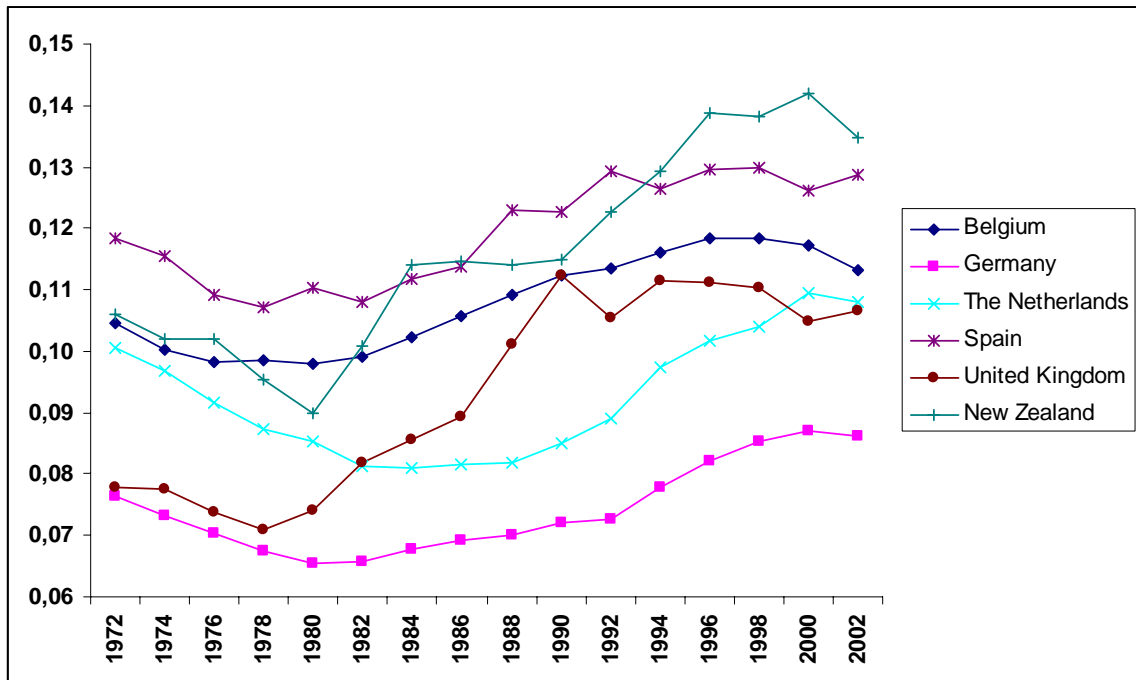
Carree and Thurik (2003) distinguishing between three entrepreneurial roles and one following Audretsch and Thurik (2004) distinguishing between three impacts of entrepreneurial capital.

In creating our collection of articles we went for originality and spread rather than tradition and reputation. This strategy allowed to go beyond the traditional A-journals and to give ample attention to recent material. The collection contains a selection of both theoretical contributions, mainly in the field of endogenous growth theory, and of empirical contributions. The collection also pays separate attention to two key intermediate variables, innovation and competition. The present collection complements that of Acs (1996) where a small business perspective rather than an entrepreneurship view is taken.

## 2. The re-emergence of entrepreneurship

In view of the general belief that large-scale production was driving out small firms, it seemed paradoxical when scholars first began to document that the inevitable demise of small business had not only stopped but that it even reversed. Following the work of Blau (1987); both Loveman and Sengenberger (1991) and Acs and Audretsch (1993) carried out international analyses of the re-emergence of small business and entrepreneurship in North America and Europe. Two major findings emerged from these studies. First, the relative importance of small business varies strongly across countries, and, secondly, in many European countries and North America the prevalence of small business increased in the last several decades.

The reversal of the trend away from large enterprises towards the re-emergence of small business started in North America in the late 1970s but was not limited to that part of the world. It was also seen in parts of Europe. A study by EIM (2002) documents how the relative importance of small firms in Europe (19 countries), measured in terms of employment shares, has continued to increase between 1988 and 2001. In a different study by Van Stel (2003) the development of the self-employment rates (defined in terms of business ownership rates) for 23 OECD countries is reported. See Figure 1 for the development of this rate in a selection of countries. A distinct U-shape can be observed for these countries. This may be interpreted as a manifestation of the change from the *Managed* to the *Entrepreneurial Economy*. In the first years of the 21<sup>st</sup> century, the upward trend started levelling off in such countries as the UK and the US. See Van Stel (2003) or Audretsch, Thurik, Verheul and Wennekers (2002) for precise data and figures of the US development. In the UK this levelling off may be due to policy measures favouring incumbent growth businesses rather than start-ups (Thurik, 2003). In the US this may be due to the shake out in industries that are in a more advanced stage than elsewhere in the area of modern OECD countries.

**Figure 1: Self-employment rates (business owners per workforce) in six OECD countries**

As the empirical evidence documenting the re-emergence of entrepreneurship increased, scholars began to look for explanations and to develop a theoretical basis. Carlsson (1989 and 1992) advances two explanations for the shift toward smallness in manufacturing industries. The first deals with fundamental changes in the world economy from the 1970s onwards. These changes relate to intensifying global competition, the increasing degree of uncertainty and market fragmentation. The second explanation deals with changes in the character of technological progress. Piore and Sable (1984) argue that the market instability of the 1970s resulted in the demise of mass production and promoted flexible specialization. This fundamental change in the path of technological development generated important diseconomies of scale. The shift away from large firms was not just confined to manufacturing industries. Brock and Evans (1989) show that this trend has occurred in more sectors of the economy in the United States. They provide four more reasons why this shift has occurred: the increase of labour supply leading to lower real wages and coinciding with an increasing level of education; changes in consumer tastes; relaxation of (entry) regulations and the current period of creative destruction (“Third Industrial Revolution”).

Loveman and Sengenberger (1991) stress the influence of two industrial restructuring trends: that of decentralization and vertical disintegration (the breaking up of large plants and businesses) as well as the formation of new business communities. These intermediate forms of market coordination flourish owing to declining costs of transaction. They also emphasize the role of public and private policies promoting the small business sector. Audretsch and Thurik (2000, 2001) explain the re-emergence of entrepreneurship in Europe and North America on the basis of increased globalisation, which has shifted the comparative advantage of economically advanced countries towards knowledge-based economic activity.

### 3. Consequences of entrepreneurship

The causes of the shift are one domain. Its consequences also cover a broad area of research. For example, Acs (1992) distinguishes four consequences of the increased importance of small firms: a vehicle for entrepreneurship, routes of innovation, industry dynamics and job generation. Baumol (1993) 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 by Acs and Audretsch (1990) and Audretsch (1995). A discussion of the relation between the role of small firms and industry dynamics can be found in Audretsch (1995). Acs and Armington (2004) and Foelster (2000) are examples of studies of job generation. The Global Entrepreneurship Monitor (GEM) project has recently made internationally comparable data on entrepreneurial activity available for research. In Reynolds et al. (2000, 2001 and 2002) growth and entrepreneurial activity are found to have a strong positive correlation. Using GEM data in the context of a model controlling for several alternative drivers of growth Stel, Carree and Thurik (2005) find that entrepreneurial activity affects economic growth, but that this effect depends upon the level of per capita income in that entrepreneurship has a negative impact on GDP growth for developing countries and a positive one for developed countries.

Audretsch and Keilbach (2004) emphasize that entrepreneurship capital may be a missing link in explaining variations in economic performance. An alternative and wider view of this missing link may be that it is the institutional fabric that makes the difference between high and low performance. For example, Saxenian (1990 and 1994) attributes the superior performance of Silicon Valley to a high capacity for promoting entrepreneurship. While entrepreneurs undertake a definitive action, i.e., they start a new business or introduce a new product, this action cannot be viewed in a vacuum devoid of context. Rather, as Audretsch, Thurik, Verheul and Thurik (2002) show, entrepreneurship is shaped by a number of forces and factors, including legal and institutional as well as cultural and social factors. The study of social capital and its impact on economic decision making and behaviour dates back to the classic economics and sociology literature where it is argued that social and relational structures influence market processes (Granovetter, 1985). Thorton and Flynne (2003) and Saxenian (1994) argue that entrepreneurial environments are characterized by thriving supportive networks that provide the institutional fabric linking individual entrepreneurs to organized sources of learning and resources.

Carree and Thurik (2003) focus on three entrepreneurial roles, emphasized by Schumpeter, Kirzner and Knight, respectively. The first is the role of innovator. Schumpeter 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). The second is the role of perceiving profit opportunities. We label this role as Kirznerian (or neo-Austrian) entrepreneurship (see for instance Kirzner, 1997). The third role is that of assuming the risk associated with uncertainty. This role can be called Knightian entrepreneurship. The Knightian entrepreneur has also been interpreted as the “neo-classical entrepreneur” (Shane, 2000). In the neo-classical (equilibrium) framework, entrepreneurship is explained by fundamental attributes of people (like “taste” for uncertainty). When an individual introduces a new product or starts a new firm, this can be interpreted as an entrepreneurial act in terms of each of the three types of entrepreneurship. The individual is an innovator, has perceived a hitherto unnoticed profit opportunity and takes the risk that the product or venture may turn out to be a failure. A lack of entrepreneurial activity or alertness is therefore directly connected to low rates of innovation, to unused profit opportunities and to risk-averse attitudes. These are important barriers for a healthy economic development.

Audretsch and Thurik (2004) distinguish three ways in which entrepreneurial capital affects growth. The first way is by creating knowledge spillovers. Romer (1986), Lucas (1988 and 1993) and Grossman and Helpman (1991) established that knowledge spillovers are an important

mechanism driving growth. Insight into the process of knowledge diffusion is important, especially since a policy implication commonly drawn from new economic growth theory is that, due to the increasing role of knowledge and the resulting increasing returns, knowledge factors, such as R&D, should be publicly supported. However, they shed little light on the actual mechanisms by which knowledge is transmitted across firms and individuals.

The literature identifying the creation of knowledge spillover mechanisms is underdeveloped. However, entrepreneurship is an important area where some of the transmission mechanisms have been identified. Cohen and Levinthal (1989) suggest that firms develop the capacity to adapt new technology and ideas developed in other firms and are therefore able to appropriate some of the returns accruing to investments in new knowledge made externally, i.e., outside their own organization. Audretsch (1995) proposes a shift in the unit of observation away from exogenously assumed firms towards individuals, such as scientists, engineers or other knowledge workers, i.e., agents with endowments of new economic knowledge. When the focus is shifted from the firm to the individual as the relevant unit of observation, the appropriability issue remains, but the question becomes: how can economic agents with a given endowment of new knowledge best appropriate the returns from that knowledge? In this spillover process, where a knowledge worker may exit the firm or university in order to create a new company, the knowledge production function is reversed. Knowledge is exogenous and embodied in a worker and the firm is created endogenously through the worker's effort to appropriate the value of his knowledge by way of innovative activity. Hence, entrepreneurship serves as a mechanism by which knowledge spills over to a new firm in which it is commercialised.

The second way in which entrepreneurship capital generates economic growth is through augmenting the number of enterprises and increasing competition. Jacobs (1969) and Porter (1990) argue that competition is more conducive to knowledge externalities than local monopolies. With local competition Jacobs (1969) is not referring to competition within product markets as traditionally envisioned by the industrial organization literature, but rather to the competition for new ideas embodied in economic agents. Not only does an increase in the number of firms enhance the competition for new ideas, but greater competition across firms also facilitates the entry of new firms specializing in a particular new product niche. This is because the necessary complementary inputs are more likely available from small specialist niche firms than from large, vertically integrated producers. Glaeser et al. (1992) as well as Feldman and Audretsch (1999) found empirical evidence supporting the hypothesis that an increase in competition within a city, as measured by the number of enterprises, is accompanied by higher growth performance of that city. Van Stel and Nieuwenhuijsen (2004) found that this competition effect may prevail in particular for manufacturing industries.

A third way in which entrepreneurship capital generates economic output is by providing diversity among firms (Cohen and Klepper, 1992). Not only does entrepreneurship capital generate a greater number of enterprises, it also increases the variety of enterprises in a certain location. There has been a series of theoretical arguments suggesting that the degree of diversity, as opposed to homogeneity, will influence the growth potential of a location.

The basis for linking diversity to economic performance is provided by Jacobs (1969), who argues that the most important sources of knowledge spillovers are external to the industry in which the firm operates and that cities are a source of considerable innovation because here the diversity of knowledge sources is greatest (Audretsch and Feldman, 1996; Jaffe, Trajtenberg and Henderson, 1993). According to Jacobs it is the exchange of complementary knowledge across diverse firms and economic agents that yields an important return on new economic knowledge. She develops a theory emphasizing the role of the geographic environment at promoting knowledge externalities which lead to innovative activity and economic growth. In this environment entrepreneurship capital can contribute to growth by injecting diversity and serving

as a conduit for knowledge spillovers, leading to increased competition. The entrepreneurial economy is characterized by a high reliance on this third role of entrepreneurship capital.

#### 4. The collection

The collection of twenty-three articles in this Handbook can be divided into six broad categories of subjects. The first group of articles can be described as providing a general introduction to the effect of entrepreneurial activity on economic growth and development. There are four papers selected in this category: Wennekers and Thurik (1999), Audretsch and Thurik (2004), Schumpeter (1961) and Holcombe (1998). The paper by Wennekers and Thurik gives an overview of how different kinds of entrepreneurship may influence economic progress and sketches a causal scheme relating several entrepreneurial aspects to macro-economic performance. Audretsch and Thurik concentrate on the entrepreneurial economy, building on their earlier work (Audretsch and Thurik, 2000). They show that this economy differs from the previous economy where progress was based upon economies of scale and scope (Chandler, 1990). It goes without saying that Joseph Schumpeter has been highly influential in our understanding of the role of entrepreneurs in technological and economic progress. We have incorporated the second chapter of *The Theory of Economic Development* in which the prominent role of entrepreneurial activity is explained. Holcombe (1998) provides a good overview of the role of the entrepreneur in economic development from an (neo)-Austrian viewpoint, combining insights from Kirzner and Schumpeter.

The second group of articles also deal with the general issue of the effect of entrepreneurial activity, and focus on historical and country-specific contexts. The four papers included are Baumol (1990), Eisenhardt and Forbes (1984), McMillan and Woodruff (2002) and Yu (1998). Baumol stresses the historical context and shows that entrepreneurial activity has not always had a productive contribution to economic welfare, has been on many occasions been unproductive or destructive. He shows how the institutional framework is crucial to have entrepreneurship positively impacting economic progress. Eisenhardt and Forbes provide an early contribution on the oft-cited Silicon Valley cluster of high-tech firms. They provide an international comparison of 'technical' entrepreneurship. McMillan and Woodruff deal with the importance of entrepreneurship in the transition economies. These formerly centrally planned economies have had little or no experience with entrepreneurial ventures, making the transition towards a capitalist economy more challenging. Yu studies entrepreneurial activity in Hong Kong, and especially deals with adaptive (Kirznerian) entrepreneurship (partly) explaining how the Hong Kong economy progresses over time.

The third group of articles deals with the issue of innovation. While Acs and Audrestch (1990) already provided ample evidence of small firms being an important source of innovative activity we will introduce three additional viewpoints: Cohen and Klepper (1992), Gifford (1998) and Prusa and Schmitz (1991). Cohen and Klepper discuss the trade-off for technological progress between an industry having many small firms or having a few large firms. On the one hand, the presence of many small firms guarantees variety of innovative approaches. On the other hand, large firms have the capacity to invest and make use of economies of scale in R&D (e.g. Klepper, 1996). Gifford investigates the issue of the allocation of entrepreneurial attention to different kinds of activity including innovation. The extent to which entrepreneurs have the ability and attention for innovative activities will be highly influential for future economic development. Prusa and Schmitz provide a short empirical example of small and new firms in the PC software industry being more likely than their larger and older counterparts to introduce radical innovation.



It is in line with the ideas on 'dynamic complementarity' as introduced by Rothwell (1983, 1984) suggesting different roles for small and large firm in the innovation process.

Consequences for growth is the common denominator of the fourth group of articles. The study of economic growth and development has radically altered since the introduction of endogenous growth models in the late 1980s (Romer, 1986 and Lucas, 1988). Elements of entrepreneurship and firm size distribution have been introduced into these growth models. Although mathematical tractability limits the way in which entrepreneurial activity can be incorporated, there have been some important contributions in this area. We have chosen to include six articles, namely Schmitz (1989), Howitt and Aghion (1998), Michelacci (2003), Iyigun and Owen (1999), Lloyd-Ellis and Bernhardt (2000) and Peretto (1998). Schmitz made an early contribution introducing one aspect of entrepreneurial activity (imitation) into an endogenous growth model. An interesting outcome is that the socially optimal rate of entrepreneurship is higher than the market equilibrium rate providing a rationale for policies promoting entrepreneurial activity. Howitt and Aghion extend upon their famous article of 1992 introducing a (mathematical) form of creative destruction into an endogenous growth framework. They add capital accumulation complementing the innovative element in achieving progress. Michelacci (2003) makes a case for entrepreneurship by investigating circumstances in which innovation should be promoted by encouraging entrepreneurship rather than research. His model shows that the growth process may stagnate because of the lack of entrepreneurial skills. The three papers by Iyigun and Owen, by Lloyd-Ellis and Bernhardt and by Peretto all consider the changing role of small versus large firms over the stages of economic development. Iyigun and Owen show that countries that initially have too little of either entrepreneurial or professional human capital may end up in a development trap. Lloyd-Ellis and Bernhardt as well as Peretto take more aspects of economic development into consideration. The former shows that the average firm size tends to increase through the first stages of development but then tends to decrease during the later stages. Peretto shows that there is an optimum (in terms of promoting progress) in the size distribution of firms, in line with the Cohen and Klepper (1992) paper.

It has been argued that the presence of new and small firms promotes competition which is often seen as stimulating economic growth. Competition is the central element in the fifth group of articles. Kirzner already argued that entrepreneurship and competition may be considered identical notions (see for a summary of these thoughts, Kirzner, 1997). We have included two contributions illustrating the role of competitive pressure on productivity growth: Nickell (1996) and Gort and Sung (1999). Nickell finds that competition measured by either number of competitors or by lower level of rent has a positive effect on productivity growth. Gort and Sung consider a special case: the U.S. telephone industry and also find confirmation for competition to boost productivity.

The final group of articles are four empirical contributions directly measuring the impact of entrepreneurial activity on economic performance: Carree et al. (2002), Acs and Armington (2004), Foelster (2000) and Audretsch and Keilbach (2004). Carree, van Stel, Thurik and Wennekers investigate whether countries that have a self-employment rate deviating from a 'natural' rate given the level of economic development suffer in terms of economic performance. They find confirmation of a growth penalty to exist for these countries. Countries may have too high self-employment rates (e.g. Italy) or too low self-employment rates (e.g. Scandinavian countries). See also Audretsch et al. (2002) showing that deviating from an "optimal" economy-wide small firm presence may negatively influence subsequent economic growth. Acs and Armington find evidence for U.S. Local Market Area data that the level of entrepreneurial activity has a positive effect on the employment growth rate. Foelster uses Swedish data for the 1976-1995 period and finds that self-employment has a positive effect on total employment. Lastly, Audretsch and Keilbach introduce the factor of entrepreneurship capital and find evidence for German regions that this positively influences productivity.

## 5. References (\*are part of the current collection)

- Acs, Z.J. (1992), Small business economics; a global perspective, *Challenge* 35, 38-44.
- Acs, Z.J. (1996), *Small Firms and Economic Growth*, The International Library of Critical Writings in Economics 61, Cheltenham, UK/Brookfield, US: Edward Elgar Publishing Limited.
- \*Acs, Z.J. and C. Armington (2004), Employment growth and entrepreneurial activity in cities, *Regional Studies* 38, 911-927.
- Acs, Z.J. and D.B. Audretsch (1990), *Innovation and Small Firms*, Cambridge, MA: MIT Press.
- Acs, Z.J. and D.B. Audretsch (1993), Conclusion, in *Small Firms and Entrepreneurship; an East-West Perspective*, Z.J. Acs and D.B. Audretsch (eds.), Cambridge, UK: Cambridge University Press.
- Aghion, P. and P. Howitt (1992), A model of growth through creative destruction, *Econometrica* 60, 323-351.
- Audretsch, D.B. (1995), *Innovation and Industry Evolution*, Cambridge, MA: MIT Press.
- Audretsch, D.B. M.A. Carree, A.J. van Stel and A.R. Thurik (2002), Impeded industrial restructuring: the growth penalty, *Kyklos* 55(1), 81-97.
- Audretsch, D.B., M.A. Carree and A.R. Thurik (2001), Does entrepreneurship reduce unemployment? Tinbergen Institute Discussion Paper TI 2001-074/3, Rotterdam: Tinbergen Institute.
- Audretsch, D.B. and M.P. Feldman (1996), R&D spillovers and the geography of innovation and production, *American Economic Review* 86(3), 630-640.
- \*Audretsch, D.B. and M. Keilbach (2004), Entrepreneurship capital and economic performance, *Regional Studies* 38, 949-959.
- Audretsch, D.B. and A. R. Thurik (2000), Capitalism and democracy in the 21<sup>st</sup> century: from the managed to the entrepreneurial economy, *Journal of Evolutionary Economics* 10, 17-34.
- Audretsch, D.B. and A.R. Thurik (2001), What is new about the new economy: sources of growth in the managed and entrepreneurial economies, *Industrial and Corporate Change* 19, 795-821.
- \*Audretsch, D. and R. Thurik (2004), A model of the entrepreneurial economy, *International Journal of Entrepreneurship Education* 2(2), 143-166.
- Audretsch, D.B., A.R. Thurik, I. Verheul and A.R.M. Wennekers (eds.) (2002), *Entrepreneurship: Determinants and Policy in a European - US Comparison*, Boston/Dordrecht: Kluwer Academic Publishers, 2002.
- \*Baumol, W.J. (1990), Entrepreneurship: productive, unproductive and destructive, *Journal of Political Economy* 98, 893-921.
- Baumol, W.J. (1993), *Entrepreneurship, Management and the Structure of Payoffs*, Cambridge, MA: MIT-Press.
- Blanchflower, D.G. (2000), Self-employment in OECD countries, *Labor Economics* 7, 471-505.
- Blau, D. (1987), A time series analysis of self-employment, *Journal of Political Economy* 95, 445-467.
- Brock, W.A. and D.S. Evans (1989), Small business economics, *Small Business Economics* 1(1), 7-20.
- Carlsson, B. (1989), The evolution of manufacturing technology and its impact on industrial structure: an international study, *Small Business Economics* 1(1), 21-38.
- Carlsson, B. (1992), The rise of small business; causes and consequences, in *Singular Europe, Economy and Policy of the European Community after 1992*, W.J. Adams (ed.), Ann Arbor, MI: University of Michigan Press, 145-169.
- \*Carree, M., A. van Stel, R. Thurik and S. Wennekers (2002), Economic development and business ownership: an analysis using data of 23 OECD countries in the period 1976-1996, *Small Business Economics* 19, 271-290.
- Carree, M.A. and A.R. Thurik (2003), The impact of entrepreneurship on economic growth, in *Handbook of Entrepreneurship Research*, D.B. Audretsch and Z.J. Acs (eds), Boston/Dordrecht: Kluwer Academic Publishers, 437-471.
- Caves, R. (1982), *Multinational Enterprise and Economic Analysis*, Cambridge: Cambridge University Press.
- Chandler, A.D. (1977), *The Visible Hand: The Managerial Revolution in American Business*, Cambridge, MA: Harvard University Press.
- Chandler, A.D. Jr. (1990), *Scale and Scope: The Dynamics of Industrial Capitalism*, Cambridge, MA: Harvard University Press.
- \*Cohen, W.M. and S. Klepper (1992), The trade-off between firm size and diversity in the pursuit of technological progress, *Small Business Economics* 4, 1-14.

- Cohen, W. and D. Levinthal (1989), Innovation and learning: the two faces of R&D, *Economic Journal* 99(3), 569-596.
- Davidsson, P. (2004), *Researching Entrepreneurship*, International Studies in Entrepreneurship, Boston/New York/Heidelberg/Dordrecht: Springer
- \*Eisenhardt, K.M. & Forbes, N. (1984). Technical entrepreneurship: an international perspective, *Colombia Journal of World Business*; Winter, 31-37.
- EIM (2002), *SMEs in Europe*, Report submitted to the Enterprise Directorate General of the EC by KPMG Special Services, Zoetermeer: EIM Business & Policy Research.
- Feldman, M.P. and D.B. Audretsch (1999), Innovation in cities: science-based diversity, specialization and localized monopoly, *European Economic Review* 43, 409-429.
- \*Foelster, S. (2000), Do entrepreneurs create jobs? *Small Business Economics* 14: 137-148.
- Galbraith, J.K. (1956), *American Capitalism: the Concept of Countervailing Power*, Boston: Houghton Mifflin Co.
- \*Gifford, S. (1998), Limited entrepreneurial attention and economic development, *Small Business Economics* 10, 17-30.
- Glaeser, E., Kallal, H., Scheinkman, J. and A. Shleifer (1992), Growth in cities, *Journal of Political Economy* 100, 1126-1152.
- \*Gort, M. and N. Sung (1999), Competition and productivity growth: the case of the U.S. telephone industry, *Economic Inquiry* 37, 678-691.
- Granovetter, M.S. (1985), Economic action and social structure: the problem of embeddedness, *American Journal of Sociology* 91(3), 481-510.
- Grossman, G.M. and Helpman, E. (1991), *Innovation and Growth in the Global Economy*, Cambridge, MA: MIT Press.
- \*Holcombe, R.G. (1998), Entrepreneurship and economic growth, *Quarterly Journal of Austrian Economics* 1, 45-62.
- \*Howitt, P. and P. Aghion (1998), Capital accumulation and innovation as complementary factors in long-run growth, *Journal of Economic Growth* 3, 111-130.
- \*Iyigun, M.F. and A.L. Owen (1999), Entrepreneurs, professionals, and growth, *Journal of Economic Growth* 4, 213-232.
- Jacobs, J. (1969), *The Economy of Cities*, New York: Vintage Books.
- Jaffe, A., Trajtenberg, M. and R. Henderson (1993), Geographic localization of knowledge spillovers as evidenced by patent citations, *Quarterly Journal of Economics* 63, 577-598.
- Karlsson, Ch., Ch. Friis and Th. Paulsson (2005), Relating entrepreneurship to economic growth, in: *The Emerging Digital Economy: Entrepreneurship, Clusters and Policy*, B. Johansson, Ch. Karlsson and R.R. Stough (eds), Berlin: Springer-Verlag, **forthcoming**.
- Kirzner, I.M. (1997), Entrepreneurial discovery and the competitive market process: an Austrian approach, *Journal of Economic Literature* 35, 60-85.
- Klepper, S. (1996), Entry, exit, growth, and innovation over the product life cycle, *American Economic Review* 86, 562-583.
- \*Lloyd-Ellis, H. and D. Bernhardt (2000), Enterprise, inequality and economic development, *Review of Economic Studies* 67, 147-168.
- Loveman, G. and W. Sengenberger (1991), The re-emergence of small-scale production; an international comparison, *Small Business Economics* 3(1), 1-37.
- Low, M.B. (2001), The adolescence of entrepreneurship research: specification of purpose, *Entrepreneurship: Theory and Practise*, June, 17-25.
- Lucas, R.E. (1988), On the mechanics of economic development, *Journal of Monetary Economics* 22, 3-39.
- Lucas, R.E. (1993), Making a miracle, *Econometrica* 61(2), 251-272.
- \*McMillan, J. and C. Woodruff (2002), The central role of entrepreneurs in transition economies, *Journal of Economic Perspectives* 16(3), 153-170.
- \*Michelacci, C. (2003), Low returns in R&D due to the lack of entrepreneurial skills, *Economic Journal* 113, 207-225.
- \*Nickell, S.J. (1996), Competition and corporate performance, *Journal of Political Economy* 104, 724-746.
- \*Peretto, P.F. (1998), Technological change, market rivalry, and the evolution of the capitalist engine of growth, *Journal of Economic Growth* 3, 53-80.

- Piore, M.J. and C.F. Sabel (1984), *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.
- Porter, M. (1990), *The Comparative Advantage of Nations*, New York: Free Press.
- \*Prusa, T.J. and J.A. Schmitz, Jr. (1991), Are new firms an important source of innovation? Evidence from the pc software industry, *Economics Letters* 35, 339-342.
- Reynolds, P.D., M. Hay, W.D. Bygrave, S.M. Camp and E. Autio (2000), *Global Entrepreneurship Monitor: 2000 Executive Report*, Kauffman Centre for Entrepreneurial Leadership at the Ewing Marion Kauffman Foundation.
- Reynolds, P.D., S.M. Camp, W.D. Bygrave, E. Autio and M. Hay (2001), *Global Entrepreneurship Monitor: 2001 Executive Report*, Kauffman Centre for Entrepreneurial Leadership at the Ewing Marion Kauffman Foundation.
- Reynolds, P.D., W.D. Bygrave, E. Autio, L.W. Cox and M. Hay (2002), *Global Entrepreneurship Monitor: 2002 Executive Report*, Ewing Marion Kauffman Foundation.
- Romer, P.M. (1986), Increasing returns and long-run growth, *Journal of Political Economy* 94(5), 1002-1037.
- Rothwell, R. (1983), Innovation and firm size: A case of dynamic complementarity; Or, is small really so beautiful? *Journal of General Management* 8, 5-25.
- Rothwell, R. (1984), The role of small firms in the emergence of new technologies, *OMEGA* 12, 19-29.
- Shane, S. (2000), Prior knowledge and the discovery of entrepreneurial opportunities, *Organization Science* 11, 448-469.
- Saxenian, A. (1994), *Regional Advantage*, Cambridge, MA: Harvard University Press.
- Saxenian, A. (1990), Regional networks and the resurgence of Silicon Valley, *California Management Review* 33, 89-111.
- \*Schmitz, Jr., J.A. (1989), Imitation, entrepreneurship, and long-run growth, *Journal of Political Economy* 97, 721-739.
- \*Schumpeter, J.A. (1961), The fundamental phenomenon of economic development, Chapter II of *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*, New York: Oxford University Press, 57 - 94.
- Schumpeter, J.A. (1934), *The Theory of Economic Development*, Cambridge, MA: Harvard University Press (originally published in 1912).
- Schumpeter, J.A. (1942), *Capitalism, Socialism and Democracy*, New York: Harper and Row.
- Stel, A.J. van (2003), COMPENDIA 2000.2: a harmonized data set of business ownership rates in 23 OECD countries, EIM Research Report H200302, Zoetermeer: EIM Business and Policy Research.
- Stel, A.J. van and H.R. Nieuwenhuijsen (2004), Knowledge spillovers and economic growth: an analysis using data of Dutch regions in the period 1987-1995, *Regional Studies* 38, 393-407.
- Stel, A.J. van, M.A. Carree and A.R. Thurik (2005), The effect of entrepreneurial activity on national economic growth, *Small Business Economics*, forthcoming.
- Stevenson, H.H. and D.E. Gumpert (1991), The heart of entrepreneurship, in: W.A. Sahlman and H.H. Stevenson (eds), *The Entrepreneurial Venture*, Boston: McGraw-Hill.
- Teece, D.J. (1993), The dynamics of industrial capitalism: perspectives on Alfred Chandler's "Scale and Scope", *Journal of Economic Literature* 31, 199-225.
- Thorton, P.H. and K.H. Flynne (2003), Entrepreneurship, networks and geographies, in: Z.J. Acs and D.B. Audretsch (eds.), *Handbook of Entrepreneurship Research*, Boston/Dordrecht: Kluwer Academic Publishers, 401-433.
- Thurik, A.R. (2003), Entrepreneurship and unemployment in the UK, *Scottish Journal of Political Economy* 50(3), 264-290.
- Thurik, A.R. and S. Wennekers (2004), Entrepreneurship, small business and economic growth, *Journal of Small Business and Enterprise Development* 11(1), 140-149.
- \*Wennekers, S. and A.R. Thurik (1999), Linking entrepreneurship and economic growth, *Small Business Economics* 13, nr. 1, 27-55.
- \*Yu, T.F. (1998), Adaptive entrepreneurship and the economic development of Hong Kong, *World Development* 26, 897-911.